



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

May 5, 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 05000317/2010002 AND 05000318/2010002

Dear Mr. Gellrich:

On March 31, 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 April 7, 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.

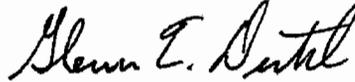
This report documents one NRC-identified finding of very low safety significance (Green). This finding was determined to involve a violation of NRC requirements. However, because the finding is of very low safety significance and because it is entered into your corrective action program (CAP), the NRC is treating this finding as a non-cited violation (NCV) 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 characterization of 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. The information you provide will be considered in accordance with Inspection Manual Chapter (IMC) 0305.

G. Gellrich

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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 05000317/2010002 and 05000318/2010002
w/Attachment: Supplemental Information

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Sincerely,

/RA/

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

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S. Collins, RA
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N. Perry, DRP
J. Hawkins, DRP
D. Lew, DRP
J. Clifford, DRP

S. Kennedy, DRP, Senior Resident Inspector
M. Davis, DRP, Resident Inspector
C. Newgent, DRP, Resident AA
Region I Docket Room (with concurrences)
ROPResources@nrc.gov
L. Pinkham, DRP

SUNSI Review Complete: NP (Reviewer's Initials)

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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.: 05000317/2010002 and 05000318/2010002

Licensee: Constellation Energy Nuclear Group, LLC

Facility: Calvert Cliffs Nuclear Power Plant, Units 1 and 2

Location: Lusby, MD

Dates: January 1, 2010, through March 31, 2010

Inspectors: S. Kennedy, Senior Resident Inspector
M. Davis, Resident Inspector
J. Hawkins, Acting Resident Inspector
D. Johnson, Physical Security Inspector
M. Modes, Senior Reactor Engineer
R. Montgomery, Reactor Engineer
R. Rolph, Health Physicist
J. Schoppy, Senior Reactor Inspector

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

Enclosure

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SUMMARY OF FINDINGS

IR 05000317/2010002, 05000318/2010002; 1/1/10 – 3/31/10; Calvert Cliffs Nuclear Power Plant (CCNPP), Units 1 and 2: Fire Protection.

The report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. One Green finding, which was a non-cited violation, was 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: Mitigating Systems

Green. The inspectors identified a non-cited violation (NCV) of Calvert Cliffs Renewed Facility Operating License Numbers DPR-53 and DPR-54, License Condition 2.E, because Constellation did not adequately implement and maintain surveillance procedures associated with fire barrier and penetration seal inspections. As a result, Constellation did not identify degraded conditions associated with one fire barrier and three penetration seals. Immediate actions taken included entering the appropriate Technical Requirement Manual (TRM) action statement, establishing an hourly fire tour until temporary repairs were completed, and entering each issue into their corrective action program (CAP) for resolution.

The finding is more than minor because it was associated with the external factors attribute (i.e. fire) of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiation events to prevent undesirable consequences. Specifically, the degraded conditions had to be repaired or evaluated to ensure that the barriers/penetrations would meet their design function. In addition, if left uncorrected, the finding could result in a more significant safety concern in that that the condition could continue to degrade such that the barriers/penetrations could no longer perform their specified function and/or result in the inability of Constellation to recognize additional degraded fire barriers/penetrations. The inspectors determined that the finding is of very low safety significance because there was a non-degraded automatic full area water based fire suppression system in the exposing fire area. This finding has a crosscutting aspect in the area of human performance because Constellation did not define and effectively communicate expectations regarding procedural compliance and personnel following procedures for fire penetration seal inspections (H.4.b of IMC 0310). (Section 1R05)

Other Findings

None

Enclosure

REPORT DETAILS

Summary of Plant Status

Calvert Cliffs Unit 1 began the inspection period at 100 percent power. On February 18, 2010, Unit 1 experienced an automatic reactor trip due to loss of the 12B reactor coolant pump. The Unit remained shutdown to support a planned refueling outage (RFO). Following the RFO on March 26, operators returned Unit 1 to 100 percent power. The unit remained at 100 percent power for the remainder of the inspection period.

Calvert Cliffs Unit 2 began the inspection period at 100 percent power. On February 18, 2010, Unit 2 experienced an automatic reactor trip due to loss of all reactor coolant pumps due to a relay failure and isolation of a 13kV transformer following the Unit 1 reactor trip. Operators returned the Unit to 100 percent power on March 1 and the unit remained at 100 percent power for the remainder of the inspection period.

1. REACTOR SAFETY**Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity**1R01 Adverse Weather Protection (71111.01 – One Sample)a. Inspection Scope

The inspectors reviewed the adverse weather preparation and mitigating strategies for Constellation's response to impending adverse weather associated with low bay water temperature on January 9 and January 13, 2010. This review included an assessment of Constellation's implementation of abnormal operating procedure (AOP) – 7L, "Circulating Water/Intake Malfunctions," and a walkdown of the intake structure. The inspectors verified that the operator actions specified in the associated procedures maintain readiness of essential equipment and systems to preclude weather induced initiating events. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment.1 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. 11 saltwater (SW) header subsystems during planned maintenance on the 12 SW header;
- 2A emergency diesel generator (EDG) during planned maintenance on the 2B EDG;
- No. 12 emergency core cooling system (ECCS) during planned maintenance on the 11 ECCS header; and
- No. 11 low pressure safety injection (LPSI) system during planned maintenance on the 12 LPSI system.

b. Findings

No findings of significance were identified.

.2 Complete Walkdown (71111.04S – One Sample)

a. Inspection Scope

The inspectors performed a complete system walkdown of the Unit 1 and Unit 2 auxiliary feedwater (AFW) system air headers to identify any discrepancies between the existing equipment lineup and the specified lineup. During the walkdown, the inspectors used system drawings and operating instructions to verify proper equipment alignment and the operational status. The inspectors reviewed open work orders on the system for any deficiencies that could affect the ability of the system to perform its safety function. Inspectors also reviewed unresolved design issues such as temporary modifications, operator workarounds, and items tracked by plant engineering to assess their collective impact on system operation. Additionally, the inspectors reviewed the condition report (CR) database to verify that equipment alignment problems were being identified and appropriately resolved.

a. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05Q – Seven Samples)

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.

- Unit 1 No. 12 ECCS pump room, fire area 3, room 118.
- Unit 1 service water pump room, fire area 39, room 226.
- Unit 1 turbine building (TB) elevation 12', fire area TB, rooms 601/607.
- Unit 1 west electrical penetration room, fire area 32, room 423.

- Unit 1 TB elevation 45', fire area TB, rooms 800/802.
- Unit 2 TB elevation 45', fire area TB, rooms 801/803.
- Unit 1 AFW pump room, fire area 42, room 603.

b. Findings

Introduction: The inspectors identified a finding of very low safety significance (Green) associated with an NCV of Calvert Cliffs Renewed Facility Operating License Numbers DPR-53 and DPR-54, License Condition 2.E, because Constellation did not adequately implement and maintain surveillance procedures associated with fire barrier and penetration seal inspections. As a result, Constellation did not identify degraded conditions associated with one fire barrier and three penetration seals.

Description: On March 18, 2010, during a walkdown of the Unit 1 AFW pump room, the inspectors identified two potentially degraded fire penetration seals (1BPS601/603S005 and 1BPS601/603S006) on the east wall. The inspectors noted that the area between the two seals was degraded on both sides of the fire barrier wall (1BARR-601/603). Operations initiated CR 2010-003194 declaring that the penetration seals were "inoperable" due to the inability to evaluate per surveillance procedure STP-F-592-1, "Penetration Fire Barrier Inspection." The two seals were listed as insulation installed (INS); however, the procedure had no written acceptance criteria for penetrations labeled as INS. Constellation entered into TRM section 15.7.10, "Fire Barrier Penetrations," and established an hourly fire tour. The following day, Constellation removed the insulation, conducted a more detailed inspection, and concluded that both penetration seals were operable due to a link seal being installed in each penetration. Based on this information, Constellation exited the associated TRM action statement. However, upon further inspection with the Site Fire Marshal, the inspectors identified that the void around the two penetration seals extended through the fire barrier wall (1BARR-601/603). STP-F-592-1, Attachment A, Paragraph XX, "Fire Barrier Integrity," stated that unsealed opening through the barrier is a failure criterion for the barrier. Constellation declared the fire barrier around the two penetration seals inoperable and re-entered the appropriate TRM action statement. The inspectors concluded that the penetration seals did not meet the acceptance criteria for similar penetration seals (Typical Detail M3) listed in the surveillance procedure and that the area around the penetration seals did not meet the surveillance acceptance criteria for an operable fire barrier wall.

During an extent of condition review, Constellation identified an additional inoperable fire barrier penetration (1BPS601/603C015) on the south wall of the Unit 1 AFW pump room. This penetration did not meet the surveillance acceptance criteria (Typical Detail E7) for a 3 hour rated seal for a conduit penetration. Specifically, the penetration did not contain grout as required by the acceptance criteria. Constellation initiated CR-2010-003407, entered TRM section 15.7.10 for the inoperable penetration seal, and conducted a temporary repair of the seal.

The inspectors noted that the fire barrier wall and all three penetrations were last inspected in January 2009. During this inspection, Constellation identified that penetration seal (1BPS601/603S005) was degraded. However, the nature and the extent of the degradation were not documented in a condition report. Based on the as-found condition of the degraded barrier and penetrations, the degraded conditions appeared to have existed prior to January 2009. The inspectors determined that

although there was no acceptance criteria for the two penetration seals listed as INS, the void through the fire barrier around the seals could have been identified using the acceptance criteria for the fire barrier wall. The surveillance required that the entire fire barrier wall and all penetrations to be inspected. Constellation entered this finding into their corrective action program as CR-2010-003704.

Analysis: The performance deficiency associated with this finding is that Constellation did not adequately implement and maintain surveillance procedures associated with fire barrier and penetration seal inspections. The finding is more than minor because it was associated with the external factors attribute (i.e. fire) of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure availability, reliability, and capability of systems that respond to initiation events to prevent undesirable consequences. Specifically, the degraded conditions had to be repaired or evaluated to ensure that the barriers/penetrations would meet their design function. In addition, if left uncorrected, the finding could result in a more significant safety concern in that the condition could continue to degrade such that the barriers/penetrations could no longer perform their specified function and/or result in the inability of Constellation to recognize additional degraded fire barriers/penetrations.

Using IMC 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings," Table 3b, the finding affected the fire protection defense-in-depth strategy involving fire barriers. Therefore, Table 3b requires additional evaluation using IMC 0609, Appendix F, "Fire Protection Significance Determination Process." The inspectors determined that the most degraded condition was the fire penetration seal on the Unit 1 AFW pump room south wall (1BPS601/603C015). IMC 0609, Appendix F, Step 1.2 requires the inspectors to assign a degradation rating that reflects the severity of the deficiency using Attachment 2. In accordance with Table A2.2 of Attachment 2, the inspectors assigned a degradation level of Moderate A due to the fire barrier missing greater than 30 percent of the required concrete depth. Based on IMC 0609, Appendix F, Attachment 1, "Part 1: Fire Protection SDP Phase 1 Worksheet" and "Task 1.3.2: Supplemental Screening for Fire Confinement Findings," the inspectors determined that the exposing fire area did not have an automatic gaseous room-flooding fire suppression system and would not have provided a 2-hour or greater fire endurance rating. However, inspectors determined that the exposing fire area did contain an automatic full area water based fire suppression system, ensuring a very low safety significance (Green) to this finding.

The finding also has a crosscutting aspect in the area of human performance because Constellation did not define and effectively communicate expectations regarding procedural compliance and personnel following procedures for fire penetration seal inspections (H.4.b).

Enforcement: CCNPP, Facility Operating License Number DPR-53 and DPR-54 License Condition 2.E, requires Constellation to implement and maintain in effect all provisions of the approved fire protection program as described in the Updated Final Safety Analysis Report (UFSAR) for the facility and as approved in the Safety Evaluation Report dated September 14, 1979, and Supplements. Section 9.9.9, "Fire Protection Controls and Compensatory Measures," of the CCNPP UFSAR states that, "The fire protection program is designed to assure that adequate levels of protection are available at all times. This is accomplished by established controls and compensatory measures and

through surveillance and testing procedures, as well as requiring documenting of non-compliance when fire protection features are determined to be inoperable.”

Contrary to the above, prior to April 1, 2010, Constellation did not assure that adequate levels of protection were available at all times through proper implementation and maintenance of surveillance procedures (STP-F-592-1/STP-F-592-2) associated with fire barrier and penetration seal inspections. As a result, Constellation did not identify degraded conditions associated with one fire barrier and three penetration seals. Because this violation was of very low safety significance and it was entered into the CAP (CR-2010-003704), this violation is being treated as an NCV, consistent with the NRC Enforcement Policy. **(NCV 05000317/318/2010002-01: Failure to Implement and Maintain Surveillance Procedures Associated with Fire Barrier and Penetration Seal Inspections)**

1R08 Inservice Inspection Activities (IP 71111.08 - One Sample)

a. Inspection Scope

The inspector selected a sample of nondestructive examination activities, including ultrasonic inspection of dissimilar welds and visual inspection of the reactor head, for review and evaluation for compliance with the requirements of American Society of Mechanical Engineers (ASME) Section XI. The inspector reviewed the repair of a Class I socket weld in Unit 2, performed prior to start up from an unplanned shut down. The inspector reviewed examination procedures, personnel qualifications, and examination test results. The inspector reviewed samples of examination reports and condition reports initiated during inservice inspection examinations to evaluate the licensee's effectiveness in the identification and resolution of problems.

The inspector reviewed the degradation management program for the Unit 1 Steam Generators. The Unit 1 Steam Generators were replaced and inspected for baseline indications in 2002 and placed into service on an alternate outage inspection schedule. Therefore, there was no inspection of the steam generators at Unit 1 during this outage. The inspector reviewed the results of the prior steam generator inspection to determine if a continued schedule of alternate outage inspection was in keeping with the suggested criteria of the Electric Power Research Institute guidelines for steam generator aging management. The only mechanisms identified during the inspection in 2008, that could affect steam generator integrity, were fan bar wear, foreign object wear, and lattice support wear. The inspector compared the licensee's evaluation of this wear against industry accepted practices to verify that Constellation can reliably predict the progress of these degradation mechanisms. The inspector verified that Constellation's continuation of an alternate outage inspection schedule satisfies the suggested schedule limits of the Electric Power Research Institute guidelines for steam generator aging management.

The inspector reviewed the planned inspection schedule for the Unit 1 steam generators. The next Unit 1 steam generator inspections are scheduled for 2012, 2016, and 2020. The 2008 inspection was the mid-point for the first 144 effective full power months interval prescribed in the Technical Specifications. In keeping with the Electric Power Research Institute guidelines for steam generator aging management the inspector noted the 2012 inspection can be skipped as well. However, the inspector noted that

Constellation recognized this would cause the 2016 inspection to exceed the 72 effective full power month limit suggested by the Electric Power Research Institute guidelines. The inspector reviewed the licensee's plan for the 2012 inspection which includes 100 percent full length bobbin coil, approximately 50 percent top-of-tubesheet rotating pancake coil, and Special Interest Probe to follow up on bobbin inspections indications.

The inspector reviewed the evaluation of the Pressurizer nozzle weld 4-SR-1006-1. The inspector discussed an axial and multiple circumferential indications with contractor personnel while reviewing the raw phased-array ultrasonic test data. The inspector reviewed the conventional ultrasonic test data from 2006 for this weld, and reviewed the retest by the same methodology during this outage. The inspector reviewed the digitized construction radiographs with the Constellation Radiography Level III, and compared this with the ultrasonic mapping implemented by the Constellation Ultrasonic Test Level III. The inspector reviewed all the data from these inspections, as well as the results of inspections of similar welds on the replaced pressurizer at Crystal River and the abandoned pressurizer taken from a terminated Washington Nuclear Power plant project, with Electric Power Research Institute Ultrasonic test consultants. The inspector reviewed a sample of CRs, which identified flaws and other nonconforming conditions to verify that the nonconforming conditions identified were appropriately characterized and evaluated.

b. Findings

There were no findings of significance.

1R11 Licensed Operator Requalification Program

Resident Inspector Quarterly Review (71111.11Q - One Sample)

a. Inspection Scope

On February 9, 2010, the inspectors observed just-in-time training associated with mode changes in preparation for the Unit 1 refueling outage. The scenario involved the use of alarm manuals, operating procedures, and technical specifications to conduct a plant shutdown from 100 percent power, take the turbine off-line, and plant cooldown. 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)Quarterly Reviewa. 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 structures, systems, and components (SSCs) classified as (a)(2) and/or appropriateness and adequacy of goals and corrective actions for SSCs classified as (a)(1).

- No. 21 and No. 22 condensate booster pumps tripping off (CR-2010-000175).
- 1-SV-105 solenoid valve did not operate during surveillance testing (CR-2010-1546).

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – Seven 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 station procedure NO-1-117, "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. 12 SW header with the 1B EDG, 12 component cooling heat exchanger, and 'B' train of the ECCS out of service (OOS) on January 11, 2010.
- Planned maintenance on the 2B EDG with the 22 SW air compressor OOS on January 19, 2010.
- Emergent maintenance on the 2B EDG with the P-13000-2 transformer OOS on February 18, 2010.
- Planned maintenance on the AFW cross-connect valve with the 22 charging pump and the No. 13 AFW pump OOS on March 11, 2010.

- Planned maintenance on the 2A EDG with the 22 charging pump OOS on March 15, 2010.
- Planned maintenance on draining the reactor coolant system to perform vacuum fill activities with other outage activities being performed on March 16, 2010.
- Planned maintenance on the No. 23 AFW pump on March 30, 2010.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15 – Eight Samples)

a. Inspection Scope

The inspectors reviewed operability evaluations and/or 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:

- Spent fuel handling machine degraded grapple actuator tube (CR-2010-000151/FA-10-001);
- Through-wall piping leakage near the 12B service water heat exchanger SW outlet low pressure root stop valve 1-FT-5212 (CR-2010-000263);
- Missed surveillance tests for the Unit 1 and 2 instrument air relief valves to the AFW steam admission control valves and the Unit 1 safety injection relief valves (CR-2010-000585, CR-2010-000589, and CR-2010-000590);
- Non-safety related part installed in the containment dome temperature indication circuit (CR-2010-000892);
- Refueling pool upender vertical proximity switch failure (CR-2010-002010/OD-10-001);
- No. 11 low pressure safety injection (LPSI) pump motor inboard high bearing temperature (CR-2010-002656/OD-10-002);
- Design thrust calculation had incorrect diagnostic value for motor operated valves (1-MOV-403 and 1-MOV-405) (CR-2010-002243); and
- Pressurizer safety relief valves lifted outside of the Technical Specification limits (1-RC-200 and 1-RC-201, CR-2010-002789 and CR-2010-002791).

b. Findings

No findings of significance were identified.

1R18 Plant Modifications (71111.18 – Two 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.

- Temporary modification to disconnect 12B reactor coolant pump current transformer leads from 1BKR252-14P02 (ECP-10-000170).
- Permanent modification to install the Unit 1 reactor coolant system level monitoring system (ECP-09-000105).

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing (71111.19 – Five Samples)**a. Inspection Scope**

The inspectors reviewed the post-maintenance tests for the maintenance activities listed below to verify that procedures and test activities ensured system operability and functional capability. The inspectors reviewed the test procedure to verify that the procedure adequately tested the safety functions that may have been affected by the maintenance activity, that the acceptance criteria in the procedure 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.

- Replaced defective analog electronic circuit card on the 2B EDG (WO (work order) #220074963).
- Overhauled and replaced SW valve 1-SW-5206 (WO #120030218).
- Replaced emergency core cooling fan control valve (1-CV-5174) (WO #C120084947).
- Removed and replaced rotating assembly installed in 11 LPSI pump (WO #C90719558).
- No. 11 and 12 main steam isolation valve actuator replacement (WO #C120084216).

b. Findings

No findings of significance were identified.

1R20 Refueling and Other Outage Activities (71111.20 – Two Samples)

.1 Unit 1 Refueling Outage

a. Inspection Scope

The inspectors reviewed the activities associated with the Unit 1 twentieth refueling outage (1RFO20). Prior to the outage, the inspectors reviewed the outage plan and the risk assessment of the schedule. During the outage, the inspectors examined the following activities: shutdown of the plant; cool-down; drain down to the reactor vessel flange and mid-loop conditions; fuel handling operations; 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 also conducted periodic outage reviews of the following items: location of scaffolding; clearance activities; foreign material exclusion controls; reactor coolant system instrumentation; electrical power configuration; shutdown cooling system operation; spent fuel pool cooling system operation; inventory control measures; reactivity control measures; containment closure requirements; and fatigue management. The inspectors evaluated the activities against Technical Specification requirements, site procedures, and other applicable guidance and requirements.

b. Findings

No findings of significance were identified.

.2 Unit 2 Forced Outage

a. Inspection Scope

The inspectors reviewed the activities associated with the Unit 2 forced outage due to a dual unit reactor trip on February 18, 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 Technical Specification 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. 11 LPSI pump quarterly operability inservice test (STP-O-73J-1).
- Unit 1 and Unit 2 Relief valve testing and setting (STP-M-31-0)
- Unit 1 On-line main steam safety valve testing (STP-M-003A-0).
- Unit 1 Safety injection valve leak test (STP-O-067M-1).
- Unit 1 Containment penetration local leak rate test containment isolation valve (STP-O-108D-1).
- Unit 1 Reactor vessel and pressurizer vent valves operability test (STP-O-066L-1).
- Unit 1 and Unit 2 Penetration fire barrier inspection (STP-F-592-1/2).
- Unit 1 AFW pump large flow test (STP-O-073H-1).

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational/Public Radiation Safety

2RS01 Radiological Hazard Assessment and Exposure Controls (71124.01)

.1 Pre-Outage Inspection

a. Inspection Scope

During the period January 25, 2010, through January 29, 2010, the inspectors conducted the following activities to verify that Calvert Cliffs properly assessed the radiological hazards in the workplace and implemented appropriate radiation monitoring and exposure controls during routine operations. Implementation of these controls was reviewed against the criteria contained in 10 CFR 20, relevant Technical Specifications, and Constellation's procedures.

Inspection Planning

The inspectors reviewed all of Calvert Cliffs' Performance Indicators (PIs) for the Occupational Exposure Cornerstone for followup. The inspectors reviewed radiation protection program self-assessments and audits. The inspectors verified no operational events occurred relating to radiation safety.

Radiological Hazard Assessment

The inspectors verified no changes to plant operations were implemented or are planned that could result in a change to plant radiological conditions. The inspectors reviewed the last two surveys performed on each level of the Auxiliary Building to include the Charging Pump Room, Gas Decay Tank Room, and the Spent Fuel Pool. The inspectors walked down the facility, including the radioactive waste processing, storage and handling areas to evaluate material and radiological conditions. With the assistance

of a radiation protection technician, dose rates were verified at the boundary of several high radiation areas (HRA) and at the doors to 16 locked high radiation areas (LHRA).

Instructions to Workers

The inspectors verified the labeling of several drums containing licensed material staged in the "Material Processing Facility." The inspectors reviewed all medium risk radiation work permits (RWPs) and verified appropriate work control instructions were specified. The permissible dose was included on each RWP as the electronic personal dosimeter (EPD) alarm set point. The RWP also required a dose rate alarm set point for the EPD. The inspectors reviewed one condition report where a worker's EPD alarmed.

Contamination and Radioactive Material Control

The inspectors reviewed Constellation's criteria for the survey and release of material and the response required for an alarm indicating the presence of licensed material. The inspectors verified the presence of five sources on Constellation's inventory and verified that three of the sources were leak tested and were not leaking. The inspectors verified that Constellation has three sources meeting the requirements to be reported on the nationally tracked sources system. The sources have not been moved and are still in use.

Radiological Hazards Control and Work Coverage

The inspectors observed work in progress in the Unit 1 component cooling water room for insulation removal in preparation for in-service inspection. The inspectors attended the pre-job briefing and verified the existing conditions were consistent with posted surveys, the RWP, and worker briefing. The inspectors verified the adequacy of radiological controls such as radiation and contamination surveys during personnel egress from the area and during an unexpected alarm. The inspectors verified the placement of radiation monitoring devices on the individuals. There were no airborne radioactivity areas; therefore, there was no opportunity to review RWPs for airborne radioactivity areas. The inspectors verified the physical and programmatic controls for highly activated material stored within the spent fuel pool. The inspectors verified that appropriate controls are in place to preclude inadvertent removal of these materials from the pool. The inspectors verified the integrity and posting of 16 LHRA doors. Calvert Cliffs has one very high radiation area (VHRA) in each unit. These areas, under the vessel, were not accessible during the inspection as they are in the containment buildings.

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

The inspectors discussed the controls and procedures for high-risk HRAs and VHRAs with the Radiation Protection Manager (RPM). Only administrative changes have been made to the procedures. The controls for the VHRA access include those controls for LHRAs and the key is maintained in the RPM office in a lock box under the control of the RPM. The inspectors discussed the controls in place for special areas that have the potential to become VHRAs during certain plant operations with a Radiation Protection Supervisor. The inspector verified that communication is required with radiation protection prior to the evolution to allow appropriate radiation protection actions.

The inspectors verified that controls for VHRAs ensure that an individual is not able to gain unauthorized access to a VHRA.

Radiation Worker Performance

The inspectors observed radiation worker performance and verified that they were aware of the radiological conditions and the RWP controls, and that their performance reflected the level of radiological hazards present. The inspectors reviewed four CRs where human performance errors were the cause. No observable trends were noted.

Radiation Protection Technician Proficiency

The inspectors observed radiation protection technician performance to determine if technicians were aware of the radiological conditions in their workplace and the RWP controls. The inspectors reviewed two CRs where the cause was radiation protection technician error. No observable trend was noted.

Problem Identification and Resolution

The inspectors reviewed Calvert Cliffs' self-assessments, audits, and Special Reports related to the radiation protection program to determine if identified problems were entered into the corrective action program. The inspectors verified that problems identified were put into the corrective action program and appropriate corrective actions were identified. Appropriate industry and plant operating experience were discussed at the pre-job briefing attended by the inspectors.

b. Findings

No findings of significance were identified.

.2 Outage Inspection

a. Inspection Scope

During the period March 1, 2010 through March 5, 2010, the inspectors conducted the following activities to verify that Calvert Cliffs properly assessed the radiological hazards in the workplace and implemented appropriate radiation monitoring and exposure controls during refueling outage operations. Implementation of these controls was reviewed against the criteria contained in 10 CFR 20, relevant Technical Specifications, and Constellation's procedures.

Inspection Planning

The inspectors reviewed radiation protection program self-assessments and audits.

Radiological Hazard Assessment

The inspectors walked down the facility, including the containment building to evaluate material and radiological conditions. With the assistance of a radiation protection technician, dose rates were verified at the boundary of several HRA and the doors to

LHRA. The inspectors verified the integrity and postings of the LHRA in the reactor building and one VHRA. The inspectors reviewed pre-work and in-progress surveys for the reactor coolant pumps (RCPs) 11A and 12A, scaffolding work, insulation work, and in-service inspection. The inspectors verified for five lapel air samples that they were collected and analyzed in accordance with Constellation's procedures.

Instructions to Workers

The inspectors verified that Constellation had established a means to inform workers of changes that could significantly impact their occupational doses. The inspectors noted that Constellation had a robust central monitoring system, implemented new alarming electronic dosimeters with transmitting capability, and had intercom stations setup at various job sites inside containment.

Contamination and Radioactive Material Control

The inspectors reviewed Constellation's procedure for the survey and release of material and verified it is sufficient to control the spread of contamination and prevent the unintended release of radioactive materials from the site. The inspectors observed the surveys of material at the Radiologically Controlled Area exit point and the actions taken when alarms occurred. The inspectors verified that the surveys and actions taken in response to alarms were in accordance with Constellation's procedures.

Radiological Hazards Control and Work Coverage

The inspectors verified the placement of radiation monitoring devices on selected individuals. The inspectors reviewed RWP for the removal of the blind flange in the refueling pool (RFP), the cutting of the reactor head O-rings, and in-service inspection on the blind flange in the RFP. The inspectors reviewed lapel air sample results and Total Effective Dose Equivalent evaluations for these tasks.

Problem Identification and Resolution

The inspectors reviewed Constellation's self-assessments, audits, and Special Reports related to the radiation protection program to determine if identified problems were entered into the corrective action program. The inspectors verified that problems identified were put into the corrective action program and appropriate corrective actions were identified.

b. Findings

No findings of significance were identified.

2RS02 Occupational ALARA Planning and Controls (71124.02)

.1 Pre-Outage Samples

a. Inspection Scope

During the period January 25, 2010, through January 29, 2010, the inspectors conducted the following activities to verify that Calvert Cliffs was properly implementing operational, engineering, and administrative controls to maintain personnel exposure as low as reasonably achievable (ALARA). Implementation of these controls was reviewed against the criteria contained in 10 CFR 20, applicable industry standards, and Constellation's procedures.

Inspection Planning

The inspectors reviewed pertinent information regarding cumulative exposure history, current exposure trends, and ongoing activities. The inspectors reviewed the site's 3-year rolling average dose and compared the site's average with industry's average. The inspectors reviewed Constellation's trend in collective exposure and the site's source term measurements. The inspectors reviewed Constellation's procedures associated with maintaining occupational exposure ALARA. The inspectors reviewed the site's processes used to estimate and track exposures.

Radiological Work Planning

The inspectors received a list of work activities with estimated and actual exposure from the previous (2009 Unit 2) outage. The inspectors selected the following five activities: Refueling Minor Maintenance, Reactor Coolant Pump Maintenance, Scaffolding, Insulation, and Radiation Protection Activities.

The inspectors reviewed the ALARA evaluations, exposure estimates, and exposure mitigation requirements. The inspectors verified the ALARA planning identified appropriate dose mitigation features and worker efficiency. The inspectors also verified that ALARA requirements were integrated into the RWPs. The inspectors compared the results achieved with the intended dose established in the ALARA planning for the above activities. The inspectors also compared the work hour estimates with the actual work activity time. The inspectors noted that the work hour estimates were from work history rather than current estimates. The inspectors reviewed the post job reviews for the above activities and verified that identified problems were entered into Constellation's corrective action program.

Source Term Reduction and Control

The inspectors reviewed the historical trends and current status of significant tracked plant source terms. The inspectors reviewed the plant's contingency plans for plant fuel performance changes and identified that no primary chemistry changes are anticipated.

Radiation Worker Performance

The inspectors performed this inspection activity as part of Inspection Procedure 71124.01 as reported previously in this report.

Problem Identification and Resolution

The inspectors verified that problems associated with the ALARA planning and controls were entered into the corrective action program. The inspectors reviewed two CRs associated with the ALARA program.

b. Findings

No findings of significance were identified.

.2 Outage Inspection

a. Inspection Scope

During the period March 1, 2010, through March 5, 2010, the inspectors conducted the following activities to verify that Calvert Cliffs was properly implementing operational, engineering, and administrative controls to maintain personnel exposure ALARA. Implementation of these controls was reviewed against the criteria contained in 10 CFR 20, applicable industry standards, and Constellation's procedures.

Verification of Dose Estimates and Exposure Tracking Systems

The inspectors reviewed the assumptions and basis described in the RWP and ALARA packages for in-service inspection activities, radiation protection activities, reactor path minor maintenance activities, scaffold activities, and minor maintenance activities. The inspectors reviewed the "ALARA" and the "ALARA Planning and RWP Preparation" procedures to ensure that the procedures included processes for estimating and tracking exposures for specific work activities.

The inspectors verified for the above activities that Constellation established measures to track, trend, and adjust occupational dose estimates for ongoing work activities. The inspector verified trigger points were used to prompt additional reviews.

The inspectors reviewed Constellation's method for adjusting exposure estimates when unexpected changes in scope, dose rates, or emergent work are encountered. The inspectors attended an ALARA committee challenge board for evaluating the RCP activities, Refuel Path activities, and Scaffold activities, due to higher than expected dose rates.

b. Findings

No findings of significance were identified.

2RS03 In-Plant Airborne Radioactivity Control and Mitigation (71124.03)a. Inspection Scope

During the period March 1, 2010, through March 5, 2010, the inspectors conducted the following activities to verify that Calvert Cliffs was controlling in-plant airborne concentrations consistent with ALARA. Implementation of these controls was reviewed against the criteria contained in 10 CFR 20, applicable industry standards, and Constellation's procedures.

Engineering Controls

The inspectors verified Constellation used ventilation systems as part of its engineering controls to control airborne radioactivity. The inspectors verified the containment purge and pressurizer dog house portable ventilation unit efficiencies and airflow capacities were consistent with maintaining concentrations of airborne radioactivity in work areas below the concentrations of an airborne area to the extent practicable.

Use of Respiratory Protection Devices

The inspectors verified that Constellation provided respiratory protective devices such that occupational doses were ALARA. The inspectors verified that Calvert Cliffs performed an evaluation concluding that the use of respirators is ALARA for the reactor head O-ring replacement and removal of the blind flange in the RFP. The inspectors also verified that the level of protection provided by the respiratory protection devices during use was consistent with assumptions used in Constellation's work controls and dose assessment. For the reactor head O-ring removal and the blind flange removal, the inspectors verified the respiratory protection devices used were National Institute for Occupational Safety and Health certified. The inspectors verified the individuals that removed the reactor head O-rings and the blind flange in the RFP were qualified to wear respiratory protection equipment by reviewing applicable training records and physical examination records.

b. Findings

No findings of significance were identified.

2RS04 Occupational Dose Assessment (71124.04)a. Inspection Scope

During the period March 1, 2010, through March 5, 2010, the inspectors conducted the following activities to verify that Constellation appropriately monitors occupational dose. Implementation of these controls was reviewed against the criteria contained in 10 CFR 20, applicable industry standards, and Constellation's procedures.

Special Dosimetric Situations

The inspectors reviewed the exposure records for the three individuals, who declared their pregnancy. The inspectors verified that Constellation's radiological monitoring program was technically adequate to assess dose to the embryo/fetus.

b. Findings

No findings of significance were identified.

4. **OTHER ACTIVITIES (OA)**

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

a. Inspection Scope

The inspectors reviewed Constellation's submittal of the Safety System Functional Failures (SSFF) PIs for Units 1 and 2. The inspectors reviewed the PIs for the period of January 2009 through December 2009. These dates account for the previous four quarters reported in Licensee Event Reports, maintenance rule records, and maintenance work orders that prevented, or could have prevented, the fulfillment of a safety function. The inspectors used the guidance provided in Nuclear Energy Institute (NEI) 99-02 to assess the accuracy of PI data collected and reported. The inspectors reviewed Constellation's PI data and plant records associated with the SSFF PIs that also included operator logs and system health reports.

b. Findings

No findings of significance were identified.

4OA2 Problem Identification and Resolution (71152 – One Sample)

.1 Reviews of Items Entered Into the CAP

a. Inspection Scope

The inspectors performed a daily screening, as required by Inspection Procedure 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 Annual Sample: Follow-Up Review Containment Outage Door

a. Inspection Scope

The inspectors performed an in-depth review of Constellation's evaluation and corrective actions related to methods of monitoring potential effluent releases at the Containment Outage Door (CR-2009-003720 and CR-2009-004951). The issue and associated NCV were discussed in NRC Inspection Report 2009005 as NCV 050005317/318/2009005-03. The issue involved Constellation not having an adequate method in use for monitoring and assessing an actual or potential offsite release as a result of a fuel handling incident inside containment with the containment outage door open. The inspectors conducted a review of the corrective actions to verify that appropriate measures were in place prior to the handling of fuel inside containment in support of the Unit 1 refueling outage. The inspectors reviewed the appropriateness of the assigned significance, the scope and depth of the causal analysis, and the timeliness of resolution. The inspectors assessed whether the evaluation identified likely causes for the issues and identified appropriate corrective actions to address the identified causes. In addition, the inspectors assessed whether Constellation's evaluation considered extent of condition, generic implications, common cause, and previous occurrences. The inspectors reviewed the potential impact on nuclear safety and risk to verify that Constellation had taken corrective actions commensurate with the significance of the issue. The inspectors evaluated these actions against the requirements of Constellation's CAP and 10 CFR 50.47(b)(9).

b. Findings and Observations

No findings of significance were identified. The inspectors determined that Constellation's corrective actions were adequate and commensurate with the safety significance of the issue. Constellation modified procedure Door-01, "Opening and Closing of Containment Outage Door," to ensure that Radiation Protection has staged equipment in the vicinity of the containment outage door to monitor airborne radioactivity

40A3 Followup of Events and Notices of Enforcement Discretion (71153 – One Sample)

a. Inspection Scope

On February 18, 2010, the inspectors responded to a dual unit reactor trip. Unit 1 experienced an unexpected loss of an RCP. The loss of the RCP resulted in a valid reactor protection system (RPS) actuation on low reactor coolant system flow and a Unit 1 reactor trip. At approximately the same time, the site experienced a loss of P-13000-2 (500 kV to 13.8 kV transformer) which caused a loss of the Unit 2 RCPs, the non-safety related buses, the main feedwater pumps, condensate pumps, the subsequent loss of the normal heat sink, and a Unit 2 reactor trip due to low reactor coolant system flow. In addition, the loss of P-13000-2 caused a loss of power to the Unit 1 "14" and Unit 2 "24" 4 kV safety buses resulting in a valid start signal for the 1B and 2B EDGs, respectively. The 1B EDG started and re-powered the "14" safety bus; however, the 2B EDG tripped during loading resulting in the loss of the "24" safety bus. This resulted in the unavailability of the "B" safety train for Unit 2. The cause of the Unit 1 reactor trip was determined to be a ground fault on the 12B RCP due an auxiliary building roof leak. The cause of the Unit 2 reactor trip was due to the failure of a relay to properly isolate the

ground fault to Unit 1. The inspectors reviewed operator actions taken in accordance with procedures and reviewed system indications to verify that actions and system responses were as expected. The inspectors also reviewed Constellation's initial investigation to assess the adequacy of immediate and interim corrective actions prior to restart. Inspectors' observations were compared to the requirements specified in the Calvert Cliffs procedures listed in the Attachment 1.

b. Findings

On February 22, 2010, a Special Inspection Team (SIT) was chartered to evaluate the dual unit trip with complications. The results of this inspection will be documented under NRC Inspection Report 2010006 for CCNPP.

4OA5 Other Activities

.1 NRC Temporary Instruction 2515/172 - Reactor Coolant System Dissimilar Metal Butt Welds

a. Inspection Scope

The inspector implemented this temporary instruction (TI) to support NRC staff oversight of licensees' dissimilar metal butt weld mitigation and inspection activities. These are being implemented in accordance with the industry guidelines of the Materials Reliability Program (MRP) -139, "Primary System Piping Butt Weld Inspection and Evaluation Guidelines," July 2005. The inspector verified that Calvert Cliffs conforms to its commitments to conduct an inspection program consistent with the industry's MRP-139 guidelines and that mitigation techniques are consistent with MRP-139 as discussed in the inspection requirements section of this TI.

The inspector reviewed the results of the 27 baseline examinations of dissimilar welds inspected, without deviation from the guidance contained in MRP-139, during this outage. The inspector reviewed the processes used to inspect the welds and compared them against the MRP-139 Section 5.1 for unmitigated and mechanically stress improved welds. The inspector reviewed the qualifications of the individuals performing these inspections and compared them to the requirements of ASME Section XI, Appendix 8 for both standard and phased array ultrasonic inspection.

The inspections did not result in any repairs, replacements, or weld overlays, nor was any mechanical stress improvement performed during the outage. The dissimilar welds inspected, due to the criteria established in MRP-139, were ultrasonically tested using the established ASME Section XI, Inservice Inspection program as a supplement.

b. Findings

No findings of significance were identified.

.2 (Closed) NRC Temporary Instruction 2515/177 – Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal and Containment Spray Systems

a. Inspection Scope

The inspectors performed this inspection in accordance with TI 2515/177, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal and Containment Spray Systems," for Units 1 and 2. The NRC staff developed TI 2515/177 to support the NRC's confirmatory review of licensees' responses to NRC Generic Letter (GL) 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal and Containment Spray Systems." The Office of Nuclear Reactor Regulation (NRR) documented completion of their review of Constellation's GL 2008-01 response in a closure letter dated January 8, 2010 (ADAMS Accession No. ML100070330). The NRR staff reviewed Constellation's GL 2008-01 response letters and provided guidance on TI inspection scope to the regional inspectors. The inspectors implemented this inspection guidance and selectively verified that Constellation implemented or was in the process of acceptably implementing the commitments, modifications, and programmatically controlled actions described in their GL 2008-01 response. The inspectors verified that the plant-specific information (including licensing basis documents and design characteristics) was consistent with the information used by NRR in its assessment and that it supported a conclusion that the subject systems' operability was reasonably assured.

The inspectors reviewed isometric drawings and piping and instrument diagrams, and conducted walkdowns to verify that Constellation had drawings that described the subject system configurations and UFSAR descriptions. Specifically, the inspectors verified the following related to the isometric drawings for the high pressure safety injection (HPSI), LPSI, containment spray and shutdown cooling (SDC) systems:

- High point vents were identified.
- High points that did not have vents were acceptably recognizable.
- Other areas where gas could accumulate and potentially impact subject system operability, such as at orifices in horizontal pipes, isolated branch lines, heat exchangers, improperly sloped piping, and under closed valves, were acceptably described in the drawings or in referenced documentation.
- Horizontal pipe centerline elevation deviations and pipe slopes in nominally horizontal lines that exceed specified criteria were identified.
- All pipes and fittings were clearly shown.

The inspectors verified that the drawings were up-to-date with respect to recent hardware changes, and that any discrepancies between as-built configurations and the drawings were documented and entered into the CAP for resolution.

The inspectors reviewed Constellation's procedures used for filling and venting following conditions which may have introduced voids into GL 2008-01 systems to verify that the procedures acceptably addressed testing for such voids and provided acceptable processes for their reduction or elimination. The inspectors verified that Constellation's specified ultrasonic test (UT) and venting surveillance frequencies were consistent with Calvert Cliff's Technical Specifications, Technical Requirements Manual, and UFSAR. The inspectors reviewed a risk-informed sample of GL 2008-01 response-related UT

results and modification packages (including post-modification test results) to verify that Constellation adequately implemented their associated procedures, appropriately documented test results, and provided reasonable assurance that the subject systems remained operable consistent with applicable requirements.

The inspectors verified that Constellation conducted walkdowns of their HPSI, LPSI, containment spray and SDC systems to confirm that system orientations and vents, in combination with instructions, procedures, and training, would ensure that each system was sufficiently full of water to assure operability as required. The inspectors conducted a walkdown of accessible portions of the above systems at Unit 1 and Unit 2 in sufficient detail to reasonably assure the acceptability of Constellation's walkdowns. The inspectors verified that items identified during the inspectors' independent walkdown were consistent with information obtained during Constellation's walkdowns. On January 12, 2010, the inspectors accompanied Constellation's system engineers and non-destructive examination personnel and observed portions of the system restoration after the installation of LPSI vent valve 1-HV-SI-571. In response to GL 2008-01, Constellation installed 1-HV-SI-571 at an unvented high point in the SDC suction header. Constellation discovered the high point during their GL 2008-01 response system walkdowns. The inspectors also directly observed the venting and UT of the associated LPSI and SDC piping to assess the adequacy of Constellation's post-maintenance testing and controls.

The inspectors reviewed CAP documents to verify that selected corrective actions described in Constellation's nine-month and supplemental submittals were acceptably documented including completed actions, completion schedule for incomplete actions, extent-of-condition reviews, and actions to prevent recurrence. In particular, the inspectors reviewed Constellation's completed and planned corrective actions in response to a recent NRC identified inspection finding associated with Constellation's use of a non-conservative void fraction acceptance criterion (see NRC Component Design Bases Inspection Report 05000317/2009006 and 05000318/2009006, Section 1R21.2.3.1). In addition, the inspectors performed an independent CAP database search for potential gas-related issues impacting the subject systems to ensure that Constellation appropriately evaluated and adequately addressed any gas voiding concerns. Additionally, the inspectors reviewed Constellation's training plans that addressed preventing and managing gas accumulation in piping systems to assess the accuracy and adequacy of the guidance provided. The inspectors discussed gas voiding concerns with a cross-section of plant personnel to assess their awareness, sensitivity, involvement, and the effectiveness of Constellation's associated training.

b. Findings

No findings of significance were identified. This completes the inspection requirements for this TI.

40A6 Meetings, Including Exit

Exit Meeting Summary

On April 7, 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
A. Ball, Radiation Protection Supervisor
T. Baummer, GS Engineering Programs
T. Beck, Inservice Inspection
C. Blue, Radiation Protection Technician
S. Brown, Quality Assurance Director
R. Cantrell, Welding Engineer
R. Courtney, Radiation Protection Supervisor
B. Dansberg, Radiation Protection Supervisor
C. Dobry, Fire Protection Engineer
P. Fatka, ECCS Systems Engineer
D. Frye, Operations Manager
J. Governale, Radiation Protection Technician
E. Hussain, Design Engineering
P. Jones, Health Physicist
R. Jones, Inservice Inspection
D. Lauver, Director, Licensing
D. McElheny, Systems Engineer
D. Neyman, Regulatory Matters
S. Peden, Radiation Protection Technician
A. Simpson, Principal Engineer
M. Stanley, Site Fire Marshal
B. Wilson, GS Engineering Programs
J. Wilson, Systems Engineering

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened and Closed

05000317/318/2010002-01	NCV	Failure to Implement and Maintain Surveillance Procedures Associated with Fire Barrier and Penetration Seal Inspections (Section 1R05)
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Discussed

5000317/318/2009005-03	NCV	Initial Dose Assessment with the Containment Outage door Opened (Section 40A2.2)
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LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures

AOP-7L, Circulating Water/Intake Malfunctions, Revision 11
OI-38A, Screen Wash System, Revision 23

Section 1R04: Equipment Alignment

Condition Reports

CR-2010-003181
CR-2010-003185
IRE-004-955

Drawings

60731SH0001, Safety Injection & Containment Spray System, Revision 83
60731SH0003, Safety Injection & Containment Spray System, Revision 27
60712SH0005, Compressed Air, System Instrument Air & Plant Air, Revision 9
60712SH0003, Compressed Air, System Instrument Air & Plant Air, Revision 112

Procedures

OI-21A, 2A Diesel Generator, Revision 19
OI-29-1, Salt Water System, Revision 65
OI-19-1, Instrument System, Revision 27
OI-19-2, Instrument System, Revision 25

Section 1R05: Fire Protection

Procedures

SA-1-100, Fire Prevention, Revision 16
STP-592-1, Penetration Fire Barrier Inspection, Revision 7

Condition Reports

CR-2009-000677
CR-2010-000957
CR-2010-001053
CR-2010-003080
CR-2010-003090
CR-2010-003091
CR-2010-003194
CR-2010-003407
CR-2010-003704

Miscellaneous

FP00002, Fire Hazards Analysis Summary Document, Revision 0

Fire Fighting Strategies Manual [U-1 Service Water Pump Room], Revision 1
0113-00092-FPE-015, Fire Protection Evaluation of Insulated Piping Penetration With
Inaccessible Seal Material, Revision 0
0113-00092-01, Engineering Report for Penetration Seal Program Assessment, Revision 1

Drawings

ES-001, Attachment 3 Auxiliary Building Room Maps, Revision 1
62148SH0001, Mechanical Seal Details Appendix "R" Fire Barriers, Revision 9
Typical Detail M3 enlarged photo from 62148SH001, Mechanical Seal Details Appendix "R" Fire
Barriers, Rev 9
62149SH0001, Appendix "R" Separation Requirements Aux. Bldg. & Cntmt. Struct. Floor Plan at
EL. (-)10'-0" & (-)15'-0", Revision 6
62149SH0003, Barrier Segment Drawing for Plant Elevation (-)10'-0" & (-)15'-0", Revision 0
62149SH0004, Barrier Segment Drawing for Plant Elevation (-)10'-0" & (-)15'-0", Revision 1
62150SH0001, Appendix "R" Separation Requirements Aux. Bldg. & Cntmt. Struct. Floor Plan at
EL. 5'-0", Revision 7
62150SH0047, Barrier Segment Drawing for Plant Elevation 5'-0", Revision 0
62150SH0040, Barrier Segment Drawing for Plant Elevation 5'-0", Revision 2
62150SH0041, Barrier Segment Drawing for Plant Elevation 5'-0", Revision 0
62150SH0038, Barrier Segment Drawing for Plant Elevation 5'-0", Revision 1
62150SH0048, Barrier Segment Drawing for Plant Elevation 5'-0", Revision 0
62151SH0037, Barrier Segment Drawing for Plant Elevation 5'-0", Revision 0
62150SH0018, Barrier Segment Drawing for Plant Elevation 5'-0", Revision 1
62151SH0027, Barrier Segment Drawing for Plant Elevation 5'-0", Revision 0
62150SH0004, Barrier Segment Drawing for Plant Elevation 5'-0", Revision 0
62151SH0001, Appendix "R" Separation Requirements Aux. Bldg. & Cntmt. Struct. Floor Plan at
EL. 27'-0", Revision 9
62151SH0039, Barrier Segment Drawing for Plant Elevation 27'-0", Revision 0
62151SH0032, Barrier Segment Drawing for Plant Elevation 27'-0", Revision 0
62152SH0001, Appendix "R" Separation Requirements Aux. Bldg. & Cntmt. Struct. Floor Plan at
EL. 45'-0", Revision 11
62152SH0003, Barrier Segment Drawing for Plant Elevation 45'-0", Revision 0
62152SH0004, Barrier Segment Drawing for Plant Elevation 45'-0", Revision 0
62153SH0001, Appendix "R" Separation Requirements Aux. Bldg. & Cntmt. Struct. Floor Plan at
EL. 69'-0", Revision 0
62153SH0025, Barrier Segment Drawing for Plant Elevation 69'-0", Revision 0

Section 1R08: Inservice Inspection

Calvert Cliffs Nuclear Power Plant Steam Generator Cliffs Inspection and Maintenance Long Range
Plan, Revision 00100, 06/12/2009
Calvert Cliffs Steam Generator Program Snapshot Self Assessment CI Report ePIC AI-2008-
000745-001 11/2009
Calvert Cliffs Nuclear Power Plant, Station Administrative Procedure EN-4-106, Steam
Generator Program, Revision 00601
Calvert Cliffs Unit 1 – RFO18 Steam Generator Condition Monitoring and Operational
Assessment Document No. 51-9073099-000, Revision 0
Calvert Cliffs Nuclear Power Plant Unit 1, Steam Generator Degradation Assessment, Spring
2008, Document No. 51-9069274-000

Electric Power Research Institute "Steam Generator Integrity Assessment Guidelines," Revision 2, Document 1012987
Alloy 600 Technical Basis Document Calvert Cliffs Nuclear Power Plant, Revision 7

Section 1R11: Licensed Operator Regualification Program

Lesson Plan LOR-JIT-10-01, Just In Time Training 2010 Unit 1 RFO Shutdown
NO-1-201, Control Of Shift Activities, Revision 004401

Section 1R12: Maintenance Effectiveness

Condition Reports

CR-2010-000175
CR-2010-001546

Procedures

ER-1-103, Maintenance Rule Program Implementation, Revision 4
CNG-AM-1.01-1023, Maintenance Rule Program, Revision 0

Miscellaneous

CCNPP Maintenance Rule Scoping Document

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

NO-1-117, Integrated Risk Management, Revision 22

Section 1R15: Operability Evaluations

Condition Reports

CR-2010-000151/FA-10-00	CR-2010-000263	CR-2010-000585
CR-2010-000589	CR-2010-000590	CR-2010-000892
CR-2010-002010/OD-10-001	CR-2010-002243	CR-2010-002334
CR-2010-002341	CR-2010-002656	CR-2010-002710
CR-2010-002892	CR-2010-003112	CR-2010-003162
CR-2010-003177	CR-2010-003187	

Work Orders

WO# C90811414

Miscellaneous

IN 91-56, Potential Radioactive Leakage to Tank Vented to Atmosphere
CNG-OP-1-01-1002, Conduct of Operability Determinations/Functionality Assessments,
Revision 0

Section 1R18: Plant Modifications

Procedures

MD-1, Modification Program, Revision 3
MD-1-100, Temporary Alterations, Revision 14

Miscellaneous

ECP-10-000170
ECP-09-000105

Section 1R19: Post-Maintenance Testing

Condition Reports

CR-2010-002828
CR-2010-002952
CR-2010-003055
CR-2010-003189

Work Orders

WO #C90719558
WO #2200704963
WO #1200602298

Miscellaneous

ISTBD Section 14 Safety Injection System

Section 1R20: Refueling and Other Outage Activities

Procedures

OP-1-1, Plant Startup from Cold Shutdown, Revision 58
OP-1-2, Plant Startup from Cold Shutdown, Revision 27
OP-2-1, Plant Startup from Hot Standby to Minimum Load, Revision 45
OP-2-2, Plant Startup from Hot Standby to Minimum Load, Revision 45
OP-3-1, Normal Power Operation, Revision 61
OP-3-2, Normal Power Operation, Revision 49
OP-4-1, Plant Shutdown from Power Operation to Hot Standby, Revision 34
OP-4-2, Plant Shutdown from Power Operation to Hot Standby, Revision 18
OP-5-1, Plant Shutdown from Hot Standby to Cold Shutdown, Revision 61
OP-5-2, Plant Shutdown from Hot Standby to Cold Shutdown, Revision 26
OP-6, Pre-Startup Checkoff, Revision 52
OP-7-1, Shutdown Operations, Revision 47
OP-7-2, Shutdown Operations, Revision 43
PSTP-02, Initial Approach to Criticality and Low Power Physics Testing Procedure, Revision 03001

Condition Reports

CR-2010-002812	CR-2010-002817	CR-2010-002848
CR-2010-002858	CR-2010-002893	CR-2010-002894
CR-2010-002902	CR-2010-002960	CR-2010-002984
CR-2010-003067	CR-2010-003151	CR-2010-003152
CR-2010-003155	CR-2010-003161	CR-2010-003175
CR-2010-003177	CR-2010-003196	CR-2010-003207
CR-2010-003291	CR-2010-003303	CR-2010-003322
CR-2010-003323	CR-2010-003324	CR-2010-003332

CR-2010-003334
CR-2010-003379

CR-2010-003359
CR-2010-003435

CR-2010-003367
CR-2010-003826

Miscellaneous

Containment Evacuation Plan U1 RFO 2010
NRC GL 87-12, Loss of RHR While the RCS is Partially Filled
NRC GL 88-17, Reduced Inventory and Mid-Loop Conditions
OE 2009-000055
OE-2009-003279
OE-2009-002847

Section 1R22: Surveillance Testing

Procedures

STP-M-003A-0, On-line Main Steam Safety Valve Testing, Revision 00500
STP-O-73H-1, AFW Pump Large flow Test, Revision 8
STP O-108D-1, Containment Penetration Local Leak Rate Test, Revision 6
STP-O-73J-1, No. 11 Low Pressure Safety Injection Pump (LPSIP) Quarterly Operability Test,
Revision 8
STP-M-31-0, Relief Valve Testing and Setting, Revision 2
STP-O-067M-1, Safety Injection Valve Leak Test, Revision 3
STP-O-066L-1, Reactor Vessel and Pressurizer Vent Valves Operability Test, Revision 6
STP-F-592-1/2, Penetration fire barrier inspection, Revision 7

Condition Reports

CR-2010-002761	CR-2010-002860	CR-2010-002890
CR-2010-002914	CR-2010-002948	CR-2010-003025
CR-2010-003107	CR-2010-003199	CR-2010-003371
CR-2010-003375	CR-2010-003479	CR-2010-003484
CR-2010-003575	CR-2010-003640	

Work Orders

WO# C090809958
WO# C120084947

Miscellaneous

DE10477
DWG# 60731SH0001
ECP-10-000217

Section 2RSO1: Radiological Hazard Assessment and Exposure Controls

Procedures

1-132, Job Coverage in Radiologically Controlled Areas, Revision 01301
NO-1-110, Calvert Cliffs Key and Lock Control, Revision 00800
RP-1-100, Radiation Protection, Revision 00900
RP-2-100, Radioactive Materials Management, Revision 01201
RPPG-01-004, Resin Transfer Surveys, Revision 1

RPPG-01-017, Radiation Protection's Response to Radiological Changing Conditions,
 Revision 1
 RSP-1-101, Routine Radiological Surveys, Revision 02601
 RSP 1-104, Area Posting and Barricading, Revision 02201
 RSP 1-113, Release of Items, Material and Vehicles From a Contaminated or Radiologically
 Controlled Area, Revision 01000
 RSP 1-115, Radiological Air Sampling Program, Revision 01001
 RSP 1-130, Containment RMS Sampling, Revision 00202
 RSP 1-131, Operation of the Eberline AMS-4, Revision 00300
 RSP 1-200, ALARA Planning and RWP Preparation, Revision 02400
 RSP 3-402, Beam Irradiator Operation, Revision 00501

Condition Reports

Radiological Hazard	Radiation Worker	Radiation Technician
CR-2009-002465	CR-2009-007406	CR-2009-007463
CR-2009-007201	CR-2009-007780	CR-2009-007961
CR-2009-007412	CR-2009-008160	
CR-2009-007472	CR-2009-008838	
CR-2009-007491		
CR-2009-007504		
CR-2009-007611		
CR-2009-007655		
CR-2009-008204		
CR-2009-009118		
CR-2010-000305		
CR-2010-000764		
CR-2010-000891		
CR-2010-001505		

TEDE ALARA Evaluations

RWP #	Task #	Job Description
2010-1315	1	Blind Flange Removal/Install (High Risk)
2010-1311	1	Refuel Path Maintenance

Audits and Assessments

Un-numbered SA, Spent Fuel Pool Radiological Work Practices
 SA-2009-000060, Radiation Protection Technician Training
 Report Number 2009-069, QPA Assessment Report, CCNPP Self-Assessments
 Report of Audit RPP-09-01-C, Radiation Protection
 AI-2009-000278-001, 10CR20.1101c Review of RP Program
 AI-2008-000986-001, RWP Package Document Quality

Section 2RSO2: Occupational ALARA Planning and Controls

Procedures

RSP 1-200, ALARA Planning and RWP Preparation, Revision 02400
 RP-1-101, ALARA, Revision 5

RWP and ALARA Packages

2009-2400, Reactor Coolant Pump Maintenance
 2009-2401, Replace Reactor Coolant Pump (RCP) Seals for U-2 RFO
 2009-2311, Rx Path Minor Maintenance
 2009-2010, Minor Maintenance Activities to Support Unit 2 RFO
 2009-2016, Scaffold Activities for Unit 2 RFO
 2009-2017, Insulation Activities for Unit 2 RFO
 2009-2000, Radiation Protection Activities for Unit 2 RFO
 1000, Radiation Protection Activities for Unit 1 Refueling Outage
 1002, ISI/NDE Activities Performed During a Unit 1 Refueling Outage
 1008, Inspections & FME Activities Performed During a Unit 1 Refueling Outage
 1010, Minor Maintenance Activities Performed During a Unit 1 Refueling Outage
 1016, Scaffold Activities Performed During a Unit 1 Refueling Outage
 1311, Reactor Path Minor Maintenance Activities (excluding underwater work) Performed
 During a Unit 1 Refueling Outage

Condition Reports

CR-2009-002465
 CR-2009-007780
 CR-2010-001752

Audits and Assessments

AI-2009-000278-001, 10CR20.1101c Review of RP Program
 AI-2008-000986-001, RWP Package Document Quality

Section 2RS03: In-Plant Airborne Radioactivity Control and MitigationProcedures

RSP 1-115, Radiological Air Sampling Program, Revision 01001
 RSP 1-131, Operation of the Eberline AMS-4, Revision 00300

Condition Reports

CR-2010-000187
 CR-2010-000697

Air Samples

Type	Sampler Serial #	Off Date/Time
Reactor Head O-rings		
Lapel	1012	2/23/2010/02:50
Lapel	1018	2/23/2010/02:50
Lapel	2006	2/23/2010/03:35
Reactor Head Inspection		
Lapel	1008	2/28/2010/11:35
Lapel	2003	2/28/2010/12:04
Blind Flange Removal RFP		
Lapel	2009	2/28/2010/12:24
Lapel	2006	2/28/2010/12:25
Lapel	2010	2/28/2010/12:28

Section 40A1: Performance Indicator Verification

Condition Reports

- CR-2009-005172
- CR-2009-008722
- CR-2010-002741
- CR-2010-003188

Section 40A2: Problem Identification and Resolution

Condition Reports

- CR-2009-003720
- CR-2009-004951

Procedures

- CNG-CA-1.01-1000, Corrective Action Program, Revision 00200
- DOOR-01, Opening and Closing of Containment Outage Door, Revision 00402

Section 40A3: Followup of Events and Notices of Enforcement Discretion

Procedures

- CNG-OP-1.01-1006, Post Trip Reviews, Revision 00001
- EOP-0-1, Post-Trip Immediate Actions, Revision 11
- EOP-0-2, Post-Trip Immediate Actions, Revision 10
- EOP-1-1, Reactor Trip, Revision 13
- EOP-2-2, Loss of Offsite Power/Loss of Forced Circulation, Revision 14

Section 40A5: Other Activities

Audits and Self-Assessments

- SA-2009-000201, Snapshot Self Assessment, Calvert Cliffs Readiness Assessment to Prepare for NRC Inspection Regarding NRC Generic Letter (GL) 2008-01, dated 12/18/09

Calculations

- CA04750, Evaluation of Vortexing in the RWT, and Resultant Void Fraction of Fluid Ingested by ECCS Pumps, Revision 2
- CA04891, Evaluation of Vortexing in the RWT, and Computes the Resultant Void Fraction of the Fluid Ingested by the ECCS Pumps During Post-RAS Operation, Revision 1

Corrective Action Reports

- | | | |
|----------------|----------------|----------------|
| CR-2008-000004 | CR-2009-000637 | CR-2009-003287 |
| CR-2008-000012 | CR-2009-000722 | CR-2009-003288 |
| CR-2008-000142 | CR-2009-002132 | CR-2009-003319 |
| CR-2008-000186 | CR-2009-002551 | CR-2009-004497 |
| CR-2008-000457 | CR-2009-002870 | CR-2009-005881 |
| CR-2008-000595 | CR-2009-003056 | CR-2009-006099 |
| CR-2009-000466 | CR-2009-003148 | CR-2009-006253 |

CR-2009-006291	IRE-031-510	CR-2010-002734
CR-2009-009101	IRE-031-517	CR-2010-002753
CR-2009-009119	IRE-032-724	CR-2010-002824
CR-2009-009134	IRE-032-841	CR-2010-002825
CR-2009-009141	IRE-032-857	CR-2010-002838
CR-2009-009144	IRE-032-863	CR-2010-002913
CR-2009-009147	IRE-032-864	CR-2010-002949
CR-2010-000226	IRE-032-953	CR-2010-003013
CR-2010-000231	IRE-033-005	CR-2010-003039
CR-2010-000255	IRE-033-108	CR-2010-003044
CR-2010-000275	IRE-018-939	CR-2010-003054
CR-2010-000277	CR-2009-005289	CR-2010-003116
CR-2010-000278	CR-2009-005305	CR-2010-003122
CR-2010-000326	CR-2009-005508	CR-2010-003124
CR-2010-000342	CR-2010-002489	CR-2010-003141
IRE-029-290	CR-2010-002503	CR-2010-003310
IRE-029-386	CR-2010-002613	CR-2010-003386
IRE-030-901	CR-2010-002646	

Design & Licensing Bases

Letter from CCNPP to NRC, Change in Alternative Course of Action Schedule Described in our Three-Month Supplemental Response to NRC Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat and Containment Spray Systems," dated 8/28/09

Letter from CCNPP to NRC, Nine-Month Supplemental (Post-Outage) Response to NRC Generic Letter 2008-01, dated 6/12/09

Letter from CCNPP to NRC, Response to Request for Additional Information RE: Response to Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal and Containment Spray Systems" – Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2 (TAC Nos. MD7807 and MD7808), dated 9/28/09

Letter from NRC to CCNPP, Request for Additional Information RE: Response to Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal and Containment Spray Systems" – Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2 (TAC Nos. MD7807 and MD7808), dated 8/12/09

Drawings

60731ELEV01, Unit 1 Containment Spray System System Piping Profile, Revision 0
 60731ELEV02, Unit 1 Safety Injection System System Piping Profile, Revision 0
 60731ELEV03, Unit 1 Safety Injection System System Piping Profile, Revision 0
 60731SH0001, Unit 1 Safety Injection & Containment Spray Systems PI&D, Revision 83
 60731SH0002, Units 1 & 2 Safety Injection & Containment Spray Systems PI&D, Revision 45
 60731SH0003, Unit 1 Safety Injection & Containment Spray Systems PI&D, Revision 27
 62730ELEV02, Unit 2 Chemical and Volume Control System Piping Profile, Revision 0
 62730SH0002, Unit 2 Chemical and Volume Control System PI&D, Revision 65
 62731ELEV01, Unit 2 Containment Spray System System Piping Profile, Revision 1
 62731ELEV02, Unit 2 Safety Injection System System Piping Profile, Revision 0
 62731ELEV03, Unit 2 Safety Injection System System Piping Profile, Revision 1
 62731SH0001, Unit 2 Safety Injection & Containment Spray Systems PI&D, Revision 75
 62731SH0002, Unit 2 Safety Injection & Containment Spray Systems PI&D, Revision 42
 62731SH0003, Unit 2 Safety Injection & Containment Spray Systems PI&D, Revision 27
 FSK-MP-489-D, Unit 1 Regenerative Heat Exchanger No.11 Outlet, Revision 12

FSK-MP-0490, Unit 1 Regenerative Heat Exchanger No.11 to Auxiliary Spray, Revision 27
FSK-MP-0491, Unit 1 Regenerative Heat Exchanger No.11 to Charging Loop Line 12B,
Revision 16
FSK-MP-0492, Unit 1 Regenerative Heat Exchanger No.11 to Charging Loop Line 11A,
Revision 30
FSK-MP-3105, Unit 2 Regenerative Heat Exchanger No.21 Outlet, Revision 8
FSK-MP-3106, Unit 2 Regenerative Heat Exchanger No.21 to Auxiliary Spray, Revision 35
FSK-MP-3107, Unit 2 Regenerative Heat Exchanger to Charging Loop Line, Revision 18
FSK-MP-3108, Unit 2 Regenerative Heat Exchanger No.21 to Charging Loop Line, Revision 25

Engineering Evaluations

ES200800200, Evaluate the Ability to Dynamically Fill and Vent the Charging Pump Discharge
Piping from the Charging Pump to the RCS and to Aux Spray, Revision 0
ES200800212, Install Vent Valves in ECCS Piping, Revision 0
ES200800217, Evaluate the Ability to Dynamically Fill and Vent the ECCS System 11A and 11B
Inverted Loop Piping at Valve Stations 1MOV-616/617/626/627 and Sweep the Air
Bubble into the RCS using the HPSI and LPSI Pumps, Revision 0

Miscellaneous

08-03, Nuclear Safety Services Standing Order - Gas Intrusion in Safety Related Systems,
dated 1/7/10
CC09-BP-016, 2HVSI-562 Liquid Penetrant Examination, dated 3/3/09
CC09-BP-017, 2-DC1-2004 Liquid Penetrant Examination, dated 3/3/09
DCN No. 91384-2001SH0001, Install New Vent Valve 2-SI-562 in Support of Generic Letter
2008-01, dated 11/19/08
Foreign Material Exclusion Plan for the Unit 2 Primary Piping High Point Vent Installation, dated
2/27/09
GL 2008-01 Gas Intrusion Tracking Doc (AIT CT200800002), dated 12/14/09 & 1/13/10
GL 2008-01 Mods List, dated 1/4/10
Instrument and Controls Admin Update Training for Instrument and Controls Continuing Training
Program, Revision 0
Licensed Operator Requalification Training Lesson Plan # LOP-300-3-09, Session 4 of 2009
LOR-300-3-09, Ops Performance (Training Doc), dated 8/21/09
NEI 09-10, Guidelines for Effective Prevention and Management of System Gas Accumulation,
Revision 0
OD-09-001
OD-09-002
RWT Vortexing Design Basis Apparent Cause Analysis, dated 10/09/09
Unit 1 ECCS Discharge Piping GL 2008-01 System Walkdown Binder and Associated Isometric
Drawings
Unit 1 ECCS Suction Piping GL 2008-01 System Walkdown Binder and Associated Isometric
Drawings
Unit 2 ECCS Discharge Piping GL 2008-01 System Walkdown Binder and Associated Isometric
Drawings
Unit 2 ECCS Suction Piping GL 2008-01 System Walkdown Binder and Associated Isometric
Drawings
Unit 1 Operator Narrative Logs, dated 12/1/09 - 1/8/10

Operating Experience

NRC Generic Letter 2008-01: Managing Gas Accumulation in Emergency Core Cooling, Decay
Heat Removal and Containment Spray Systems, dated 1/11/08

NRC Information Notice 94-36: Undetected Accumulation of Gas in Reactor Coolant System,
dated 5/24/94

Procedures

- 1C09-ALM, ESFAS 12 Alarm Manual, Revision 35
- AOP-3B, Abnormal Shutdown Cooling Conditions - Unit 1, Revision 24
- EOP-5, Loss of Coolant Accident, Revision 24
- EOP-8, Functional Recovery Procedure, Revision 33
- EOP Attachments - Unit 1, Revision 18
- OI-2A, Chemical and Volume Control System - Unit 1, Revision 55
- OI-2A, Chemical and Volume Control System - Unit 2, Revision 54
- OI-2D, Purification System Operation - Unit 1, Revision 23
- OI-2D, Purification System Operation - Unit 2, Revision 23
- OI-3A, Safety Injection and Containment Spray - Unit 1, Revision 24
- OI-3A, Safety Injection and Containment Spray - Unit 2, Revision 25
- OI-3B, Shutdown Cooling - Unit 1, Revision 27
- OI-3B, Shutdown Cooling - Unit 2, Revision 23

Risk and Margin Management

- CCNPP Margin List, dated 1/14/10
- Risk-Informed Inspection Notebook for Calvert Cliffs Nuclear Power Plant Units 1 and 2,
Revision 2.1a

System Health Reports, Maintenance History & Trending

- Units 1 & 2 Containment Spray System Health Report, dated 7/1/09 - 9/30/09
- Units 1 & 2 Chemical and Volume Control System Health Report, dated 7/1/09 - 9/30/09
- Units 1 & 2 Safety Injection System Health Report, dated 7/1/09 - 9/30/09

Work Orders

2200803010	2200801852	2200900480	2200801408
2200802605	C90634951	C990634990	C90670783
C90634994	C90670780	C90670782	

LIST OF ACRONYMS

ADAMS	Agency-Wide Documents Access and Management System
AFW	Auxiliary Feedwater
ALARA	As Low As Reasonably Achievable
AOP	Abnormal Operating Procedure
ASME	American Society of Mechanical Engineers
CAP	Corrective Action Program
CCNPP	Calvert Cliffs Nuclear Power Plant
CFR	Code of Federal Regulations
CR	Condition Report
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
EPD	Electronic Personal Dosimeter
GL	Generic Letter

HPSI	High Pressure Safety Injection
HRA	High Radiation Area
IMC	Inspection Manual Chapter
INS	Insulation Installed
kV	Kilovolt
LHRA	Locked High Radiation Area
LPSI	Low Pressure Safety Injection
MRP	Materials Reliability Program
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
OOS	Out of Service
PARS	Publicly Available Records
PI	Performance Indicator
RCP	Reactor Coolant Pump
RFO	Refueling Outage
RFP	Refueling Pool
RPM	Radiation Protection Manager
RPS	Reactor Protection System
RWP	Radiation Work Permit
SDC	Shutdown Cooling
SDP	Significance Determination Process
SIT	Special Inspection Team
SSC	Structure, System and Component
SSFF	Safety System Functional Failure
SW	Saltwater
TB	Turbine Building
TI	Temporary Instruction
TRM	Technical Requirement Manual
UFSAR	Updated Final Safety Analysis Report
UT	Ultrasonic Test
VHRA	Very High Radiation Area
WO	Work Order