Calvert Cliffs 2
1Q/2011 Plant Inspection Findings

Initiating Events

Significance: G Jun 30, 2010
Identified By: NRC
Item Type: NCV NonCited Violation
Inadequate Design Control Reviews of the Turbine Control System and the Nuclear Steam Supply System
The inspectors identified an NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," because Constellation did not perform adequate design reviews associated with modifications to the turbine control system and the nuclear steam supply system (NSSS). Specifically, Constellation did not adequately evaluate the potential adverse impacts of removal of the power load unbalance (PLU) turbine trip on the quality of safety related systems, structure, and components (SSCs) such as the main steam safety valves (MSSVs) and power operated relief valves (PORVs). In addition, during significant changes to plant design such as steam generator replacements and power uprates, Constellation did not conduct an adequate evaluation to determine if the turbine bypass valve (TBV)/atmospheric dump valve (ADV) design specification of opening within 3 seconds after receiving the quick open signal would still be sufficient to prevent lifting MSSVs. Immediate corrective actions included entering these issues into their corrective action program (CAP) and performing an immediate operability determination and a probabilistic risk analysis.

This finding is more than minor because it affected the Initiating Event cornerstone attribute of design control and affects 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. Specifically, the removal of the PLU turbine trip and the modifications to the NSSS could challenge primary and secondary overpressure protection devices and result in a stuck open MSSV or PORV. The inspectors evaluated this finding using an SDP phase 2 analysis and determined that the issue is of very low safety significance. This finding has a cross-cutting aspect in the area of human performance, decision making, because Constellation did not adequately make safety-significant decisions using a systematic process when faced with uncertain or unexpected plant conditions, to ensure safety is maintained. (H.1.a of IMC 0310).

Inspection Report# : 2010003 *(pdf)*

Significance: G Jun 30, 2010
Identified By: Self-Revealing
Item Type: FIN Finding
Did Not Establish Preventive Maintenance Program for Switchyard Panels

Green. A self-revealing finding of very low safety significance was identified because Constellation did not establish an appropriate preventive maintenance program for the 125 VDC switchyard distribution panels in accordance with MN-1, "Maintenance Program." The 125 VDC switchyard distribution system supplies power to the switchyard direct current (DC) loads for the operation of switchyard circuit breakers, emergency lights, and protective relays. Immediate corrective actions included entering this issue into the CAP and performing an inspection of all 125 VDC switchyard distribution panels. Long-term corrective actions planned include establishing an adequate preventative measure (PM) program for the 125 VDC switchyard distribution panels.

The finding is more than minor because it is associated with the equipment performance attribute of the Initiating Events cornerstone and affects the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety function. In addition, if left uncorrected, the performance deficiency could lead to a more significant safety concern. Specifically, the failure to establish an adequate preventive maintenance program for the 125 VDC switchyard distribution panels could preclude the identification of equipment deficiencies, such as loose connections, that could result in a plant transient. The finding is of very low safety significance because it did

not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions will not be available. This finding has a cross-cutting aspect in the area of problem identification and resolution, operating experience (OE), because Constellation did not use OE information, including vendor recommendations to support plant safety. Specifically, the Constellation did not implement and institutionalize OE through changes to station processes, procedures, equipment, and training associated with the switchyard preventive maintenance program (P.2.b of IMC 0305).

Inspection Report# : 2010003 *(pdf)*

Significance: G Apr 30, 2010
Identified By: NRC
Item Type: FIN Finding
Failure to Translate Design Calculation Setpoint of Phase Overcurrent Relay on Feeder Breakers
The team identified a finding for failure to translate the design calculations of phase overcurrent relays on 13 kV feeder breakers into the actual relay settings. The overcurrent relays protect the unit service transformer against faults in the primary or secondary side windings. The design specified limit of 1200 amps was determined based on the breaker rating of the feeder breakers. Constellation determined the as-found relay setting for the feeder breakers was 1440 amps which exceeded the rating of the feeder breakers. The team determined that due to the as-found relay setting, certain phase overcurrent conditions could potentially cause the breakers to fail prior to the phase overcurrent relay sensing the degraded condition. This condition could affect the recovery of the safey buses from the electrical grid. Constellation entered this issue into the corrective action program (condition report 2010-002123).

This finding is more than minor because it affected the Initiating Events Cornerstone attribute of equipment performance for ensuring the availability and reliability of systems to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Also, this issue was similar to Example 3j of IMC 0612, Appendix E, "Examples of Minor Issues," because the condition resulted in reasonable doubt of the operability of the component, and additional analysis was necessary to verify operability. This finding was determined to be of very low safety significance because the design deficiency did not result in an actual loss of function based on Constellation's determination that the maximum load current possible would not challenge the feeder breaker ratings. Enforcement action does not apply because the performance deficiency did not involve a violation of a regulatory requirement. The finding did not have a cross-cuting aspect because the most significant contributor to the perfoormance deficiency was not reflective of current licensee performance.
Inspection Report# : 2010006 *(pdf)*

Significance: G Apr 30, 2010
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Failure to Thoroughly Evaluate and Promptly Correct Degraded Conditions Associated with Auxiliary Building Roof Leakage
A self-revealing non-cited violation (NCV) of 10 CFR Part 50, Appendix , Criterion XVI "Corrective Actions," was identified, because auxiliary building roof leakage into the Unit 1 and Unit 2 45 foot switchgear rooms was identified on several occasions from 2002 to 2009, but was not thoroughly evaluated and corrective actions to this condition adverse to quality were untimely and ineffective. This degraded condition led to the failure of the auxiliary building to provide protection to several safety related systems from external events, a ground on a reactor coolant pump (RCP) bus, and ultimately a Unit 1 reactor trip. Immediate corrective actions included: repair of degraded areas of the roof; walk downs of other buildings within the protected area that could be susceptible to damage to electrical equipment due to water intrusion; issuance of standing orders to incude guidance regarding priortizing work orders due to roof leakage; and identifying further actions to take during periods of snow or rain to ensure plant equipment is not affected. Constellation entered the issue into their corrective action program (Condition Report (CR) 2010-001351). Long-term corrective actions include implementation of improved plant processes for categorization, prioritization and management of roofing issues.

The findings is more than minor because it is associated with the protection against external factors 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 during shutdown as well as power operations. The team

determined the finding had a very low safety significance because, although it caused the reactor trip, it did not contribute to the likelihood that mitigation equipment or functions will not be available. The cause of the finding is related to the crosscutting area of Problem Identification and Resolution, Corrective Action Program aspect P.1(c) because Constellation did not thoroughly evaluate the problems related to the water intrusion into the auxiliary building such that the resolutions addressed the causes and extent-of-condition. This includles properly classifying, prioritizing, and evaluating the condition adverse to quality.
Inspection Report# : 2010006 *(pdf)*

Mitigating Systems

Significance: G Dec 31, 2010
Identified By: NRC
Item Type: NCV NonCited Violation
Inadequate Corrective Actions Associated with Submerged SR Cables
The inspectors identified an non cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Actions," because Constellation did not establish and take adequate measures for conditions adverse to quality associated with submerged safety related (SR) cables including the 1A diesel generator (DG) cables. As a result, SR cables were subjected to a submerged environment for unknown or extended periods. Immediate corrective action included entering this issue into their corrective action program (CAP), conducting an operability determination for the 1A DG, and increasing the frequency of manhole inspections. Long-term corrective actions (C/As) planned include evaluating the need for sump pumps and including all SR manholes in the preventive maintenance routine.

The finding is more than minor because it was associated with the Mitigating Systems cornerstone attribute of equipment performance and affected the associated cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, repeated submergence of medium voltage cables can cause excessive aging and degradation in the exposed sections of cable, which could significantly shorten its qualified life and cause unexpected failures. The inspectors determined that the finding is of very low safety significance because the finding is a design or qualification deficiency confirmed not to result in a loss of operability. This finding had a cross-cutting aspect in the area of problem identification and resolution, operating experience (OE), because Constellation did not implement and institutionalize OE through changes to station processes and procedures associated with submerged cables (P.2.b of IMC 0310).

Inspection Report# : 2010005 *(pdf)*

Significance: G Dec 31, 2010
Identified By: NRC
Item Type: NCV NonCited Violation
Inadequate Functionality Review of 0C Diesel Degraded Condition.
The inspectors identified a finding of very low safety significance because Constellation did not conduct an adequate functionality review following failure of the 0C DG (the station blackout (SBO) diesel) battery charger. Specifically, Constellation did not take into account the Appendix R mission time in the functionality review. As a result, Constellation did not recognize that the 0C diesel was not available for its Appendix R function with its associated battery charger out-of-service (OOS). Immediate corrective actions included entering this issue in the CAP and providing instructions to operators to declare the 0C diesel not available anytime its associated battery charger is taken OOS. Additional corrective actions planned include changing OI-26A, “125 Volt Direct Current (VDC) System,” to reflect that the battery charger is required to support the 0C diesel functionality.

The finding is more than minor because it was associated with the equipment performance attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, Constellation did not recognize that the 0C diesel was not available for its Appendix R function with its associated battery charger OOS. The inspectors determined that the finding is of very low safety significance because it only affected the ability to reach and maintain cold shutdown conditions. The finding has a cross-cutting aspect in the area of human performance,

resources, because Constellation did not ensure complete, accurate, and up-to-date procedures (OI-26A) were available and adequate to assure nuclear safety (H.2.c of IMC 0310).

Inspection Report# : 2010005 *(pdf)*

Significance: G Jun 30, 2010
Identified By: NRC
Item Type: NCV NonCited Violation
Inadequate Risk Assessment Associated with the 2B EDG
The inspectors identified an NCV of 10 CFR Part 50.65 (a)(4), “Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants,” because Constellation did not perform an adequate risk assessment, which resulted in an underestimation and lack of awareness of the risk during maintenance activities on the 2B emergency diesel generator (EDG). On June 18, 2010, operators removed the 2B EDG from service and shut the air start valves in preparation for a maintenance activity. The inspectors noted that this would have prevented the 2B EDG from starting and loading automatically on a safety injection actuation signal (SIAS) or loss of offsite power. The inspectors determined that Constellation did not include the unavailability of the 2B EDG on the risk assessment. Immediate corrective actions included entering this issue into the CAP and re-performing the risk assessment. When re-performed, the core damage frequency (CDF) risk during the 2B EDG maintenance activity would have increased to medium (yellow).

The finding is more than minor because if the overall risk had been correctly assessed, it would have placed Unit 2 into a higher risk category. The finding is associated with the configuration control attribute of the Mitigating Systems cornerstone and affects the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors determined that the finding is of very low safety significance because the incrementally core damage probability deficit was less than 1.0E-6. This finding has a cross-cutting aspect in the area of human performance, work control, because Constellation did not appropriately plan and incorporate risk insights in work activities that impacted the availability of the 2B EDG (H.3.a of IMC 0310).

Inspection Report# : 2010003 *(pdf)*

Significance: W Apr 30, 2010
Identified By: NRC
Item Type: VIO Violation
Inadequate Preventive Maintenance Results in the Failure of the 2B Emergency Diesel Generator
The NRC identified a violation of Technical Specifidcation 5.4.1 for the failure of Constellation to establish, implement, and maintain preventive maintenance requirements associated with safety related relays. The team identified that Constellation did not implement a performance monitoring program specified by the Licensee in Engineering Service Package (ES200100067) in lieu of a previously established (in 1987) 10 year service life replacement PM requirement for the 2B EDG T3A time delay relay. As a consequence, the 2B EDG failed to run following a demand start signal on February 18, 2010. Following identification of the failed T3A relay, it was replaced and the 2B EDG was satisfactorily tested and returned to service. In addition, time delay relays used in the 1B and 2A EDG protective circuits, that also exceeded the vendor recommended 10 year service life, were replaced. Constellation entered this issue, including the evaluation of extent-of-condition, into the corrective action program.

This find is more than minor because it is associated with the equipment performance attribute of the Mitigating Systems Cornerstone and adversely impacted the objective of ensuring the availability, reliability, and capability of the safety related 2B EDG to respond to a loss of normal electrical power to its associated safety bus. This finding was assessed using IMC 0609, Appendix A and preliminarily determined to be White (low to moderate safety significance) based upon a Phase 3 Risk Analysis with an exposure time of 323 days which resulted in a total (internal and external contributions) calculated conditional core damage frequency (CCDF) of 7.1E-6. The cause of this finding is related to crosscutting area of Human Performance, Resources aspect H.2(a) because preventive maintenance procedures for the EDGs were not properly established and implemented to maintain long term plant safety by maintenance of design margins and minimization of long standing equipment issues.
Inspection Report# : 2010006 *(pdf)*

Significance: G Apr 30, 2010
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Evaluate Degraded Conditions Associated with CO-8 Relays and Implement Timely and Effective Action to Correct the Condition Adverse to Quality.
The team identified a NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," because Constellation did not thoroughly evaluate and correct a degraded condition of a CO-8 relay disc sticking or binding issues which can adversely impact the function of the EDGs and the electrical distribution protection scheme. Specifically, following the February 18, 2010 event, Constellation did not identify and adequately evaluate the recent CO-8 relay failures due to sticking or binding of the induction discs in the safety related and non-safety related applications. Constellation entered this issue into the corrective action pprogram (CR 20100004673).

The finding is more than minor because it is associated with the equipment reliability attribute of the Mitigating Systems Cornerstone, and it adversely affected the associated cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). This finding was determined to be of very low safety significance safety function. The cause of the finding is related to the crosscutting area of Problem Identification and Resoluton, Corrective Action Program aspect P.1(c) because Constellation did not thoroughly evaluate the previous station operating experience of CO-8 relay induction disc sticking and binding issues such that resolutions addressed the causes and extent-of-condition.
Inspection Report# : 2010006 *(pdf)*

Significance: G Apr 30, 2010
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Failed to Establish Adequate Procedures for Letdown Restoration
A self-revealing NCV of Technical Specification (TS) 5.4.1.a, "Procedures" was identified for failure to establish adequate procedures for restoration of Chemical and Volume Control System (CVCS) letdown flow. On February 18, 2010, an electrical ground fault caused a Unit 1 reactor trip, loss of the 500 kV Red Bus, and CVCS letdown isolation as expected on the ensuring instrument bus 1Y10 electrical transient. Deficient operating instructions prevented timely restoration of letdown flow following the initial transient. Pressurizer level remained above the range specified in Emergency Operating Procedure (EOP)-1 for an extended period because of the operators' inability to restore letdown. This ultimately led to exceeding the TS high limit for pressurizer level. CVCS Operating Instruction OI-2A was subsequently revised, providing necessary guidance for re-opening the letdown system excess flow check valve to restore letdown flow. This event was entered into the licensee's correction action program (CR 2010-001378).

This finding is more than minor because it is associated with the procedure quality attribute of the Mitigating Systems Cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The finding is of very low safety significance because it is not a design or qualification deficiency, did not represent a loss of a safety function of a system or a single train greater than its TS allowed outage time, and did not screen as potentially risk significant due to external events. This finding has a crosscutting aspect in the area of human performance resources aspect H.2(c), because Constellation did not ensure that procedures for restoring CVCS letdown were complete and accurate.
Inspection Report# : 2010006 *(pdf)*

Barrier Integrity

Emergency Preparedness

Significance: G Sep 30, 2010

Identified By: NRC
Item Type: NCV NonCited Violation
Untimely Declaration of Notice of Unusual Event
The inspectors identified an NCV of 10 CFR Part 50.47(b)(4) for the failure to implement the emergency classification and action level scheme in a timely manner during an actual event due to the complete loss of communications to one off-site agency. Specifically, on July 4, 2010, phone communications to St. Mary's County were lost and conditions requiring declaration of a Notice of Unusual Event (NOUE) were met. However, Constellation did not declare the NOUE in a timely manner. Shortly after Constellation determined that conditions met the declaration criteria for an NOUE, the phone system was restored. Constellation entered this issue into their corrective action program (CAP) for resolution. Immediate corrective action included establishing a standing order to provide operators guidance in the event of a loss of communications.

The finding is greater than minor because it is associated with the Emergency Preparedness (EP) cornerstone attribute of emergency response organization performance (actual event response) and it adversely affects the cornerstone objective to ensure that Constellation was capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. The inspectors determined that the finding is of very low safety significance in that it was associated with an actual event where the operators failed to declare an NOUE in a timely manner during a complete loss of communications to one off-site agency. This finding has a cross-cutting aspect in the area of human performance, decision making, because Constellation did not make a safety significant decision using a systematic process to declare the NOUE in a timely manner. Specifically, Constellation did not use a systematic process such as a standing order or procedure to provide guidance to operators to address a loss of communications. In addition, Constellation did not adequately implement emergency response organization's (ERO) roles and authorities as designed to obtain interdisciplinary input on safety significance decisions such as event classification (H.1.a of IMC 0310).

Inspection Report# : 2010004 *(pdf)*

Occupational Radiation Safety

Significance: G Dec 31, 2010
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Implement Procedures to Calibrate and Maintain Ventilaton and Radiation Effluent Monitoring Equipment.
The inspectors identified a finding of very low safety significance associated with a non-cited violation (NCV) of Technical Specification 5.4.1.a, "Procedures," involving Constellation's failure to implement procedures to calibrate and maintain ventilation and radiation effluent monitoring equipment. Specifically, on December 9, 2010, refurbishment of the steam generator (SG) nozzle dams and manway stud tensioners was in progress in the material processing facility; at that time, only one exhaust train of the ventilation system was in operation and a negative pressure of approximately one-half inch of water was not being maintained. Immediate corrective actions included stopping all work in the building and completing the necessary repairs before restarting activities.

The finding was more than minor because the failure to maintain the ventilation and radiation monitoring equipment affects the Radiation Protection cornerstone to ensure adequate protection of public health and safety from exposure to radioactive materials released into the public domain as a result of routine civilian nuclear reactor operation. The inspectors determined that the finding is of very low safety significance because it did not impair Constellation's ability to assess dose. Constellation did assess dose and the limits of 10 CFR 50 Appendix I and 10 CFR 20.1301(e) were not exceeded. The finding also has a cross-cutting aspect in the area of problem identification and resolution, Corrective Action, because appropriate corrective actions were not taken in a timely manner. The exhaust fan was out-of-service (OOS) for eight months, the supply fan was OOS for seven years, and the radiation monitor was OOS for most of four years (P.1.d or IMC 0310).

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

Last modified : June 07, 2011