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

August 4, 2010

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 POWER PLANT - NRC INTEGRATED INSPECTION REPORT 05000317/2010003 AND 05000318/2010003

Dear Mr. Gellrich:

On June 30, 2010, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Calvert Cliffs Nuclear Power Plant (CCNPP) Units 1 and 2. The enclosed inspection report documents the inspection results, which were discussed on July 16, 2010, 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 one self-revealing finding of very low safety significance (Green). Two of these findings were determined to involve violations of NRC requirements. However, because the findings are of 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 VI.A.1 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 1, and the NRC Resident Inspector at CCNPP.

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Sincerely,

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 05000317/2010003 and 05000318/2010003
w/Attachment: Supplemental Information

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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,

/RA/

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

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J. Clifford, DRP
S. Kennedy, DRP, Senior Resident Inspector
M. Osborn, DRP, Resident Inspector
C. Newgent, DRP, Resident Office AA
Region I Docket Room (with concurrences)
ROPResources@nrc.gov
L. Pinkham, DRP
D. Bearde, DRS

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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.:	05000317/2010003 and 05000318/2010003
Licensee:	Constellation Energy Nuclear Group, LLC
Facility:	Calvert Cliffs Nuclear Power Plant, Units 1 and 2
Location:	Lusby, MD
Dates:	April 1, 2010, through June 30, 2010
Inspectors:	S. Kennedy, Senior Resident Inspector J. Hawkins, Acting Resident Inspector M. Osborn, Resident Inspector R. Montgomery, Reactor Engineer R. Rolph, Health Physicist S. Pindale, Senior Reactor Inspector K. Mangan, Senior Reactor Inspector
Approved by:	Glenn T. Dentel, Chief Reactor Projects Branch 1 Division of Reactor Projects

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SUMMARY OF FINDINGS

IR 05000317/2010003, 05000318/2010003; 4/1/10 – 6/30/10; Calvert Cliffs Nuclear Power Plant (CCNPP), Units 1 and 2: Maintenance Risk Assessments and Emergent Work Control; Plant Modifications; 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. Three Green findings, two 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. The inspectors identified an NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," because Constellation did not perform adequate design reviews associated with modifications to the turbine control system and the nuclear steam supply system (NSSS). Specifically, Constellation did not adequately evaluate the potential adverse impacts of removal of the power load unbalance (PLU) turbine trip on safety related systems, structures, and components (SSCs) such as the main steam safety valves (MSSVs) and pressurizer power operated relief valves (PORVs). In addition, during significant changes to plant design such as steam generator replacements and power uprates, Constellation did not conduct an adequate evaluation to determine if the turbine bypass valve (TBV) and the atmospheric dump valve (ADV) design specification of opening within 3 seconds after receiving the quick open signal would still be sufficient to prevent lifting MSSVs. Immediate corrective actions included entering these issues into their corrective action program (CAP) and performing an immediate operability determination and a probabilistic risk analysis.

This finding is more than minor because it affected the Initiating Event cornerstone attribute of design control and affects the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the removal of the PLU turbine trip and the modifications to the NSSS could challenge primary and secondary overpressure protection devices and result in a stuck open MSSV or PORV. The inspectors evaluated this finding using an SDP phase 2 analysis and determined that the issue is of very low safety significance. This finding has a cross-cutting aspect in the area of human performance, decision making, because Constellation did not adequately make safety-significant decisions using a systematic process when faced with uncertain or unexpected plant conditions, to ensure safety is maintained. (H.1.a of IMC 0310). (Section 1R18)

Green. A self-revealing finding of very low safety significance was identified because Constellation did not establish an appropriate preventive maintenance (PM) program for the 125 volts direct current (VDC) switchyard distribution panels in accordance with MN-1, "Maintenance Program." The 125 VDC switchyard distribution system supplies power

to the switchyard direct current (DC) loads for the operation of switchyard circuit breakers, emergency lights, and protective relays. Immediate corrective actions included entering this issue into the CAP and performing an inspection of all 125 VDC switchyard distribution panels. Long-term corrective actions planned include establishing an adequate PM program for the 125 VDC switchyard distribution panels.

The finding is more than minor because it is associated with the equipment performance attribute of the Initiating Events cornerstone and affects the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety function. In addition, if left uncorrected, the performance deficiency could lead to a more significant safety concern. Specifically, the failure to establish an adequate PM program for the 125 VDC switchyard distribution panels could preclude the identification of equipment deficiencies, such as loose connections, that could result in a plant transient. The finding is of very low safety significance because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions will not be available. This finding has a cross-cutting aspect in the area of problem identification and resolution, operating experience (OE), because Constellation did not use OE information, including vendor recommendations to support plant safety. Specifically, Constellation did not implement and institutionalize OE through changes to station processes, procedures, equipment, and training associated with the switchyard PM program (P.2.b of IMC 0305). (Section 4OA3)

Cornerstone: Mitigating Systems

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

The finding is more than minor because if the overall risk had been correctly assessed, it would have placed Unit 2 into a higher risk category. The finding is associated with the configuration control attribute of the Mitigating Systems cornerstone and affects the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors determined that the finding is of very low safety significance because the incremental core damage probability deficit was less than 1.0E-6. This finding has a cross-cutting aspect in the area of human performance, work control, because Constellation did not appropriately plan and incorporate risk insights in work activities that impacted the availability of the 2B EDG (H.3.a of IMC 0310). (Section 1R13)

Other Findings

None

REPORT DETAILS

Summary of Plant Status

Calvert Cliffs Unit 1 began the inspection period at 100 percent power. On April 24, 2010, operators reduced power to 85 percent to perform power uprate testing. Operators returned the unit to 100 percent on the same day. On May 12, 2010, Unit 1 experienced an automatic reactor trip due to an electrical transient in the 500 kilovolt (kV) switchyard. Operators returned the unit to 100 percent power on May 19, 2010. On June 25, 2010, operators reduced power to 88 percent to clean condenser waterboxes. Operators returned the unit to 100 percent power the same day. On June 27, 2010, operators reduced power to 92 percent power to clean condenser waterboxes. Operators returned the unit to 100 percent power the same day. The unit remained at or near 100 percent power for the remainder of the inspection period.

Calvert Cliffs Unit 2 began the inspection period at 100 percent power. On May 2, 2010, operators performed an unplanned power reduction to 68 percent power due to flow oscillations on the No. 21 steam generator feed pump control oil system. Operators returned the unit to 100 percent power on May 3, 2010. On June 5, 2010, operators reduced power to 65 percent to perform main turbine valve testing and planned maintenance on the No. 21 steam generator feed pump. Operators returned the unit to 100 percent power on June 6, 2010. On June 17, 2010, operators reduced power to 82 percent to clean condenser waterboxes and perform data acquisition software cabinet maintenance. Operators returned the unit to 100 percent power on June 18, 2010. 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 – Two Samples)

a. Inspection Scope

The inspectors reviewed the adverse weather preparation and mitigating strategies before the onset of hot weather operations and the high grid loading summer season. This review included an assessment of Nuclear Operations Administrative Procedure NO-1-119, "Seasonal Readiness." The inspectors assessed the effectiveness of Constellation's preparations for hot weather and grid related stress conditions to evaluate the site's readiness for seasonal susceptibilities. Risk-significant systems affected by hot weather and grid related stresses were selected for review. This review included an assessment of Constellation's implementation of abnormal operating procedure AOP – 7L, "Circulating Water/Intake Malfunctions," and a walk down of the intake structure. The review included the intake structure, the saltwater (SW) system, and the 1A EDG. The inspectors also performed a partial walk down of the offsite 500 kV electrical system. The inspectors interviewed control room operators and system engineers to ensure protective measures applicable to these risk-significant systems were available. This inspection satisfied two inspection samples for review of risk-significant systems during seasonal susceptibilities and grid related stress conditions. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

Partial Walkdown (71111.04Q – Four Samples)

a. Inspection Scope

The inspectors conducted partial walkdowns to verify equipment alignment of selected risk significant systems. The inspectors reviewed plant documents to determine the correct system and power alignments, as well as the required positions of critical valves and breakers. The inspectors verified that Constellation had properly identified and resolved equipment alignment problems that could cause initiating events or potentially affect the availability of associated mitigating systems. The inspectors performed a partial walkdown of the following systems:

- No. 22 emergency core cooling system (ECCS) during maintenance on the No. 21 ECCS ventilation cooler SW outlet valve;
- 125 VDC reserve battery during planned maintenance on the No. 12A station battery;
- Diesel fire pump during planned maintenance on the electric fire pump; and,
- No. 11 ECCS during maintenance on the No. 12 ECCS ventilation cooler SW outlet valve.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05Q – Five Samples)

.1 Fire Protection Tours

a. Inspection Scope

The inspectors conducted a tour of the areas listed below to assess the material condition and operational status of fire protection features. The inspectors verified that combustibles and ignition sources were controlled in accordance with Constellation's administrative procedures; the fire detection and suppression equipment was available for use; passive fire barriers were maintained in good material condition; and compensatory measures for out-of-service, degraded, or inoperable fire protection equipment were implemented in accordance with Constellation's fire plan.

- 0C (Station Blackout) diesel generator building fire area EDG0C, rooms SBO 202 and SB 102;
- Unit 1 cable spreading room, fire area 16, room 306;
- Unit 2 cable spreading room, fire area 17, room 302;

- Unit 1 battery room, fire area 16A, rooms 301 and 304; and
- Unit 1 27 foot switchgear room, fire area 19, room 317.

b. Findings

No findings of significance were identified.

.2 Fire Protection - Drill Observation (71111.05A - One Sample)

a. Inspection Scope

The inspectors observed a fire brigade drill scenario conducted on April 15, 2010, that involved a fire in the waterfront fabrication shop office, north of the intake structure. The inspectors evaluated the readiness of the plant fire brigade to fight fires. The inspectors verified that Constellation personnel identified deficiencies, openly discussed them in a self-critical manner at the debrief, and took appropriate corrective actions as required. The inspectors evaluated specific attributes as follows: (1) proper wearing of turnout gear and self-contained breathing apparatus; (2) proper use and layout of fire hoses; (3) employment of appropriate fire fighting techniques; (4) sufficient fire fighting equipment brought to the scene; (5) effectiveness of command and control; (6) search for victims and propagation of the fire into other plant areas; (7) smoke removal operations; (8) utilization of pre-planned strategies; (9) adherence to the pre-planned drill scenario; and (10) drill objectives met. The inspectors verified that fire brigade actions were in accordance with Constellation's fire fighting strategies. Following the drill, the inspectors reviewed the post drill debriefing conducted between the assessment team and the fire brigade members.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors reviewed the thermal performance test and inspection activities for the No. 22A service water heat exchanger. The inspectors reviewed the performance data and evaluated the test acceptance criteria to ensure that the design basis requirements were satisfied. The inspectors evaluated the heat transfer capabilities based on completed flow verification tests to ensure that specific safety functions could be performed in accordance with design specifications. The inspectors also reviewed Constellation's periodic maintenance methods to verify that they conformed to the guidelines delineated in Electric Power Research Institute Report NP-7552, "Heat Exchanger Performance Monitoring Guidelines."

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program

Resident Inspector Quarterly Review (71111.11Q - One Sample)

a. Inspection Scope

On June 3, 2010, the inspectors observed a licensed operator requalification scenario to assess operator performance and the adequacy of the licensed operator-training program. The scenario included lessons learned associated with the dual unit reactor trip that occurred on February 18, 2010. The inspectors verified the clarity and formality of communications, the completion of appropriate operator actions in response to alarms, the performance of timely control board operations and manipulations, and that the oversight and direction provided by the shift manager were in accordance with Constellation's administrative and technical procedures.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12Q – Two Samples)

Resident Inspector Quarterly Review

a. Inspection Scope

The inspectors reviewed the maintenance effectiveness of the sample listed below for the following: 1) appropriate work practices; 2) identifying and addressing common cause failures; 3) scoping in accordance with 10 CFR Part 50.65(b) of the maintenance rule; 4) characterizing reliability issues for performance; 5) trending key parameters for condition monitoring; 6) recording unavailability for performance; 7) classification and reclassification in accordance with 10 CFR Part 50.65(a)(1) or (a)(2); and 8) appropriateness of performance criteria for SSCs classified as (a)(2) and/or appropriateness and adequacy of goals and corrective actions for SSCs classified as (a)(1).

- Unit 1 main steam isolation valves a(1) status (CR-2010-004595); and
- Unit 1 reactor trip due to a loose connection in the 125 VDC switchyard power panel (CR-2010-005173).

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors reviewed the following activities to verify that Constellation performed the appropriate risk assessments for planned maintenance of out of service equipment and emergent work. For the emergent work activities performed by station personnel, the

inspectors verified that Constellation promptly reassessed and managed the plant risk. The inspectors compared the risk assessments and risk management actions with CNG-OP-4.01-1000, "Integrated Risk Management," and Constellation's risk assessment tool to the requirements of 10 CFR Part 50.65(a)(4) and the recommendations of the Nuclear Management and Resources Council 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." In addition, the inspectors assessed the adequacy of Constellation's identification and resolution of problems associated with maintenance risk assessments and emergent work activities.

- Planned maintenance on the No. 21 battery with the reserve battery connected to the No. 21 bus on April 13, 2010;
- 2A EDG and the station blackout diesel out of service due to relay testing of the No. 21 4KV bus on April 14, 2010;
- Unplanned maintenance on No. 12 instrument air compressor with No. 11 instrument air compressor out of service on April 21, 2010;
- Unplanned maintenance on No. 21 heater drain tank normal level control valve (2-CV-1467) and No. 21 steam generator feed pump control oil flow oscillations on April 27, 2010;
- Planned maintenance on the 1A EDG on May 24, 2010;
- No. 23 charging pump out of service due to seal leakage while conducting planned maintenance on the No. 21 steam generator feed pump on June 4, 2010;
- Planned maintenance on the No. 21 auxiliary feedwater (AFW) pump on June 9, 2010; and
- Planned maintenance and approved troubleshooting on the 2B EDG on June 18, 2010.

b. Findings

Introduction: The inspectors identified a finding of very low safety significance (Green) associated with an NCV of 10 CFR Part 50.65 (a)(4), "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," because Constellation did not perform an adequate risk assessment which resulted in an underestimation and lack of awareness of the risk during maintenance activities on the 2B EDG.

Description: On June 18, 2010, operators removed the 2B EDG from service in preparation for troubleshooting a slow speed start issue. The troubleshooting activities included swapping leads on the speed probe, installing test equipment, conducting two slow speed starts, restoring the speed probe normal configuration, and returning the 2B EDG to an operable status following a fast speed start. Prior to troubleshooting, the operators shut the air start valves to the 2B EDG. This would have prevented the 2B EDG from starting and loading automatically on a SIAS or loss of offsite power. The inspectors noted that the recorded CDF risk was low and questioned the accuracy of the risk assessment. Following a discussion with engineering and the probabilistic risk assessment group, the inspectors concluded that the 2B EDG was unavailable and that Constellation did not include the unavailability of the 2B EDG on the CDF risk assessment during the maintenance activity. Immediate corrective actions included entering this issue into the CAP and re-performing the risk assessment. When re-performed, the CDF risk during the 2B EDG maintenance would have increased to medium (Yellow).

The inspectors performed a review of the risk management actions (RMAs) that Constellation had in place during the maintenance activity. The inspectors noted that Constellation had declared the maintenance activity as nuclear medium risk (NMR) due to the potential to lose the associated 4kV safety related bus when paralleling the 2B EDG to the 4kV bus. The inspectors noted that the associated RMAs taken for NMR were similar to RMAs for yellow risk with the exception that not all RMA actions were performed for risk awareness and control associated with the increase in CDF risk. For example, Constellation did not record the increase in CDF risk in the control room logs, plant status documents, and work schedules. In addition, Constellation did not discuss the increase in CDF risk during shift turnover, the pre-job brief, and the management plan of the day meeting.

Analysis: The performance deficiency is that Constellation did not perform an adequate risk assessment, which resulted in an underestimation and lack of awareness of the risk during maintenance activities on the 2B EDG. Using IMC 0612, "Power Reactor Inspection Reports," Appendix E, Example 7.e, the finding is more than minor because if the overall risk had been correctly assessed, it would have placed Unit 2 into a higher risk category. The finding is associated with the configuration control attribute of the Mitigating Systems cornerstone and affects the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Because this finding involves the licensee's assessment and management of risk associated with performing maintenance activities under all plant operating or shutdown conditions, the inspectors used IMC 0609, Appendix K, "Maintenance Risk Assessment and Risk Management Significance Determination Process," to evaluate this finding. The inspectors determined that the finding is of very low safety significance using flowchart 1 because the incremental core damage probability deficit was less than 1.0E-6. This finding has a cross-cutting aspect in the area of human performance, work control, because Constellation did not appropriately plan and incorporate risk insights in work activities that impacted the availability of the 2B EDG (H.3.a).

Enforcement: 10 CFR Part 50.65 (a)(4) states, in part, that "the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities." Contrary to the above, on June 18, 2010, Constellation did not adequately assess and manage the increase in risk associated with the maintenance activity on the 2B EDG. This resulted in an underestimation and lack of awareness of the plant CDF risk. Because this violation is of very low safety significance (Green) and Constellation entered the issue into their CAP (CR-2010-006881), this violation is being treated as an NCV consistent with the NRC Enforcement Policy. **(NCV 05000318/2010003-01: Inadequate Risk Assessment Associated with the 2B Emergency Diesel Generator)**

1R15 Operability Evaluations (71111.15 – Eight Samples)

a. Inspection Scope

The inspectors reviewed operability evaluations and/or condition reports (CRs) to verify that the identified conditions did not adversely affect safety system operability or plant safety. The evaluations were reviewed using criteria specified in NRC Regulatory Issue Summary 2005-20, "Revision to Guidance formerly contained in NRC Generic Letter

91-18, Information to Licensees Regarding two NRC Inspection Manual Sections on Resolution of Degraded and Nonconforming Conditions and on Operability," and Inspection Manual Part 9900, "Operability Determinations and Functionality Assessments for Resolution of Degraded or Nonconforming Conditions Adverse to Quality or Safety." In addition, where a component was inoperable, the inspectors verified the Technical Specification limiting condition for operation implications were properly addressed. The inspectors performed field walkdowns, interviewed personnel, and reviewed the following items:

- Minor through-wall leakage on No. 12 SW pump discharge piping downstream of check valve 1-SW-107 (CR-2010-003924);
- 2A EDG room temperature indicator reads incorrectly (CR-2010-004032);
- Loss of level indication for No. 11B safety injection tank (CR-2010-004557);
- Several Unit 1 MSSVs wisping (CR-2010-005224);
- No. 11 charging pump tripped off during low temperature overpressure protection surveillance (CR-2010-001284);
- Unit 1 pressurizer safety valve (1-RV-201) leakage (CR-2010-005182);
- No. 12 steam generator feed pump did not operate as expected following Unit 1 reactor trip (CR-2010-005241); and
- No. 22 component cooling heat exchanger normal outlet valve (2-CV-5208) stroke time in the alert range (CR-2010-006157).

b. Findings

No findings of significance were identified.

1R18 Plant Modifications (71111.18 – Three Samples)

a. Inspection Scope

The inspectors reviewed the plant modifications listed below to verify that the modifications did not affect the safety functions of systems that are important to safety. The inspectors verified that the system design and licensing bases did not degrade due to the modifications to ensure that the system maintained its availability, reliability, and functional capability. The inspectors conducted walkdowns of accessible portions of the modifications to verify that the proper configuration control was maintained to ensure that the plant was not placed in an unsafe condition and that the modifications were implemented in accordance with Constellation procedures.

- Permanent plant modification for power uprate (ES200300421);
- Permanent plant modification to replace the Mark I turbine control system with Mark VI turbine control system (ES200300470); and
- Permanent plant modification to replace TBVs (FCR-85-0068).

b. Findings

Introduction: The inspectors identified a finding of very low safety significance (Green) associated with an NCV of 10 CFR 50, Appendix B, Criterion III, "Design Control," because Constellation did not perform adequate design reviews associated with modifications to the turbine control system and NSSS.

Description: On May 12, 2010, a 500 kV switchyard breaker tripped open while maintenance personnel were restoring DC control power following a wiring modification to the 500 kV switchyard breakers protective relay circuitry. This disconnected the Unit 1 main generator from the grid. Reactor coolant system (RCS) and secondary pressure rapidly increased until a valid high pressurizer pressure reactor trip occurred. Both PORVs and several MSSVs lifted as a result of the transient. The inspectors questioned why the turbine did not trip prior to the reactor trip.

During review of Constellation's engineering package for the Mark VI turbine control modification, ES200300470, the inspectors determined that the design review was inadequate because Constellation did not properly evaluate the potential adverse impacts of removal of the PLU turbine trip on safety related SSCs, specifically the MSSVs and the pressurizer PORVs. The PLU turbine trip was designed to limit pressure rise in the RCS during a loss of load event. The PLU turbine trip feature senses unbalances between mechanical load and electrical power and initiates a turbine trip if that unbalance reaches a pre-determined setpoint. The turbine trip signal provides an input into the reactor regulating system that initiates a quick open signal to rapidly open the TBVs and ADVs to limit the pressure rise in both primary and secondary systems. In addition, the turbine trip would cause a loss of load reactor trip. However, for a 100 percent load rejection event without the PLU turbine trip, the reactor would trip on high pressurizer pressure prior to the turbine tripping and the quick opening of the TBVs and ADVs. The inspectors noted that this would unnecessarily challenge both MSSVs and PORVs and could complicate emergency response and plant stabilization. For example, a high pressurizer pressure reactor trip on Unit 2 on November 16, 2006, resulted in a stuck open PORV for 90 seconds resulting in a SIAS. NRC Generic Safety Issue 70, "PORV and Block Valve Reliability Revision 3" and NRC Generic Letter 1990-06 provide additional operational concerns relating to malfunctions of PORVs. Also, the May 12, 2010, event resulted in the wisping of several MSSVs due to the high-pressure transient that occurred in the secondary system.

In addition, the inspectors questioned the performance of the steam dump and turbine bypass system following the May 12, 2010, Unit 1 reactor trip. Section 7.4.6.1 of the Updated Final Safety Analysis Report (UFSAR), states in part, "The steam dump and bypass valves are sized to prevent opening of the MSSVs following a turbine trip at full load." During a review of the TBV design calculation, "000-TH-9301," Rev. 0, the inspectors identified discrepancies associated with the assumptions. The inspectors determined that nominal steam generator pressures in the calculation were lower than current operating pressures. Also, the initial thermal power assumed in the calculation was lower than the current operating thermal power limit. The inspectors determined that during significant changes to plant design such as steam generator replacements and power uprates, Constellation did not perform an adequate evaluation to determine if the TBV/ADV design specification of opening within 3 seconds after receiving the quick open signal would still be sufficient to prevent lifting MSSVs. Calculation 000-TH-9301 stated, "Challenging an MSSV unnecessarily could result in a stuck open MSSV and the possible loss of operator control of the secondary system."

Immediate corrective actions included entering these issues into the CAP under CR 2010-006763 and CR 2010-006897, and conducting an immediate operability determination and probabilistic risk analysis. Constellation determined that the turbine

control system and PLU trip were not credited in any UFSAR design basis accident analysis and the plant remained within its design basis response during accident conditions.

Analysis: The performance deficiency is that Constellation did not perform adequate design reviews associated with modifications to the turbine control system and NSSS. This finding is more than minor because it affected the Initiating Event cornerstone attribute of design control and affects the associated cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the removal of the PLU turbine trip and the modifications to the NSSS could challenge primary and secondary overpressure protection devices and result in a stuck open MSSV or PORV. The inspectors evaluated this finding using IMC 0609 Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings." The inspectors determined that a Phase 2 analysis was required because in the worst case if a PORV failed to close following a pressure transient, the resulting loss of primary coolant would exceed the Technical Specifications (TS) limit for identified RCS leakage. The phase 2 SDP analysis was conducted by the senior reactor analyst (SRA) using the Risk Informed Inspection Notebook for CCNPP's Units 1 and 2, Revision 2.1a. The SRA made the following assumptions to support the Phase 2 risk assessment: 1) the degraded condition would impact PORV closure safety function only; 2) consistent with the SDP usage rules, this degraded condition is most appropriately modeled by increasing the stuck open PORV (SORV) initiating event frequency by one order of magnitude; 3) since only the PORV closure safety function was impacted, only the stuck open PORV worksheet (Table 3.4) was solved; and 4) the exposure time for this condition was >30 days. The dominant core damage sequences for the stuck open PORV events involved: the failure to close the block valve with the subsequent failure of high pressure injection; and, the failure to close the block valve with subsequent failure of high pressure recirculation. The phase 2 analysis determined the issue was of very low safety significance (Green) and estimated an increase in CDF in the mid E-8 range. This finding has a cross-cutting aspect in the area of human performance, decision making, because Constellation did not adequately make safety-significant decisions using a systematic process when faced with uncertain or unexpected plant conditions, to ensure safety is maintained (H.1.a of IMC 0310). This cross-cutting aspect was determined to be consistent with current license performance since the last power up-rate request occurred on August 28, 2008.

Enforcement: 10 CFR 50, Appendix B, Criterion III, "Design Control," requires licensees to assure design control measures include verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculation methods, or by the performance of a suitable testing program. Contrary to the above, on August 29, 2008, July 22, 2003, and August 15, 2001, Constellation failed to perform an adequate design review during the removal of the PLU turbine trip and modifications to the NSSS system. As a result, Constellation did not recognize that the risk significant changes could unnecessarily challenge operation of the PORVs and MSSVs. Because this violation is of very low safety significance and Constellation entered the issue into their CAP (CR 2010-006763 and CR 2010-006897), this issue is being treated as an NCV, consistent with the NRC Enforcement Policy. **(NCV 5000317/318/2010003-02, Inadequate Design Control Reviews of the Turbine Control System and the Nuclear Steam Supply System)**

1R19 Post-Maintenance Testing (71111.19 – Eight 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 was 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.

- Unit 1 pressurizer safety valve (1-RV-201) replacement (work order (WO) #C90873154);
- Shutdown cooling heat exchanger recirculation stop valve (1-SI-399) repair (WO #C120052505);
- Overhaul No. 11 spent fuel pool cooling service water inlet valve (1-CV-1597) (WO #C120001179);
- No. 12 ECCS pump room air cooler outlet valve (1-CV-5175) solenoid replacement (rover WO #CR-2010-0058910);
- Inspect relays and perform functional testing of the ADV and TBV quick open (WO #C120085063);
- Replace No. 14 containment air cooler normal inlet solenoid valve (1-SV-1592) (WO #C120074611);
- Replace No. 22 steam generator AFW blocking valve solenoid valve (2-SV-4532) (WO #C220073729); and
- No. 21 ECCS pump room air cooler outlet valve (2-CV-5171) repair (rover WO #CR-2010-004880).

b. Findings

No findings of significance were identified.

1R20 Refueling and Other Outage Activities (71111.20 – One Sample)

a. Inspection Scope

The inspectors reviewed the activities associated with the Unit 1 forced outage due to a reactor trip during switchyard maintenance activities on May 12, 2010. During the outage, the inspectors examined the following activities: shutdown of the plant; cool-down; heat-up; dilution to criticality; and rise to full power operations. The inspectors reviewed applicable procedures, observed control room activities, conducted walkdowns, and interviewed key personnel. The inspectors evaluated the activities against TS requirements, site procedures, and other applicable guidance and requirements.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22 – Eight Samples)

a. Inspection Scope

The inspectors observed and/or reviewed the surveillance tests listed below associated with selected risk-significant SSCs to determine whether the testing adequately demonstrated the ability to perform its intended safety function. The inspectors also verified that proper test conditions were established as specified in the procedures, no equipment preconditioning activities occurred, and that acceptance criteria had been satisfied.

- No. 12 SW Subsystem Valve Quarterly Operability In-service Test (STP-O-065P-1);
- Unit 1 RCS Leakage Evaluation (STP-O-27-1);
- Unit 2 RCS Leakage Evaluation (STP-O-27-2);
- Reactor Protection System Functional Test (STP-M-212A-1);
- "A" Train Engineered Safety Features Logic Test (STP-O-7A-1);
- AFW Actuating System Monthly Logic Test (STP-O-009-1);
- No. 21 AFW Pump Quarterly Surveillance (STP-O-005A-2); and
- 2B EDG and 24 kV Bus Loss of Coolant Incident Sequencer (STP-O-00B-2).

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational/Public Radiation Safety

2RS05 Radiation Monitoring Instrumentation (71124.05)

a. Inspection Scope

During the period May 3 through May 7, 2010, the inspectors conducted the following activities to verify that the licensee was ensuring the accuracy and operability of radiation monitoring instrumentation. Implementation of these controls was reviewed against the criteria contained in 10 CFR Part 20, relevant TS, and Constellation's procedures.

Inspection Planning

- The inspectors reviewed the UFSAR to identify radiation instruments associated with monitoring area radiological conditions including airborne radioactivity, process streams, effluents, material/articles, and workers;
- The inspectors obtained a listing of all survey instrumentation including air samplers, small article monitors (SAMs) personnel contamination monitors (PCMs), and other

monitors used to detect contamination. The inspectors reviewed the list to determine if an adequate number and type of instruments are available to support operations;
- The inspectors obtained and reviewed copies of evaluation reports of the radiation monitoring program since the last inspection;
- The inspectors obtained and reviewed copies of procedures used for instrument source checks and calibrations;
- The inspectors reviewed area radiation monitor set point values and basis; and
- The inspectors reviewed the effluent monitor set point basis and the calculation methods provided in the Offsite Dose Calculation Manual (ODCM).

Walkdowns and Observations

- The inspectors toured the Auxiliary building and observed the condition of the Unit 1 and Unit 2 liquid discharge tanks and monitor (0-RIT-2201), and the Unit 1 Main Ventilation monitor (1-RI-5415A). The inspectors verified that these monitor configurations aligned with Calvert Cliffs' ODCM descriptions;
- The inspectors checked the calibration due dates and source check stickers for portable survey instruments ready for issue or in the field. The type of instruments checked included RO-2s, SAC-4, Telepoles, Amp 100s, and AMS-4s;
- The inspectors observed a technician perform instrument source checks. The inspectors verified that the instrument source checks included exposures at each high-range scale. The source check observations included RO-2s, Telepoles, and a SAM-11; and
- The inspectors verified area radiation monitors (ARMs) and continuous air monitors (CAMs) were appropriately positioned relative to the radiation source(s) they were intended to monitor. The inspectors compared the monitor response with actual area conditions for several ARMs; and
- The inspectors observed the daily source checks for PCM-1B #429 and SAM-11 #417. The inspectors verified the source checks were in accordance with the manufacturer's recommendations and Calvert Cliffs' procedures.

Calibration and Testing Program

Process and Effluent Monitors

- The inspectors verified for more than four effluent monitor instruments that channel calibration and functional tests were performed consistent with radiological effluent TS.
- The inspectors verified that the source calibrations used National Institute of Standards and Technology's (NIST) traceable sources or secondary measured have been calibrated to NIST standard.
- The inspectors verified that the sources represent the plant nuclide mix;
- The inspectors verified that effluent monitor alarm set points are established as provided in the ODCM and station procedures; and
- There were no changes to effluent monitor set points during this inspection period.

Laboratory Instrumentation

- The inspectors verified that the daily performance checks and calibration data indicate the frequency of calibration is adequate and there is no degradation of instrument performance.

Whole Body Counter (WBC)

- The inspectors reviewed the methods and sources used to perform the WBC checks prior to daily use. The inspectors verified the checks are appropriate and align with the plant's isotopic mix; and
- The inspectors reviewed the WBC calibration reports completed since the last inspection. The inspectors verified the calibration sources and phantoms used were appropriate and representative of the plant source term.

Post-Accident Monitoring Instrumentation

- The inspectors reviewed the February 19 and 25, 2010, calibration records for the Unit 1 containment high range monitors, 1-RE-5317A and 1-RE-5317B. The inspectors reviewed the February 23, 2009, calibration records for the Unit 2 containment high range monitors, 2-RE-5317A and 2-RE-5317B;
- The inspectors verified that an electronic calibration for the containment high-range monitors was performed and included each decade above 10 rem/hour. The inspectors also verified that a source calibration was performed and included an exposure for at least one decade below 10 rem/hour;
- The inspectors verified the acceptance criteria were reasonable;
- The inspectors reviewed the calibration records and availability for the Unit 1 Wide Range Noble Gas Monitor, the Unit 1 Main Vent Gaseous Radiation Monitor, (1-RI-5415), and the Unit 2 Main Vent Gaseous Radiation Monitor (2-RI-5415);
- The inspectors reviewed Calvert Cliffs' capability to collect high-range, post-accident iodine effluent samples; and
- There were no opportunities to observe electronic or source calibrations of the high range monitors during this inspection.

Portable Survey Instruments, ARMs, Electronic Dosimetry, and Air Samplers/CAMs

- The inspectors reviewed calibration records for an AMS-4, an RO-2, an MP-2, an HD-29, a PM-7, a Telepole, an E-600, and an SAC-4. The inspectors reviewed the detector measurement geometry and calibration methods for ARMs and portable radiation survey instruments. The inspectors had a technician simulate the use of the instrument calibrator; and
- The inspectors reviewed the licensee corrective actions taken in response to a failed daily source check for an RM-14.

Instrument Calculbrator

- The inspectors reviewed the current output tables for Calvert Cliffs' portable survey and ARM instrument calibrator unit. The inspectors verified that Calvert Cliffs periodically measures the calibrator output over the range of the instruments; and

- The inspectors verified the calibrator is sent for periodic calibration to a facility that uses NIST traceable sources.

Calibration and Check Sources

- The inspectors reviewed Calvert Cliffs' 10 CFR Part 61 source term to verify that the calibration sources used are representative of the types and energies of radiation encountered in the plant.

Problem Identification and Resolution

- The inspectors reviewed ten CRs related to radiation monitoring instrumentation and verified that appropriate corrective actions have been taken or initiated. The inspectors verified that problems are being identified at the appropriate threshold and are properly addressed for resolution.

b. Findings

No findings of significance were identified.

2RS06 Radioactive Gaseous and Liquid Effluent Treatment (71124.06)

a. Inspection Scope

During the period June 7, 2010, through June 11, 2010, the inspectors conducted the following activities to verify the gaseous and liquid effluent systems are maintained and discharges and conditions are controlled in accordance with applicable regulatory requirements and Calvert Cliffs procedures.

Inspection Planning

- The inspectors reviewed the Effluent and Waste Disposal 2008 Annual Report. The inspectors noted no anomalous results and reviewed the effluent monitor operability issues reported;
- The inspectors reviewed the UFSAR and descriptions of the radioactive effluent monitoring systems, treatment systems, and effluent flow paths. The inspectors verified no changes were made to the ODCM since the last inspection. The inspectors verified there were no systems contaminated with licensed material that were previously uncontaminated;
- The inspectors reviewed reported ground water monitoring results, and changes to the Calvert Cliffs written program for identifying and controlling contaminated spills/leaks to ground water; and
- The inspectors reviewed reports and procedures for the effluent program.

Walk-downs and Observations

- The inspectors walked down accessible components of the gaseous and liquid discharge systems. The inspectors verified the equipment configuration, equipment physical condition, and flow paths aligned with the UFSAR;

- The inspectors determined no condition surveillance records exist for areas that are not readily accessible;
- The inspectors walked-down the filtered ventilation systems and verified there were no degraded high efficiency particulate assemblies or charcoal banks, improper alignment, or system installation issues that would impact performance, or the effluent monitoring capability, of the effluent system;
- The inspectors observed sampling and analysis of the Unit 1 main stack ventilation;
- The inspectors verified that no changes have been made to effluent release points; and
- The inspectors observed the sampling and analysis of the 12 reactor coolant waste monitor tank for release.

Sampling and Analysis

- The inspectors verified liquid effluent sampling includes provisions for sample line flushing, vessel recirculation, and composite sampling during a release;
- The inspectors reviewed three release packages for releases made with monitoring equipment out of service. The inspectors verified that compensatory sampling was performed consistent with the ODCM;
- The inspectors verified Calvert Cliffs is not routinely relying on the use of compensatory sampling in lieu of adequate system maintenance. The releases reviewed were during a period when new monitoring equipment was being installed; and
- The inspectors reviewed the inter-laboratory comparison program to verify the quality of the radioactive effluent sample analyses and that the program included hard-to-detect isotopes.

Instrumentation and Equipment

- The inspectors reviewed the methodology Calvert Cliffs uses to determine the effluent stack and vent flow rates. The inspectors verified the flow rates used are consistent with the ODCM values; and
- The inspectors reviewed surveillance test results for the containment, auxiliary building, and the spent fuel exhaust to verify they met TS acceptance criteria.

Dose Calculations

- The inspectors verified there were no significant changes in the reported dose values compared to the previous Radiological Effluent Release Report;
- The inspectors reviewed four liquid and three gaseous release permits to verify that projected doses to members of the public were accurate and based on representative samples;
- The inspectors reviewed the analysis used to determine hard-to-detect radionuclides. The inspectors verified these radioisotopes were included in the source term;
- The inspectors reviewed the latest land use census and verified that no changes were needed to the dose calculations;
- The inspectors verified for the release packages review, the calculated doses were within the 10 CFR Part 50, Appendix I and TS dose criteria; and

- The inspectors verified there were no abnormal releases during this inspection period.

Ground Water Protection Initiative (GPI) Implementation

- The inspectors reviewed the monitoring results of the GPI to verify Calvert Cliffs has implemented their program as intended and to identify any anomalous results;
- The inspectors verified that no entries were made into the 10 CFR Part 50.75 (g) file during this inspection period;
- The inspectors verified there were no leaks or spills during this inspection period;
- The inspectors could not evaluate discharges from onsite surface water bodies because Calvert Cliffs has no onsite surface water bodies;
- The inspectors verified the results of ground water monitoring are included in the Annual Radiological Environmental Operating Report (AREOR) and the Annual Radiological Effluent Release Report (ARERR); and
- The inspectors noted that Calvert Cliffs has no new discharge points.

Problem Identification and Resolution

- The inspectors reviewed Calvert Cliffs' self-assessments, audits, and special reports related to the radiological effluent treatment system to determine if identified problems were entered into the CAP. The inspectors verified that problems identified were put into the CAP and appropriate corrective actions were identified.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES (OA)

4OA1 Performance Indicator (PI) Verification (71151 – Four Samples)

Barrier Integrity

a. Inspection Scope

The inspectors reviewed Constellation's PI program to evaluate, collect, and report information on the following Unit 1 and 2 PIs: RCS specific activity and RCS leak rate. The inspectors reviewed the PIs for the period of April 2009 through March 2010. 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 RCS sample analysis, control room logs of daily measurements for RCS leakage and compared that information to the data reported by the PI. Additionally, the inspectors observed surveillance activities that determined the RCS identified leakage rate, and chemistry personnel taking and analyzing an RCS sample.

b. Findings

No findings of significance were identified.

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

.1 Reviews of Items Entered Into the CAP

a. Inspection Scope

The inspectors performed a daily screening, as required by Inspection Procedure (IP) 71152, "Identification and Resolution of Problems," of items entered into Constellation's CAP. The review facilitated the identification of potentially repetitive equipment failures or specific human performance issues for follow-up inspection. The inspectors reviewed the description of each new CR and attended screening meetings.

b. Findings

No findings of significance were identified.

.2 Semi-Annual Review

a. Inspection Scope

The inspectors performed a review of Constellation's CAP and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review considered the six-month period of October 2009 to March 2010, although some examples expanded beyond those dates when the scope of the trend warranted. The inspectors compared their results with the results contained in Constellation's quarterly trend reports, operator logs, and CRs. The corrective actions assigned to address select individual issues were reviewed for adequacy.

b. Findings and Observations

No findings or observations of significance were identified.

.3 Annual Sample: SW Pumps Exceeded Maintenance Rule Unavailability Criteria

a. Inspection Scope

This inspection was conducted to assess whether Constellation's corrective actions associated with exceeding the unavailability criteria for two of the three Unit 2 SW pumps were reasonable to correct the identified causes. The inspectors also reviewed equipment performance for additional SW system components, both at Unit 1 and Unit 2, to assess the overall performance of the system. In particular, the inspectors reviewed Constellation's evaluation and corrective actions associated with CR 2009-000630 regarding SW pumps 21 and 23 exceeding the maintenance rule unavailability performance criterion. The inspectors interviewed station personnel, reviewed component and system performance data, and reviewed procedures to evaluate the

performance of the SW system and the effectiveness of Constellation's corrective actions. The inspectors conducted an independent walkdown of selected portions of the SW system to assess the material condition of the system. The inspectors also reviewed system health reports and CRs associated with the SW system to evaluate past performance of the system and determine if Constellation had corrected deficient conditions when identified.

b. Findings

No findings of significance were identified. The inspectors determined that Constellation's actions associated with exceeding the unavailability performance criterion were reasonable to correct the identified causes and return SW pumps 21 and 23 to a 10 CFR 50.65 (a)(2) status. For the CRs reviewed, the associated evaluations were appropriately detailed to identify apparent and/or root causes and to develop suitable corrective actions. During the course of the review, the inspectors noted that the SW system had some equipment challenges (e.g., check and control valve failures), most of which appeared to be attributed to environmental conditions of the system (e.g., silt). Constellation had submitted CRs for the noted deficiencies, and was developing actions to improve equipment performance.

.4 Review of Operator Work-Arounds

a. Inspection Scope

The inspectors performed an in-depth review of operator work-arounds for CCNPP's Units 1 and 2. This included an evaluation of the potential cumulative affects of all outstanding work-arounds to determine whether they could affect the reliability, availability, and potential for misoperation of a mitigating system, affect multiple mitigating systems, or affect the ability of operators to respond in a correct and timely manner to plant transients and accidents. The inspectors discussed these potential effects with control room licensed operators. The inspectors' evaluation followed the guidelines in IP71152, paragraph 03.02b, and assessed potential work-arounds not evaluated by station personnel, work-arounds that have been formalized as long-term corrective actions, and work-arounds that increase the potential for human performance errors.

b. Findings

No findings of significance were identified. The inspectors determined that operator work-arounds were classified, tracked, and assessed in accordance with Constellation's procedures.

4OA3 Followup of Events and Notices of Enforcement Discretion (71153 – One Sample)

a. Inspection Scope

On May 12, 2010, the inspectors responded to a reactor trip of Unit 1. In the events leading up to the trip, workers were performing a wiring modification to the 500 kV switchyard breakers protective relay circuitry. While restoring DC control power, a switchyard breaker tripped open and disconnected the Unit 1 main generator from the

grid. RCS and secondary pressure rapidly increased until a valid high pressurizer pressure trip occurred. Both PORVs and several MSSVs lifted as a result of the transient. The cause of the Unit 1 switchyard breaker tripping was determined to be a loose connection located within a 125 VDC switchyard distribution panel that provides DC control power for the switchyard breakers. The 125 VDC switchyard distribution system supplies power to the switchyard direct current (DC) loads for the operation of switchyard circuit breakers, emergency lights, and protective relays. The inspectors reviewed operator actions to determine if actions taken were in accordance with procedures. The inspectors also reviewed system indications to verify that system responses were as expected. In addition, the inspectors reviewed Constellation's initial investigation to assess the adequacy of immediate and interim corrective actions prior to restart. The inspectors compared their observations to the requirements specified in the Constellation procedures.

b. Findings

Introduction: A self-revealing finding of very low safety significance (Green) was identified because Constellation did not establish an appropriate PM program for the 125 VDC switchyard distribution panels in accordance with MN-1, "Maintenance Program."

Description: During a review of Constellation's initial investigation, the root cause analysis report (RCAR), and CRs associated with the May 12, 2010, reactor trip, the inspectors determined that there was no PM program established for the 125 VDC switchyard distribution panels. This is contrary to MN-1, "Maintenance Program," which stated, "A maintenance program shall be developed to maintain structures, systems, and components at the level of quality needed to perform their intended function. In addition, a PM program shall be used to minimize equipment failure and downtime, and extend equipment life." The inspectors determined that this issue was reasonably within Constellations' ability to foresee and correct. Under action item IH200400014, Constellation performed an effectiveness review of corrective actions associated with an external organization's recommendations related to grid stability. One such recommendation stated that all switchyard components that could result in a plant transient should be fully incorporated in the plant's PM program. The inspectors noted that the 125 VDC switchyard distribution panels were scoped into the maintenance rule because the failure of 125 VDC components could result in a plant transient. However, the effectiveness review did not identify the 125 VDC switchyard distribution panels as equipment that should be included into the plant's PM program. In addition, the vendor technical manual recommended annual inspections of the panels.

The RCAR concluded that the loose connection that caused the reactor breaker trip was located in a position in the panel such that a normal PM program would not have identified the equipment deficiency. The inspectors concluded that there was no direct correlation between the failure to establish a PM program for the 125 VDC distribution panel and the failure to identify the loose connection that caused the May 12, 2010, plant trip. However, the inspectors determined that the failure to establish a PM program for the 125 VDC switchyard distribution panels could preclude the identification of equipment deficiencies that could result in similar events (i.e. plant transient). For example, during an extent of condition review following the May 12, 2010, event, Constellation identified numerous loose connections in the 125 VDC switchyard distribution panels. Immediate corrective actions included entering this issue into the

CAP and performing an extent of condition review on similar switchyard panels. Long-term corrective actions planned include establishing an adequate PM program for the 125 VDC switchyard distribution panels.

Analysis: The performance deficiency is that Constellation did not establish an appropriate PM program for the 125 VDC switchyard distribution panels in accordance with MN-1. The finding is more than minor because it is associated with the equipment performance attribute of the Initiating Events cornerstone and affects the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety function. In addition, if left uncorrected, the performance deficiency could lead to a more significant safety concern. Specifically, the failure to establish a PM program for the 125 VDC panel could preclude the identification of equipment deficiencies, such as loose connections, that could result in a plant transient. The inspectors evaluated this finding using IMC 0609 Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings." The inspectors determined that the finding is of very low safety significance (Green) because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions will not be available. This finding has a cross-cutting aspect in the area of problem identification and resolution, OE, because Constellation did not use OE information, including vendor recommendations, to support plant safety. Specifically, the licensee did not implement and institutionalize OE through changes to station processes, procedures, equipment, and training associated with the switchyard PM program. (P.2.b of IMC 0305)

Enforcement: This finding does not involve enforcement action because no regulatory violation was identified. Because this finding does not involve a violation of regulatory requirements and has a very low safety significance, it is identified as a finding (FIN). The issue has been entered into Constellation's CAP as CR-2010-005173. **(FIN 05000318/2010003-03: Did Not Establish Preventive Maintenance Program for Switchyard Panels)**

4OA5 Other Activities

1. List of Items Opened, Closed, and Discussed in IR 05000517/518/2010006

The inspectors noted several items in IR 05000517/518/2010006 that were inadvertently listed as "Opened" vice "Opened and Closed." These items are listed as "Closed" in this inspection report in Attachment 1, List of Items Opened, Closed, and Discussed.

2. NRC Temporary Instruction (TI) 2515/173

a. Inspection Scope

During the period June 7, 2010, through June 11, 2010, the inspectors conducted the following activities to confirm Calvert Cliff's implementation of the voluntary GPI.

GPI Objective 1.1 – Site Hydrology and Geology

- The inspectors verified that a hydrology and geologic study was performed by an outside contractor to determine the predominant ground water flow characteristics and gradients. The contractor issued a report in September 2006;
- The inspectors verified the study was reviewed by a knowledgeable utility employee;
- The inspectors verified that potential pathways have been identified for ground water migration from on-site locations to off-site locations through ground water;
- The inspectors verified that a five year frequency has been established in Calvert Cliff's procedures for periodic review of the hydro geologic studies; and
- The inspectors verified that no changes were required to the UFSAR.

GPI Objective 1.2 – Site Risk Assessment

- The inspectors verified that Calvert Cliffs has identified SSCs and work practices that involve or could reasonably be expected to involve licensed material and for which there is a credible mechanism for licensed material to reach ground water;
- The inspectors verified that Calvert Cliffs has identified leak detection methods for each of the SSCs and work practices that involves or could reasonably be expected to involve licensed material and for which there is a credible mechanism for licensed material to reach ground water;
- The inspectors verified that potential enhancements to the leak detection systems or programs have been identified;
- The inspectors verified that potential enhancements have been identified to prevent leaks and spills from reaching ground water;
- The inspectors verified that Calvert Cliffs' CAP will be used to identify and track corrective actions;
- The inspectors verified a long-term program has been established to perform preventative maintenance or surveillance activities to minimize the potential for inadvertent releases of licensed materials due to equipment failure;
- The inspectors verified that a five year frequency has been established in Calvert Cliffs' procedures for periodic review of SSCs and work practices;

GPI Objective 1.3 – On-Site Ground Water Monitoring

- The inspectors verified Calvert Cliffs has considered the placement of monitoring wells down gradient from the plant but within the site boundary;
- The inspectors verified that Calvert Cliffs considered placing sentinel wells closer to SSCs that have the highest potential for inadvertent releases that could reach ground water;
- The inspectors verified that Calvert Cliffs has established sampling and analysis protocols, including analytical sensitivity in site procedures;
- The inspectors verified that a formal written program has been established for long term ground water monitoring. The inspectors verified that the ODCM has not been revised, per the recommendation of NEI, to include ground water monitoring, as the monitoring locations are not included in the Radiological Environmental Monitoring Program (REMP);

- The inspectors verified that a long-term program has been established in Calvert Cliffs' procedures for the ground water monitoring wells; and
- The inspectors verified a frequency has been established in Calvert Cliffs' procedures for the periodic review of the ground water monitoring program.

GPI Objective 1.4 – Remediation Process

- The inspectors verified that written procedures have been established outlining the decision making process for the remediation of leaks and spills or other instances of inadvertent releases;
- The inspectors verified that an evaluation was performed of the potential for detectible levels of licensed material from planned releases of liquids and/or airborne materials; and
- The inspectors verified that an evaluation has been performed and documented on the decommissioning impacts resulting from remediation activities.

GPI Objective 1.5 – Record Keeping

- The inspectors verified that a record keeping program has been established to meet the requirements of 10 CFR Part 50.75 (g).

GPI Objective 2.1 – Stakeholder Briefings

- The inspectors verified Calvert Cliffs has considered including additional information or updates on ground water protection in the annual reports for the state and local officials; and
- Calvert Cliffs is the only nuclear power plant in the State of Maryland and has conducted initial briefings with state and local officials.

GPI Objective 2.2 – Voluntary Communications

- The inspectors verified that Calvert Cliffs' procedures establish communication protocols for communicating leaks and spills to state and local officials; and
- The inspectors verified that the ODCM establishes communication protocols for ground or surface water samples exceeding REMP reporting criteria.

GPI Objective 2.3 – Thirty Day Reports

- The inspectors verified that ground water samples are analyzed and compared to the standards and limits contained in the ODCM; and
- The inspectors verified that no thirty-day special reports for ground water monitoring have been submitted to the NRC.

GPI Objective 2.4 – Annual Reporting

- The inspectors verified that appropriate changes have been made to appropriate Calvert Cliffs' procedures to support the 2006 performance;
- The inspectors verified that all ground water sample results are included in the AREOR and the ARERR;

- The inspectors verified that no ground water samples taken as part of the GPI are part of the REMP program;
- The inspectors verified that no leaks or spills have been communicated to the state or local officials since the implementation of the GPI; and
- The inspectors verified that no water sample requests have exceeded REMP reporting thresholds since the implementation of the GPI.

GPI Objective 3.1 – Perform a Self-Assessment of the GPI Program

- The inspectors verified an independent knowledgeable individual performed the initial self-assessment of the ground water program prior to the implementation of the GPI and another self-assessment performed in 2009;
- The inspectors verified that self-assessments are required every five years per Calvert Cliffs' procedures;
- The inspectors verified that the self-assessment included an evaluation of all of the GPI objectives; and
- The inspectors verified the self-assessments are documented in accordance with Calvert Cliffs' procedures.

GPI Objective 3.2 – Review the Program Under the Auspices of NEI

- The inspectors verified an independent, knowledgeable individual performed an initial review after the initial assessment; and
- The inspectors verified that Calvert Cliffs' procedures require periodic review of the GPI program every five years.

b. Findings

No findings of significance were identified. This TI is closed.

4OA6 Meetings, Including Exit

Exit Meeting Summary

On July 16, 2010, the resident inspectors presented the inspection results to Mr. George H. Gellrich and other members of Constellation staff who acknowledged the findings. The inspectors asked Constellation whether any of the material examined during the inspection should be considered proprietary. There was no proprietary information identified.

ATTACHMENTS: SUPPLEMENTAL INFORMATION

ATTACHMENT 1

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Constellation Personnel

G. Gellrich, Site Vice President
D. Trepanier, Plant General Manager
D. Brink, Chemistry Technician
C. Conover, Supervisor Chemistry Support
D. Frye, Operations Manager
R. Fearrington, Radiation Protection Technician
J. Gines, System Manager
M. Goldman, Engineer Underground Pipes and Tanks
G. Helmrich, Chemistry Technician
J. Herron, Supervisor Engineering
C. Jackson, Senior Engineering Analyst
D. Lauver, Director, Licensing
C. Ledwich, Radiation Protection Technician
S. Loftis, Staff Chemist
K. Mills, General Supervisor Shift Operations
B. Pickett, Radiation Protection Technician
T. Riti, General Supervisor System Engineering
A. Simpson, Principal Engineer
J. Stanley, Manager, Engineering Services
J. Wilson, Supervisor Engineering
J. Wynn, Engineer Ventilation

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened and Closed

05000318/2010003-01	NCV	Inadequate Risk Assessment Associated with the 2B EDG (Section 1R13)
05000317/318/2010003-02	NCV	Inadequate Design Control Reviews of the Turbine Control System and the Nuclear Steam Supply System (Section 1R18)
05000317/318/2010003-03	FIN	Did Not Establish Preventive Maintenance Program for Switchyard Panels (Section 4OA3)

Closed

05000317/318/2010006-01	NCV	Failure to Thoroughly Evaluate and Promptly Correct Degraded Conditions Associated with Auxiliary Building Roof Leakage
05000317/318/2010006-03	NCV	Failure to Evaluate Degraded Conditions Associated with CO-8 Relays and Implement Timely and Effective Action to Correct Condition Adverse to Quality
05000317/318/2010006-04	FIN	Failure to Translate Design Calculation Setpoint of Phase Overcurrent Relay on Feeder Breakers
05000317/318/2010006-05	NCV	Failure to Establish Adequate Procedures for Letdown Restoration

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures
AOP-7I-1, Loss of 4kV, 480V, or 208/120V Instrument Bus Power, Revision 23
AOP-7M, Major Grid Disturbance, Revision 1
ERPIP 3.0, Immediate Actions, Attachment 20, Severe Weather, Revision 44
EP-1-108, Severe Weather Preparation, Revision 0
NO-1-119, Seasonal Readiness, Revision 2
OI-22L, Intake Structure Ventilation System, Revision 1
OI-28, Operation of 500 kV Switchyard System, Revision 15
OI-38A, Screen Wash System, Revision 23

Miscellaneous
FA-10-02, Functional Assessment for 1A EDG SWGR Room Sprinkler System, Revision 0
Seasonal Readiness Status Sheet 2010

Section 1R04: Equipment Alignment

Procedures
MN-1-101, Control of Maintenance Activities, Revision 03601, Att. 2 Rover Maintenance Approval and Closeout Form
STP-F-77-0, Diesel Fire Pump Staggered Test, Revision 1000
STP M-352-0, Reserve Battery Quarterly Check, Revision 01100
STP M-552(5V)-2, 21 Station Battery Performance Discharge Test, Revision 00901
OI-29-2, Saltwater System, Revision 58

Condition Reports
CR-2010-004567
CR-2010-000943
CR-2010-004888

CR-2010-004599
CR-2010-000669
CR-2010-001135
CR-2010-004880
CR-2010-005891

Maintenance Orders/Work Orders
WO #C90640029
WO #C90867946
WO #C90777685
WO #C90708521

Miscellaneous
Hand-wheel Assembly (SW Valve 5175), Rev. 21-RP00532
Inservice Testing Basis Document Section 15 Saltwater System

Section 1R05: Fire Protection

Procedures
SA-1, Fire Protection Program, Revision 6
SA-1-100, Fire Prevention, Revision 16
OI-20, Fire Protection System, Revision 03001

Miscellaneous
Calculation CA02243, Combustible Loading Analysis Report, Revision 2
FP0002, Fire Hazards Analysis Summary Document, Revision 0
SA-1-105, Fire Drill Scenario, Revision 1
SE-2, Security Program, Revision 3
Fire Fighting Strategies Manual, Revision 0
UFSAR Section 9.9, Calvert Cliffs Power Plant Fire Protection Program, Revision 39

Section 1R07: Heat Sink Performance

Procedures
CNG-AM-1.01-1016, Heat Exchanger Program, Revision 0
EN-1-125, Heat Exchanger Program, Revision 0
EN-1-327, Service Water Reliability Program, Revision 4
ETP 99-002R 22A and 22B SRW HX Thermal Performance Test, September 1, 2009
ETP 98-041R 12A and 12B SRW HX Thermal Performance Test, September 2, 2009
OI-29-1, Saltwater System, Revision 65

System Health Reports
Unit 1 Saltwater System Q1 2010 System Health Report
Unit 2 Saltwater System Q1 2010 System Health Report

Miscellaneous
EPRI-NP-7552, Heat Exchanger Performance Monitoring Guidelines, December 1991
ES-2009-000391
ECP-09-000196, Revision 000
ESR-09-003888

Section 1R11: Licensed Operator Requalification Program

Miscellaneous
Lesson Plan LOR 300-3-10, Ops Performance
CNG-OP-1.01-1000, Conduct of Operations, Revision 00300

Section 1R12: Maintenance Effectiveness

Procedures
ER-1-103, Maintenance Rule Program Implementation, Revision 1
CNG-AM-1.01-1023, Maintenance Rule Program, Revision 0

Condition Reports
CR-2010-004595
CR-2010-005173
CR-2010-004595

Miscellaneous
CCNPP Maintenance Rule Scoping Document, Revision 28

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 00600
CNG-OP-1.01-2000, Operations Logkeeping and Station Rounds, Revision 0
OI-21B-2, 2B Diesel Generator, Revision 19

Condition Reports
CR-2010-006120
CR-2010-006197
CR-2010-006681

Miscellaneous
Plant Status/Integrated Work Schedule for June 18, 2010

Section 1R15: Operability Evaluations

Procedures
CNG-OP-1-01-1002, Conduct of Operability Determinations/Functionality Assessments, Revision 0
NDE-5710-CC, Section XI Visual Examination (VT-2) for Leakage, Revision 8
NO-1-208, Calvert Cliffs Operability and Maintenance Testing
ERPIP-821, Accidental Radioactivity Release Monitoring and Sampling Methods, Revision 5
ERPIP-3.0, Immediate Actions, Attachment 1, Emergency Action Level Criteria, Revision 42
OI-29-1, Saltwater System – Unit 1, Revision 65
OI-29-1, Saltwater System – Unit 2, Revision 58

Condition Reports

CR-2010-003924	CR-2010-001181	CR-2010-004032
CR-2010-004557	CR-2010-006157	CR-2010-005182

CR-2010-004583	CR-2010-003944	CR-2010-001697
CR-2010-005179	CR-2010-005241	
CR-2010-005241	CR-2010-001284	
CR-2010-004035	CR-2010-004036	

Maintenance Orders/Work Orders
WO #C90839252
WO #C020080307

Miscellaneous
Loop Diagram 11B Safety Injection Tank Level (1LT321) Drawing No. 98-611-B, Sheet 11, Revision 8
FA-09-003, Functionality Assessment for the Unit 2 Wide Range Noble Gas Monitor (2-RIC-5415), Revision 0
NEI 99-01, Methodology for Development of Emergency Action Levels, Revision 4

Section 1R18: Plant Modifications

Procedures
CNG-AM-1.01-1023, Maintenance Rule Program, Revision 00000
CNG-OM-1.01-3000, Issue Response Team, Revision 00000
CNG-OP-1.01-1001, Operational Decision Making, Revision 00100
CNG-OP-1.01-1002, Conduct of Operability Determinations/Functionality, Revision 00100
Maintenance Rule Scoping Document, Revision 30
MD-1, Modification Program, Revision 3
MD-1-100, Temporary Alterations, Revision 14
PSTP-04 Variable T-avg Testing, Revision 0400
OI-29, Saltwater System – Unit 1, Revision 65
STP O-65B-1, 11 SRW Subsystem Valve Quarterly Operability Test, Revision 0410

Condition Reports

CR-2010-006763	CR-2010-004805	CR-2010-004299
CR-2010-004284	CR-2010-004601	CR-2010-004508
CR-2010-003752	CR-2010-004290	CR-2010-003758
CR-2010-003839	CR-2010-004288	CR-2010-003904
CR-2010-004798	CR-2010-003465	CR-2010-003900
CR-2010-004797	CR-2010-004291	CR-2010-004798
CR-2010-004601	CR-2010-004292	IR4-000-319
CR-2010-004626	CR-2010-004296	IR4-028-083
CR-2010-004676	CR-2010-004293	
CR-2010-004795	CR-2010-004298	

Maintenance Orders/Work Orders

WO #907001957	WO #C120085873
WO #C90836235	WO #C907003333
WO #C90799265	WO #C120040214
WO #C907001773	WO #C220040146

Miscellaneous
Calculation 000-TH-9301, Turbine Bypass Valve Response During a Loss of Load Event, Revision 0

ES200300421, Appendix K Power Uprate, Revision 0
ES200300470, Unit I Mark VI Turbine Control Replacement, Revision 009
FCR 85-0068, Turbine Bypass Valves Equivalency Report, Revision 0
FCR 75-1069, Power Load Unbalance Circuit Installation, Revision 0
AOP-3G, Malfunctions of Main Feedwater System, Revision 01200
EC-20080288-000, Isolate Instrument Air (1-IA-1302) to Valve (1-CV-5163) in Order to Fail it in its Safe Position (Open), Revision 0
EC-20090055-000, Change the Fan Sheaves and Motors for the AFW Pump Room Emergency Ventilation Fans, Revision 0
ECP-09-000039, TCP for 12 MSIV Hydraulic Pressure Alarm, Revision 0
OPESS FY 2009-02 Negative Trend and Recurring Events Involving Feedwater Systems
TCF# 90836235, Replace "A" Path Pulse Width Modulator and Controller Card in 21 SGFP LPEHC, Revision 0
TSCF 2010-003900

Section 1R19: Post-Maintenance Testing

Procedures
M-500 (BGEDRWG 92401) Instrument and Tubing Installation, Revision 25
CCNPP Main Feedwater System, System Description No. 45A, Revision 6
Steam Generator Feed Pump Turbines Unit 1(2), System Description No. 45B-1(45B-2), Revision 1 (Revision 4)
OP-2, Plant Startup from Hot Standby to Minimum Load, Revision 45
STP O-27-1(2) Reactor Coolant System Leakage Evaluation, Revision 20(18) OP-3 Normal Power Operation, Revision 44
CNG-CA-1.01-1000, Corrective Action Program, Revision 2
CNG-MN-4.01-1008, Pre/Post Maintenance Testing, Revision 0
STP O-65S-1, ECCS LPSI Loop Isolation Valves Quarterly Operability Test, Revision 0500

Condition Reports
CR-2010-003985
CR-2010-003985
CR-2010-002795
CR-2010-005182
CR-2010-004562
CR-2010-003660
CR-2010-005891

Maintenance Orders/Work Orders
WO #C90873154
WO #C120091179
WO #C120052505
WO #C120085063
WO #C120074611
WO #C220073729
Rover WO #CR-2010-004880
Rover WO #CR-2010-005891

Miscellaneous
EPRI Engineering Technical Training Modules for Nuclear Plant Engineers – Relief and Safety Valves, October 1999

TR-105872, Safety ad Relief Valve Testing Guide, August 1996
Specification Limits T57501-1, Wyle Laboratories Certified Test Results, May 15, 2010
LER 2006-004-00, Reactor Trip Due to Loose Wire During Maintenance on Turbine Control System
LER 2008-002-01, Pressurizer Safety Valve Setpoint High Due to Excessive Drift
LER 2008-002-00, Pressurizer Safety Valve Setpoint High Due to Low Torque and Misalignment
LER 2003-003-00, Reactor Trip Due to Main Turbine Governor Valves Closing
LER 2010-002-00, Pressurizer Safety Valves As-Found Settings Outside Technical Specifications

Section 1R20: Refueling and Other Outage Activities

Procedures
OP-1-1, Plant Startup from Cold Shutdown, Revision 58
OP-2-1, Plant Startup from Hot Standby to Minimum Load, Revision 45
OP-3-1, Normal Power Operation, Revision 61
OP-4-1, Plant Shutdown from Power Operation to Hot Standby, Revision 34
OP-5-1, Plant Shutdown from Hot Standby to Cold Shutdown, Revision 61
OP-6, Pre-Startup Checkoff, Revision 52
OP-7-1, Shutdown Operations, Revision 47

Section 1R22: Surveillance Testing

Procedures
STP-O-065P-1, 12 SW Subsystem Valve Quarterly Operability Test, Revision 0514
STP-O-27-1, Reactor Coolant System Leakage Evaluation, Revision 02001
STP-O-27-2, Reactor Coolant System Leakage Evaluation, Revision 01801
STP-M-212A-1, Channel "A" Reactor Protective System Functional Test, Revision 0800
STP-O-7A-1, "A" Train Engineered Safety Features Logic Test, Revision 06105
STP-O-005A-2, Auxillary Feedwater System Quarterly Surveillance, Revision 02102
STP-O-008B-2, Test of 2B DG and 24 4KV Bus LOCI Sequencer, Revision 02703
EN-4-102, ASME Pump and Valve Inservice Testing Program Requirements, Revision 6
EN-4-104, Surveillance Testing, Revision 6
EN-4-107, ASME Inservice Testing of Pumps, Revision 1
STP-O-73A-2, Saltwater pump and check valve quarterly operability test, Revision 01700
STP-O-11-1, ECCS Pump Room Ventilation System Monthly Test, Revision 0300
STP-O-65Q-1, Safety Injection System Valve Operability Test, Revision 512

Miscellaneous
Fourth-Ten-Year-Plan (ISTPP), Pump and Valve Inservice Testing (IST) Program Fourth-Ten-Year Interval, Revision 2

Section 2RS05: Radiation Monitoring Instrumentation

Procedures
ITEC-618, Calibration of Eberline Ion Chamber Models RO-2 and RO-2A, Revision 2
ITEC 668, Generic Calibration Process for Radiation Instrumentation, Revision 0
RSP 1- 102, Pre- Operational Checks of Portable Survey Instruments, Revision 19
ETP 09-004, Common Liquid Waste Discharge Monitor, 0-RIT-2201 Functional Check, Revision 0

STP M-562-1, Containment High Range Radiation Monitor Alignment Check, Revision 00800
STP M-562-2, Containment High Range Radiation Monitor Alignment Check, Revision 00700
STP-M-563-1, Unit 1 Containment High Range Radiation Monitor Source Check, Revision 0501
STP-M-563-2, Unit 2 Containment High Range Radiation Monitor Source Check, Revision 4
STP-M-564-1, WRNGM Calibration Check, Revision 01203
STP M-564-2, WRNGM Calibration Check, Revision 01403
STP-M-567-0, Gaseous and Liquid Discharge Radiation Monitors Calibration Check, Revision 4
STP M-567-1, Steam Generator Blowdown Recovery Radiation Monitor and Loop Flow Channel Calibration, Revision 00700
STP M-567-2, Steam Generator Blowdown Recovery Radiation Monitor and Loop Flow Channel Calibration, Revision 00600
STP M-567-2, Steam Generator Blowdown Recovery Radiation Monitor and Loop Flow Channel Calibration, Revision 00601
STP-M-569-1, Main Vent Gaseous Radiation Monitor Channel Calibration, Revision 1
STP-M-569-2, Main Vent Gaseous Radiation Monitor Channel Calibration, Revision 1

Condition Reports
CR-2010-000382
CR-2010-001995
CR-2010-004148
CR-2010-000733
CR-2010-004397
CR-2010-004937
CR-2010-001300
CR-2010-003862
CR-2010-001712
CR-2010-004062

Calibration Records
Portable Radiation Survey Instruments

Instrument Type	Serial #	Calibration Date
AMS-4	790	2/16/2010
RO-2	4764	1/23/2010
Telepole	79	1/30/2010
E-520	1006	11/28/2009
Contamination Monitors		
PM-7	250	6/13/2009
RM-14	1618	10/31/2009
Air Sampler Flow Gauge		
Gilair 5	1021	1/7/2010
HD-29	689	6/5/2009

Audits and Self-Assessments

SA-RP-007, Self Assessment on Half Body Beta Monitors
SA-RP-008, Self Assessment on Gamma Portable Monitors
SA-RP-009, Self Assessment on Gamma Sensitive Tool Monitors

Other
Report # S92976 Radcal Corporation

Section 2RSO6: Radioactive Gaseous and Liquid Effluent Treatment

Procedures:
CP-422, Waste Processing Sampling System, Revision 00402
CP-601, Liquid Radioactive Waste Release Permit, Revision 01403
CP-604, Radioactive Gaseous Waste Permits, Revision 01800
CP-614, Unmonitored Liquid Radioactive Waste Release Permit, Revision 7
CP-615, Plant Main Vent Releases, Revision 00601
CP-0977, Operation of the Gamma Spectroscopy Counting System, Revision 07

Condition Reports:
CR-2009-001693
CR-2009-008224
CR-2009-006112
CR-2009-008227
CR-2009-006712
CR-2010-000733
CR-2009-007583
CR-2010-005219

Audits and Assessments:
CHE-09-01-C, Chemistry Program 5/17/09
10-1P-C, Calvert Cliffs NPP Periodic Assessment Report for 1/1/10 to 4/30/10, 5/25/10
09-3P-C, Calvert Cliffs NPP Periodic Assessment Report for 9/1/09 to 12/31/09, 1/27/10
09-2P-C, Calvert Cliffs NPP Periodic Assessment Report for 5/1/09 to 8/31/09, 9/25/09
09-1P-C, Calvert Cliffs NPP Periodic Assessment Report for 1/1/09 to 4/30/09, 6/2/09
SA-2009-000174, RETS Program, 11/20/09
FSA-2006-79, Fleet Focused Self Assessment of H3

Ventilation Surveillances
STP-M-542-0, SFP HEPA, 8/22/08
STP-M-543-, SF Storage Filter Test (Charcoal), 8/31/08
STP-M-545A-1 #12 Penetration Room Exhaust Filter Test (HEPA and Charcoal, 2/1/08
STP-M-547-1, ECCS Pump Room Exhaust Filter Test (Charcoal), 5/18/09
STP-M-546-1, ECCS Pump Room Exhaust Filter Test (HEPA), 4/30/09
I-130, Auxiliary Building and Radwaste Area Ventilation Exhaust System HEPA Filter Test, 10/28/09

Release Permits

Gaseous	Liquid	Liquid with Monitors OOS
90005	90001	90078
90009	90002	90083
90010	90007	90093
	90010	

Section 4OA1: Performance Indicator Verification

Condition Reports
CR-2010-003966
CR-2010-003969

Section 4OA2: Problem Identification and Resolution

Procedures
CNG-AM-1.01-1023, Maintenance Rule Program, Revision 1
CNG-CA-1.02-1000, Corrective Action Program, Revision 2
CNG-OP-1.01-1005, Temporary Notes Operator Aids and Permanent Labels, Revision 0
CNG-MN-4.01-1002, Work Order Screening and Prioritization, Revision 1
NO-1-200, Control of Shift Activities, Revision 03601
Maintenance Rule Scoping Document, Revision 30
OI-29, Saltwater System – Unit 1, Revision 65
OI-29, Saltwater System – Unit 2, Revision 58
NEI 99-02, Regulatory Assessment Performance Indicator, Revision 5
STP-O-027-1, Reactor Coolant System Leakage Evaluation, Revision 20
STP-O-027-2, Reactor Coolant System Leakage Evaluation, Revision 18
CP-204, Specification and Surveillance Primary Systems, Revision 31
AOP-6A, Abnormal Reactor Coolant Chemistry/Activity, Revision 10
OI-1A, Reactor Coolant System and Pump Operations, Section 6.9 High RCS Leakage, Revision 36
WCAP-16465-NP, Pressurized Water Reactor Owner's Group Standard RCS Leakage Action Levels and Response Guidelines for PWR's, Revision 0
WCAP-16423-NP, Pressurized Water Reactor Owner's Group Standard Process for Calculating RCS Leakage Rate for PWR's, Revision 0

Condition Reports
CR-2009-000630
CR-2009-000630
CR-2008-002321
CR-2009-005328
CR-2008-000664
CR-2010-005203
CR-2009-002888
CR-2008-003019
CR-2009-007250
CR-2009-000846
CR-2009-007249

Drawings
62708, Circulating Water Cooling System, Sh. 2, Revision 106
62708, Circulating Saltwater System, Sh. 3, Revision 7

Miscellaneous
System Report, Nuclear Saltwater System – Unit 1, 3Q09, 4Q10
System Report, Nuclear Saltwater System – Unit 2, 3Q09, 4Q10
Calvert Cliffs Unit 1 and Unit 2 Monthly PI Data

Calvert Cliffs Unit 1 and Unit 2 Operator Narrative Logs
Site Roll Up 1st Quarter 2010 Trend Report

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

Condition Reports
CR-2010-005173
CR-2010-005191
CR-2010-005182
CR-2010-006143
CR-2010-006068
CR-2010-006318
CR-2010-005304
CR-2010-005257
CR-2010-005328
CR-2010-005393
IRE-032-680

Miscellaneous
STM-0002-0001, 125 VDC Distribution Panels System Technical Manual, Revision 1
BGE Drawing No. 61416E, 500 KV Switchyard 125 VDC Station Service Single-Line Diagram, Revision 13

Section 4OA5: Other Activities

Procedures
EV-1-109, Ground Water Protection Program, Revision 00000

Condition Reports

IRE-016-039	CR-2009-004589	CR-2009-004594
CR-2009-004585	CR-2009-004590	CR-2009-003570
CR-2009-004587	CR-2009-004592	
CR-2009-004588	CR-2009-004593	

Reports
Ground Water Flow Evaluation, Calvert Cliffs Nuclear Power Plant, O'Brien and Gere, September 2006

LIST OF ACRONYMS

ADAMS	Agency-Wide Documents Access and Management System
ADV	Atmospheric Dump Valve
ARM	Area Radiation Monitor
AFW	Auxiliary Feedwater
AREOR	Annual Radiological Environmental Operating Report
ARERR	Annual Radiological Effluent Release Report
CAM	Continuous Air Monitor
CAP	Corrective Action Program
CCNPP	Calvert Cliffs Nuclear Power Plant
CDF	Core Damage Frequency
CFR	Code of Federal Regulations
CR	Condition Report
DC	Direct Current
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
FIN	Finding
GPI	Ground Water Protection Initiative
IMC	Inspection Manual Chapter
IP	Inspection Procedure
kV	Kilovolt
MSSV	Main Steam Safety Valve
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NIST	National Institute of Standards and Technology
NSSS	Nuclear Steam Supply System
NRC	Nuclear Regulatory Commission
NMR	Nuclear Medium Risk
OE	Operating Experience
ODCM	Offsite Dose Calculation Manual
PARS	Publicly Available Records
PCM	Personnel Contamination Monitor
PM	Preventive Maintenance
PI	Performance Indicator
PLU	Power Load Unbalance
PORV	Power Operated Relief Valve
RCAR	Root Cause Analysis Report
RCS	Reactor Coolant System
REMP	Radiological Environmental Monitoring Program
RMA	Risk Management Action
SAM	Small Article Monitor
SDP	Significance Determination Process
SIAS	Safety Injection Actuation Signal
SRA	Senior Reactor Analyst
SSC	System, Structure and Component
SW	Saltwater
TBV	Turbine Bypass Valve
TI	Temporary Instruction

TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report
VDC	Volts of Direct Current
WBC	Whole Body Counter