

# Harris 1

## 3Q/2010 Plant Inspection Findings

---

### Initiating Events

**Significance:** G Jun 30, 2010

Identified By: Self-Revealing

Item Type: FIN Finding

#### **Reactor Trip due to Failing to Properly Assemble an Oil Filter in the Hydrogen Seal Oil System**

Green. A self-revealing Green finding was identified for the licensee's failure to follow Work Control Management procedure WCM-006, Graded Approach to Planning and Scheduling, which has requirements that would have ensured the proper rebuild of the oil filter assembly in the hydrogen seal oil (HSO) system. Specifically, this resulted in inadequate maintenance on the filter assembly which caused the handle of the assembly to eject during power operations, causing an oil spill which necessitated a manual reactor trip. The licensee entered this issue into the CAP as Action Request (AR) #366174. The licensee took corrective action to replace the oil filter assembly, as well as clean and replace the spilled oil. Additionally, the licensee reviewed both completed and upcoming work orders to verify they were properly classified based upon potential impact on plant operations.

The licensee's failure to follow WCM-006 requirements which resulted in the improper rebuild of the oil filter assembly in the HSO system was identified as a performance deficiency. The finding was determined to be more than minor because it was associated with the procedure quality attribute of the initiating events cornerstone and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions. Specifically, the performance deficiency resulted in an initiating event causing a manual reactor trip and the possibility of an oil fire in the vicinity of the offsite power electrical supply ducts. Using IMC 0609, "Significance Determination Process," Phase 1 Worksheet, the inspectors concluded that a Phase 2 evaluation was required since the finding contributed to both the likelihood of a reactor trip and the likelihood that mitigating systems would not have been available. This conclusion was based upon the potential for the spilled oil to ignite in a location that could have challenged the offsite electrical power supply bus ducts following the reactor trip. A regional Senior Reactor Analyst completed a Phase 3 evaluation under the Significance Determination Process. The performance deficiency was characterized as of very low safety significance (Green) based upon the results of this evaluation. The dominant accident sequence involved the postulation of oil igniting in the spill zone. Once ignited, suppression efforts were unsuccessful, causing the loss of the turbine building and a loss of offsite power. Given this damage state, recovery of offsite power was not considered credible. Subsequently, it was postulated that the emergency diesel generators failed which ultimately led to a loss of core cooling and core damage. The finding has a cross cutting aspect of Work Planning, as described in the Work Control component of the Human Performance cross-cutting area because the failure to correctly classify the work package as "Quality Critical" resulted in not correctly mitigating the risk associated with working on this equipment by including additional guidance to assist the technicians in completing the work successfully (H.3(a))

Inspection Report# : [2010003](#) (*pdf*)

**Significance:** SL-IV Mar 31, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Failure to Submit a Licensee Event Report for a Condition Prohibited by Technical Specifications Associated with the "B" Emergency Service Water Discharge Valve**

The inspectors identified a Severity Level IV, non-cited violation (NCV) of 10 CFR 50.73(a)(2)(i)(B) due to the licensee's failure to recognize that the inability of the "B" Emergency Service Water (ESW) Discharge Valve (1SW-271) to open on the start of "B" ESW pump caused a reportable condition. Consequently, the licensee failed to submit a licensee event report (LER) within 60 days as required by 10 CFR 50.73. The licensee entered this issue into the corrective action program (CAP) as Action Request (AR) #361821 and AR #358062. The licensee took corrective action by reporting this event in LER 05000400/2010-001, Clearance Error Results in Equipment Becoming Inoperable.

The licensee's failure to recognize that the inability of 1SW-271 to open caused a reportable condition and submit an LER as required by 10 CFR 50.73 was a performance deficiency. This issue was dispositioned as traditional enforcement, instead of the Significance Determination Process, because it had the potential for impacting the NRC's ability to perform its regulatory function. However, because this violation was of very low safety significance, was not repetitive or willful, and was entered into the licensee's CAP as AR #361821 and AR #358062, the NRC has characterized the significance of this violation as a Severity Level IV NCV in accordance with section IV.A.3 and supplement I of the NRC Enforcement Policy. The cause of this event was directly related to the cross-cutting aspect in the area of problem identification and resolution within the CAP component because the licensee did not adequately evaluate the need to submit an LER per the requirements of 10 CFR 50.73. (P.1(c))

Inspection Report# : [2010002](#) (pdf)

---

## Mitigating Systems

**Significance:**  Jun 30, 2010

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **Failure to Follow Procedure to Install the Load Block 5 Auxiliary Relay**

Green. A self-revealing Green NCV of TS 6.8.1, Procedures, was identified for the licensee's failure to follow procedure PIC-E069, Sequencer Electomechanical Timing Relays; D.C. Pick-Up, D.C. Drop-Out, A.C. Pick-Up, and A.C. Drop-Out. Specifically, the licensee failed to properly reinstall the Load Block 5 Auxiliary Relay, resulting in the automatic start of "B" Motor Driven Auxiliary Feedwater (MDAFW) pump and water flowing to all three steam generators. Operators immediately secured the "B" MDAFW pump. The licensee entered this issue into their corrective action program (CAP) as action request (AR) #381672. As corrective action, the licensee removed and correctly installed the relay followed by a successful post maintenance test. Additionally, the licensee plans to revise ADM-NGGC-0104, Work Management Process, to require the work implementer to specify which mitigating actions and/or human performance barriers will be used for critical steps.

The failure to follow procedure PIC-E069 section 7.6 for the restoration of the load block 5 auxiliary relay was a performance deficiency. The violation was more than minor because it is associated with the procedure quality attribute of the Mitigating Systems cornerstone, and it 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). Specifically, it resulted in the automatic start of the "B" MDAFW pump and water flowing to all three steam generators. Using IMC 0609, "Significance Determination Process," Phase 1 screening worksheet of the SDP this finding was determined to be of very low safety significance because it was not a design or qualification deficiency confirmed to result in a loss of operability or functionality, did not represent a loss of system safety function, did not result in a loss of safety system function for a single train for greater than TS allowed outage time, did not result in a loss of safety function of one or more non-TS trains of equipment designated as risk-significant for greater than 24 hours, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. The finding has a cross-cutting aspect of Human error prevention, as described in the Work Practices component of the Human Performance cross-cutting area because the licensee did not apply sufficient human error prevention tools to ensure the correct installation of the relay (H.4(a))

Inspection Report# : [2010003](#) (pdf)

**Significance:**  Mar 31, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Promptly Evaluate Operating Experience and Identify Potential Steam Voiding as a Condition Adverse to Quality**

The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action, when the licensee failed to promptly evaluate operating experience (OE) received October 22, 2008 and identify potential steam voiding in the residual heat removal (RHR) system as a condition adverse to quality. During the evaluation, which

was not completed until July 16, 2009, the licensee learned that the suction lines for the RHR pumps are susceptible to steam voiding at temperatures as low as 240°F. If the steam void flowed to an RHR pump, that pump could fail causing the associated train of the Emergency Core Cooling System (ECCS) to fail. The delay in evaluating the OE resulted in a delay of determining and implementing appropriate corrective actions. Specifically, the failure to promptly evaluate this OE enabled the licensee to violate Technical Specification (TS) 3.0.4 when the plant transitioned from Mode 4 to Mode 1 with only one operable train of ECCS after refueling outage (RFO) 15 on May 9, 2009. The licensee entered this issue into the CAP as AR #345425. The licensee took corrective action by changing procedures to avoid exposing the suction lines to excessive temperatures during Modes when it is required to be operable for ECCS, thereby preventing potential steam voiding.

The inspectors determined that the failure to promptly evaluate OE received on October 22, 2008, and identify potential steam voiding as condition adverse to quality was a performance deficiency. The performance deficiency was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems Cornerstone and it adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, it could have potentially caused one or more RHR pumps and associated ECCS trains to be inoperable due to steam voiding. Using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," Phase 1 Worksheet, the inspectors concluded that a Phase 2 evaluation was required because this finding represented a potential loss of safety function of the RHR system. The inspectors performed a Phase 2 analysis using IMC 0609 Appendix A, "Determining the Safety Significance of Reactor Inspection Findings for At-Power Situations" and the site specific risk informed inspection notebook. Due to the site specific risk informed inspection notebook not containing appropriate target sets to accurately estimate the risk input of the finding, it was determined that a Phase 3 analysis was required. A regional Senior Reactor Analyst performed the Phase 3 evaluation and concluded the finding was of very low safety significance (Green). The NRC's most current Standardized Plant Analysis Risk Model was used for the evaluation. The evaluation assumed that the "B" RHR Pump always failed to start for the exposure time of seventy hours. Also, there was a potential increase in the common cause failure of the RHR pumps. The dominant accident sequence was a postulated Small Break LOCA with initial success of the ECCS via High Pressure Injection, but the ECCS failed in the recirculation mode. The SDP performed for this violation considered the potential loss of safety function of the RHR system and therefore bounded all violations described in LER 05000400/2009-002 which is further discussed in Section 4OA3.2. This finding was determined to have a cross-cutting aspect in the OE component of the Problem Identification and Resolution area, in that the licensee failed to evaluate OE in a timely manner (P.2(a))  
Inspection Report# : [2010002](#) (pdf)

**Significance:** G Mar 31, 2010

Identified By: NRC

Item Type: NCV NonCited Violation

#### **"A" ESW Pump Power Supply Cables Submerged in Water**

The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," in that the licensee failed to maintain the "A" ESW pump power cables in an environment for which they were designed. Specifically, the cables were submerged in water in manway 73B-SA, a condition for which they were not qualified. The licensee entered this issue into the CAP as AR #376709. As immediate corrective action, the licensee pumped the manway dry.

The inspectors determined that the failure to ensure that the "A" ESW pump power cables were maintained in an environment for which they were designed was a performance deficiency. The finding was more than minor because, if left uncorrected, it had the potential to lead to a more significant safety concern. Specifically, it could have caused the "A" ESW pump to become inoperable in the event that the cable failed due to long term degradation as a result of continuous submergence. The finding affected the equipment performance attribute of the Mitigating Systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors evaluated the significance of this finding using IMC 0609, "Significance Determination Process," Phase 1 Worksheet. The finding was of very low safety significance because it was a qualification deficiency that did not result in a loss of operability. This finding was determined to have a cross-cutting aspect in the CAP component of the Problem Identification and Resolution area associated with timely and effective corrective actions (P.1(d))

**Significance:**  Dec 31, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Properly Install Spot Type Smoke Detectors**

The inspectors identified a Green NCV of the Shearon Harris Nuclear Power Plant Operating License condition 2.F, Fire Protection Program, for failing to correctly install spot type smoke detectors between four and twelve inches down from the ceiling to the top of the detector as required by National Fire Protection Association (NFPA) 72E, Automatic Fire Detectors. Specifically, it was determined that eight spot type smoke detectors are installed approximately five feet below the ceiling in the plant's Computer Room. The licensee took immediate corrective action by initiating compensatory fire watches. The licensee entered this into the corrective action program (CAP) as Action Request (AR) #363555.

The finding was determined to be more than minor because it affected the Mitigating Systems Cornerstone objective of availability, reliability, and capability of the fixed fire detection system and was associated with the protection against external factors (fire) attribute. Specifically, this failure could affect the timeliness of response to a fire due to the delayed detection of smoke and resulting alarm, allowing the fire to grow larger prior to the fire brigade taking action. Using MC 0609, Appendix F, it was determined that this issue was in the category of fixed fire protection systems which had moderate degradation due to the fact that the system would function, although delayed. Further, it was determined that this issue was a Fire Damage State Zero (FDS0). As such, only the fire ignition source and initiating fuels are damaged by the fire. FDS0 is not analyzed in the fire protection SDP as a risk contributor and is therefore of very low safety significance (Green). Due to the fact that this condition has been present since initial installation during plant construction, it was determined that this was not indicative of current licensee performance and therefore no cross-cutting aspect was identified.

---

## **Barrier Integrity**

**Significance:**  Oct 02, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Preclude Repetition of a Significant Condition Adverse to Quality for Both Containment Spray Additive System Eductors Being Outside of the Technical Specification Flow Band**

The team identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for the licensee's failure to identify the cause and take corrective actions to preclude repetition of a significant condition adverse to quality for both containment spray additive system eductors being outside of the technical specification flow band. Specifically, between July 2009 and the present, the violation occurred when Eductor A was found three times and Eductor B was found once outside of the Technical Specification 3.6.2.2 flow band. This issue was previously identified as a significant condition adverse to quality in January 2008, but the corrective actions taken failed to preclude repetition. The licensee entered this issue into the corrective action program as nuclear condition report 356873. The licensee took immediate corrective actions to throttle the eductor flow to within the band, and is developing corrective actions to preclude repetition.

The finding is more than minor because it is associated with the design control attribute of the Barrier Integrity Cornerstone and affects the cornerstone objective of providing reasonable assurance that physical design barriers, such as the iodine scrubbing capability of the containment spray additive system eductors, will protect the public from radionuclide releases caused by accidents or events. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to have a very low safety significance because it did not represent a degradation of the radiological barrier function provided for the control room, auxiliary building, or spent fuel pool; the finding did not represent a degradation of the barrier function of the control room against smoke or a toxic atmosphere; the finding did not represent an actual open pathway in the physical integrity of reactor containment; and the finding did not involve an actual reduction in function of the hydrogen igniters in the reactor

containment. The finding had a cross-cutting aspect in the area of problem identification and resolution associated with the corrective action program because the licensee did not thoroughly evaluate problems such that the resolutions address causes and extent of conditions, as necessary, and for significant problems, conduct effectiveness reviews of corrective actions to ensure that the problems are resolved (P.1(c))

Inspection Report# : [2009006](#) (pdf)

**Significance:**  Oct 02, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Correct a Condition Adverse to Quality Involving a Main Steam Isolation Valve Degrading Trend Before Valve Failure**

The team identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for the licensee's failure to correct a condition adverse to quality in a timely manner. Specifically, between May 27, 1997 and September 29, 2007, Main Steam Isolation Valve 82 close stroke time exhibited a condition adverse to quality for a trend degrading towards the technical specification limit, without sufficient corrective actions to prevent failure. This resulted in Main Steam Isolation Valve 82 exceeding the five-second stroke time limit required in Technical Specification 3.7.1.5. The licensee entered this issue into the corrective action program as nuclear condition report 358464.

This finding is more than minor because it is associated with the containment barrier performance attribute of the Barrier Integrity Cornerstone and affects the cornerstone objective of providing reasonable assurance that physical design barriers, such as the main steam isolation valve radiological release barrier required for a steam generator tube rupture, protect the public from radionuclide releases caused by accidents or events. Using Manual Chapter 0609.04, "Phase 1 – Initial Screening and Characterization of Findings," the finding was determined to have a very low safety significance because it did not represent a degradation of the radiological barrier function provided for the control room, auxiliary building, or spent fuel pool; the finding did not represent a degradation of the barrier function of the control room against smoke or a toxic atmosphere; the finding did not represent an actual open pathway in the physical integrity of reactor containment; and the finding did not involve an actual reduction in function of the hydrogen igniters in the reactor containment. This finding had a cross-cutting aspect in the area of human performance associated with decisionmaking because the licensee did not use conservative assumptions so that safety-significant decisions were verified to validate underlying assumptions and identify unintended consequences (H.1.(b))

Inspection Report# : [2009006](#) (pdf)

---

## **Emergency Preparedness**

---

## **Occupational Radiation Safety**

---

## **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

Last modified : November 29, 2010