

Surry 1

3Q/2009 Plant Inspection Findings

Initiating Events

Significance:  Dec 31, 2008

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Inadequate Work Instructions Result in Actuation of Unit 1 Safety Injection Train B.

A Green self-revealing non-cited violation (NCV) of Technical Specification 6.4.A.7 was identified for failure to provide adequate work instructions for corrective maintenance on the safety injection (SI) system. The inadequate work instructions led to an inadvertent actuation of the Unit 1 B train of safety injection on October 29, 2008. Control room operators terminated the invalid actuation within two minutes. The licensee entered the deficiency into the corrective action program for resolution (CR 116664). The proposed corrective actions to establish a response procedure for an inadvertent SI actuation and to provide guidance/restrictions in the work planning process to assure appropriate reviews are obtained, commensurate with the safety significance of the work, appear appropriate.

The finding is greater than minor because it had an actual impact by causing a SI and if left uncorrected could lead to a more significant safety issue. The finding is associated with the human performance attribute of the Reactor Safety Initiating Events cornerstone and adversely affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The finding was determined to be of very low safety significance (Green) based on a Phase 3 SDP analyses performed by a regional Senior Reactor Analyst. The analysis was accomplished by increasing the initiating event frequency for a stuck open power operated relief valve (PORV) by one order of magnitude and solving the applicable accident sequences, two of which were Green.

This finding had a cross-cutting aspect in the area of human performance, decision making, because the decision to continue with the planned work was made without a complete understanding of either the effects of the job steps or the worst case possible unintended consequences (H.1(b)). (Section 40A3)

Inspection Report# : [2008005](#) (*pdf*)

Significance:  Dec 31, 2008

Identified By: Self-Revealing

Item Type: FIN Finding

Inadequate Review of Vendor Information Led to Unit 1 Manual Reactor Trip.

A Green self-revealing Finding was identified for failure to perform an adequate review of the vendor's recommended balance moves for the Unit 1 main turbine. As a result, an improper balance move was made to the Unit 1 main turbine during the April forced outage which caused high turbine vibrations that required the insertion of a manual turbine and reactor trip during the startup on April 20, 2008. A violation of regulatory requirements was not identified. The licensee entered the deficiency with the work instructions into the corrective action program for resolution (CR 096233). The corrective actions to correct the balance move, implement peer review requirements, and procedural changes that require specifying the detailed location and weight for balance moves with an independent verification appear adequate.

The finding is greater than minor because it had an actual impact, it led to a plant trip, and is associated with the human performance attribute of the Reactor Safety Initiating Events cornerstone and adversely affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The finding, evaluated per Attachment 4 of the SDP, screened

to very low safety significance (Green) because it did not contribute to both an initiating event and the likelihood of a loss of mitigating equipment or functions.

The cause of the finding is related to the cross-cutting element of human performance work practices. Human error prevention techniques such as peer checks were not invoked by the licensee (H.4(a)). (Section 40A3)

Inspection Report# : [2008005](#) (*pdf*)

Mitigating Systems

Significance:  Sep 30, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Compensatory Measures for the Impairment of Fire Detection Systems

The inspectors identified a Green NCV of the Surry operating license, section 3.1 "Fire Protection," for an inadequate procedure that resulted in compensatory continuous fire watches in MERs #3 and #4 being inadequate (CR342078). Corrective action, revising the requirements for a continuous fire watch, has been implemented. The finding is greater than minor because it is associated with the reactor safety mitigating systems cornerstone attribute to provide protection against external events and adversely affects the cornerstone objective to ensure the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors used MC 0609, Appendix F, "Fire Protection Significance Determination Process," to analyze this finding because the condition had an adverse affect on the "Fixed Fire Protection Systems" element of fire watches posted as a compensatory measure for fixed fire protection system outages or degradations. A low degradation rating was assigned to this finding as the provision affected by this finding is expected to display nearly the same level of effectiveness and reliability. Using MC 0609, Appendix F, this finding was determined to be of very low safety significance (Green). A cross-cutting aspect was not assigned to this finding because the performance deficiency for the inadequate procedure occurred long ago and is not a reflection of current performance (Section 1R05)

Inspection Report# : [2009004](#) (*pdf*)

Significance:  Sep 30, 2009

Identified By: NRC

Item Type: FIN Finding

Failure to Provide an Adequate Basis for Operability of ESW Pump !-SW-P-1B.

The inspectors identified a Green finding for the incorrect operability determination for emergency service water pump 1-SW-P-1B on August 1, 2009, after vibrations had increased 391% in the vertical plane (CR 343396). A violation of regulatory requirements was not identified. The pump, declared inoperable on August 2, was replaced within the Technical Specification allowed outage time.

The finding is more than minor because if left uncorrected the performance deficiency could potentially lead to more significant safety concerns. The finding is associated with the equipment performance attribute of the mitigation systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding, evaluated per MC-609, Attachment 4, "Phase 1-Initial Screening and Characterization of Findings," was determined to be of very low safety significance (Green) because it did not result in a loss of safety function or the loss of a single train of ESW for greater than the allowed outage time. This finding has a cross-cutting aspect in the area of human performance, decision making, because the licensee failed to use conservative assumptions in their operability decision for !-SW-P-1B (H.1.b). (Section 1R15)

Inspection Report# : [2009004](#) (*pdf*)

Significance:  Sep 30, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Tornado Protection for Engine Driven Emergency Service Water Pumps 1-SW-P-1A/B/C

The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion III, "Design Control". The design change for the emergency service water pumps (DC-SU-08-0001) was not adequate to protect the diesel-driven emergency service water pumps from damage resulting from a tornado missile as required by the UFSAR (CRs 337720, 337337, 341557). Pending resolution, interim compensatory measures have been established to provide assurance the pumps will be capable of performing their safety function.

The finding, associated with the design control attribute of the mitigation systems cornerstone, is more than minor because it adversely affected the cornerstone objective of ensuring the availability, reliability and capability of systems that evaluated per MC-0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At-power Situations," was determined to be of very low safety significance (Green) because of the extremely low initiating event frequency for a tornado. A phase III risk analysis was performed because the finding screened potentially risk significant for a severe weather initiating event. This finding has a cross-cutting aspect in the area of human performance resources, because the licensee's design documentation for DC SU-08-0001 and ET-S-08-0032 was not complete and accurate which led to the installation of inadequate modifications on ESWPs 1-SW-P-1A/1B/1C (H.2.c)(Section 1R18)

Inspection Report# : [2009004](#) (pdf)

Significance:  Sep 30, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Work Instructions Lead to Packing Failure of ESW Pump 1-SW-P-1B.

A self-revealing Green NCV of Technical Specification 6.4, "Unit Operating Procedures and Programs," was identified for the failure to provide adequate work instructions for maintenance on 1-SW-P-1B, a safety-related component, which led to failure of the pump's packing gland on August 26, 2009, and required the pump be removed from service and repacked (CR 346268).

The finding is associated with the equipment performance attribute of the mitigation systems cornerstone and is more than minor because it adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding, evaluated per MC-0609, Attachment 4, "Phase 1- Initial Screening and Characterization of Findings" was determined to be of very low safety significance (green) because it did not result in a loss of safety function or loss of a single train of ESW for more than its allowed outage time. This finding has a cross-cutting aspect in the area of human performance, resources, in that a complete and accurate procedure was not available to assure nuclear safety during replacement of 1-Sw-P-1B (H.2.c) (Section 1R19)

Inspection Report# : [2009004](#) (pdf)

Significance:  Sep 30, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Promptly Identify and Correct a Ground on Safety Bus 1H

A green NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," was identified by the inspectors for failure to promptly identify and correct a condition adverse to quality related to a ground on emergency safety bus 1H. This resulted in the degraded condition being allowed to exist for 72 days prior to de-energizing the containment recirculation fan and correcting the adverse condition (CR 336041).

This finding is more than minor because it adversely impacted the equipment performance attribute of the reactor safety mitigation system cornerstone and its objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding, evaluated per MC-0609, Appendix A, "Determining the Significance of Reactor Inspection Findings for At-power Situations," was determined to be of very low safety significance (Green). The finding screened to a phase II assessment on the assumption that a second ground would result in a complete loss of the safety bus and its safety function. The phase II analysis was performed for the core damage sequence "Loss of a 4.16Kv Bus (1J or 1H)" utilizing an increased initiating event likelihood (IEL) value of 1 due to the degraded condition of the 1H bus. The duration of the degraded condition was 72 days. The

finding was not greater than Green because full mitigation capability of the opposite train remained available. This finding has a cross cutting aspect in human performance, decision making, in that the licensee did not use conservative assumption in their decision making process and adopt a requirement to demonstrate that the proposed action is safe in order to proceed rather than to demonstrate that it is unsafe in order to disapprove the action of continuing to operate with a ground on the 1H emergency bus (H.1.b) (Section 4OA2).

Inspection Report# : [2009004](#) (pdf)

Significance:  Sep 30, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

Ineffective Action for ELU Performance Deficiencies

The inspectors identified a Green NCV of Surry Operating Licenses, Section 3.1 "Fire Protection," for failure to promptly identify and correct a condition adverse to fire protection in regard to Appendix R emergency lighting unit performance failures due to inadequate configuration control of the emergency light's defeat switch. Failure to reposition the switch following maintenance and or inadvertent switch manipulation has over time led to numerous Appendix R emergency lights being discovered non-functional. Corrective action to address the failure to restore the switch following maintenance has been taken and actions to prevent inadvertent manipulation are being evaluated (CR 352214).

The finding is more than minor because it adversely affected the external factors attribute (fire) of the mitigating system cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the reliability and availability of the emergency lighting units (ELUs) was affected. The finding, evaluated per MC-0609, Appendix F, "Fire Protection Significance Determination Process," was determined to be of very low safety significance (Green). The finding affected post fire safe shutdown and was assigned a low degradation rating because the issue did not have a significant impact on safe shutdown operations because there was not a simultaneous wide spread failure of the ELUs. This finding has a cross-cutting aspect in the area of problem identification and resolution, because the licensee did not take adequate corrective action in a timely manner to address an adverse trend in ELU functionality (P.1.d). (Section 4OA2)

Inspection Report# : [2009004](#) (pdf)

Significance:  Sep 30, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Remove Blocking Device From Piping Supports

The inspectors identified a Green NCV of Technical Specification 6.4, "Unit Operating Procedures," associated with blocking devices not being removed from piping supports following maintenance due to procedure issues related to procedure adequacy and adherence. The blocking devices were removed upon discovery and appropriate corrective action established to address the issue (ACE017736).

the finding is more than minor because if left uncorrected the performance deficiency could potentially lead to more significant safety concerns. The finding is associated with the procedure quality attribute of the mitigating systems cornerstone, and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding evaluated per MC-0609, Attachment 4, "Phase 1-Initial Screening and Characterization of Findings," was determined to be of very low safety significance (Green) because operability of a safety system, though challenged, was never lost. This finding has a cross-cutting aspect in the area of problem identification and resolution because the licensee's corrective actions were not effective in identifying additional blocked spring hangers on safety-related systems or preventing further configuration control issues associated with spring hanger blocking devices (P.1.d). (Section 4OA2)

Inspection Report# : [2009004](#) (pdf)

Significance:  Jun 30, 2009

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Inadequate Work Instructions for Installation of a Design Change

A self-revealing Green non-cited violation of TS 6.4 "Unit Operating Procedures and Programs" was identified for the failure to provide adequate work instructions for installation of design change SU-08-0001, for engine-driven emergency service water pump 1-SW-P-1A. Corrective action to remove the modification from the A pump was completed and reasonable compensatory measures established for all 3 pumps pending removal/alteration of the exhaust piping modification. The licensee entered this issue into the CA program as CR 3337337

The finding associated with the Procedure Quality attribute of the Mitigating Systems Cornerstone, is more than minor because it adversely affected the cornerstone objective to ensure the availability, reliability, and operability of 1-SW-P-1A to perform its safety function during a design basis event. Evaluated using a Phase II SDP risk analysis per Appendix A of MC-0609, the finding was determined to be of very low safety significance (Green) due to availability of the two remaining ESWPs which provided full mitigation capability for the safety functions required.

A cross cutting aspect in the area of human performance work control was assigned to the finding (H.3.a)

Inspection Report# : [2009003](#) (pdf)

Significance:  Jun 26, 2009

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Establish Maintenance for Backup Battery for the Halon 1301 System in ESGRs

The team identified a performance deficiency and Green NCV for failing to implement a maintenance program for the backup batteries for the Halon 1301 system for the emergency switchgear rooms to ensure on a continuing basis that 24-hour backup power was available as required by the fire protection program (FPP) and Units 1 & 2 Operating License Condition 3.I, "Fire Protection." The licensee entered this finding into their corrective action program, and demonstrated that the backup battery had sufficient capacity in the short term until the long term corrective actions can be implemented.

The licensee's failure to implement a maintenance program to help ensure that the backup battery for the Halon 1301 system continued to meet its licensing basis requirement of providing backup power for 24 hours is a performance deficiency. The finding is more than minor because the backup battery actually degraded on several occasions in the past, and the finding is associated with the reactor safety, mitigating systems, cornerstone attribute of protection against external factors, and affected the objective of ensuring reliability and capability of systems that respond to initiating events. The finding was determined to be of very low safety significance because it represented a low degradation of the fixed fire suppression systems. A cross-cutting aspect was not identified in relation to this finding since the cause was not representative of current license performance.

Inspection Report# : [2009007](#) (pdf)

Barrier Integrity

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

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