Surry 1
4Q/2010 Plant Inspection Findings

Initiating Events

Significance: G Dec 31, 2010
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Follow Procedure Results in Inadvertent Actuation of Safety Injection
A self-revealing Green NCV of TS 6.4, Unit Operating Procedures and Programs, was identified for the failure to follow procedure 1-OPT-ZZ-001, ESF Actuation with Undervoltage and Degraded Voltage 1H Bus. Specifically, on October 26, 2010, a test lead was incorrectly installed in the Unit 1 relay room for the logic circuit associated with the A train of Consequence Limiting Safeguards (CLS). This resulted in an inadvertent safety injection, isolated component cooling water supply to the standby residual heat removal (RHR) train, and automatically initiated several safety-related components including emergency diesel generator (EDG) #1. Operators entered AP-10.20, Response To Spurious Safety Injection With RCS Temperature Less Than 350°F, and terminated the safety injection in approximately three minutes. The licensee entered this issue into the CAP (CR 400908).
Failure to install the test leads as required by procedure 1-OPT-ZZ-001, is a performance deficiency. The finding is more than minor because it is associated with the configuration control attribute of the Initiating Events Cornerstone and adversely affected the cornerstone's 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 in accordance with NRC Inspection Manual Chapter (IMC) 0609, Appendix G, "Shutdown Operations Significance Determination Process," Attachment 1, Checklist 3, identified the finding is of very low safety significance (Green) because the finding did not lead to a loss of decay heat removal. This finding has a cross cutting aspect in the work practices component in the Human Performance area, because human error prevention techniques were not properly used commensurate with the risk significance of the assigned task (H.4(a)).
Inspection Report# : 2010005 *(pdf)*

Significance: G Aug 16, 2010
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Identify and Correct Degraded Unit 1 Nuclear Instrument RC Filters
An NRC identified non-cited violation of 10 CFR 50, Appendix B, Criteria XVI, Corrective Action, was identified for the licensee's failure to identify and correct degraded RC filters associated with Unit 1 Nuclear Instrument (NI) cabinets for N-42 and N-44 based on a similar degraded condition identified on Unit 2 NI cabinet N-43 in November 2009. The issue was entered into the licensee's corrective action program as condition report CR383881. All the RC filters in the Surry Unit 1 and 2 NI cabinets have been replaced with new RC filters.
The finding was determined to be of more than minor significance because it is associated with the equipment performance attribute of the Initiating Events cornerstone. It adversely affected the cornerstone objective of protection against external events, i.e., fire. The performance deficiency was screened using phase 1 of the Significance Determination Process (SDP) and was determined to be a fire initiator contributor and to
have impact on post fire safe shutdown, therefore a phase 2 analysis utilizing Inspection Manual chapter 0609 Appendix F was required. Since the finding involved MCR fire scenarios, a phase 3 analysis was required. A phase 3 risk analysis was performed by a regional SRA in accordance with IMC 0609 Appendix F, NUREG/CR6850, and utilizing the latest Surry SPAR probabilistic risk analysis model. The fire scenarios were
determined to impact MCR operator actions but would not credibly require MCR evacuation for either habitability or safe shutdown functional requirements. The dominant sequence was a fire induced reactor trip transient initiator, with failures of auxiliary feedwater, main feedwater and failure to implement feed and bleed leading to
core damage. Factors which mitigated the risk of the fire were the minimal fire growth potential and the potential for NI cabinet fires to damage SSD equipment. The risk evaluation result was an increase of <1E-6 for core damage frequency, a finding of very low risk significance (Green). This finding involved the cross cutting area of problem identification and resolution, the component of operating experience (OE), and the aspect of evaluating

internal OE (P.2.a), because the licensee did not effectively evaluate the internal operating experience gained from the November 2009 RC filter failure prior to the failure of the RC filters on June 8, 2010.

Inspection Report# : 2010006 *(pdf)*

Significance: G Jun 30, 2010
Identified By: Self-Revealing
Item Type: FIN Finding
Inadequate Rigging Practices Result in Damage to Safety Related Equipment
A self-revealing Green Finding was identified for failure to adequately rig a 300 pound motor in the auxiliary building in accordance with the manufacturer's recommendations on May 11, 2010. As a result, the motor slipped from its rigging and dropped approximately 15 feet onto the A component cooling water (CCW) pump motor below, damaging the motor's cabling and electrical junction box. The CCW pump was declared inoperable (CR 380834), the damage was repaired, and the CCW pump restored to an operable status on May 15, 2010.

Inspectors determined that the failure to implement adequate rigging practices in accordance with vendor recommendations as required by procedure MA-AA-101, Revision 5, "Fleet Lifting and Material Handling" constituted a performance deficiency and a finding which was reasonably within the licensee's ability to foresee and correct and which should have been prevented. The finding is similar to MC 0612, Appendix E example 4.f, and is more than minor because it resulted in damage to and inoperability of a risk significant component. The finding is associated with the human performance attribute of the initiating events cornerstone and adversely affected the cornerstone objective to limit the likelihood of those events which upset
plant stability and challenge critical safety functions during shutdown as well as power operations because a loss of the component cooling water system would have resulted in a unit transient. The finding, evaluated per Attachment 4 of MC-0609, "Phase 1 – Initial Screening and Characterization of Findings," was determined to be of very low safety significance (Green) because it did not contribute to both the likelihood of a plant transient and the loss of accident mitigation equipment. This finding has a cross-cutting aspect in the area of human performance, decision making because the licensee did not make safety/risk significant decisions using a systematic process, especially when faced with uncertain decisions, to ensure safety is maintained (H.1(a)). Specifically, the rigging team made safety/risk significant decisions within lifting/rigging procedures that did not include a systematic process for evaluating each lift, especially loads <5000 lbs in the vicinity of risk significant equipment.
Inspection Report# : 2010003 *(pdf)*

Mitigating Systems

Significance: TBD Dec 31, 2010
Identified By: NRC
Item Type: AV Apparent Violation
Failure to Correct Multiple Conditions Adverse to Fire Protection
A self-revealing apparent violation (AV) of Condition 1.B to the Surry Unit 1 and Unit 2 Updated Facility Operating Licenses, DPR-32 and DPR-37, was identified for the licensee's failure to take corrective action for degraded conditions adverse to the fire protection program. Specifically, in 2003-2004, three breakers with loads including the Unit 2 1B Refueling Water Storage Tank (RWST) chiller motor, the Unit 1 2B charging component cooling water pump, and the Unit 2 B hydrogen recombiner were identified as being oversized with respect to the Surry design standard for breaker sizing and cable protection. The failure to take corrective action on the affected breakers led to a fault on the Unit 2 RWST Chiller Motor 1B on October 11, 2010, and a resulting fire which damaged the electrical cable and motor controller. The fire was promptly extinguished by the fire brigade. The licensee entered this issue into the CAP (CR 398628) and isolated the remaining breakers to prevent additional failures.

The inspectors found that the failure to take action to correct multiple oversized breakers constituted a performance deficiency. The finding is more than minor because it adversely affected the external factors attribute (fire) of the Mitigating Systems Cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the Unit 2 1B RWST chiller motor and the Unit 2 B hydrogen recombiner breakers were the most susceptible to fire due to their size; also a cable fault could

potentially damage safety related cables routed nearby. In addition, the Unit 1 2B charging component cooling water pump is safety related and was also unprotected. The inspectors reviewed IMC 0609, Appendix F, Attachment 1, and determined the category of post fire safe shutdown was affected and the finding required a phase 3 analysis. The significance of this finding is to be determined pending completion of the phase 3 evaluation. This finding has a cross cutting aspect in the work control component in the Human Performance area because the licensee did not appropriately plan work activities by incorporating risk insights. Specifically, although work orders were planned in 2006 they were neither prioritized consistent with their safety significance nor scheduled and completed in a timely manner. (H.3(a)).

Inspection Report# : 2010005 *(pdf)*

Significance: TBD Dec 31, 2010
Identified By: NRC
Item Type: AV Apparent Violation
Inadequate Risk Evaluation for Leaving Common ESGR HELB Door Open
A licensee identified AV of 10CFR50.65 (a)(4), Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants, was revealed after the licensee discovered that 2-BS-DR-21, common emergency switchgear room (ESGR) door was blocked open for two hours without clear communication to licensed operators. The licensee did not adequately assess the increase in operational risk that resulted in the
required risk management actions of fire and environmentally qualified watches not being established. The licensee immediately corrected the condition by shutting the HELB door and having security control personnel access. The issue was entered into the licensee's CAP as CR397720.

The failure to adequately assess the increased risk associated with blocking open the common ESGR door and to take the required risk management actions is a performance deficiency. This finding is more than minor because it is associated with the Mitigating Systems Cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, both Unit 1 and Unit 2 plant risk were not evaluated and risk management activities were not put in place when the common ESGR door was blocked open for maintenance and unable to perform its function as a fire barrier, a halon suppression pressure boundary, a main control room pressure boundary, and a HELB boundary. In
accordance with IMC 0609, Appendix K, Maintenance Risk Assessment and Risk Management Significance Determination Process, this finding will require a phase 3 analysis. The significance of this finding is to be determined pending completion of the phase 3 evaluation. The inspectors determined that this finding had a cross-cutting aspect in the work control component of the human performance area because the licensee did not appropriately plan work activities by incorporating risk insights (H.3(a)).
Inspection Report# : 2010005 *(pdf)*

Significance: G Jun 30, 2010
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Demonstrate that the Reliability of Systems or Components were effectively controlled per 10 CFR 50.65 (a)(2)
The NRC identified a Green Non-Cited Violation of 10CFR50.65 a(2) for the licensee's failure to demonstrate that the reliability of High Safety Significant (HSS) systems and Low Safety Significant (LSS) systems in stand-by was being effectively controlled through the performance of appropriate preventative maintenance, such that the systems or components remain capable of performing their function. Specifically, the licensee's MR program would not demonstrate that a system should remain in category a(2) as defined by regulatory requirements.
The inspectors determined the licensee's MR program could not demonstrate that reliability of High Safety Significant (HSS) systems and Low Safety Significant (LSS) systems in stand-by were being effectively controlled through the performance of appropriate preventative maintenance, such that the systems or components remain capable of performing their function is a performance deficiency. Specifically, the monitoring established by the license did not effectively demonstrate that systems in a(2) were being effectively controlled through performance of appropriate preventative maintenance. This masking of poor equipment performance does not allow the licensee to determine if a system should be in increased
monitoring of a(1).

The finding was more than minor because it adversely affected the equipment performance attribute of the reactor safety mitigating systems cornerstone, and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of HSS and LSS systems to perform their functions when required. Specifically, multiple HSS and LSS systems could have a high probability of failure, because poor equipment performance would not be recognized by the licensee. This could prevent a poor performing system from being placed into the a(1) category when required and appropriate corrective action would not be taken.

The finding was evaluated using MC-0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings," and determined to be of very low safety significance (Green), because the finding did not involve an actual failure of equipment. This finding had a crosscutting aspect in the area of human performance and resources because the licensee did not ensure that personnel, procedures, and other resources were available and adequate to assure proper implementation of MR program. The MR personnel did not have the training required to implement the program within the required industry regulations and guidelines (H.2.b).
Inspection Report# : 2010003 *(pdf)*

Significance: G Mar 31, 2010
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to identify a non-conservative error in the quarterly TS surveillance for the Unit 1 A battery
The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action" for failure to identify that a non-conservative error had been introduced into the Unit 1 A main station battery quarterly technical specification surveillance procedure (CR 366388). The licensee modified the procedure to eliminate the non-conservative error.

The inspectors determined the failure to identify a non-conservative error which was introduced into the TS quarterly surveillance procedure following the replacement of individual battery cells, was a condition adverse to quality and a performance deficiency which was reasonably within the licensee's ability to foresee and correct, and should have been prevented. The finding was more than minor because if left uncorrected the non-conservative error in 1-EPT-0103-01 would have the potential to lead to a more significant safety concern. Specifically, this is because the error was large enough to mask cell degradation and an inoperable cell. The finding was associated with the equipment performance attribute of the reactor safety mitigating systems
cornerstone, and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of the safety related 125 VDC station batteries that provide class 1E backup power to risk significant components needed to prevent undesirable consequences during a loss of offsite power event. The finding was evaluated using MC-0609, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings," and determined to be of very low safety significance (Green) because operability of the Unit 1 A battery was not lost and the error was removed prior to the next quarterly surveillance. This finding had a cross cutting aspect in the area of problem identification and resolution because the licensee did not evaluate and communicate relevant external OE, including vendor recommendations, to affected internal stakeholders in a timely manner (P.2(a)). Specifically, the caveat to have cells on a float charge for 72 hours was not fully evaluated when the battery cells were replaced.
Inspection Report# : 2010002 *(pdf)*

Barrier Integrity

Significance: G Dec 31, 2010
Identified By: NRC
Item Type: NCV NonCited Violation
Heavy Load Lift of the 1B RCP Motor Over Exposed Reactor Fuel
An NRC-identified Green NCV of Technical Specification (TS) 6.4, Unit Operating Procedures and Programs, was identified. Personnel failed to follow the defined heavy load shipping path inside containment as specified in procedure, GMP-001, Heavy Load Rigging and Movement, which resulted in the movement of the 1B reactor coolant pump motor over exposed reactor fuel. The licensee has entered the issue into the CAP (CR 404106).

Transport of the 1B reactor coolant pump motor over the exposed reactor core is a performance deficiency. The finding is more than minor because it can reasonably be viewed as a precursor to a significant event, the heavy load traveled over exposed irradiated fuel with the reactor vessel head removed. In accordance with NRC Inspection Manual Chapter (IMC) 0609, Appendix G, “Shutdown Operations Significance Determination Process,” Attachment 1, Checklist 4, the inspectors conducted a Phase 1 SDP screening and determined the finding required a Phase 2 analysis. The Phase 2 analysis determined the finding is of very low safety significance (Green) because: (1) there is a low probability of dropping the load based on a study in NUREG-1774 performed for crane operating experience; (2) the polar crane was in working condition and had no known deficiencies that would have affected the crane’s ability to lift the load; and, (3) the duration of the heavy load lift over the exposed reactor core was very short. In addition, in accordance with NRC IMC 0609, Appendix H, “Containment Integrity SDP,” the finding would not contribute to LERF due to the time since the reactor was shutdown. The finding has a cross-cutting aspect in the work practices component of the Human Performance area because plant supervisors failed to properly supervise workers executing procedure steps (H.4(c)).

Inspection Report# : 2010005 *(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

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