UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

February 2, 2012

George H. Gellrich, Vice President
Calvert Cliffs Nuclear Power Plant, LLC
Constellation Energy Nuclear Group, LLC
1650 Calvert Cliffs Parkway
Lusby, Maryland 20657-4702

SUBJECT: CALVERT CLIFFS NUCLEAR GENERATING STATION – NRC INTEGRATED INSPECTION REPORT 05000317/2011005 AND 05000318/2011005

Dear Mr. Gellrich:

On December 31, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Calvert Cliffs Nuclear Power Plant (CCNPP), Units 1 and 2. The enclosed inspection report documents the inspection results, which were discussed on January 13, 2012, with you and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents two NRC-identified findings and two self-revealing findings of very low safety significance (Green). Three of these findings were determined to involve violations of NRC requirements. However, because of the very low safety significance, and because they are entered into your corrective action program (CAP), the NRC is treating these findings as non-cited violations (NCVs) consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest any NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region 1; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Calvert Cliffs. In addition, if you disagree with the cross-cutting aspect assigned to any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region I; and the NRC Resident Inspector at Calvert Cliffs.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

Glenn T. Dentel

Glenn T. Dentel, Chief
Reactor Projects Branch 1
Division of Reactor Projects

Docket Nos.: 50-317, 50-318
License Nos.: DPR-53, DPR-69

Enclosure: Inspection Report 05000317/2011005 and 05000318/2011005
w/Attachment: Supplemental Information

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/RA/
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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos.:	50-317, 50-318
License Nos.:	DPR-53, DPR-69
Report No.:	05000317/2011005 and 05000318/2011005
Licensee:	Constellation Energy Nuclear Group, LLC
Facility:	Calvert Cliffs Nuclear Power Plant, Units 1 and 2
Location:	Lusby, MD
Dates:	October 1, 2011, through December 31, 2011
Inspectors:	S. Kennedy, Senior Resident Inspector E. Torres, Resident Inspector K. Cronk, Project Engineer M. Jennerich, Project Engineer J. Hawkins, Project Engineer D. Kern, Senior Reactor Inspector S. Pindale, Senior Reactor Inspector D. Silk, Senior Operations Engineer P. Presby, Senior Operations Engineer R. Rolph, Health Physicist
Approved by:	Glenn T. Dentel, Chief Reactor Projects Branch 1 Division of Reactor Projects

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SUMMARY OF FINDINGS

IR 05000317/2011005, 05000318/2011005; 10/1/2011 – 12/31/2011; Calvert Cliffs Nuclear Power Plant (CCNPP), Units 1 and 2: Equipment Alignment; Licensed Operator Requalification Program; and Followup of Events and Notices of Enforcement Discretion.

The report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. Four Green findings, three of which were non-cited violations (NCVs), were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). The cross-cutting aspects for the findings were determined using IMC 0310, "Components Within the Cross-Cutting Areas." Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

Cornerstone: Initiating Events

- Green: A self-revealing finding of very low safety significance was identified because Constellation did not ensure the turbine building (TB) siding was installed in accordance with design requirements of ES-005, Civil and Structural Design Criteria. This resulted in wind induced TB siding failures significantly below design wind speeds. Consequently, Unit 1 experienced an automatic trip from 100 percent power due to a phase-to-phase short circuit on the main transformer when the main transformer high voltage lines were struck by dislodged TB siding caused by high winds associated with Hurricane Irene. The inspectors determined that Constellation missed multiple opportunities to identify the TB siding installation deficiencies following several high wind events and through the use of operating experience (OE). Immediate corrective actions included entering this issue into their CAP and restricting personnel travel in outside areas with sustained wind speed greater than 40 mph until the TB corner siding on all corners has been verified to be properly installed. Other corrective actions include testing and inspection of the main transformer, repairs to the 'B' and 'C' phase high line drops to the main transformer, temporary repairs to the TB siding, and development of new installation requirements which meet the design requirements of the TB siding corners. In addition, Constellation's planned corrective actions include inspecting all building siding inside the protective area to identify other possible deficiencies.

  The finding is more than minor because it is associated with the protection against external factors attribute (wind and grid stability) of the 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 power operations. Specifically, the finding resulted in a reactor trip of Unit 1. The inspectors determined that the finding is of very low safety significance because the finding did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available. This finding has a cross-cutting aspect in the area of problem identification and resolution, OE, because Constellation did not use OE information and internally generated lessons learned, to support plant safety and implement changes to station processes, procedures, equipment, and training programs. Specifically, Constellation did not implement and institutionalize OE associated with siding failures through changes to station processes, procedures, and equipment, and training programs (P.2.b per IMC 0310). (Section 4OA3)

Cornerstone: Mitigating Systems

- Green: A self-revealing NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified, because Constellation did not prescribe and accomplish procedures appropriate to the circumstances associated with protected safety related equipment. As a result, on October 3, 2011, Constellation allowed work on a protected emergency diesel generator (EDG). The work activity inadvertently resulted in the protected EDG becoming inoperable. This led to required Technical Specification (TS) shutdowns of Unit 1 and Unit 2 because the other required EDG was already out of service (OOS) for planned maintenance. Prior to the shutdown being completed, the protected EDG was restored to an operable status and the shutdowns were aborted. Immediate corrective actions included entering this issue into their corrective action program (CAP), issuing a site wide communication stating the expectations regarding work on protected safety equipment, and revising the Operations Administrative Policy (OAP) associated with protected equipment.

  The finding 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. Specifically, the work activity impacted the availability and capability of the 1A EDG. The inspectors determined the finding is of very low safety significance because the performance deficiency was not a design or qualification deficiency, did not involve an actual loss of safety function for greater than its individual TS allowed outage time, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a cross-cutting aspect in the area of human performance, decision making, because the Constellation did not adequately make a risk significant decision using a systematic process when faced with uncertain or unexpected plant conditions, to ensure safety is maintained. Specifically, Constellation personnel did not follow the integrated work management process for emergent work which ultimately led to the downpower of both units (H.1.a per IMC 0310). (Section 1R04)

- Green: The inspectors identified an NCV of 10 CFR Part 55.59(a)(2)(ii) for Constellation's failure to administer annual operating tests to licensed operators to accomplish a comprehensive sample of items specified by 10 CFR Part 55.45(a)(7)&(8). Specifically, for the past five years, Constellation's annual operating tests have not evaluated licensed operators on important tasks that would be performed inside the auxiliary building. Constellation entered this issue into their CAP to evaluate corrective actions.

  This finding is more than minor because if left uncorrected, it would have the potential to lead to a more significant safety concern. This finding is associated with human performance 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. Specifically, Constellation's annual operating tests have not evaluated licensed operators on mitigation tasks that would be performed inside the auxiliary building. The finding is of very low safety significance according to IMC 0609, "SDP," Appendix I, "Licensed Operator Requalification SDP," because the issue was related to operating test quality. The inspectors determined that this

finding had a cross-cutting aspect in the area of human performance, decision making, because Constellation did not use conservative assumptions in decision making that resulted in the development and administration of annual operating tests over the past five years that were not comprehensive (H.1.b per IMC 0310). (Section 1R11)

Green: The inspectors identified an NCV of TS 5.4.1, "Procedures," because Constellation did not adequately implement the procedural requirements to conduct floor drain inspections. Specifically, operators did not ensure that floor drains were free to drain and clear of debris in the 80 foot elevation of the 1A EDG building. This contributed to the inoperability of the 1A EDG due to clogged floor drains during Hurricane Irene on August 28, 2011. Additional causes included the failure of a combustion intake penetration boot seal to remain leak tight and the installation of drain filters without an engineering evaluation. Immediate corrective actions included entering this issue into their CAP, removing all the drain filters from the 1A EDG building, and installation of a curb around the combustion intake penetration. Planned corrective actions include replacing combustion intake penetration boot seal.

The finding is more than minor because it is associated with the human performance attribute of the Mitigating System cornerstone and affected the cornerstone's objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the performance deficiency resulted in the 1A EDG becoming inoperable. A phase 3 SDP was required because the finding was potentially risk significant due to a seismic, flooding, or severe weather initiating event. A Region I Senior Reactor Analyst (SRA) conducted a Phase 3 assessment and concluded that the finding was of very low safety significance. The finding has a cross-cutting aspect in the area of human performance, work practices, because Constellation did not ensure that personnel work practices support human performance by defining and effectively communicating expectations regarding procedural compliance and personnel following procedures related to floor drain inspections (H.4.b per IMC 0310). (Section 4OA3)

Other Findings

None

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at 100 percent power. On October 3, 2011, operators commenced an unplanned TS required shutdown due to two station vital 125 volts direct current (VDC) buses that were rendered inoperable when the Unit 1 and Unit 2 "A" EDG train became inoperable. Power reduction activities were aborted at 35 percent when the 1A EDG was restored to service. Operators returned the unit to full power the following day. On December 17, 2011, operators reduced power to 82 percent to perform main turbine valve testing. Operators returned the unit to 100 percent on the same day. The unit remained at or near 100 percent power for the remainder of the inspection period.

Unit 2 began the inspection period at 100 percent power. On October 3, 2011, operators commenced an unplanned TS required shutdown due to two station vital 125 VDC buses that were rendered inoperable when the Unit 1 and Unit 2 "A" EDG train became inoperable. Power reduction activities were aborted at 44 percent when the 1A EDG was restored to service. Operators returned the unit to full power the following day. The unit remained at or near 100 percent power for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection (71111.01 – One Sample)

Readiness for Seasonal Extreme Weather Conditions

a. Inspection Scope

The inspectors performed a review of Constellation's readiness for the onset of the cold weather season. The review focused on the refueling water tanks (RWTs) and the EDG rooms. The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), TSs, control room logs, and the CAP to determine what temperatures or other seasonal weather could challenge these systems, and to ensure Calvert Cliffs personnel had adequately prepared for these challenges. The inspectors reviewed station procedures, including Calvert Cliffs' seasonal weather preparation procedure and applicable operating procedures. The inspectors performed walkdowns of the selected systems to ensure station personnel identified issues that could challenge the operability of the systems during cold weather conditions. Documents reviewed for each section of this inspection report are listed in the Attachment.

b. Findings

No findings were identified.

1R04 Equipment Alignment

Partial Walkdowns (71111.04Q – Three Samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- 1A EDG with 2A EDG OOS for scheduled maintenance on October 3, 2011
- U-4000-21 transformer with U-4000-11 OOS on October 19, 2011
- 1A EDG partial equipment alignment while cross-tied to the 0C diesel generator on October 31, 2011

The inspectors selected these systems based on their risk-significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors reviewed applicable procedures, system diagrams, the UFSAR, TSs, condition reports (CRs), and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted system performance of their intended safety functions. The inspectors also performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and were operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. The inspectors also reviewed whether Constellation staff had properly identified equipment issues and entered them into the CAP for resolution with the appropriate significance characterization.

b. Findings

Introduction: A Green self-revealing NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified because Constellation did not prescribe and accomplish procedures appropriate to the circumstances associated with protected safety related equipment. Specifically, Constellation allowed work on a protected EDG which inadvertently resulted in the protected EDG becoming inoperable.

Description: On October 3, 2011, Constellation removed the No. 21 saltwater (SW) train from service for scheduled maintenance which affected the Unit 2 "A" service water (SRW) train. Because the Unit 2 "A" SRW train supports cooling of the 2A EDG, the 2A EDG was rendered OOS. Operators protected the 1A, 1B, and 2B EDGs to ensure that those EDGs would remain operable and available. An electrical maintenance first line supervisor realized that a weekly critical component preventive maintenance (PM) activity for the 1A EDG battery was not performed on September 29, 2011, and requested permission from the shift operation work control (OWC) supervisor to perform the critical component PM. The shift OWC supervisor processed the work on the 1A EDG battery as emergent work. The shift OWC supervisor was required to perform attachment 11, "Emergent Activity Risk Assessment Worksheet," of procedure CNG-OP-4.01-1000, "Integrated Risk Management," to risk assess the emergent work activity. However, the shift OWC supervisor performed the review by memory due to the routine nature of the PM and that it had been done successfully in the past. The independent senior reactor operator (SRO) review of attachment 11 was also conducted from memory. The shift OWC supervisor obtained permission from the shift manager to perform the missed PM on the 1A EDG battery in accordance with OAP 02-02,

"Protection of Defense in Depth Equipment & Systems." During the PM activity, the electrical maintenance technicians found the 16 battery charger float voltage out of specification. The technicians adjusted the voltage per the PM. During the adjustment of the float voltage, the charger unexpectedly failed which rendered the 1A EDG inoperable. The failure of the 1A EDG with the 2A EDG already OOS required operators to initiate action within one hour to shut down the units in accordance with TS Limiting Condition for Operation (LCO) 3.0.3 due to the impact on the stations 125 VDC buses. Operations aborted the shutdown with Unit 1 at 35 percent power and Unit 2 at 44 percent power following the repair of the 16 battery charger. Unit 1 and Unit 2 were returned to full power the following day.

The inspectors concluded that Constellation did not adequately prescribe and accomplish procedures appropriate to the circumstances associated with protected safety related equipment. Constellation personnel did not adequately implement attachment 11 of CNG-OP-4.01-1000. Attachment 11, question 5, required the OWC to evaluate if "the emergent activity being performed on a redundant system, train or channel that is being relied upon to support plant operation because the other system or train has components that are OOS." Operators incorrectly evaluated the activity and failed to recognize that the PM would place the units in nuclear high risk which would have required a more rigorous evaluation and management approval. In addition, the root cause evaluation report determined that OAP 02-02 was inadequate in that it focused on allowing work on protected equipment vice preventing work on protected equipment; did not have a formal authorization process to approve maintenance on protected equipment; and did not adequately describe the cross unit impact associated with the EDGs. The inspectors noted that there were also other barriers that could have prevented this issue such as plant impact cautions in maintenance procedures and work orders. Immediate corrective actions included entering this issue into their CAP, issuing a site wide communication stating the expectations regarding work on protected safety equipment, and revising the OAP associated with protected equipment.

Analysis: Constellation's failure to prescribe and accomplish procedures appropriate to the circumstances associated with protected safety related equipment is a performance deficiency. The finding 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. Specifically, the work activity impacted the availability and capability of the 1A EDG. In accordance with IMC 0609, attachment 4, "Phase 1- Initial Screening and Characterization of Findings," table 4a, the finding is of very low safety significance because the performance deficiency was not a design or qualification deficiency, did not involve an actual loss of safety function for greater than its individual TS allowed outage time, and did not screen as potentially risk significant due to a seismic, flooding, or severe weather initiating event. This finding has a cross-cutting aspect in the area of human performance, decision making, because Constellation did not adequately make a risk significant decision using a systematic process when faced with uncertain or unexpected plant conditions, to ensure safety is maintained. Specifically, Constellation personnel did not follow the integrated work management process for emergent work which ultimately led to the downpower of both units (H.1.a per IMC 0310).

Enforcement: 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," states, in part, that activities affecting quality shall be prescribed by

documented instructions, procedures, or drawings of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Contrary to the above, on October 3, 2011, Constellation did not adequately prescribe and accomplish procedures appropriate to the circumstances associated with protected safety related equipment. As a result, Constellation allowed work on a protected EDG which inadvertently resulted in the protected EDG becoming inoperable. This led to a required TS shutdown of both units because the other required EDG was already OOS for planned maintenance. As immediate corrective actions, Constellation revised the OAP associated with protected equipment. Because this violation was of very low safety significance and Constellation entered the issue into their CAP (CR-2011-009871), this violation is being treated as an NCV, consistent with the Enforcement Policy. **(NCV-05000317/318/2011005-01: Did Not Adequately Prescribe and Implement Procedures Associated with Protected Equipment)**

1R05 Fire Protection

Quarterly Inspection (71111.05Q – One Sample)

a. Inspection Scope

The inspectors conducted a tour of the area listed below to assess the material condition and operational status of fire protection features. The inspectors verified that Constellation controlled combustible materials and ignition sources in accordance with administrative procedures. The inspectors verified that fire protection and suppression equipment was available for use as specified in Constellation's fire plan, and passive fire barriers were maintained in good material condition. The inspectors also verified that station personnel implemented compensatory measures for OOS, degraded, or inoperable fire protection equipment, as applicable, in accordance with procedures.

- 2A EDG room, fire area 31, room 422

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07A – One Sample)

a. Inspection Scope

The inspectors reviewed the No. 22B service water heat exchanger (SRWHX) to determine its readiness and availability to perform its safety functions. The inspectors reviewed the design basis for the component and verified Constellation's commitments to NRC Generic Letter 89-13. The inspectors discussed the results of the most recent inspection with engineering staff and reviewed pictures of the as-found and as-left conditions. The inspectors verified that Constellation initiated appropriate corrective actions for identified deficiencies. The inspectors also verified that the number of tubes plugged within the heat exchanger did not exceed the maximum amount allowed.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11B – One Sample)

a. Inspection Scope

The following inspection activities were performed using NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 9, Supplement 1, Inspection Procedure (IP) Attachment 71111.11, "Licensed Operator Requalification Program," Appendix A, "Checklist for Evaluating Facility Testing Material," Appendix B, "Suggested Interview Topics," and Appendix C "Checklist for Evaluating Plant-Referenced Simulators Operating Under 10 CFR 55.46(c) and (d)."

A review was conducted of recent operating history documentation found in inspection reports, Constellation's CAP, and the most recent NRC plant issues matrix. The inspectors also reviewed specific events from Constellation's CAP which indicated possible training deficiencies, to verify that they had been appropriately addressed. The senior resident inspector was also consulted for insights regarding licensed operators' performance. These reviews did not detect any operational events that were indicative of possible training deficiencies.

The operating and written tests for the weeks of November 14 and 21, 2011, were reviewed for quality.

On December 19, 2011, the results of the annual operating tests and the written exam for 2011 were reviewed to determine if pass/fail rates were consistent with the guidance of NUREG-1021 and NRC IMC 0609, Appendix I, "Operator Requalification Human Performance SDP." The review verified the following:

- Crew pass rates were greater than 80 percent. (Pass rate was 100 percent.)
- Individual pass rates on the dynamic simulator test were greater than 80 percent. (Pass rate was 96.2 percent.)
- Individual pass rates on the written exam were greater than 80 percent. (Pass rate was 94.9 percent.)
- Individual pass rates on the job performance measures (JPMs) of the operating exam were greater than 80 percent. (Pass rate was 100 percent.)
- More than 75 percent of the individuals passed all portions of the exam. (91.1 percent of the individuals passed all portions of the examination)

Observations were made of the dynamic simulator exams and JPMs administered during the week of November 14, 2011. These observations included facility evaluations of crew and individual performance during the dynamic simulator exams and individual performance of five JPMs.

The remediation plans for the past two years for individual failures for operating and written tests were reviewed to assess the effectiveness of the remedial training. The inspectors reviewed records to ensure that individuals who required remediation were disqualified from performing licensed duties until they were successfully remediated.

Seventeen licensed operator activations were reviewed to ensure that 10 CFR Part 55.53 license conditions and applicable program requirements were met.

Operators, instructors and training supervision were interviewed for feedback on their training program and the quality of training.

Simulator performance and fidelity were reviewed for conformance to the reference plant control room.

A sample of records for requalification training attendance, program feedback, reporting, and medical examinations were reviewed for compliance with license conditions, including NRC regulations.

b. Findings

Introduction: The inspectors identified an NCV of 10 CFR Part 55.59(a)(2)(ii) for Constellation's failure to administer annual operating tests to licensed operators to accomplish a comprehensive sample of items specified by 10 CFR Part 55.45(a)(7)&(8). Specifically, for the past five years, Constellation's annual operating tests have not evaluated licensed operators on important tasks that would be performed inside the auxiliary building.

Description: During the biennial licensed operator requalification training program inspection, the inspectors determined that Constellation had not been conducting JPMs, as part of their annual operating tests, for tasks that can be performed inside the auxiliary building. This issue was discovered when Constellation requalification examination personnel stated that auxiliary building entries were not made to minimize radiological dose to site personnel. Upon further investigation by the inspectors and Constellation, it was determined that no JPMs had been administered to licensed operators in the auxiliary building since the 2006 annual operating examination. Therefore, in the past five annual operating tests (2007-2011), Constellation has not evaluated licensed operators on their ability to perform tasks on equipment which is located inside the auxiliary building.

NRC regulation 10 CFR Part 55.59(a) (2) (ii) refers to sampling items specified in 10 CFR Part 55.45(a). In part, 10 CFR Part 55.45(a) states:

> "The operating test, to the extent applicable, requires the applicant to demonstrate an understanding of and the ability to perform the actions necessary to accomplish a representative sample from among the following 13 items....
>
> (7) Safely operate the facility's heat removal systems, including primary coolant, emergency coolant, and decay heat removal systems, and identify the relations of the proper operation of these systems to the operation of the facility.
> (8) Safely operate the facility's auxiliary and emergency systems, including operation of those controls associated with plant equipment that could affect reactivity or the release of radioactive materials to the environment..."

Many of the systems stated in 10 CFR Part 55.45(a) (7) & (8) are located inside the auxiliary building.

Each year, as required by 10 CFR Part 55.59, licensed operators take an operating test. The test consists of two dynamic simulator scenarios and five JPMs. Three JPMs can be administered in the simulator while the remaining two are conducted in the plant. Based upon data from the Operator Licensing Tracking System regarding the number of licensed individuals at the CCNPP from 2007 to the present, a total of approximately 1920 JPM evaluations were conducted, of which about 768 were conducted in the plant. None of these in-plant JPM evaluations were administered inside the auxiliary building. Thus, during this time period, ample opportunity existed for Constellation to sample operator performance pertaining to tasks that can be performed inside the auxiliary building.

When this issue was brought to Constellation management's attention, the inspectors were informed that according to Constellation's Systems Approach to Training, there were no programmatic criteria prompting the evaluation of operators on auxiliary building tasks. Furthermore, Constellation stated that all abnormal or emergency tasks that need to be performed inside the auxiliary building will be performed by qualified non-licensed operators.

To identify a sample of safety significant tasks that can be performed inside the auxiliary building, the inspectors reviewed abnormal operating procedure (AOP)-9A, "Control Room Evacuation and Safe Shutdown Due to a Severe Control Room Fire." Of the approximately 90 block steps (tasks or field actions) listed, 26 tasks are performed inside the auxiliary building. Some of the tasks related to the topics of 10 CFR Part 55.45(a)(7) & (8) include: (1) verification of main steam isolation valve closure, (2) lineup charging pump suction to the boric acid storage tanks, (3) establish SRW flow to containment air coolers, (4) shift charging suction to the RWT, (5) operate auxiliary spray control valve, (6) commence shutdown cooling lineup, and (7) adjust shutdown cooling temperature.

According to NRC guidance in NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," ES-603, "Requalification Walk-Through Examinations," Section C.1.b, JPM tasks should have an importance rating (as based upon NUREG-1122, "Knowledge and Abilities Catalog for Nuclear Power Plant Operators") of at least 3.0. According to NUREG-1022, the above mentioned tasks have reactor operator (RO)/SRO importance ratings as follows:

Importance Rating (RO/SRO)	Catalog Location
1. 4.5/4.6	(035 A4.06)
2. 3.9/3.7	(004 A4.07)
3. 3.5/3.5	(076 A4.04)
4. 3.9/4.1	(068 AA1.11)
5. 3.8/4.0	(068 AA1.28)
6. 4.3/4.5	(068 AA1.01)
7. 3.4/3.1	(005 A4.02)

Although some of the above listings pertain to the ability to operate the system from the control room, the importance ratings associated with the operation of those systems are relatively high. Furthermore, it should also be noted that NUREG-1122 assigns importance ratings of 4.2 and 4.5 (RO/SRO) for knowledge of "Actions contained in the

emergency operating procedure for control room evacuation emergency task" (068 AK3.18). Also, NUREG-1122 assigns importance ratings of 3.8 and 4.0 for "Knowledge of local auxiliary operator tasks during an emergency and the resultant operational effects" (Generic 2.4.35).

Constellation stated during the two year training cycle that crews are trained on the implementation of AOP-9A in a classroom setting. The crew members will then walk-through the implementation of the procedure with non-licensed operators simulating tasks in the auxiliary building while the licensed operators man their stations outside of the auxiliary building.

It should be noted, however, that Constellation's procedure OAP 09-05, "12 Hour Shift/Staffing Policies and Time Off Guidelines," allows for "Cascading Watches." Cascading watches occur when an extra licensed operator is used to stand a non-licensed operator watch. Likewise, an SRO can fulfill an RO watch. Thus, given the possibility of cascading watches, the inspectors asked Constellation to determine when each licensed operator had last entered the auxiliary building. It was determined that three licensed operators had not entered the auxiliary building at least since January 1, 2007. (The search criteria reviewed the period from January 1, 2007, to the present.) Furthermore, it was determined that 13 additional licensed operators had not been inside the auxiliary building in over one year. Therefore, due to the possibility of conducting cascading watches, evaluating licensed operators on tasks that can be performed in any area of the plant would be necessary to assess operator ability and training program effectiveness.

Therefore, based on the above sample of important field actions that can be performed inside the auxiliary building, and also that Constellation has not tested any of these operator tasks during the past five years using JPMs, it was determined that Constellation's annual operating tests were not comprehensive as required by 10 CFR Part 55.59(a)(2)(ii).

Analysis: The inspectors determined that the failure to administer comprehensive annual operating tests for the past five years to meet the requirements of 10 CFR Part 55.59(a)(2)(ii) is a performance deficiency that was reasonably within Constellation's ability to foresee and correct, and should have been prevented. Traditional enforcement does not apply since there were no actual safety consequences, impacts on the NRC's ability to perform its regulatory function, nor willful aspects of the finding. This finding was more than minor because it was associated with human performance 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 and, if this finding were left uncorrected would have the potential to lead to a more significant safety concern. Specifically, Constellation's annual operating tests have not evaluated licensed operators on mitigation tasks that would be performed inside the auxiliary building.

IMC 0609, "SDP," Appendix I, "Licensed Operator Requalification SDP" was used to assess this issue. This finding affected the individual operating tests and was related to test quality. Because two of the five JPMs (40%) that comprise the annual operating tests are conducted in the plant, and because for the past five years this portion of the

tests did not sample operator tasks that would be performed inside the auxiliary building during certain emergency conditions, the inspectors determined that this issue affected more than 20 percent of the individual operating test items and thus the finding was determined to be of very low safety significance (Green).

This finding had a cross-cutting aspect in the area of human performance, decision making, in that Constellation did not use conservative assumptions in decision making that resulted in the development and administration of annual operating tests over the past five years that were not comprehensive (H.1.b per IMC 0310).

Enforcement: NRC regulation 10 CFR Part 55.59(a) (2) (ii) states, in part, that, "...the operating test will require the operator or senior operator to demonstrate an understanding of and the ability to perform the actions necessary to accomplish a comprehensive sample of items specified in 10 CFR Part 55.45(a) (2) through (13) inclusive to the extent applicable to the facility." Contrary to the above, during the period of 2007 through 2011, Constellation failed to administer annual operating tests that accomplished a comprehensive sampled of items in 10 CFR Part 55.45(a) pertaining to tasks that would be performed inside the auxiliary building. Immediate corrective action included entering this item into the CAP. Because this finding is of low safety significance and has been entered into the CAP as CR-2012-000175, this violation is being treated as an NCV, consistent with the NRC Enforcement Policy. **(NCV-05000317/318/2011005-02, Annual Operating Tests Are Not Comprehensive)**

1R12 Maintenance Effectiveness (71111.12Q – Two Samples)

a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on systems, structures, and components (SSCs) performance and reliability. The inspectors reviewed system health reports, CAP documents, maintenance work orders (WOs), and maintenance rule basis documents to ensure that Constellation was identifying and properly evaluating performance problems within the scope of the maintenance rule. For each sample selected, the inspectors verified that the SSC was properly scoped into the maintenance rule in accordance with 10 CFR Part 50.65 and verified that the (a) (2) performance criteria established by Constellation staff was reasonable. As applicable, for SSCs classified as (a) (1), the inspectors assessed the adequacy of goals and corrective actions to return these SSCs to (a) (2). Additionally, the inspectors ensured that Constellation staff was identifying and addressing common cause failures that occurred within and across maintenance rule system boundaries.

- Maintenance Rule (a)(3) Assessment (SA-2010-000055)
- 1A EDG OOS during Hurricane Irene (CR-2011-008708)

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – Two Samples)

a. Inspection Scope

The inspectors reviewed station evaluation and management of plant risk for the maintenance and emergent work activities listed below to verify that Constellation performed the appropriate risk assessments prior to removing equipment for work. The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that Constellation personnel performed risk assessments as required by 10 CFR Part 50.65(a)(4) and that the assessments were accurate and complete. When Constellation performed emergent work, the inspectors verified that operations personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work and discussed the results of the assessment with the station's probabilistic risk analyst to verify plant conditions were consistent with the risk assessment. The inspectors also reviewed the TS requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

- Loss of two 125 VDC buses on both units on October 3, 2011
- Planned maintenance on U-4000-22, 4 kilovolt (kV) transformer, on October 18, 2011

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – Four Samples)

a. Inspection Scope

The inspectors reviewed operability determinations for the following degraded or non-conforming conditions:

- High pressure safety injection (HPSI) isolation check valve, 1-SI-113, excessive back leakage (CR-2011-009825)
- No.13 SW pump to No.11 SW header isolation valves appear to be leaking by (CR-2011-010578)
- No. 22A/22B SRWHX SW bypass pressure indicator controller will not maintain No. 22 SW header pressure below setpoint (CR-2011-012251)
- Auxiliary HPSI header isolation valve, 1-MOV-627OP, running torque found higher than expected during viper testing (CR-2011-010646)

The inspectors selected these issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the operability determinations to assess whether TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TSs and UFSAR to Constellation's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the

measures in place would function as intended and were properly controlled by Constellation. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – Five Samples)

a. Inspection Scope

The inspectors reviewed the post-maintenance tests for the maintenance activities listed below to verify that procedures and test activities ensured system operability and functional capability. The inspectors reviewed the test procedure to verify that the procedure adequately tested the safety functions that may have been affected by the maintenance activity, that the acceptance criteria in the procedure were consistent with information in the applicable licensing basis and/or design basis documents, and that the procedure had been properly reviewed and approved. The inspectors also witnessed the test or reviewed test data to verify that the test results adequately demonstrated restoration of the affected safety functions.

- Repair 1A EDG No. 16 battery charger (WO# C91639822)
- Repair 1B EDG blower oil leak (WO# C91057001)
- Replace 0C diesel fuel rack position indicator (WO# C90928769)
- Replace No. 11 low pressure safety injection valve (WO# 1199603350)
- Replace 2B EDG jacket cooling water jumpers (WO# C91546914)

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – Four Samples)

a. Inspection Scope

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk-significant SSCs to assess whether test results satisfied TSs, the UFSAR, and Constellation procedural requirements. The inspectors verified that test acceptance criteria were clear, tests demonstrated operational readiness and were consistent with design documentation, test instrumentation had current calibrations and the range and accuracy for the application, tests were performed as written, and applicable test prerequisites were satisfied. Upon test completion, the inspectors considered whether the test results supported that equipment was capable of performing the required safety functions.

The inspectors reviewed the following surveillance tests:

- MOV 9B , HPSI main and auxiliary header isolation valve (1-MOV-656OP) viper testing
- STP-M-212D-1, Channel "D" reactor protection system (RPS) functional test
- STP-O-73I-1, HPSI pump and check valve quarterly operability in service test
- STP-O-73I-1, Power operated relief valve block valve operability test

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstone: Occupational/Public Radiation Safety

2RS01 Radiological Hazard Assessment and Exposure Controls (71124.01)

a. Inspection Scope

During the period December 5, through December 9, 2011, the inspectors conducted the following activities to verify that Calvert Cliffs properly assessed the radiological hazards in the workplace and implemented appropriate radiation monitoring and exposure controls. Implementation of these controls was reviewed against the criteria contained in 10 CFR Part 20, relevant TSs, and Constellation's procedures.

Inspection Planning

- The inspectors reviewed all Constellation Performance Indicators (PI) for the Occupational Exposure Cornerstone for follow-up and the results of radiation protection program self-assessments and audits.

Radiological Hazard Assessment

- The inspectors verified that there have been no operational occurrences effecting radiological controls.
- The inspectors reviewed the two most recent surveys of the general walkways in the auxiliary building, the waste gas decay tank, the emergency core cooling system, and the charging pump rooms.
- The inspectors walked down the auxiliary building general area and the material processing building to evaluate material conditions and potential radiological conditions.
- The inspectors observed the loading of a new high integrity container into the rail car pit, discussed reactor coolant pump seal rebuild with workers in the auxiliary building, and observed workers preparing the nozzle dams for the upcoming outage. The inspectors verified appropriate pre-work surveys were performed.

Instructions to Workers

- The inspectors verified proper labeling on a sampling of containers stored in the material processing building.
- The inspectors reviewed four radiation work permits (RWPs) for entry into high radiation areas and verified that appropriate work control instructions were specified.
- The inspectors verified that appropriate electronic personal dosimeter (EPD) alarm set points were specified.
- The inspectors reviewed one case where a worker's EPD alarmed on dose. The worker responded appropriately and the event was included in the CAP

Contamination and Radioactive Material Control

- The inspectors reviewed procedures and records to verify that radiation detection instrumentation is used at its typical sensitivity and Calvert Cliffs has not established a de facto "release limit."
- The inspectors verified locations for three sources and that the sources were leak tested.
- The inspectors verified there were no transactions involving nationally tracked sources.

Radiological Hazards Control and Work Coverage

- The inspectors verified that existing conditions were consistent with posted surveys and RWPs.
- The inspectors verified appropriate radiological controls and radiation protection job coverage was in place for the high integrity container replacement in the rail car pit and other jobs in the auxiliary building.
- There was no opportunity to observe work in high radiation areas with significant dose rate gradients during this inspection.
- The inspectors reviewed the only RWP for work in an airborne area. This RWP was for rapid entry into the containment at power. The inspectors verified appropriate controls and barriers were specified.
- The inspectors examined Calvert Cliffs' physical and programmatic controls for highly activated material stored within the spent fuel pools. The inspectors verified the controls were adequate to preclude inadvertent removal of the material from the pools.
- The inspectors observed the postings and physical controls for several high radiation areas. The very high radiation areas, under the reactor vessel, are not accessible during reactor power operation.

Risk-Significant High Radiation Area and Very High Radiation Area Controls

- The inspectors discussed the controls and procedures for high-risk high radiation areas and very high radiation areas with the radiation protection manager, and the general supervisor radiation protection. The inspectors verified Calvert Cliffs provides stricter controls for very high radiation area access. The radiation protection manager controls the only access to the keys for these areas.

- The inspectors discussed with a first line health physics supervisor, the controls in place for special areas that have the potential to become a very high radiation area during certain plant operation. Diving operations in the spent fuel pool were specifically discussed.
- The inspectors verified that Calvert Cliffs' controls for all very high radiation areas will ensure an individual will not be able to gain unauthorized access to a very high radiation area.

Radiation Worker Performance

- During plant tours and discussions with workers, the inspectors verified workers were aware of the radiological conditions in their work area and the RWP controls in place.
- The inspectors reviewed CRs with human performance errors and observed no patterns traceable to a similar cause.

Radiation Protection Technician Proficiency

- During observation of the new high integrity container installation in the rail car pit, the inspectors verified the radiation protection technicians were aware of the radiological conditions and the RWP requirements. The inspectors observed three way communications between the workers and radiation protection technicians in the rail car pit, and the workers and radiation protection technicians on the floor above. The inspectors also observed use of the procedure for the work.
- The inspectors reviewed CRs where the cause of the event was determined to be radiation protection technician error. The inspectors verified no observable patterns traceable to a similar cause.

Problem Identification and Resolution

- The inspectors reviewed CRs associated with radiation monitoring and exposure control and verified Calvert Cliffs' problems are identified at an appropriate threshold and are properly addressed for resolution.

b. Findings

No findings were identified.

2RS04 Occupational Dose Assessment (71124.04)

a. Inspection Scope

During the period December 5, through December 9, 2011, the inspectors conducted the following activities to verify that Calvert Cliffs appropriately monitors occupational dose. Implementation of these controls was reviewed against the criteria contained in 10 CFR Part 20, applicable industry standards, and Constellation's procedures.

Inspection Planning

- The inspectors reviewed audits and self assessments of the radiation protection program.
- The inspectors reviewed the most recent National Voluntary Laboratory Accreditation Program (NVLAP) accreditation report for Calvert Cliffs' vendor.
- The inspectors reviewed Calvert Cliffs' dosimetry procedures.
- The inspectors verified that Calvert Cliffs has established procedural requirements for determining when external and internal dosimetry is required.

External Dosimetry

- The inspectors verified that Calvert Cliffs' personnel dosimeters are NVLAP accredited.
- The inspectors evaluated the storage of dosimeters on site and verified guidance is provided to radiation workers with respect to care and storage of dosimeters.
- The inspectors verified that Calvert Cliffs does not use non-NVLAP dosimeters.
- The inspectors verified that Calvert Cliffs uses a "correction factor" to bias the electronic dosimeters to read 10 percent high.

Internal Dosimetry

- The inspectors verified the procedures used to assess dose from internally deposited nuclides address methods for determining if an individual is internally or externally contaminated, the release of contaminated individuals, the determination of entry route, and assignment of dose. The inspectors verified that the frequency of whole body count measurements is consistent with the biological half-life of the potential nuclides available for intake. The inspectors verified that whole body counting is the method for screening intakes. The inspectors reviewed whole body counts performed for contaminated individuals and verified that each had sufficient counting time/low background, used an appropriate nuclide library, and anomalous peaks/nuclides received appropriate disposition. The inspectors verified that hard-to-detect nuclides are accounted for in the dose assessments.
- The inspectors verified that no in-vitro monitoring was performed during the inspection period.
- The inspectors verified that Calvert Cliffs had no events where airborne/derived air concentration dose assessment was used.
- The inspectors verified that there were no internal dose assessments for any actual internal exposure greater than 10 millirem.

Special Dosimetric Situations

- The inspectors reviewed Calvert Cliffs' process to inform workers of the risks of radiation exposure to the embryo/fetus and the process to be used for declaring a pregnancy.
- The inspectors reviewed two shallow dose equivalent (SDE) dose assessments for adequacy. Calvert Cliffs uses VARSKIN to calculate SDE from distributed skin contamination and from discrete radioactive particles.
- The inspectors reviewed Calvert Cliffs' neutron dosimetry program and verified the dosimetry and instrumentation were appropriate for the expected neutron spectra.

- The inspectors verified that Calvert Cliffs appropriately assigns total effective dose equivalent, SDE, and lens dose equivalent to individuals from both internal and external monitoring results, supplementary information, and surveys including air monitoring results, as required.

Problem Identification and Resolution

- The inspectors verified that problems associated with occupational dose assessment have been identified at the appropriate threshold and properly addressed in Calvert Cliffs' CAP.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES (OA)

4OA1 Performance Indicator (PI) Verification (71151)

.1 Mitigating Systems (Six Samples)

a. Inspection Scope

The inspectors reviewed Constellation's PI program to evaluate, collect, and report information on the following Unit 1 and Unit 2 PIs: (1) Unplanned Transients; (2) Unplanned Scrams; and (3) Unplanned Scrams with Complications. The inspectors reviewed these PIs for the period of July 2010 through September 2011. The inspectors used the guidance provided in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment PI Guideline," to assess the accuracy of PI data collected and reported. The inspectors reviewed the Licensee Event Reports (LERs), monthly operating reports, power history charts, NRC inspection reports, and operator narrative logs.

b. Findings

No findings were identified.

.2 Occupational Exposure Control Effectiveness (One Sample)

a. Inspection Scope

The inspectors reviewed implementation of Constellation's Occupational Exposure Control Effectiveness PI Program. Specifically, the inspectors reviewed recent CRs, and associated documents, for occurrences involving locked high radiation areas, very high radiation areas, and unplanned exposures against the criteria specified in NEI 99-02 to verify that all occurrences that met the NEI criteria were identified and reported as PIs. This inspection activity represents the completion of one sample relative to this inspection area; completing the annual inspection requirement.

b. Findings

No findings were identified.

.3 RETS/ODCM Radiological Effluent Occurrences (One Sample)

a. Inspection Scope

The inspectors reviewed relevant effluent release reports for the period January 1-December 31, 2010, for issues related to the public radiation safety PI, which measures radiological effluent release occurrences that exceed 1.5 millirem/quarter whole body or 5.0 millirem/quarter organ dose for liquid effluents; 5 millirads/quarter gamma air dose, 10 millirads/quarter beta air dose, and 7.5 millirads/quarter for organ dose for gaseous effluents. This inspection activity represents the completion of one sample relative to this inspection area; completing the annual inspection requirement.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – Five Samples)

.1 Routine Review of Problem Identification and Resolution Activities

a. Inspection Scope

As required by Inspection Procedure 71152, "Problem Identification and Resolution," the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that Constellation entered issues into the CAP at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and addressed adverse trends. In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the CAP and periodically attended CR screening meetings.

b. Findings

No findings were identified.

.2 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a semi-annual review of site issues, as required by IP 71152, "Problem Identification and Resolution," to identify trends that might indicate the existence of more significant safety issues. In this review, the inspectors included repetitive or closely-related issues that may have been documented by Constellation outside of the CAP, such as trend reports, PIs, system health reports, and quality assurance assessments. The inspectors also reviewed Constellation's CAP database to assess CRs written in various subject areas (equipment problems, human performance

issues, etc.), as well as individual issues identified during the NRC's daily CR review (Section 4OA2.1). The inspectors reviewed Constellation's quarterly trend report for the third quarter of 2011 for selected departments to verify that Constellation personnel were appropriately evaluating and trending adverse conditions in accordance with applicable procedures.

b. Findings and Observations

No findings were identified.

In general, Constellation identified trends and appropriately addressed the trends within their CAP. No trends were noted that indicated a potentially safety significant issue. Examples of trends identified by Constellation were trends in the areas of pressurizer safety valve performance, safety tagging performance, and radioactive material control.

.3 Annual Sample: Review of the Operator Workaround Program

a. Inspection Scope

The inspectors reviewed the cumulative effects of the existing operator workarounds, operator burdens, existing operator aids and disabled alarms, and open main control room deficiencies to identify any effect on emergency operating procedure operator actions, and any impact on possible initiating events and mitigating systems. The inspectors evaluated whether station personnel had identified, assessed, and reviewed operator workarounds as specified in Constellation procedure NO-1-123, Managing Operator Impacts.

The inspectors reviewed Constellation's process to identify, prioritize and resolve main control room distractions to minimize operator burdens. The inspectors reviewed the system used to track these operator workarounds and recent Constellation self assessments of the program. The inspectors also toured the control room and discussed the current operator workarounds with the operators to ensure the items were being addressed on a schedule consistent with their relative safety significance.

b. Findings and Observations

No findings were identified.

The inspectors determined that operator work-arounds were classified, tracked, and assessed in accordance with Constellation's procedures.

.4 Annual Sample: Atmospheric Dump Valve (ADV) Performance Testing Failures

a. Inspection Scope

The inspectors reviewed the identification, evaluation, and corrective actions taken by Constellation associated with the Unit 2 ADVs, 2-CV-3938 and 2-CV-3939. Constellation identified issues with both ADVs during the 2011 refueling outage while conducting performance testing. These conditions were identified on February 14, 2011,

when the 21 ADV failed to stroke and the 22 ADV failed to fully stroke during the performance testing. Constellation entered these issues into the CAP as CR-2011-001483 and CR-2011-001485. The inspectors reviewed the associated apparent cause evaluations (ACE), performance data, maintenance history, vendor technical manuals, and interviewed engineering and operations personnel to evaluate component performance and the effectiveness of Constellation's corrective actions.

b. Findings and Observations

No findings were identified.

The inspectors determined that Constellation adequately implemented the CAP following the discovery of the issues with the ADVs. Constellation determined that the cause of the failure of the No. 21 ADV was a degraded valve seat due to improper machining by the original equipment manufacturer. Constellation replaced the defective valve seat and conducted an extent of condition on the other ADVs. Additional corrective actions included revising the ADV overhaul procedure to include a check of all critical dimensions related to the valve and ensuring the vendor documentation provides documentation of those critical dimensions upon receipt of parts. Constellation determined that the cause of the failure of the No. 22 ADV was a degraded diaphragm that allowed air to leak from the mating surface of the diaphragm and the actuator covers. Constellation immediately replaced the diaphragm with a different type of diaphragm material that is less susceptible to becoming brittle by exposure to high temperatures. Constellation also replaced 2 of the other ADV diaphragms with the new material and has actions planned to replace the final ADV during the next outage. The inspectors determined that corrective actions were timely and appropriate to address the causes of these issues.

.5 Annual Sample: Pressurizer Code Safety Valve Leakage

a. Inspection Scope

On May 12, 2010, Unit 1 automatically tripped due to a generator loss of load. Both pressurizer power operated relief valves (PORVs) lifted as designed to limit the associated reactor coolant system (RCS) pressure transient. The peak transient RCS pressure remained about 170 pounds per square inch below the pressurizer code safety valve (PSV) lift setpoint. Several hours after the reactor trip, operators identified that PSV 1RV201 was leaking. Operators quantified the maximum PSV leakage to be approximately 0.25 gallons per minute, determined both PSVs remained operable, and attempted unsuccessfully to reseat 1RV201. On May 13, the plant was placed in cold shutdown and the leaking valve was replaced. Station personnel initiated CR-2010-005182 to identify the cause of the valve leakage, evaluate extent-of-condition implications, and implement corrective actions as appropriate. Subsequent visual inspection upon valve disassembly revealed 1RV201 had lifted during the transient. Engineers revised CR-2010-005182 to evaluate the premature PSV lift. The original ACE was revised to incorporate the new information gained during the valve failure analysis at the vendor facility.

The inspectors noted this was the fifth time in the last 10 years that one or both PSVs had experienced leakage. The inspectors assessed Constellation's problem identification threshold, causal analyses, extent-of-condition reviews, compensatory

actions, and the prioritization and timeliness of corrective actions to determine whether Constellation was appropriately identifying, characterizing, and correcting problems associated with this issue and whether the planned or completed corrective actions were appropriate. The inspectors compared the actions taken to the requirements of Constellation's CAP and 10 CFR Part 50, Appendix B. In addition, the inspectors reviewed various maintenance and testing records, plant operating history and industry OE, and interviewed engineers, technicians and managers to assess the effectiveness of the implemented corrective actions.

b. Findings and Observations

No findings were identified.

The original ACE concluded the apparent cause of the PSV leakage was thermal stress in the PSV body as a result of rapid heating following actuation of the pressurizer PORVs. The thermal stress was the result of the piping design configuration in which the PSV shares a common discharge line with the pressurizer PORV. The pressurizer PORV discharge on the downstream side of the PSV caused uneven PSV body thermal expansion, which led to the PSV seat leakage. Engineers recommended corrective action to manage PSV leakage, upon occurrence, using site procedure VALVE-66, Pressurizer Safety Valves Seat Lift, Revision 3. This procedure uses a hydroset pump to manually lift and reseat the PSV disc. The procedure was used successfully in the past to relieve thermal stress and stop PSV leakage. Engineers did not recommend corrective action to eliminate the cause of the PSV leakage (e.g., modify the SRV / PORV discharge piping design to eliminate the thermal stress), due to the complexity. Station personnel considered PSV leakage to be infrequent and not a challenge to nuclear safety. The inspectors determined the PSVs remained operable. The PSV leakage was an operational challenge that did not affect PSV operability and, therefore, corrective actions to manage PSV leakage were adequate.

Post-event valve disassembly and inspection at a vendor facility revealed that 1RV201 had actually lifted during the May 2010 plant trip. This was unexpected, because RCS pressure had remained far below the PSV design lift setpoint. Engineers assessed the new PSV inspection information, reviewed a wide variety of related PSV industry OE, and reviewed Calvert Cliffs PSV/PORV piping stress design studies. Based on the new information, engineers revised the ACE and determined the apparent cause of 1RV201 prematurely lifting and leaking was a marginal PSV disc collar setting which made the valve vulnerable to dynamic conditions present during a reactor trip on high pressurizer pressure. The disc collar is used to control bellows nose stretch in a PSV. Inspection revealed that the 1RV201 bellows nose had stretched further than expected. This, in turn, caused the disc collar to seat on the bellows, which removed seating pressure from the disc and distributed it to the bellows. Consequently, seating force applied to the disc was reduced, causing the PSV lift pressure to decrease and the PSV to leak. Corrective actions included revision of the vendor PSV overhaul procedure to increase the disk collar to bellows gap by 0.004 inches. The results of CR-2010-005182 were incorporated into a separate root cause analysis report (RCAR) of cumulative PSV performance issues occurring over the last 10 years. The RCAR remained in progress at the end of this inspection.

The inspectors reviewed both ACEs and additional PSV maintenance and operational records and did not identify any significant additional issues related to PSV leakage.

Engineers demonstrated detailed knowledge of PSV design, maintenance, and operation. The inspectors determined Constellation's overall response to the issue was commensurate with the safety significance, was timely, and causal assessment was thorough. Corrective actions were reasonable to reduce the likelihood of premature PSV lift and PSV leakage.

The inspectors identified the following additional issues related to PSV leakage, monitoring, or testing and discussed them with station personnel. Procedure VALVE-66 did not contain instruction on how to install a gagging device in the event the PSV stuck open. Based on the consequence and infrequency of this action, the instruction to "gag (PSV) closed" was not sufficient to provide reasonable assurance of success. The procedure RCS-40, Pressurizer Safety Valve Removal and Installation, Revision 5, Attachment 2 PSV drawing was not the same model PSV as is installed in the plant. The industry OE report associated with the deficient PSV collar setting was not submitted as required by corrective action CA-2010-006449. The inspectors determined the above issues were minor because they did not significantly affect equipment operability or functionality. In accordance with NRC IMC 0612, "Power Reactor Inspection Reports," the above issues constituted violations of minor significance that are not subject to enforcement action in accordance with the Enforcement Policy. Additionally, records of Unit 1 and Unit 2 PSV area ambient temperature, which can affect PSV lift setpoints, were limited. The amount of temperature data recorded and evaluated was not sufficient to support verification that appropriate test conditions (e.g., temperature) were established for PSV as-left lift setpoint testing at the vendor facility. Constellation entered the inspectors' observations as appropriate into their CAP (CR-2011-011853, CR-2011-011894, and CR-2011-011735).

.6 Annual Sample: Low Pressure Safety Injection Flow Control Valve Inadvertently Mispositioned

a. Inspection Scope

The inspectors performed an in-depth review of Constellation's cause analysis and corrective actions associated with CR-2010-012257, which documented an inadvertent mispositioning of Unit 2 valve CV-306, the low pressure safety injection (LPSI) flow control valve. Specifically, during an instrument calibration activity on December 1, 2010, a maintenance technician bumped the valve's associated electro-pneumatic (I/P) converter, which caused the valve to move from its required fully open position to about 75 percent of full open.

The inspectors assessed Constellation's problem identification threshold, cause analysis, extent-of-condition review, compensatory actions, and the prioritization and timeliness of corrective actions to determine whether they were appropriately identifying, characterizing, and correcting problems associated with the December 1, 2010, incident. In addition, the inspectors performed field walkdowns, and interviewed engineering, maintenance and operations personnel to assess the effectiveness of Constellation's corrective actions. Finally, the inspectors reviewed the design and licensing bases, including the TSs, the UFSAR, and related docketed correspondence to determine the required configuration of CV-306 relative to the alignment of its motive power (air) to operate.

b. Findings and Observations

Introduction: An unresolved item (URI) was identified because additional NRC review and evaluation is needed to assess whether a performance deficiency exists associated with a single failure vulnerability for flow control valve CV-306.

Description: The LPSI system flow control valve CV-306 is located between the LPSI pumps and the LPSI injection header. It is an air-operated valve (AOV), and is located on a single pipe that branches into four lines for emergency core cooling system (ECCS) injection into the RCS. A flow controller is used during shutdown conditions to throttle CV-306, which would result in sending a portion of the flow through the shutdown cooling heat exchangers before returning to the RCS. An inadvertent full closure of this valve would isolate all LPSI flow to the RCS.

Constellation's normal configuration of CV-306 is key-locked open, which means a control room two position key-lock switch (Auto and Open) is placed in the Open position and the key is removed. This configuration electrically removes the signal from the flow controller to the valve.

The incident on December 1, 2010, occurred when a technician bumped his hardhat on the I/P converter during an adjacent instrument calibration activity, and the valve moved from 100 percent open to 75 percent open. Constellation determined that bumping the I/P had caused calibration "shift," which caused the valve to partially close. The inspectors noted that the key-lock switch isolates the circuit between the flow controller and the I/P converter, thus any failure of the I/P could reposition the valve. Upon discovery by the control room operators, TS LCO 3.0.3 was entered as it was conservatively concluded that the LPSI flowpath was inoperable. Subsequently, Constellation performed an engineering analysis, which determined that 75 percent open would have provided sufficient ECCS flow to the RCS during a postulated accident.

The inspectors noted that TS Surveillance Requirement (SR) 3.5.2.1 requires operators to "verify the following valves are in the listed position with power to the valve operator removed." CV-306 is one of the three valves listed in the associated TS SR and its required position is open. The 12-hour frequency surveillance is performed in the control room (actually performed every six hours) by recording that the key-lock switch is in the Open position and the valve is open (red light illuminated).

Regarding the three valves listed in TS SR 3.5.2.1, the associated TS Basis states the following:

- Misalignment of these valves could render both ECCS trains inoperable;
- Securing these valves in position by interrupting the control signal to the valve operator, ensures that the valves cannot be inadvertently misaligned; and
- A 12-hour frequency is considered reasonable in view of other administrative controls ensuring that a mispositioned valve is an unlikely possibility.

However, as was observed on December 1, 2010, an inadvertent misposition of CV-306 actually occurred. Further, there is no specific alarm or annunciation that alerts the operators that the valve is not in the full open position. The inspectors noted that typically, the action that accompanies that statement "with power to the valve operator

removed" involves removing the motive force to the valve operator. For example, in the case of a motor-operated valve, the associated breaker is typically opened, and for an AOV, air is isolated to the operator or the valve is locked in the required position.

In Supplement 1 to the CCNPP Units 1 and 2 Safety Evaluation (May 1973), the NRC documented that this single "locked-open" feature and "fail-open" AOV is provided through a key-lock in the electric control circuit in the control room. It also stated that notwithstanding this feature, a single failure such as a broken valve stem could cause the valve (an active component) to fail in a closed position and block the only LPSI flow path to the reactor coolant system. The applicant committed to modify the design so that no single failure could cause the valve to close. The modification consisted of a plug (jacking screw) that was inserted through the bottom of the valve body and mechanically prevented closure of the valve.

In the time period between the licensing of the two units (circa 1974 – 1976), a question was raised regarding CCNPP's ability to prevent boron precipitation during hot leg recirculation. While Supplement 1 above indicated the need for a jackscrew to maintain CV-306 open (to satisfy single failure), the licensee subsequently communicated a need to close CV-306 for establishing hot leg recirculation (it was presented as one of the options in docketed correspondence).

In Supplement 5 to the Unit 2 Safety Evaluation (August 1976), Section 7.5.3, the NRC documented that to satisfy the single failure criterion, the applicant has proposed to lock out power to the motor operator of LPSI discharge valve CV-306 in the open position. We (the NRC) will include this requirement in the TSs.

The boron precipitation concern appears to be the reason for the difference between the words/assumptions in Unit 1/2 Supplement 1 vs. Unit 2 Supplement 5. The inspectors noted that a jackscrew was originally installed in Unit 1 and then subsequently removed via a 10 CFR 50.59 screen/analysis in 1976. It was never installed in Unit 2. During the onsite inspection, the inspectors identified that, although originally considered as an option, the CV-306 valve is currently not used in establishing hot leg recirculation in the emergency operating procedures.

The inspectors determined that a single failure vulnerability remained with Constellation's existing implementation of TS SR 3.5.2.1, in that, a single failure of a component such as the I/P converter could render all of LPSI inoperable. Further, in response to this concern, Constellation completed a Failure Mode and Effects Analysis, which identified the existence of two possible failure modes that could result in an inadvertent partial or full closure of CV-306 (I/P mechanical agitation, and I/P high output failure). However, Constellation stated they believed that Branch Technical Position ICSB 18, "Application of the Single Failure Criterion to Manually-Controlled Electrically-Operated Valves," contained a provision that would permit their configuration as meeting TS SR 3.5.2.1.

The inspectors were evaluating whether Constellation was in compliance with TS SR 3.5.2.1 and the licensing/design basis of the LPSI system. Constellation stated that based upon the historical written communications and the existing licensing basis documentation, that their CV-306 configuration satisfied TS SR 3.5.2.1 and the licensing bases. Constellation initiated CR-2011-011314 on November 14, 2011, to formally

address the concerns for this issue. In the interim, the inspectors noted that Constellation had subsequently isolated air to the CV-306 valve on each unit, and has, therefore, eliminated any immediate safety or TS compliance concerns.

This issue will be opened as an URI in order to review and evaluate Constellation's corrective actions and determine if a performance deficiency exists with respect to the single failure vulnerability for flow control valve CV-306. **(URI 05000317 and 318/2011005-05, Single Failure Vulnerability for Low Pressure Safety Injection Flow Control Valve CV-306)**

4OA3 Followup of Events and Notices of Enforcement Discretion (71153 – Two Samples)

.1 (Closed) LER 50-317/2011-001-00, Reactor Trip Due to a Phase-to-Phase Short Circuit on Main Transformer

a. Inspection Scope

On August 27, 2011, Calvert Cliffs Unit 1 experienced an automatic trip from 100 percent power. RPS actuated on a loss of load due to a phase-to-phase short circuit on the main transformer when the main transformer high lines were struck by dislodged TB siding caused by high winds associated with Hurricane Irene. At the time of the trip, the inspectors were monitoring the station's response to Hurricane Irene. The inspectors observed and provided information on the initial assessment of TB wind induced damage and the potential damage to the Unit 1 main transformer high lines. The inspectors reviewed the LER for accuracy, appropriateness of corrective actions, violations of requirements and generic issues.

b. Findings

Introduction: A self-revealing Green finding was identified because Constellation did not ensure the TB siding was installed in accordance with design requirements of ES-005, Civil and Structure Design Criteria. This resulted in wind induced TB siding failures significantly below design wind speeds. Consequently, Unit 1 experienced an automatic trip from 100 percent power due to a phase-to-phase short circuit on the main transformer when the main transformer high voltage lines were struck by dislodged TB siding caused by high winds associated with Hurricane Irene.

Description: On August 27, 2011, Calvert Cliffs Unit 1 experienced an automatic trip from 100 percent power. RPS actuated on a loss of load due to a phase-to-phase short circuit on the main transformer when the main transformer high lines were struck by dislodged TB siding from the northwest corner caused by high winds associated with Hurricane Irene. The maximum recorded gust during the hurricane was up to 80 miles per hour (mph). Constellation's RCAR determined that the TB northwest corner siding was not installed per design during original construction. ES-005, Civil and Structural Design Criteria, section 5.2.B.1, states that all structures are designed to a wind velocity of 100 mph. Design Specification A-0005, Furnishing, Delivery and Erection of Metal Siding, provided the installation details to ensure that the design requirements were met. The important installation details from Design Specification A-0005 were not translated to the original design drawings for craft use. The failure to install the TB siding per design resulted in a weaker siding connection to the TB steel structure, allowing the siding to dislodge in less than design wind speeds.

During the review of Constellation's LER, the inspectors noted that from 2006 through 2008, six events occurred at Calvert Cliffs involving dislodged siding from the TB northeast corner at wind speeds significantly lower than design. One of the CRs (IRE-028-628) written in January 2008, stated that "storm strength winds may cause this siding to travel farther than expected and injure personnel or damage plant equipment. The 13 and 23 4 kV transformers are downhill from this location." A failure of either of these transformers would trip the associated unit. However, no trend CR was initiated and no cause evaluation was conducted. Constellation procured a vendor to fix the siding on the TB northeast corner in April 2008, and closed the issue.

The RCAR also stated that an evaluation should have been performed as part of the containment building siding ACE in 2008, or as part of the River Bend OE Barrier analysis. In September 2008, siding became dislodged from the Unit 1 containment building during high winds. A CR (2008-001934) was written as a category 2 and an ACE was completed in April 2009. This ACE documented that the cause was attributed to inadequate support of the siding allowing wind induced vibration. The ACE also determined that the inadequate support was a result of structural steel being removed for a previous inspection and never reinstalled contrary to vendor and Constellation procedures. The ACE did not evaluate the TB siding issues as part of the extent of condition review because Constellation determined that no inspection procedure applied to the TB siding that would have removed the siding to inspect the structural connections like the containment building. During the time that Constellation was conducting the ACE for the containment building siding, OE from River Bend was issued that involved TB siding damage from high winds. Similar to CCNPP, the TB siding at River Bend became dislodged at less than design wind speed. Constellation conducted a priority 1 barrier analysis of the River Bend OE and determined that no barriers were needed to be strengthened or added. Constellation's containment building siding ACE acknowledged that they failed to conduct a formal cause report on the TB siding failure. However, no corrective action was initiated to conduct a formal cause evaluation for the TB siding issue.

The inspectors concluded that Constellation missed multiple recent opportunities to identify the installation issue through the use of internal and external OE. Constellation's immediate corrective actions included restricting personnel travel in outside areas when wind speed is greater than 40 mph at the 10 meter elevation until the TB corner siding on all corners has been verified to be properly installed. Other corrective actions included testing and inspection of the main transformer, repairs to the 'B' and 'C' phase high line drops to the main transformer, temporary repairs to the TB siding, and development of new installation requirements which meet the design requirements of the TB siding corners. Constellation's planned corrective actions include inspecting all building siding inside the protective area to identify other possible deficiencies.

Analysis: The performance deficiency is that Constellation failed to ensure the TB siding was installed in accordance with design requirements of ES-005 which resulted in wind induced TB siding failure significantly below design wind speeds. Constellation missed multiple opportunities to identify the TB siding installation and drawing deficiencies following high wind events and through the use of OE. This finding is more than minor because it is associated with the protection against external factors attribute (wind and grid stability) of the 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 power operations. Specifically, the finding resulted in a

reactor trip of Unit 1. In accordance with IMC 0609, attachment 4, "Phase 1- Initial Screening and Characterization of Findings," table 4a, this finding is of very low safety significance (Green) because the finding did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions will not be available. The finding has a cross-cutting aspect in the area of Problem Identification & Resolution, OE, because Constellation failed to use OE information and internally generated lessons learned, to support plant safety and implement changes to station processes, procedures, equipment, and training programs. Specifically, Constellation did not implement and institutionalize OE associated with siding failures through changes to station processes, procedures, and equipment, and training programs (P.2.b per IMC 0310).

Enforcement: This finding (FIN) does not involve enforcement action because no regulatory requirement violation was identified. Because this finding does not involve a violation and has very low safety significance, it is identified as a finding. The issue has been entered into Constellations CAP as CR-2011-008704. **(FIN 05000317/ 2011005-03: Turbine Building Siding Failure Below Design Specification)**

.2 (Closed) LER 05000317/2011-003-00. 1A Emergency Diesel Generator Inoperability Due to Water Intrusion.

a. Inspection Scope

During Hurricane Irene on the evening of August 27, 2011, precipitation entered the 1A EDG building 80 foot elevation through the air intake openings that allow air flow to support diesel operation. The water accumulated on the top elevation floor, flowed under a door to the 1A EDG combustion air intake piping, leaked through the combustion air intake piping penetration to the floors beneath, and dripped onto the 1A EDG speed switch. The wetted speed switch rendered the 1A EDG inoperable on August 28. The 1A EDG was repaired and returned to service on August 29 following a successful surveillance. The inspectors reviewed the LER for accuracy, appropriateness of corrective actions, violations of requirements, and generic issues.

b. Findings

Introduction: The inspectors identified a Green NCV of TS 5.4.1, "Procedures," because Constellation did not adequately implement the procedural requirements to conduct floor drain inspections. Specifically, operators did not ensure that floor drains were free to drain and clear of debris in the 80 foot elevation of the 1A EDG building. This contributed to the inoperability of the 1A EDG due to clogged floor drains during Hurricane Irene on August 28, 2011.

Description: During the evening of August 27, 2011, through the early morning of August 28, 2011, precipitation from Hurricane Irene entered the 1A EDG building top elevation through the air intake openings that allow air flow to support diesel operation. The water accumulated on the top elevation floor, flowed under a door to the 1A EDG combustion air intake piping, leaked through the combustion air intake piping penetration to the floors beneath, and dripped onto the 1A EDG speed switch. The wetted speed switch caused the 1A EDG field flash circuit to attempt to flash the magnetic field in the

1A EDG. Because the generator shaft was not turning, the magnetic field was not established. This condition resulted in a "field flash too long alarm." Electrical maintenance personnel removed fuses to de-energize the field flash circuit in order to prevent damage to the circuit, preventing any subsequent 1A EDG start. As a result, Operations declared the 1A EDG inoperable.

Electrical maintenance and operations personnel conducted a tour of the 1A EDG building and observed approximately two inches of water on the top elevation floor. The floor drains on the top elevation were backed up due to a paste like material that formed from dust, dirt, and pollen when the drain filters became wetted. After operators removed the drain filters, the drains were able to perform their function thereby eliminating the source of water leaking on the 1A EDG speed switch.

Constellation conducted a RCAR to identify the cause of this event. The RCAR stated that the root cause of the event was a failure of combustion intake piping penetration (boot seal) to remain leak tight. The RCAR further stated that a contributing cause was a failure to perform an engineering evaluation when the drain filters were installed in the 1A EDG building in 2005. An engineering evaluation would have identified the need for a PM to clean and inspect the filters on a periodic basis. The inspectors determined that Constellation failed to identify that operators were not adequately implementing housekeeping requirements established in CNG-OP-1.01-2000, "Operations Logkeeping and Station Rounds." Paragraph 4 of section 5.3.B, "Auxiliary Operator Rounds," in CNG-OP-1.01-2000 stated that "Plant Operators shall perform thorough inspections of their assigned area to include the following general inspection items and equipment checks as they conduct their routine duties and take appropriate actions to report and properly correct deficiencies noted." The inspectors noted that the general inspection items included "floor drains and sump gratings free to drain and clear of debris." The inspectors interviewed several operations department personnel to verify the expectations regarding floor drains inspections. Discrepancies were identified on how to meet the requirements of CNG-OP-1.01-2000. The inspectors concluded that Constellation did not maintain the floor drains clear of debris and free to drain, and determined that this was an additional contributing cause to the failure of the 1A EDG on August 28, 2011.

Immediate corrective actions included entering this issue into their CAP, removing all the drain filters from the 1A EDG building, and installation of a curb around the combustion intake penetration. Planned corrective actions include replacing the combustion intake penetration boot seal.

Analysis: Constellation's failure to ensure that floor drains in the 1A EDG building were free to drain and clear of debris in accordance with procedures is a performance deficiency. The finding is more than minor because it is associated with the human performance attribute of the Mitigating System cornerstone and affected the cornerstone's objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). A phase 3 SDP was required in accordance with IMC 0609, Attachment 4, "Phase 1- Initial Screening and Characterization of Findings," Table 4b question 2c, because the finding degraded the 1A EDG, one train of a safety system, and is therefore potentially risk significant due to a seismic, flooding, or severe weather initiating event.

A Region I SRA conducted the Phase 3 assessment of the finding utilizing the Calvert Cliffs Unit 1, Standardized Plant Analysis Risk model, version 8.15, in conjunction with the System Analysis Programs for Hands-On Integrated Reliability Evaluations, version 8.0.7.17, dated May 18, 2011, to estimate the severe weather risk contribution. Given that the condition impacted the availability of the 1A EDG during a severe weather event, the SRA made the following modeling changes and assumptions:

- The only initiating event of concern was a weather related loss of off-site power (LOOPWR).
- A new basic event, EPS-DGN-FS-H2O, was added to account for the condition in which water intrusion from high wind and rain would challenge the 1A EDG. Given the unique configuration of the building and weather conditions needed to challenge the EDG, a failure probability of 1E-1 was assigned.
- No adjustments were made to the LOOPWR frequency. This is considered conservative since this frequency also includes all weather related LOOPs.
- The condition existed for 1 year.
- Given that the finding did not impact the likelihood of a steam generator tube rupture or inter-system loss of coolant accident, large early release frequency was not impacted.

The resulting change in core damage frequency was approximately 1.8E-7. The dominant sequence was a weather related loss of offsite power, with a failure of the emergency power system combined with a failure of turbine driven auxiliary feedwater and a recovery of offsite power. Given this, the finding was determined to be Green.

The finding has a cross-cutting aspect in the area of human performance, work practices, because Constellation did not ensure that personnel work practices support human performance by defining and effectively communicating expectations regarding procedural compliance and personnel following procedures. Specifically, Constellation did not establish and communicate clear expectations to operators on the implementation of the floor drain inspection in accordance with their procedures (H.4.b per IMC 0310).

Enforcement: TS 5.4.1, "Procedures," states in part, that written procedures shall be established, implemented and maintained in accordance with Regulatory Guide (RG) 1.33, Revision 2, Appendix A, recommended procedures. RG 1.33, Appendix A, section 1.b , "Administrative procedures," requires procedures for Authorities and Responsibilities for Safe Operation and Shutdown. CNG-OP-1.01-2000 establishes the controls, standards and expectations for the monitoring of plant equipment, components, and the recording of Operating Log readings, including Operating Logs, Narrative Logs, and Station Rounds. Section 5.3.B, step 4.a, states, in part, that plant operators shall perform thorough inspections of their assigned areas to include the inspection of floor drains and sump gratings to ensure they are free to drain and clear of debris. Contrary to this, prior to August 28, 2011, Constellation failed to adequately implement the guidance in CNG-OP-1.01-2000 to ensure that floor drains in the 1A EDG building were free to drain and clear of debris. This contributed to the inoperability of the 1A EDG due

to clogged floor drains during Hurricane Irene on August 28, 2011. Because this violation was of very low safety significance and it was entered into Constellation's CAP as CR-2011-008708 and CR-2012-000511, this violation is being treated as an NCV, consistent with the Enforcement Policy. **(NCV 05000317/2011005-04, Inadequate Inspection of Floor Drains Led to Clogging and EDG Failure During Hurricane)**

4OA5 Other Activities

Denial of a Request for Notice of Enforcement Discretion for Constellation Energy Nuclear Group Regarding Calvert Cliffs Nuclear Power Plant (NOED NO. 11-1-001)

On October 12, 2011, the NRC issued a letter denying Constellation's notice of enforcement discretion (NOED) request to permit continued facility operation for both units while repairing the Unit 2 SRW header. In summary, the NRC concluded that the issuance of an NOED was not warranted because, with the information provided at the time of Constellation's request, the NRC could not clearly determine that the requested action involved no safety impact in accordance with the enforcement policy and staff guidance. This NOED denial letter can be found in ADAMS (the Public Electronic Reading Room), http://www.nrc.gov/reading-rm/adams.html, Accession No. ML112850050.

4OA6 Meetings, Including Exit

Exit Meeting Summary

On January 13, 2012, the inspectors presented the inspection results to Mr. George H. Gellrich, Vice President, and other members of the Constellation staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

ATTACHMENT: SUPPLEMENTARY INFORMATION

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Constellation Personnel
G. Gellrich, Site Vice President
C. Costanzo, Plant General Manager
A. Ball, Radiation Protection Supervisor
C. Ballard, Senior Engineering Analyst
T. Baummer, Engineer
G. Beasely, Supervisor, Engineering
C. Birke, Engineer
K. Bodine, Supervisor, Engineering
H. Crocket, Senior Engineer
J. Detchemendy, Supervisor, Radiation Protection
M. Draxton, Manager, Training
C. Jones, General Supervisor, Operations Training
M. Giacini, Manager, Operations
R. Gines, Engineer
K. Gould, General Supervisor, Radiation Protection
A. Kelly, Supervisor, Continuing Training
T. Konerth, Supervisor, Engineering
D. Lauver, Director, Licensing
N. Lavato, Principal Operations Training Specialist
M. Leno, Supervisor, Instrument & Controls Maintenance
K. Mills, General Supervisor, Shift Operations
S. Olsen, Senior Engineer Analyst
B. Pickett, Supervisor, Radiation Protection Support
M. Siewertsen, Shift Technical Advisor
A. Simpson, Supervisor, Licensing
J. Stanley, Manager Engineering Services
T. Unkle, Engineering Analyst, Licensing
J. York, General Supervisor, Chemistry

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000317/318/2011005-05	URI	Single Failure Vulnerability for Low Pressure Safety Injection Flow Control Valve CV-306 (Section 4OA2.6)

Opened and Closed

05000317/318/2011005-01	NCV	Did Not Adequately Prescribe and Implement Procedures Associated with Protected Equipment (Section 1R04)

05000317/318/2011005-02	NCV	Annual Operating Tests Are Not Comprehensive (Section 1R11)
05000317/2011005-03	FIN	Turbine Building Siding Failure Below Design Specification (Section 4AO3.1)
05000317/2011005-04	NCV	Inadequate Inspection of Floor Drains Led to Clogging and EDG Failure During Hurricane (Section 4AO3.2)

Closed

0500317/2011-001-00	LER	Reactor Trip Due to Phase-to-Phase Short Circuit on Main Transformer (Section 4AO3.1)
0500317/2011-003-00	LER	1A Emergency Diesel Generator Inoperability Due to Water Intrusion (Section 4AO3.2)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures
NO-1-119, Seasonal Readiness, Revision 00600
OAP 92-9, Cold Weather Operations, Change 7

Condition Reports
CR-2011-006930
CR-2011-007190
CR-2011-011489

Miscellaneous
SA-2011-000181, Pre-Winter Assessment 2011
SA-2011-000178, Post-Winter Assessment 2011

Section 1R04: Equipment Alignment

Procedures
OI-49, Operability Verification, Revision 10
CNG-OP-4.01-1000, Integrated Risk Management, Revision 00900
CNG-OP-1.01-1000, Conduct of Operations, Revision 00500
OAP 02-02, Protection of "Defense in Depth" Equipment & Systems, Change 17 & 18
OI-27D-1, Station Power 480 Volt System, Revision 5

Condition Reports
CR-2011-010744
CR-2011-010746
CR-2011-010758
CR-2011-009871
CR-2011-010327
CR-2011-010336
CR-2011-010540
CR-2011-012136

Miscellaneous
Dual Unit Technical Specification 3.0.3 Shutdown Power Reduction Root Cause Analysis Report

Drawings
61001SH0001, Electrical Main Single Line Diagram FSAR Fig No. 8-1, Revision 42

Section 1R05: Fire Protection

Procedures
FP-0002, Fire Hazards Analysis Summary Document, Revision 0
SA-1-100, Fire Prevention, Revision 16
UFSAR, Section 9.9, Calvert Cliffs Power Plant Fire Protection Program, Revision 39
FP-0002, Fire Hazards Analysis Summary Document, Revision 0
SA-1-100, Fire Prevention, Revision 16
SA-1-105, Fire Brigade Training, Revision 00101
OI-20, Fire Protection Performance Evaluations and Fire System Inspections, Revision 01701

Section 1R07: Heat Sink Performance

Procedures
OI-29, Saltwater System, Revision 58

Miscellaneous
SRWHX-04, Service Water Heat Exchanger Cleaning and Inspection, Revision 1000
Service Water System Health Report, 2011 Quarter 3
WO# C220072850

Section 1R11: Licensed Operator Requalification Program

Procedures
CNG-TR-1.01-1003, Design Phase Activities
CNG-TR-1.01-1013, Licensed Operator Requalification Exam Program
TR-1-104, Security and Administration of NRC Licensing Exams
Licensed Operator Requalification Training Program Manual
AOP-3B, Abnormal Shutdown Cooling Conditions
AOP-9A, Control Room Evacuation and Safe Shutdown Due to a Severe Control Room Fire
Shift Engineer – Auxiliary Operator Qualification Manual
Auxiliary Building Operator Qualification Manual
Operations Administrative Policy 09-05
Simulator Control Manual, Revision 00100

Condition Reports
CR-2009-007641
CR-2010-002197
CR-2010-004735
CR-2011-009871
CR-2010-009148
CR-2010-009686
CR-2011-000868
CR-2011-007405
CR-2011-007860
CR-2011-009852

Miscellaneous
Lesson Plan 203-1-S-11, "+ MTC Start-Up"
Simulator to Post Trip Review Comparison for August 27, 2011 Unit 1 Reactor Trip
2011 Annual Transient Test ANS 2A, Reactor Trip
2011 Annual Transient Test ANS 2I, Main Steam Line Break in Containment
2011 Annual Transient Test ANS 2J, Slow RCS Depressurization with No HPSI Flow
Site Acceptance Test Package for Simulator Upgrade Project CON09049, Revision 1
2011 Annual Steady State Test ANS 1D 100% Heat / Mass Balance Test
Simulator Core Performance Tests for U1C15, U1C16, U1C17, U1C18, U1C19 and U1C20
Simulator Advisory Committee Meeting Minutes for March 21, June 29 and September 27, 2011
Focused Self-Assessment, AI-2011-00443/SA-2011-00012

Section 1R12: Maintenance Effectiveness

Procedures
CNG-AM-1.01-1023, Maintenance Rule Program, Revision 00100
CNG-CM-1.01-1003, Design Engineering and Configuration Control, Revision 00401
CNG-AM-1.01-1017, Performance Monitoring Program, Revision 00100
CNG-AM-1.01-1000, Equipment Reliability Process, Revision 00500
CNG-AM-1.01-1021, Predictive Maintenance Program, Revision 00001
CNG-AM-1.01-2000, Scoping and Identification of Critical Components, Revision 00201

Condition Reports
IRE-008-077
CR-2009-008188
CR-2011-008708
CR-2011-009094
CR-2011-009261

Drawings
64067, Diesel Generator Building Safety-Related Penetration, Revision 2

Engineering Service Package
ES199501875

Miscellaneous
Calvert Cliffs Nuclear Power Plant Individual Plant Examination External Events
DC-A-001-DG, Architectural Design Criteria, Revision 0
SP-784, Design Specification for Diesel Generator Project Safety Related Penetration Seals, Revision 1

ES-001, Internal Plant Flooding Evaluations, Revision 3
1A Emergency Diesel Generator OOS during Hurricane Irene Root Cause Analysis Report
SA-2010-000055, Maintenance Rule (a)(3) Assessment

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures
Maintenance Rule Risk Assessment Guideline, Revision 7
CNG-OP-4.01-1000, Integrated Risk Management, Revision 00900

Section 1R15: Operability Determinations and Functionality Assessments

Procedures
CNG-OP-1.01-1002, Conduct of Operability Determinations/Functionality Assessments, Revision 00101
CNG-CA-1.01-1000, Corrective Action Program, Revision 00400
STP O-8B-1, Test of 1B DG and 14 4KV LOCI Sequencer, Revision 27
MOV-009B, Operating the Crane Nuclear VIPER System, Revision 00301
STP O-065J-1, Safety Injection Check Valve Operability Test, Revision 01901

Condition Reports
IRE-028-761
CR-2011-009825
CR-2011-010368
CR-2011-010578
CR-2011-010646

Drawings
60727SH0002, Diesel Generator Cooling Water Starting Air, Fuel, and Lube Oil Diesel No.1B, Revision 63
60731SH0001, Safety Injection and Containment Spray Systems, Revision 84
64311, Simplified System Drawing Safety Injection and Containment Spray, Revision 11

Miscellaneous
Constellation Energy IST Program Component 10 Year Interval Basis Document

Section 1R19: Post-Maintenance Testing

Procedures
STP O-8B-1, Test of 1B DG and 14 4KV LOCI Sequencer, Revision 27

Condition Reports
CR-2011-011173
CR-2011-011468

Work Orders
C91057001
C90857898
C12009268
C91639822

Section 1R22: Surveillance Testing

Procedures
MOV-009B, Operating the Crane Nuclear VIPER System, Revision 00301
MOV-12, Limitorque Motor Operated Valve Inspection and Preventive Maintenance, Revision 01201
MOV-13, Limitorque Motor Operated Valve Limit Switch Compartment Inspection and Preventative Maintenance, Revision 00401
STP O-73I-1, HPSI Pump and Check Valve Quarterly Operability Test, Revision 01002
STP O-65H-2, Pressurizer Power-Operated Relief Block Valves Quarterly Operability Test, Revision 00500

Work Orders
C90683707
C91613498

Condition Reports
CR-2011-009360
CR-2011-009343
CA-2011-005413

Drawing
62731SH0001, Safety Injection & Containment Spray Systems, Revision 72

Miscellaneous
IST Basis Document (ISTBD) Section 14 – Safety Injection System
Safety Injection and Containment Spray Systems, System Description No. 52/61, Revision 5, August 2010
UFSAR, Section 6.3, Safety Injection System, Revision 36

Section 2RS01: Radiological Hazard Assessment and Exposure Controls

Procedures:
NO-1-110, Calvert Cliffs Key and Lock Control, Revision 00801
PHP-1-107, Skin Dose Calculations, Revision 5
RSP-1-104, Area Postings and Barricading, Revision 02400
RSP-1-132, Job Coverage in Radiologically Controlled Areas, Revision 01500
RSP-1-200, ALARA Planning and RWP Preparation, Revision 02600

Surveys:

RM/Map No.	Date	Time
101	7/19/2011	0925
101	10/25/2011	1640
102	7/19/2011	1010
102	10/25/2011	1300
106	10/10/2011	0130
106	11/2/2011	0900
115	10/10/2011	0100
115	11/2/2011	1000
222	7/25/2011	2200
222	1/31/2011	1515

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CR-2011-000642
CR-2011-000800
CR-2011-001019
CR-2011-002936
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Section 2RS04: Occupational Dose Assessment

Procedures:
CNG-RP-1.01-2001, Dosimetry, Revision 00000
CNG-RP-1.01-2002, Effective Dose Equivalent – External (EDEX), Revision 00000
RP-1-101, ALARA, Revision 5
RSP-3-201, Personnel Dosimetry, 00802
RSP-3-202, Special Dosimetry, Revision 01300
RSP-3-211, Electronic Personal Dosimeter Use, Revision 00301
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RSP-3-299, Personnel Dosimetry Quality Assurance, Revision 01400
RSP-3-301, Bioassay Assessment Criteria and Requirements, Revision 01200
RSP-3-350, Bioassay Specimen Controls, Revision 3

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CR-2010-001149
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Section 4OA1: Performance Indicator Verification

Condition Reports
CR-2010-003889
CR-2010-007320
CR-2010-007344
CR-2010-007909

Miscellaneous
Calvert Cliffs Monthly Operating Reports July 1010 through September 2011
Calvert Cliffs Operator Logs
Calvert Cliffs Performance Indicator Submissions
1PINR5A Calvert Cliffs Unit 1 Reactor Power Instrument Data July 2010 through September 2011
2PINR5A Calvert Cliffs Unit 2 Reactor Power Instrument Data July 2010 through September 2011

Section 4OA2: Problem Identification and Resolution

Procedures
CNG-CA-1.01-1007, Performance Improvement Program Trending and Analysis, Revision 00300
CNG-CA-1.01-1000, Corrective Action Program, Revision 00600
CNG-CA-1.01-1005, Apparent Cause Evaluation, Revision 00601
NO-1-123, Managing Operator Impacts, Revision 00100
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CNG-AM-1.01-2000, Scoping & Identification of Critical Components
STP-M-002-1, Pressurizer Safety Valves Setpoint Adjustment, Revision 1001

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CR-2009-001246
CR-2011-001483
CR-2011-001485
CR-2009-001502
CR-2009-001818
CR-2011-002474
CR-2011-003023
CR-2009-003526
CR-2010-005191
CR-2011-006896
CR-2011-007488
CR-2011-007763
CR-2011-007782
CR-2011-009024
CR-2011-009216
CR-2011-011145
CR-2011-011820

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C90467790
C90800278
C91158970
C91158986
C90873154
C220090972
C220082708

Miscellaneous
PCR-11-02477
ES-2009-000169
PCR-09-00073
PO408851, Revision 3
System Health Report, Unit 2 Safety Injection System, 3rd Quarter 2011
System Health Report, Unit 1 Reactor Coolant System, 3rd Quarter 2011
System Health Report, Unit 2 Reactor Protective System, 3rd Quarter 2011
Program Health Report, Air Operated Valves, 3rd Quarter 2011
Site Roll Up Trend Report, 3rd Quarter 2011
QPA Assessment Report 2011-045, Water Intrusion, dated 8/31/2011

QPA Assessment Report 2011-047, Category 1 and 2 Condition Report Reviews, dated 9/23/2011
QPA Assessment Report 2011-049, Quarterly Backshift Observation, dated 9/15/2011
CCNPP Design Specification SP-0184, PSV and PORV Repair and Replacement Parts, Revision 13
CCNPP Procurement Engineering Specification (PES)-5103, Repair/Overhaul for 2 ½" Dresser PSV, Revision 27
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CCNPP Sequence of Events Log dated May 12, 2010
CCNPP Unit 1 Licensee Event Report (LER) 05000317/2008-002, PSV Setpoint High Due to Low Torque and Misalignment
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Calvert Cliffs Unit 1 and Unit 2 RCS System Health Report, 4th Quarter 2011
Calvert Cliffs Unit 1 and Unit 2 Pressurizer Safety Valve Area Temperature Profiles dated March 2010 and March 2011
Electric Power Research Institute Technical Report TR-105872s, Safety and Relief Valve Testing and Maintenance Guide dated August 1996
Hopper Elmore and Associates Engineers CCNPP PSV Start-Up Leakage Evaluation dated August 2003
Issue Report IR3-057-875, Pressurizer Safety Valve 2RV200 Seat Leakage Causal Analysis
Various Test Records for All Eight CCNPP PSVs dated 2000 to 2011

Section 4OA3: Followup of Events and Notices of Enforcement Discretion

Procedures
CNG-CA-1.01-1007, Section 5.3 Cognitive Trending, Revision 0000
CNG-CA-1.01-1000, Corrective Action Program, Revision 00501
CNG-CA-1.01-1007, Performance Improvement Program Trending and Analysis, Revision 00300
CNG-CM-1.01-1003, Design Engineering and Configuration Control, Revision 00500
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C019920089

Drawings
15227-004, Turbine Building Siding Detail
62-021, Turbine Building Corner Detail

Miscellaneous
MCR 91-102-034-01
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LER 2011-003-0

LIST OF ACRONYMS

ACE	Apparent Cause Evaluation
ADAMS	Agency-Wide Documents Access and Management System
ADV	Atmospheric Dump Valve
AOP	Abnormal Operating Procedure
AOV	Air-Operated Valve
CAP	Corrective Action Program
CCNPP	Calvert Cliffs Nuclear Power Plant
CFR	Code of Federal Regulations
CR	Condition Report
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
EPD	Electronic Personal Dosimeter
FIN	Finding
HPSI	High Pressure Safety Injection
IMC	Inspection Manual Chapter
I/P	Electro-Pneumatic
IP	Inspection Procedure
JPM	Job Performance Measure
kV	Kilovolt
LCO	Limiting Condition for Operation
LER	Licensee Event Report
LOOPWR	Loss of Offsite Power, Weather Related
LPSI	Low Pressure Safety Injection
mph	Miles Per Hour
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NOED	Notice of Enforcement Discretion
NRC	Nuclear Regulatory Commission
NVLAP	National Voluntary Laboratory Accreditation Program
OAP	Operations Administrative Policy
OE	Operating Experience
OOS	Out of Service
OWC	Operation Work Control
PARS	Publicly Available Records
PI	Performance Indicator
PM	Preventive Maintenance
PORV	Power Operated Relief Valve
PSV	Pressurizer Code Safety Valve
RCAR	Root Cause Analysis Report
RCS	Reactor Coolant System
RG	Regulatory Guide
RO	Reactor Operator
RPS	Reactor Protection System
RWT	Refueling Water Tank
RWP	Radiation Work Permit

SDP	Significance Determination Process
SDE	Shallow Dose Equivalent
SRA	Senior Reactor Analyst
SRO	Senior Reactor Operator
SR	Surveillance Requirement
SRW	Service Water
SRWHX	Service Water Heat Exchanger
SSC	Systems, Structures, and Components
SW	Saltwater
TB	Turbine Building
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
VDC	Volts Direct Current
WO	Work Order