

## Calvert Cliffs 1

### 1Q/2014 Plant Inspection Findings

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#### Initiating Events

**Significance:** G Mar 31, 2014

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

#### **Inadvertent Loss of RCS Inventory During Lowered Inventory Conditions**

Green: The inspectors identified a self-revealing NCV of Technical Specification (TS) 5.4.1, "Procedures," for the failure of Constellation Energy Nuclear Group, LLC (CENG) personnel to adequately implement procedures associated with a local leak rate test (LLRT). Specifically, CENG personnel did not isolate the letdown line in accordance with surveillance test procedure (STP)-O-108D-1, "Containment Penetration Local Leak Rate Tests," prior to draining the piping in preparation for an LLRT on chemical and volume control system (CVCS) containment isolation valves. This resulted in inadvertently draining 150 gallons from the reactor coolant system (RCS) while the reactor vessel was in a lowered inventory condition. Immediate corrective actions included entering this issue into their corrective action program (CAP), performing a prompt investigation, and conducting a safety stand-down. In addition, an apparent cause evaluation will be performed to determine any additional corrective actions.

The finding is more than minor because it is associated with the configuration control attribute of the Initiating Events 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 to isolate the letdown line prior to draining resulted in the loss of 150 gallons of RCS inventory and challenged the critical safety function of inventory control while in a lowered inventory condition. Operator actions were required to identify and isolate the leak to prevent further inventory loss. The inspectors evaluated this finding using IMC 0609.04, "Initial Characterization of Findings," issued June 19, 2012, and IMC 0609, Appendix G, "Shutdown Operations Significance Determination Process," issued February 28, 2005, and determined that the issue screened to Green (very low safety significance). Specifically, the inspectors determined that adequate mitigating capability remained available and the finding did not represent a loss of control of RCS level due to less than 2 feet of inventory loss when not in midloop. As a result, a Phase 2 quantitative assessment was not required and the issue screened to Green. The inspectors determined that the finding has a cross-cutting aspect in the area of Human Performance, Teamwork, because CENG individuals and work groups did not adequately communicate and coordinate their activities within and across organizational boundaries to ensure nuclear safety was maintained. Specifically, a detailed shift turnover between dayshift and nightshift LLRT operators was not completed to ensure that the oncoming operators were aware of the letdown system configuration [H.4]. (Section 1R20)

Inspection Report# : [2014002](#) (pdf)

**Significance:** G Dec 31, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Inadequate Emergency and Abnormal Operating Procedures for the Loss of the 21 DC Bus**

Green. The inspectors identified an NCV of Technical Specification (TS) 5.4.1, "Procedures," because Constellation Energy Nuclear Group (CENG) failed to maintain adequate guidance in Emergency Operating Procedure (EOP) 8,

“Functional Recovery Procedure,” and/or Abnormal Operating Procedure (AOP) 7J, “Loss of 120 Volt Vital Alternating Current (AC) or 125 Volt Vital Direct Current (DC) Power.” Specifically, EOP 8 and/or AOP-7J did not contain adequate instructions to cross-tie the 480 volt AC vital buses to restore the 120 volt AC vital buses during a loss of offsite power (LOOP) event concurrent with a single failure of the 21 125 volt DC bus. As a result, the engineered safety features actuation system (ESFAS) and auxiliary feedwater actuation system (AFAS) would inadvertently actuate on both units if the 120 volt AC vital buses were not restored within a specified period of time. CENG staff’s immediate corrective actions included entering this issue into their corrective action program (CAP). Corrective actions planned include revising AOP-7J to add in steps to cross-tie the 480 volt AC vital buses.

The finding is more than minor because it is associated with the procedure quality attribute of the Initiating Events cornerstone and 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, following a LOOP concurrent with a failure of the 21 DC bus, inadvertent ESFAS and AFAS actuations would occur on both units if power is not restored to the vital 120 volt AC buses. The inspectors evaluated the finding using IMC 0609, Appendix A, “The Significance Determination Process for Findings at Power,” Exhibit 1, “Initiating Events Screening Questions.” The inspectors determined that this finding was of very low safety significance (Green) because the finding did not cause a reactor trip and the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. The inspectors determined that this finding did not have a cross-cutting aspect because the most significant contributor to the performance deficiency was not reflective of current licensee performance. Specifically, the inspectors determined that this was a legacy procedure issue and did not note any recent reasonable opportunities for CENG personnel to identify this issue. (Section 1R15)

Inspection Report# : [2013005](#) (pdf)

## Mitigating Systems

**Significance:**  Mar 31, 2014

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **11 and 12 AFW Pumps Inoperable due to Valves Misposition**

Green: The inspectors identified a self-revealing problem consisting of NCVs of TS 3.7.3, “Auxiliary Feedwater System,” and TS 5.4.1, “Procedures,” because CENG Operations personnel did not adhere to procedures which resulted in a valve mispositioning event that inadvertently rendered the 11 and 12 turbine driven auxiliary feedwater (AFW) pumps inoperable for approximately 12 hours, a condition prohibited by TSs. Specifically, on February 7, 2014, operators did not perform draining of 11 turbine driven AFW pump steam supply drain line as stated in Operating Instruction (OI)-32A, “Auxiliary Feedwater System,” resulting in two main steam (MS) drain valves being left opened. With the drain valves open, an actual auxiliary feedwater actuation system (AFAS) signal would have resulted in steam blowing down into the room via the sump and causing room temperatures to exceed 130°F, the maximum temperature allowed in the room to protect the pump air cooled bearings. Immediate corrective actions included restoring the proper AFW system valve lineup, entering this issue into their CAP, returning the valves to their normal position on Unit 1, and ensuring that similar valves were in the correct position on Unit 2. Planned corrective actions include conducting an apparent cause evaluation to understand the apparent and contributing causes of this event and determine additional corrective actions.

The problem is more than minor because it is associated with the configuration control 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). Specifically,

Operations personnel lost configuration control of valves MS-225 and MS-228 resulting in the inoperability of the 11 and 12 AFW pumps for approximately 12 hours. The inspectors evaluated the problem using IMC 0609.04, "Initial Characterization of Findings," and IMC 0609, Appendix A, "The Significance Determination Process for Findings at Power," Exhibit 2, "Mitigating Systems Screening Questions," issued June 19, 2012, and determined that the problem represented an actual loss of function of at least a single train for greater than its TS allowed outage time which required a detailed risk evaluation. The senior reactor analyst performed a detailed risk assessment utilizing the CCNPP Unit 1 simplified plant analysis risk model version 8.2.1 and determined that the problem is of very low safety significance (Green). Specifically, given a 12 hour exposure period with both turbine driven AFW pumps assumed to fail-to-run, the change in the internal events core damage frequency (CDF) was calculated to be in the high 10<sup>-8</sup> range (Green). This problem has a cross-cutting aspect in the area of Human Performance, Procedure Adherence, because CENG personnel did not follow processes, procedures, and work instructions. Specifically, after draining the 11 AFW pump mud leg, CENG plant operators did not restore MS-225 and MS-228 to their required position as stated in procedure OI-32A [H.8]. (Section 1R15)

Inspection Report# : [2014002](#) (*pdf*)

**Significance:** G Dec 31, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

**Pre-Conditioning of Containment Air Coolers Emergency Outlet Valves**

Green. The inspectors identified an NCV of Title 10 Code of Federal Regulations (CFR) 50, Appendix B, Criterion XI, "Test Control," because CENG's in-service test (IST) procedures did not provide instructions to preclude preconditioning of the containment air cooler (CAC) emergency outlet valves. Specifically, STP-O-065B-2, "21 SRW Subsystem Operability Test," was written such that a full stroke of the CAC emergency outlet valves was allowed prior to performance of the IST stroke time testing of the valves in the open direction. As a result, the 21 CAC emergency outlet valve, 2-CV-1582, was preconditioned during the last four surveillance tests performed on the valve and the 24 CAC emergency outlet valve, 2-CV-1593, was preconditioned during three of the last four surveillance tests performed on the valve. Immediate corrective actions included entering this issue in the CAP. Corrective actions included revising STP-O-065B to prevent future preconditioning of all the CAC emergency outlet valves.

The 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). Specifically, preconditioning of the CAC emergency outlet valves prior to performing IST stroke time testing could mask valve degradation. The inspectors evaluated the finding using IMC 0609, Appendix A, "The Significance Determination Process for Findings at Power," Exhibit 2, "Mitigating Systems Screening Questions." The inspectors determined that this finding was of very low safety significance (Green) because the finding did not affect the design or qualification of a mitigating structure, system, and component (SSC), did not represent a loss of system function, did not represent an actual loss of function of at least a single train for greater than its TS allowed outage time, and did not represent an actual loss of function of one or more non-TS trains of equipment, designated as having high safety significance in accordance with the maintenance rule program, for greater than 24 hours. The inspectors determined that the finding has a cross-cutting aspect in the area of Human Performance, Resources, because CENG staff failed to ensure that personnel, equipment, procedures, and other resources were available and adequate to assure nuclear safety. Specifically, CENG staff did not provide a complete and accurate procedure that would preclude preconditioning of the CAC emergency outlet valves during in-service testing [H.2(c)]. (Section 1R22)

Inspection Report# : [2013005](#) (*pdf*)

**Significance:** G Jun 30, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Establish a Test Program for DFO Check Valves**

• Green: The inspectors identified an NCV of Title 10 of the Code of Federal Regulations (10 CFR) 50, Appendix B, Criterion XI, “Test Control,” because CENG failed to establish a test program to ensure that diesel fuel oil (DFO) transfer system header check valves, DFO-146 and DFO-148, would perform their safety function. Specifically, on November 1, 2012, the inspectors identified that DFO-146 and DFO-148 had never been tested in the reverse flow direction or inspected. DFO-146 and DFO-148 have a design function to close in reverse flow conditions to ensure that the Tornado/Missile protected No. 21 fuel oil storage tank (FOST) will not drain if the non-Tornado/Missile protected No. 11 FOST fails during a tornado/missile event. CENG’s immediate corrective actions included entering this issue into their corrective action program (CAP) and performing a reasonable expectation of continued operability. Planned corrective actions include performing an evaluation which includes a probabilistic risk assessment to credit a non tornado/missile protected manual valve located in the DFO unloading station and a tornado/missile protected manual valve in the No. 21 FOST building to perform the function of the DFO tornado/missile protected check valves.

This finding is more than minor because it is associated with the protection against external factors attribute of the Mitigating Systems cornerstone and affects the cornerstone objective of ensuring the capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, a reasonable doubt of operability existed because the capability of the check valves to perform their design function had never been demonstrated. The failure of check valves during a tornado/missile event causing the loss of the No. 11 FOST would result in the draining of the safety-related No. 21 FOST and consequential loss of all Fairbanks Morse emergency diesel generators (EDGs). Also, this issue is similar to IMC 0612, Appendix E, Example 3.i, in that, if credit is taken for manual valves in lieu of testing the check valves, additional analysis would be required to be performed to assure licensing basis requirements are met. The inspectors evaluated the significance of this finding using IMC 0609 Appendix A, “The Significance Determination Process for Findings at Power,” Exhibit 2, “Mitigating Systems Screening Questions.” The inspectors determined that this finding was of very low safety significance (Green) because the finding did not involve the loss or degradation of equipment or function specifically designed to mitigate a seismic, flooding, or severe weather event. The inspectors determined that the finding has a cross-cutting aspect in the area of Problem Identification and Resolution, CAP, because CENG failed to ensure that issues potentially impacting nuclear safety are promptly identified and fully evaluated and that actions are taken to address safety issues in a timely manner, commensurate with their significance. Specifically, CENG did not take appropriate corrective actions to address safety issues and adverse trends in a timely manner associated with inadequate testing programs of risk significant equipment. [P.1(d)] (Section 1R04)

Inspection Report# : [2013003](#) (*pdf*)

## **Barrier Integrity**

**Significance:** G Jun 30, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

### **Inadequate Steam Generator Tube Rupture Emergency Operating Procedure**

Green: The inspectors identified an NCV of Technical Specification 5.4.1.b, “Procedures,” because CENG failed to maintain guidance in Emergency Operating Procedure (EOP)-6, “Steam Generator Tube Rupture (SGTR).” Specifically, EOP-6 guidance does not provide an alternative action to cool down the reactor coolant system (RCS)

for a SGTR event with a loss of offsite power (LOOP) and the single failure of the unaffected steam generator (SG) atmospheric dump valve (ADV). This could result in the inability to terminate the primary to secondary leak into the affected SG and the cycling of the affected SG ADV to control the SG level resulting in additional dose to the public. Immediate corrective actions included entering this issue into their CAP. Corrective actions planned include revising EOP-6 to address the identified deficiency. In addition, CENG established interim administrative controls of the ADVs to ensure that appropriate remedial actions are taken if the ADVs are out of service and is evaluating adding the ADVs to their technical specifications.

This finding is more than minor because it is associated with the procedure quality attribute of the Barrier Integrity cornerstone and affects the cornerstone objective to provide reasonable assurance that physical design barriers (fuel cladding, RCS, and containment) protect the public from radionuclide releases caused by accidents or events. Specifically, the performance deficiency could result in the operation of the affected SG ADV and, consequently, the release of radioactivity to the environment until an adequate method to cool down the RCS is established. The inspectors evaluated the significance of this finding using IMC 0609, Appendix A, "The Significance Determination Process for Findings at Power," Exhibit 3, "Barrier Integrity Screening Questions." The inspectors determined that this finding was of very low safety significance (Green) because the finding does not represent an actual open pathway in the physical integrity of reactor containment. Also, the finding did not involve an actual reduction of hydrogen igniters in the reactor containment. The inspectors determined that the finding has a cross-cutting aspect in the area of Human Performance, Resources, because CENG did not ensure that personnel, equipment, procedures, and other resources were available and adequate to assure nuclear safety. Specifically, CENG did not ensure that EOP-6 was complete, accurate, and up-to-date through required periodic reviews. [H.2(c)] (Section 1R04)

Inspection Report# : [2013003](#) (*pdf*)

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## Emergency Preparedness

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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

**Significance:** N/A Sep 27, 2013

Identified By: NRC

Item Type: FIN Finding

### PI&R Report Summary

The inspectors concluded that Constellation was generally effective in identifying, evaluating, and resolving problems. Constellation personnel identified problems, entered them into the CAP at a low threshold, and prioritized issues commensurate with their safety significance. In most cases, Constellation appropriately screened issues for operability and reportability, and performed causal analyses that appropriately considered extent of condition, generic issues, and previous occurrences. The inspectors also determined that Constellation typically implemented corrective actions to address the problems identified in the CAP in a timely manner.

The inspectors concluded that, in general, Constellation adequately identified, reviewed, and applied relevant industry operating experience to Calvert Cliffs operations. In addition, based on those items selected for review, the inspectors determined that Constellation self-assessments and audits were thorough.

Based on the interviews the inspectors conducted over the course of the inspection, observations of plant activities, and reviews of individual CAP and employee concerns program issues, the inspectors did not identify any indications that site personnel were unwilling to raise safety issues nor did they identify any conditions that could have had a negative impact on the site's safety conscious work environment.

Inspection Report# : [2013008](#) (*pdf*)

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