



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
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August 6, 2007

Mr. James A. Spina, Vice President
Calvert Cliffs Nuclear Power Plant, Inc.
Constellation Generation Group, LLC
1650 Calvert Cliffs Parkway
Lusby, Maryland 20657-4702

**SUBJECT: CALVERT CLIFFS NUCLEAR POWER PLANT - NRC INTEGRATED
INSPECTION REPORT 05000317/2007003 AND 05000318/2007003 AND
EXERCISE OF ENFORCEMENT DISCRETION**

Dear Mr. Spina:

On June 30, 2007, 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 10, 2007, with Mr. Flaherty 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 four NRC-identified findings and one self-revealing finding of very low safety significance (Green). All of the findings were determined to involve violations of NRC requirements. However, because of the very low safety significance and because they are entered into your corrective action program, 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 Regulator Commission, ATTN.: Document Control Desk, Washington, D.C. 2-0555-0001; with copies to the Regional Administrator, Region 1; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Resident Inspector at the CCNPP.

The enclosed report also documents one noncompliance that was identified during your transition period to the National Fire Protection Association (NFPA) Standard 805. The NRC is not taking any enforcement action for this item because the conditions for this noncompliance meet the enforcement discretion criteria specified in the NRC Enforcement Policy, Interim Enforcement Policies, "Interim Enforcement Policy Regarding Enforcement Discretion for Certain Fire Protection Issues (10 CFR 50.48)."

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 by James W. Clifford For/

David C. Lew, Director
Division of Reactor Projects

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

Enclosure: Inspection Report 05000317/2007003 and 05000318/2007003
w/ Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos. 50-317, 50-318

License Nos. DPR-53, DPR-69

Report Nos. 05000317/2007003 and 05000318/2007003

Licensee: Constellation Generation Group, LLC

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

Location: Lusby, MD

Dates: April 1, 2007 through June 30, 2007

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SUMMARY OF FINDINGS

IR 05000317/2007-003, 05000318/2007-003; 04/01/2007 - 6/30/2007; Calvert Cliffs Nuclear Power Plant, Units 1 and 2: Equipment Alignment, Maintenance Rule, Problem Identification and Resolution, and Event Follow-up.

The report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. Five Green findings were identified, all of which were determined to be non-cited violations (NCVs). The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). 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.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Initiating Events

- Green. A self-revealing NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," occurred because Constellation did not implement adequate corrective actions for a significant condition adverse to quality associated with the slow closure of a pressurizer power operated relief valve (PORV) due to a main disc guide being out of round. Specifically, Constellation did not perform an extent of condition review from a February 2006 event such that corrective actions would preclude recurrence of the issue. Subsequently, during a Unit 2 reactor trip on November 16, 2006, a PORV remained open longer than expected and resulted in a safety injection actuation signal. Constellation entered this issue into the corrective action program (CAP) for resolution. Immediate corrective actions for this issue included replacement of the main disc guide and an extent of condition review of the remaining PORVs on Unit 1 and Unit 2.

This finding is greater 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 challenge critical safety functions. Inspectors evaluated the significance of the finding using an SDP Phase 2 analysis and determined the issue was of very low safety significance (Green). This finding has a cross-cutting aspect in the area of problem identification and resolution because Constellation did not thoroughly evaluate an equipment malfunction such that the extent of condition was considered and the cause resolved (P.1.c of IMC 0305). (Section 4OA2.4)

- Green. The inspectors identified a NCV of Technical Specifications (TS) 5.4.1.a, Administrative Controls, because Constellation did not maintain equipment alignment in accordance with site procedures during drain and fill of the reactor coolant system (RCS). Specifically, operations personnel did not verify a reactor

level instrument inlet valve shut prior to the vacuum fill of the RCS contrary to Operating Procedure (OP)-7, Shutdown Operations, and Operating Instruction (OI)-1A, Reactor Coolant System and Pump Operation. This allowed air to enter the in-service RCS level instrumentation lines causing a loss of all level indication for a period of approximately five hours while in reduced inventory. Constellation entered this issue into their CAP as IRE-021-661 and IRE-022-119. The immediate corrective actions included restoration of RCS level from a reduced inventory condition and a prompt investigation to determine the cause of the loss of all level indication.

This finding is greater than minor because it is associated with the Initiating Event cornerstone attribute of configuration control and affects the likelihood of a loss of shutdown cooling event. The inspectors evaluated the significance of the finding using IMC 0609, Appendix G, "Shutdown Operations SDP" and Appendix H, "Containment Integrity SDP," because it represented an actual loss of level indication. Based on the results of the Phase 3 analysis, this finding is determined to have very low safety significance (Green). This finding has a cross-cutting aspect in the area of human performance because Constellation did not define and effectively communicate expectations regarding procedural compliance such that personnel follow procedures (H.4.b). (Section 4OA3.1)

- Green. The inspectors identified a NCV of TS 5.4.1.a, Administrative Controls, when Constellation did not maintain an adequate procedure to drain and fill the RCS. Specifically, OP-7 permitted operation in a reduced RCS inventory condition without requiring redundant means of reactor level indication available. This is not in accordance with Nuclear Operations Administrative Procedure NO-1-103, Lower Mode Operations and Constellation's commitments in response to NRC Generic Letter (GL) 88-17, Loss of Decay Heat Removal. Constellation entered this issue into their CAP as IRE-022-121 and immediate corrective actions included the suspension of OP-7 pending resolution of this issue.

This finding is greater than minor because it is associated with the Initiating Event cornerstone attribute of equipment performance and affects the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown operations. Specifically, the inadequate procedure for operation in reduced RCS inventory increased the likelihood of the loss of RCS level indication and consequently a loss of residual heat removal (RHR) initiating event. The inspectors determined that this finding was of very low safety significance based on IMC 0609, Appendix G, Figure 1. The inspectors determined that this finding had a cross-cutting aspect in the area of human performance because Constellation did not ensure that the procedure for operation with the RCS in reduced inventory was complete and accurate (H.2.c). (Section 4OA3.2)

Cornerstone: Mitigating Systems

- Green. The inspectors identified a NCV of 10 CFR 50.65(a)(2) because Constellation did not demonstrate that performance monitoring of the main steam safety valves (MSSVs) was being effectively controlled through the performance of appropriate preventive maintenance. Specifically, in February 2006, Constellation experienced repetitive and numerous issues associated with MSSV lift settings outside specified TSs. However, Constellation did not recognize the unsatisfactory performance monitoring of this system in accordance with the 10 CFR 50.65(a)(2) and place the system in (a)(1) status. Constellation entered this issue into their CAP for resolution.

The finding is greater than minor because it is associated with the equipment performance attribute of the Mitigating Systems cornerstone and affects the cornerstone objective of ensuring the availability, reliability, and capability of the MSSVs, which respond to initiating events to prevent undesirable consequences. The finding is of very low safety significance (Green) because the finding is not a design or qualification deficiency, does not represent a loss of a system safety function or safety function of a single train, and does not screen as potentially risk significant due to external events. The inspectors also determined that this finding has a cross-cutting aspect in the area of problem identification and resolution because Constellation did not trend and assess information from the CAP and other assessments to identify programmatic and common cause problems with the MSSVs (P.1.b). (Section 1R12)

Cornerstone: Barrier Integrity

- Green. The inspectors identified a NCV of TS 3.6.3, Containment Isolation Valves, because Constellation did not implement actions as specified in TS 3.6.3. Specifically, Constellation did not include all containment isolation valves (CIVs) within the scope of TS requirements, which led to inadequate TS actions being taken for these valves when they became inoperable. Constellation entered this issue into their CAP as IRE-021-913. The planned corrective actions included a review of potential reportable conditions and a standing order for operation personnel to enter TS 3.6.3 for all CIVs as appropriate.

This finding is greater than minor because it is associated with the configuration control attribute of the Barrier Integrity cornerstone and affects the cornerstone objective to provide reasonable assurance that physical design barriers such as containment protects the public from radio nuclide releases caused by accidents or events. The inspectors evaluated the significance of this finding using a SDP Phase 1 and Phase 2 analysis, which required evaluation using IMC 0609, Appendix H, because some of the inoperable valves identified in the reportability review involved an actual reduction in the defense-in-depth for the atmospheric pressure control of the reactor containment. Based on the results of the Phase 2 analysis, this finding was determined to have very low safety significance (Green). This finding has a cross-cutting aspect in the area of problem identification and resolution because Constellation did not take actions to

address safety issues in a timely manner, commensurate with their significance
(P.1.a). (Section 1R04)

B. Licensee-Identified Violations

None.

REPORT DETAILS

Summary of Plant Status

Calvert Cliffs Unit 1 began the inspection period at 100 percent reactor power. On May 25, 2007, Unit 1 reduced power to 85 percent to perform main turbine valve testing. Following the completion of the test, Unit 1 restored power to 100 percent and remained there the rest of the inspection period.

Calvert Cliffs Unit 2 began the inspection period in a refueling outage (RFO). On April 5, 2007, Unit 2 was in the process of returning to 100 percent reactor power when it experienced problems with the 21 steam generator feed pump (SGFP). Unit 2 maintained reactor power at 65 percent while repairs were being performed for the 21 SGFP. Following the repairs on April 7, 2007, Unit 2 restored power to 100 percent until the main turbine throttle valve malfunctioned. As a result, Unit 2 reduced power to 75 percent and performed maintenance on the valve before returning to 100 percent power on April 8, 2007, and remained there the rest of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection (71111.01 - One sample)

Adverse Weather Seasonal Preparations - Hot Weather

a. Inspection Scope

The inspectors reviewed the adverse weather preparations and mitigating strategies before the onset of hot weather operations. 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. The review included the 500 kilowatt (kV) system and the station blackout diesel operations. The inspectors performed a partial walkdown of the onsite and offsite electrical systems. The inspectors interviewed control room operators and system engineers to ensure protective measures applicable to these risk-significant systems were available. This inspection satisfied one inspection sample for review of risk-significant systems during seasonal susceptibilities. Documents reviewed for each section of this report are listed in the Attachment.

b. Findings

No findings of significance were identified.

Enclosure

1R02 Evaluations of Changes, Tests, or Experiments (71111.02 - 25 samples)a. Inspection Scope

The inspectors reviewed eight safety evaluations (SEs) completed since the previous performance of this inspection. The SEs reviewed were in the Initiating Events, Mitigating Systems, and Barrier Integrity cornerstones. The selected SEs were reviewed to verify that changes to the facility or procedures as described in the Updated Final Safety Analysis Report (UFSAR) were reviewed and documented in accordance with 10 CFR 50.59, and that the safety issues pertinent to the changes were properly resolved or adequately addressed. The reviews also included the verification that the licensee had appropriately concluded that the changes could be accomplished without obtaining license amendments.

The inspectors also reviewed 17 screened-out evaluations for changes, tests and experiments for which Constellation determined that SEs were not required. This review was performed to verify that the site's threshold for performing SEs was consistent with 10 CFR 50.59.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment.1 Partial System Alignment (71111.04Q - Four Samples)a. Inspection Scope

The inspectors verified that selected equipment trains of safety-related and risk significant systems were properly aligned. 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 the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or potentially impact the availability of associated mitigating systems. The inspectors performed a partial walkdown of the following activities:

- 500 kV system during breaker No. 21 replacement in the electrical switchyard area;
- Unit 2 emergency core cooling system (ECCS) pump room exhaust filtration system during No. 21 and No. 22 exhaust fans filter replacement;
- Unit 1 auxiliary feedwater (AFW) system during testing on the Nos. 11 and 13 steam and motor driven AFW pumps; and
- 1A diesel generator (EDG) system due to a crack retaining nut for the EDG radiator breaker.

b. Findings

No findings of significance were identified.

.2 Complete System Alignment (71111.04S - One Sample)

a. Inspection Scope

The inspectors performed a complete system walkdown of accessible portions of the low pressure safety injection (LPSI) system to identify any discrepancies between the existing equipment lineup and the specified lineup. During the walkdown, system drawings and operating instructions were used to verify proper equipment alignment and operational status. The inspectors reviewed open maintenance 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.

b. Findings

Introduction. The inspectors identified a very low safety significance (Green) NCV of TS 3.6.3, Containment Isolation Valves, because Constellation did not implement TS 3.6.3 required actions. Specifically, Constellation did not include all containment isolation valves (CIVs) within the scope of TS requirements, which led to inadequate actions being taken for these valves when they became inoperable.

Description. On February 25, 2007, a LPSI valve (SI-615) failed its in-service surveillance test in the open stroke direction. Following the failure, operators left the valve open to satisfy one of its safety-related functions to provide core cooling upon receipt of a safety injection actuation signal (SIAS). This valve is a dual function valve that accommodates emergency core cooling flow and provides containment isolation. When operators left the valve opened, Constellation performed a reasonable expectation of continued operability (RECO). The inspectors reviewed the RECO and discovered that Constellation did not consider or enter TS Limiting Condition of Operation (LCO) 3.6.3 for the containment isolation function of the valve. The action in TS LCO 3.6.3 is to verify containment integrity within four hours for a penetration flow path with one containment isolation valve inoperable and not in a closed system. With the valve left in the open position, Constellation did not verify containment integrity within four hours, had no administrative controls in place, or evaluated the consequences for its containment isolation function. The inspectors reviewed the CCNPS' TS Basis and the UFSAR and identified that this issue was not limited to valve SI-615 but included an additional 70 containment isolation valves.

The inspectors noted that Figure 5.10 of the CCNPP UFSAR listed SI-615 as a CIV. The inspectors discovered that there were two lists of CIVs in the CCNPP UFSAR.

Table 5.3 of the UFSAR listed CIVs that pertains to Type C local leak rate testing and the CIVs used with respect to TS 3.6.3. However, Figure 5.10 contained the other list that included the total population of CIVs in addition to those identified in Table 5.3. The inspectors determined that for valves listed in Figure 5.10, Constellation did not consider or enter TS 3.6.3, as appropriate, or evaluate degraded or nonconforming conditions for the total population of CIVs. Constellation entered this issue into their CAP as IRE-021-913. The planned corrective actions included a review of potential reportable conditions and a standing order for operation personnel to enter TS 3.6.3 for all CIVs as appropriate.

The performance deficiency is that Constellation did not implement TS 3.6.3 required actions when valves were inoperable because the total population of CIVs were not included in the scope of TS requirements.

Analysis. This finding is greater than minor because it is associated with the configuration control attribute of the Barrier Integrity cornerstone and affected the cornerstone objective to provide reasonable assurance that physical design barriers such as containment protects the public from radio nuclide releases caused by accidents or events. Specifically, Constellation did not include all CIVs in the scope of TS requirements, which led to inadequate TS actions taken for CIVs when they became inoperable. The inspectors evaluated the significance of this finding using SDP Phase 1 of Inspection Manual Chapter (IMC) 0609. The finding required further senior risk analyst (SRA) evaluation through IMC 0609, Appendix H, because some of the inoperable valves identified in the reportability review involved an actual reduction in the defense-in-depth for the atmospheric pressure control of the reactor containment. The most limiting case involved an inoperable main feedwater isolation valve (MFIV) because it affected the likelihood of accidents leading to core damage. The dominant core damage sequence with an initiating event of a main steam line break resulted not to contribute to the large early release frequency (LERF). Based on the results of the Phase 2 analysis, this finding was determined to have very low safety significance (Green). The finding has a cross-cutting aspect in the area of problem identification and resolution because Constellation did not identify and take actions to address safety issues in a timely manner, commensurate with their significance (P.1.a).

Enforcement. TS 3.6.3, Containment Isolation Valves, requires, in part, that each CIV shall be operable in modes 1, 2, 3, and 4. Contrary to the above, for a 14-year period, Constellation did not implement required actions of TS 3.6.3 when valves were inoperable because the total population of CIVs were not included within the scope of TS requirements. For example, on February 25, 2007, Constellation did not take the required TS actions for an inoperable LPSI valve. Because this issue is of very low safety significance (Green) and is entered into Constellation's CAP (IRE-021-913), this violation is being treated as a NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy. **(NCV 05000317; 05000318/2007003-01: Failure to Implement TS 3.6.3 Required Actions for Containment Isolation Valves)**

1R05 Fire Protection (71111.05Q - 11 Samples)a. Inspection Scope

The inspectors conducted a tour of accessible portions of the eleven areas listed below to assess Constellation's control of transient combustible material and ignition sources, fire detection and suppression capabilities, fire barriers, and related compensatory measures when required. The inspectors assessed the material condition of fire protection suppression and detection equipment to determine whether any conditions or deficiencies existed which could impair the availability of that equipment. The eleven areas inspected are as follows:

- 1A EDG room, fire area EDG1A, room 2;
- 1B EDG room, fire area 30, room 421;
- 0C EDG room, fire area EDG0C, room SB202;
- Unit 2 AFW pump room, fire area 43, room 605;
- Unit 1 27' Switchgear room, fire area 19, room 317;
- Unit 2 27' Switchgear room, fire area 18, room 311;
- Unit 1 45' Switchgear room, fire area 34, room 430;
- Unit 2 45' Switchgear room, fire area 25, room 407;
- Unit 1 Battery rooms, fire area 16A, rooms 310 and 304;
- Unit 2 Battery rooms, fire area 17A, rooms 305 and 307; and
- Control room complex, fire area 24, room 405

b. Findings

During a fire protection walkdown of the Unit 1 and Unit 2 4kV switchgear rooms, on May 14, 2007, the inspectors identified a potentially degraded fire barrier between two fire areas. The inspectors noted that the fire barrier penetration was missing a retaining angle around the perimeter of a ventilation duct such that there was an open pathway between the two switchgear rooms. The inspectors also noted that the ventilation duct installation was not consistent with the inspection criteria in the penetration surveillance test procedure, STP-F-592, Penetration Fire Barrier Inspection. The inspectors provided this information to Constellation personnel. On June 6, 2007, Constellation determined that the fire barriers between the 27' and 45' 4kV switchgear rooms for both Unit 1 and Unit 2 were inoperable. Constellation entered a Technical Requirement Manual (TRM) action statement and established hourly fire watches for the inoperable barriers. Constellation also conducted a functional assessment and established compensatory action to control transient combustibles and hotwork in the affected fire areas. Additionally, an extent of condition review discovered that there were additional degraded fire barriers due to the improperly installed fire dampers, which were located in different fire areas.

The inspectors identified a noncompliance to the Calvert Cliffs Renewed Facility Operating License Numbers DPR-53 and DPR-54, License Condition 2.E, because the site's fire dampers were not installed in accordance with vendor instructions as required by the National Fire Protection Association (NFPA) Standard 90A, Air Conditioning and

Ventilating Systems. Specifically, License Condition 2.E, requires, in part, that Constellation is required to implement and maintain in effect all provisions of the approved fire protection program as described in the UFSAR for the facility. Section 9.8.3 of the UFSAR states, in part, that the work, equipment, and materials conform to the requirements and recommendations of the NFPA Code, Pamphlet 90A. NFPA 90A states that ventilation containing fire dampers shall be installed in accordance with the vendor's instructions. Contrary to the above, Constellation did not install fire dampers in accordance with vendor instructions.

The inspectors determined that the above noncompliance of License Condition 2.E met the enforcement discretion criteria specified in the NRC Enforcement Policy. The NRC Enforcement Policy, Interim Enforcement Policies, "Interim Enforcement Policy Regarding Enforcement Discretion for Certain Fire Protection Issues (10 CFR 50.48)," states, in part, that enforcement discretion may be exercised if a noncompliance is identified during the transition period to NFPA 805 and it is not associated with a finding of high safety significance (Red). Specifically, although the NRC identified the concern, it is likely that Constellation would have identified and corrected this issue as part of their transition to NFPA 805. Constellation entered the issue into their CAP, implemented appropriate compensatory measures, determined the violation was not of high safety significance, and would not likely have identified the issue by routine licensee efforts. The NRC determined there was no willful violation. Therefore, the NRC will not take any enforcement actions for this noncompliance because the conditions for this noncompliance meet the enforcement discretion criteria specified in the NRC Enforcement Policy.

1R06 Flood Protection (71111.06 - Two Samples)

Internal Flooding

a. Inspection Scope

The inspectors reviewed flood protection measures associated with internal flood events. These events were described in the Calvert Cliffs' Engineering Standard (ES)-001, the Individual Plant Examination (IPE), and the UFSAR. The inspectors performed a walkdown of the following two areas that contain risk significant systems and components: Unit 1 27' Switchgear Room, Room 317 and Unit 1 AFW Pump Room, Room 605. The inspectors observed the condition of watertight doors, drain systems, penetrations in floors and walls, and safety-related instrumentation located in these areas.

b. Findings

No findings of significance were identified.

1R07 Heat Sink (7111107A - One Sample)a. Inspection Scope

The inspectors observed the 22B service water heat exchanger during a routine cleaning and inspection. The inspectors reviewed the performance data and evaluated the test acceptance criteria from a previous completed test to ensure that design basis requirements were satisfied. The inspectors also evaluated existing heat transfer capabilities based on completed flow verification test results to ensure that specific safety functions could be performed in accordance with design specifications. The inspectors also reviewed Calvert Cliffs' periodic maintenance methods to verify that they conformed to the guidelines delineated in Electric Power Research Institute (EPRI) Report NP-7552, "Heat Exchanger Performance Monitoring Guidelines."

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11Q - One Sample)a. Inspection Scope

On May 15, 2007, the inspectors observed a licensed operator requalification training scenario to assess operator performance and the adequacy of the licensed operator training program. The training scenario involved component failures such as a degraded heater drain tank and a dropped control element assembly (CEA) requiring operators to implement abnormal operating procedures (AOP) -3G and 1B, respectively. Upon recovery of the dropped CEA, a partial loop occurred resulting in a reactor trip and two CEAs failed to insert. The inspectors focused on high-risk operator actions performed during implementation of emergency operating procedures (EOP), AOP, and classification of the event. The inspectors evaluated the clarity and formality of communications, the completion of appropriate actions in response to alarms, the performance of timely control board operations and manipulations, and the oversight and direction provided by the shift manager.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

.1 Quarterly Review (71111.12Q -Two Samples)

a. Inspection Scope

The inspectors reviewed the two samples listed below for items such as: 1) appropriate work practices; 2) identifying and addressing common cause failures; 3) scoping in accordance with 10 CFR 50.65(b) of the maintenance rule (MR); 4) characterizing reliability issues for performance; 5) trending key parameters for condition monitoring; 6) charging unavailability for performance; 7) classification and reclassification in accordance with 10 CFR 50.65(a)(1) or (a)(2); and 8) appropriateness of performance criteria for structure, 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. 22 AFW steam driven pump
- Unit 2 PORV, ERV-402

b. Findings

Failure to Demonstrate that the MSSV Performance Was Being Effectively Controlled per 10 CFR 50.65 (a)(2)

Introduction. The inspectors identified a very low safety significance (Green) NCV of 10 CFR 50.65(a)(2) because Constellation did not demonstrate that performance monitoring of the MSSVs was being effectively controlled through the performance of appropriate preventive maintenance. Constellation experienced repetitive and numerous issues associated with MSSV lift settings outside specified TSs. However, Constellation did not recognize the unsatisfactory performance monitoring of this system in accordance with the 10 CFR 50.65(a)(2) and place the system in (a)(1) status.

Description. In March of 2004, two MSSVs on Unit 1 experienced as-found valve lift settings that exceeded TS limits for valve lift setting. In February 2005, Unit 2 experienced three as-found MSSV high lift settings outside specified TS limits. In February 2006, Constellation performed the same TS surveillance test as in 2004 and 2005 on the Unit 1 MSSVs. The as-found setpoints for five of the sixteen valves exceeded specified TS limits for the individual valve lift setting. These high valve lift settings were determined to be from improper as-left valve setting. However, the lift settings did not exceed Constellation's established maintenance rule (MR) performance criteria for the MSSVs. The inspectors questioned the technical justification of the established performance criteria based on industry operating experience and overall system performance. This issue was tracked as an unresolved item (URI) that needed additional information. Constellation initiated IRE-019-372 to evaluate the technical basis for the MSSVs (a)(2) performance criteria.

Constellation concluded that the MR performance criteria for the MSSVs should be set based on the TS limits such that the valves could be effectively controlled and monitored through appropriate preventive maintenance. As a result, the MSSVs for Unit 1 exceeded the performance criteria threshold based on the February 2006 TS surveillance test, with more than three maintenance rule functional failures (MRFF). The inspectors determined that Constellation had an opportunity to recognize that the failure of five of the sixteen MSSVs constituted an unacceptable equipment performance requiring action in accordance with the maintenance rule. However, Constellation did not establish goals or monitor the performance of the MSSVs per 10 CFR 50.65(a)(1) or justify remaining in (a)(2) at that time. Additionally, in November of 2006, Constellation conducted an assessment of the MSSVs performance criteria threshold as a part of their (a)(3) periodic assessment and concluded that the performance criteria threshold for the MSSVs was set at an appropriate level. The inspectors noted that this was another missed opportunity for Constellation to have identified that the MSSV warranted (a)(1) status for five of the sixteen MSSVs that had lifts that exceeded specified TS limits. The inspectors noted that additional opportunities existed to identify the inadequate performance criteria during MSSVs high lifts in 2004 and 2005 on both Unit 1 and Unit 2.

On June 11, 2007, Constellation completed an evaluation of the MSSVs for 10 CFR 50.65(a)(1) status and determined that (a)(1) status was not warranted because the corrective actions for the high lifts had been completed for the MRFFs that occurred in February of 2006. Constellation determined the most likely cause was due to as-left valve setting process error with contributing causes being setpoint drift, disc to seat oxide bonding, and micro galling. The corrective actions included an adjustment of the valves, lifting the Unit 2 valves mid-cycle and a change in testing methodology and vendor. Based on completion of these corrective actions the inspectors determined that (a)(1) status is not warranted at this time.

The performance deficiency is that Constellation did not demonstrate effective control of the performance or condition of the MSSVs in accordance with 10 CFR 50.65 (a)(2).

Analysis. The finding is greater than minor because it is associated with the equipment performance attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors evaluated the significance of this finding using SDP Phase 1 of IMC 0609, Appendix A. The inspectors determined that the finding was of very low safety significance (Green) because the finding is not a design or qualification deficiency, does not represent a loss of a system safety function or safety function of a single train, and does not screen as potentially risk significant due to external events. The inspectors also determined that this finding has a cross-cutting aspect in the area of problem identification and resolution because Constellation did not trend and assess information from the CAP and other assessments to identify programmatic and common cause problems with the MSSVs (P.1.b).

Enforcement. Paragraph (a)(1) of 10 CFR 50.65, requires, in part, that the holders of an operating license shall monitor the performance or condition of structures, systems, or components (SSCs) within the scope of the rule as defined by 10 CFR 50.65 (b), against licensee-established goals, in a manner sufficient to provide reasonable assurance that SSCs are capable of fulfilling their functions. Paragraph (a)(2) of 10 CFR 50.65 states, in part, that monitoring as specified in 10 CFR 50.65(a)(1) is not required where it has been demonstrated that the performance or condition of an SSC is being effectively controlled through the performance of appropriate preventive maintenance, such that the SSC remains capable of performing its intended function.

Contrary to the above, Constellation did not demonstrate that the performance or condition of the MSSVs had been effectively controlled through the performance of appropriate preventive maintenance and did not monitor against licensee-established goals. Specifically, repetitive problems associated with the MSSVs from March 2004 to February 2006 demonstrated that MSSV performance was not being effectively controlled per 10 CFR 50.65 (a)(2). Because this issue is of very low safety significance (Green) and is entered into Constellation's CAP (IRE-019-372, IRE-011-601, IRE-021-038), this violation is being treated as a NCV consistent with Section VI.A.1 of the NRC Enforcement Policy. **(NCV 05000317, 05000318/2007003-02: Failure to Demonstrate that the MSSV Performance Was Being Effectively Controlled per 10 CFR 50.65 (a)(2))**

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 - Seven Samples)

a. Inspection Scope

The inspectors reviewed the following seven activities to verify that station personnel performed the appropriate risk assessments prior to removing equipment for work. When emergent work was performed, the inspectors verified that the plant risk was promptly reassessed and managed. The inspectors compared the risk assessments and risk management actions performed by station procedure NO-1-117, "Integrated Risk Management," to the requirements of 10 CFR 50.65(a)(4), the recommendations of NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Revision 3, and approved station procedures. In addition, the inspectors assessed the adequacy of Constellation's identification and resolution of problems associated with maintenance risk assessments and emergent work activities.

- 500kV breaker No. 21 replacement in the electrical switchyard area
- 13kV No.12 bus and cubicle inspection
- 1Y0926 breaker disconnect due to planned maintenance on the radiation monitors stack
- No. 21 4kV transfer to alternate feed due to planned maintenance on the U-4000-12 transformer
- Unit 2 voltage regulator transfer of No. 26 4kV bus due to planned maintenance to support a swap out and inspection on the 152-2506 breaker
- Safety injection tank leak-off header relief valves due to missed surveillances
- No. 22 AFW steam driven pump due to planned maintenance on the outboard oil level

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15 - Seven Samples)

a. Inspection Scope

For the seven operability evaluations described below, the inspectors evaluated the technical adequacy of the evaluations to ensure that Constellation properly justified TS operability and that the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors reviewed the UFSAR to verify that the system or component remained available to perform its intended function. In addition, the inspectors reviewed compensatory measures implemented to verify that the measures worked as stated and that they were adequately controlled. The inspectors also reviewed a sample of CRs to verify that Constellation identified and corrected any deficiencies associated with operability evaluations.

- Unit 2 RCS primary loop RTDs (IRE-021-790)
- Unit 1 core bypass flow greater than 3.7 percent (IRE-021-445)
- 1A EDG air receiver check valves high leak rates (IRE-022-288)
- 1A EDG radiator fan 1A1 No. 11 high oil level on the sight glass (IRE-022-258)
- Fairbanks morse diesel engine cam roller bushing material (IRE-022-177)
- No. 22 AFW steam driven pump oil sight glass (IRE-021-806)
- Unit 1 and Unit 2 degraded fire dampers (IRE-023-352)

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications (71111.17 - Ten Samples)

a. Inspection Scope

The inspectors reviewed ten plant modification packages selected from the design changes that were completed since the previous inspection. The review was performed to verify that the design bases, licensing bases, and performance capability of risk significant SSCs had not been degraded through the modifications.

For the accessible components associated with the modifications, the inspectors walked down the systems to detect possible abnormal installation conditions. The inspectors reviewed the design inputs, assumptions, and design calculations to determine the design adequacy. For the replacement components, the inspectors verified material compatibility and seismic qualification. In addition, the inspectors reviewed the post-modification testing to determine readiness for operations. The 10 CFR 50.59 screens and evaluations for the modifications were reviewed to verify that the plant changes were reviewed and documented in accordance with 10 CFR 50.59. Finally, the inspectors reviewed the affected procedures, drawings, design basis documents, and UFSAR sections to verify that the affected documents were appropriately updated.

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing (71111.19 - Seven Samples)

a. Inspection Scope

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

- 500 kV breaker due to breaker No. 21 replacement in the electrical switchyard (MO #02000400089)
- No. 11 control element drive mechanism (CEDM) motor generator set (MO #1200605510)
- No. 22 main steam isolation valve nitrogen pressure switch (MO #2200702585)
- No. 12 ECCS pump room exhaust filtration (MO #1200605540)
- No. 22 AFW steam driven pump oil sight glass indication (MO #2200702384)
- 1A EDG radiator fan due to replacing the retaining nut on the breaker (MO #1200702829)
- No. 12 control room supply fan due to loose fan belts (MO#1200702450)

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22 - Five Samples)

a. Inspection Scope

The inspectors observed and/or reviewed the five surveillance tests listed below associated with selected risk-significant SSCs to verify TS compliance and that test acceptance criteria were properly specified. 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.

- STP-M-515A-2, RTD time response data collection test
- STP-O-90-1, AC sources and onsite power distribution systems seven day operability verification
- STP-O-27-2, Reactor coolant system (RCS) leakage evaluation (RCS leakage)

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- STP-O-73B-1 Service water pump quarterly test (IST)
- STP-O-220G-1, Nos. 11 & 14 4kV undervoltage relay functional test

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23 - One Sample)

a. Inspection Scope

The inspectors reviewed one temporary modification, Unit 2 removed temperature element (2-TE-112HC) input to reactor protection system (RPS) channel C(TA-2-07-0011), to verify that the safety system did not depart from the design basis and system established criteria. The inspectors reviewed the associated 10 CFR 50.59 screening against the system design bases documentation, including the UFSAR and TS. The inspectors walked down the modification to verify that proper configuration control was maintained to ensure continued system operability. In addition, the inspectors verified that Constellation controlled the modification in accordance with the requirements of procedure MD-1-100, Temporary Alterations.

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness (EP)

1EP6 Drill Evaluation (71114.06 - Two Samples)

a. Inspection Scope

The inspectors observed an EP exercise on May 30, 2007. The inspectors observed the emergency response organization performance at the technical support center. The inspectors verified that the classification, notification, and protective action recommendations were accurate and timely. Additionally, the inspectors assessed the ability of Constellation's evaluators to adequately address operator performance deficiencies identified during the exercise.

The inspectors observed a control room simulator training exercise conducted on May 15, 2007, to assess licensed operators performance in the area of EP. This training exercise focused on equipment failures and operator challenges that would typically exist during a partial loss of offsite power and stuck opened pressurizer safety valve. The required procedural transitions and associated event classifications were observed and evaluated by the inspectors.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Public Radiation Safety

2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems (7112201 - 11 Samples)

a. Inspection Scope

The inspectors reviewed the most current Radiological Effluent Release Report to verify that the program was implemented as described in Radiological Effluent Technical Specification/Offsite Dose Calculation Manual (RETS/ODCM); reviewed the report for significant changes to the ODCM and to radioactive waste system design and operation; determined whether the changes to the ODCM were made in accordance with Regulatory Guide 1.109 and NUREG-0133 and were technically justified and documented; determined whether the modifications made to radioactive waste system design and operation changed the dose consequence to the public; verified that technical and/or 10 CFR 50.59 reviews were performed when required; and, determined whether radioactive liquid and gaseous effluent radiation monitor setpoint calculation methodology changed since completion of the modifications. The inspectors assessed whether anomalous results reported in the current Radiological Effluent Release Report were adequately resolved. The inspectors reviewed RETS/ODCM to identify the effluent radiation monitoring systems (RMS) and its flow measurement devices; reviewed effluent radiological occurrence performance indicator incidents for onsite follow-up; reviewed licensee self-assessments, audits, and licensee event reports that involved unanticipated offsite releases of radioactive material; and, reviewed the UFSAR description of all radioactive waste systems. The inspectors reviewed the RETS/ODCM to identify the programs for identifying potential contaminated spills and leakage and the process for control and assessment.

The inspectors walked down the major components of the gaseous and liquid release systems (e.g., radiation and flow monitors, demineralizers and filters, tanks, and vessels) to observe current system configuration with respect to the description in the UFSAR, ongoing activities, and equipment material condition.

The inspectors reviewed several radioactive liquid and gaseous waste release permits, including the projected doses to members of the public. The inspectors reviewed the records of any abnormal releases or releases made with inoperable effluent radiation monitors and reviewed the station's actions for these releases to ensure an adequate defense-in-depth was maintained against an unmonitored, unanticipated release of radioactive material to the environment. For unmonitored releases, the inspectors reviewed the evaluations of the type and amount of radioactive material that was released and the associated projected doses to members of the public. Additionally, for any areas where spills, leaks, or other unusual occurrences have occurred, the

inspectors verified that these areas have been properly documented in the site's decommissioning file, as required.

The inspectors assessed the station's understanding of the location and construction of underground pipes and tanks, and storage pools that contain radioactive contaminated liquids. The inspectors evaluated if Constellation may have potential unmonitored leakage of contaminated fluids to the groundwater as a result of degrading material conditions or aging of facilities. The inspectors appraised the site's capabilities of detecting spills or leaks and of identifying groundwater radiological contamination both on-site and beyond the owner controlled area. The inspectors reviewed the site's technical bases for its onsite groundwater monitoring program. The inspectors discussed with station personnel their understanding of groundwater flow patterns for the site, and in the event of a spill or leak of radioactive material, verified that the staff can estimate the pathway of a plume of contaminated fluid both on site and beyond the owner controlled area. The inspectors discussed with Constellation representatives regarding the actions taken to identify, analyze and mitigate the plume of tritium which developed just northwest of the Unit 1 turbine building. Constellation assessment determined that this plume most likely occurred in 2000 following the opening of a sink hole in the area.

The inspectors reviewed changes made by Constellation to the ODCM as well as to the liquid or gaseous radioactive waste system design, procedures, or operation since the last inspection. For each system modification and each ODCM revision that impacted effluent monitoring or release controls, the inspectors reviewed the technical justification to determine whether the changes affect the station's ability to maintain effluents as low as reasonably achievable (ALARA) and whether changes made to monitoring instrumentation resulted in a non-representative monitoring of effluents.

The inspectors reviewed a selection of monthly, quarterly, and annual dose calculations to ensure that the licensee had properly calculated the offsite dose from radiological effluent releases and to determine if any annual RETS/ODCM values (i.e., Appendix I to 10 CFR Part 50) were exceeded and, if appropriate, issued a Performance Indicator (PI) report if any quarterly values were exceeded.

The inspectors reviewed air cleaning system surveillance test results and site-specific methodology to ensure that the system is operating within the acceptance criteria. The inspectors also reviewed surveillance test results and methodology the station uses to determine the stack and vent flow rates and verified that the flow rates are consistent with RETS/ODCM or UFSAR values.

The inspectors reviewed records of RMS instrument calibrations performed since the last inspection for each point of discharge effluent radiation monitor and flow measurement device. The inspectors reviewed any completed system modifications and the current effluent radiation monitor alarm setpoint value for agreement with RETS/ODCM requirements. The inspectors also reviewed calibration records of radiation measurement (i.e., counting room) instrumentation associated with effluent monitoring and release activities and reviewed quality control records for the radiation measurement instruments.

The inspectors reviewed the results of the interlaboratory comparison program to verify the quality of radioactive effluent sample analyses performed by the licensee; reviewed the licensee's quality control evaluation of the interlaboratory comparison test and associated corrective actions for any deficiencies identified; and reviewed the results from the licensee's Quality Assurance (QA) audits and determined that the licensee met the requirements of the RETS/ODCM.

The inspectors reviewed the licensee's event reports (LERs), Special Reports, audits, and self-assessments related to the RETS/ODCM program performed since the last inspection. The inspectors determined that identified problems were entered into the corrective action program for resolution. The inspector also reviewed problem notifications affecting RETS/ODCM.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES (OA)

Cornerstones: Initiating Events, Mitigating Systems and Barrier Integrity

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

Barrier Integrity Cornerstone

a. Inspection Scope

The inspectors reviewed data and plant records from March 2006 to March 2007. The records included a review of performance indicator (PI) data summary reports, licensee event reports, operator narrative logs, and daily measurements of RCS identified leakage. The inspectors used the guidance provided in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 4, to assess the accuracy of PI data collected and reported. The inspectors also conducted interviews with the RCS system engineer and chemistry technicians that are responsible for data collection and evaluation of RCS parameters. The following PIs were reviewed:

- Unit 1 RCS Identified Leak Rate; and
- Unit 2 RCS Identified Leak Rate.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152 - Three Samples)

.1 Review of Items Entered Into the Corrective Action Program (CAP)

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

.2 Semi-Annual Trend Review

a. Inspection Scope

The inspectors performed a semiannual review to identify trends that might indicate the existence of a more significant safety issue. The inspectors reviewed CCNPP Units 1 and 2 performance indicator monthly reports, CRs, system health reports, quality assurance audits, self-assessment reports, maintenance reports, and NRC IRs and interviewed key personnel to evaluate if a trend existed.

b. Findings and Observations

No findings of significance were identified.

The inspectors documented a trend related to problems Constellation has encountered in maintaining configuration control during tagging related activities in NRC inspection report (IR) 2006005. As a result, Constellation instituted several corrective actions concerning this issue such as challenge boards for complex tagouts, a more rigorous scope deletion process for scheduling work, and a review of engineering standards used for tagouts. The inspectors noted that Constellation had a decline in tagging related issues during this inspection period.

.3 Annual Sample: Review of Core Exit Thermocouple (CET) Issues

a. Inspection Scope

The inspectors selected CR IRE-014-572 as a problem identification and resolution (PI&R) sample for a detailed follow-up review. The CR documented that average CET temperature readings dropped approximately 25 degrees Fahrenheit from the previous fuel cycle following the May 2006, Unit 1 RFO. This phenomenon occurred following the replacement of the in-core instrumentation (ICI) thimbles and thimble support plates (TSP) during the reactor vessel head replacement project.

The inspectors assessed Constellation's problem identification threshold, cause analyses, extent of condition reviews, operability determinations, and the prioritization and timeliness of corrective actions to determine whether Constellation was appropriately identifying, characterizing, and correcting problems associated with this issue and whether the planned or completed corrective actions were appropriate.

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b. Findings and Observations

No findings of significance were identified.

During the May 2006 RFO for Unit 1, the reactor vessel head project replaced all of the ICI thimbles with a different design. The ICI thimbles design changed from a double walled tube-in-tube to a single walled "fluted" configuration. After Unit 1 reached 100% rated thermal power following the RFO, the average CET temperatures indicated about 25 degrees Fahrenheit colder than the previous fuel cycle. Constellation initiated a CR to evaluate this phenomenon and performed an operability review to determine a reasonable expectation for continued operability (RECO). This phenomenon was also noted for Unit 2 following the March 2007 RFO, which the ICI thimbles and TSP were replaced as part of the reactor vessel head replacement project. Constellation engaged their engineering organization and the CET vendor regarding operability of the system, engaged other sites that have performed a similar modification, and issued operating experience to industry regarding their issue. Constellation and Westinghouse believed the cause of the lower CET temperature readings as experienced in the industry, is due to the design changes of the replacement ICI thimbles, which altered the reactor coolant bypass flow seen by the CETs.

Implemented or proposed corrective actions included the following: (1) performing an operability determination review; (2) developing new operability acceptance criteria for the CET surveillance procedure, STP O-63-1, Remote Shutdown and Post Accident Monitoring Instrument Channel Check; (3) monitoring and evaluating operability of Unit 1 and Unit 2 CET performance; and (4) determine the impact of bypass flow on the CETs. Additional recommendations suggested in the RECO included, monitoring Unit 2 CET indications for the bypass flow as observed in Unit 1, evaluating the sub-cooled monitoring alarm function for both units, evaluating the channel check criteria applied in STP O-63-1(2) for continued applicability, revising the simulator to reflect new CET performance and ensuring operators were trained that CETs may indicate values less than actual core exit conditions with reactor coolant pumps (RCPs) operating.

The inspectors determined that Constellation properly implemented their corrective action process regarding this issue. The RECO was detailed, thorough and provided reasonable justification for continued operation. Corrective actions and recommendations appeared appropriate to understand the new operating scheme for the post accident monitoring system. Constellation continued to implement scheduled corrective actions at the time of this inspection. The inspectors noted that during the review of recent completed surveillance procedures, the CET readings for both units were within the acceptance criteria of their surveillance requirements.

.4 Annual Sample: Unit 2 - Followup to the Pressurizer Power Operated Relief Valve (PORV) Failure to Close

a. Inspection Scope

The inspectors reviewed Constellation's actions in response to a PORV failure to close following a Unit 2 automatic reactor trip. On November 16, 2006, Unit 2 automatically tripped due to a pressurizer pressure high signal during the performance of a clearance

order to support scheduled maintenance. As a result of the trip, RCS pressure increased causing the two PORVs to open as designed. One PORV remained open for longer than expected resulting in a valid safety actuation signal. The inspectors reviewed Constellation's root cause evaluation of the reactor trip, the apparent cause evaluation for the PORV remaining open, and supporting records. In addition, the inspectors interviewed applicable system engineers.

b. Findings

Introduction. A self-revealing of very low safety significance (Green) NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," occurred because Constellation did not implement adequate corrective actions for a significant condition adverse to quality associated with the slow closure of a pressurizer power operated relief valve (PORV) due to a main disc guide being out of round. Specifically, Constellation did not perform an extent of condition review from a February 2006 event such that corrective actions would preclude recurrence of the issue.

Description. On November 16, 2006, Unit 2 automatically tripped due to a high pressurizer pressure signal during the performance of a clearance order to support scheduled maintenance. As a result of the trip, RCS pressure increased causing the two PORVs to open as designed. One PORV (2ERV401) closed as expected, the other PORV (2ERV402) remained open for approximately 90 seconds, which is longer than expected and resulted in a safety injection actuation signal. Constellation sent PORV 2ERV402 to Wyle Labs for analysis. As-found testing of 2ERV402 was not possible due to its condition, however, visual inspection results revealed that the main disc guide was out of round. Wyle Labs determined that the tolerances between the main disc guide and the cage had decreased sufficiently to prevent the main disc guide from moving freely within the guide bushing. Constellation determined that this is the most likely reason why the PORV did not close at the expected pressure.

The inspectors noted that a similar event occurred in February 2006. On February 21, 2006, a Unit 1 PORV (1ERV402) remained open for approximately 20 seconds following completion of the PORV response time surveillance test (STP-M-673-1). Constellation sent the valve to Wyle labs where the main disc guide was found out of round. Constellation generated a Category III CR (IRE-011-711) to address the failure of 1ERV402 to immediately close. However, Constellation's procedures do not require an extent of condition review to resolve a Category III CR. A Category II CR would have required an apparent cause evaluation and an extent of condition review. The inspectors concluded that the adverse condition was not appropriately categorized commensurate with its safety significance. QL-2-100, Corrective Action Program, Attachment 4, Condition Report Categorization Criteria, states that CRs involving maintenance rule (MR) functional failures shall be categorized as Category II. Constellation did not evaluate the Unit 1 PORV failure to close following the February 2006 surveillance test as a MR functional failure, contrary to Constellation's MR scoping documents. This missed MR functional failure evaluation was identified by Constellation 15 months later and was documented in CR IRE 022-285. In addition, QL-2-100, Attachment 4, states that any corrective maintenance on a critical component typically warrants a Category II CR. The PORV, which is classified by Constellation as a critical component, required corrective maintenance to replace the main disc guide prior to

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restoring the valve to service.

The performance deficiency is that Constellation did not take corrective actions to preclude recurrence following the identification of a significant condition adverse to quality (main disc guide being out of round on a Unit 1 PORV).

Analysis. This finding is greater 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 challenge critical safety functions. Specifically, an inadequate extent of condition review led to a similar event when the 2ERV402 had the same degraded condition. The inspectors performed a Phase 1 SDP screening using IMC 0609, Appendix A, and determined that a Phase 2 analysis was required because in the worst case if 2ERV402 failed to close following a pressure transient, the resulting loss of primary coolant would exceed the TS limit for identified RCS leakage. The Phase 2 SDP analysis was conducted by the SRA using the Risk Informed Inspection Notebook for Calvert Cliffs Nuclear Plant Units 1 and 2, Revision 2.01. The SRA made the following assumptions to support the Phase 2 risk assessment: 1) the observed PORV degraded condition adversely impacted the valve closure safety function only; 2) consistent with the SDP usage rules, this degraded valve condition is most appropriately modeled by increasing the stuck open PORV (SORV) initiating event frequency by one order of magnitude; 3) based upon the degraded valve closure condition, only the SORV worksheet (Table 3.4) was solved; and 4) the exposure time for this condition was >30 days. The dominant core damage sequences for the SORV were the failure to close the block valve with subsequent failure of high pressure injection or success of high pressure injection, with a failure of high pressure recirculation. The Phase 2 analysis determined the issue was of very low safety significance (Green) and estimated an increase in core damage frequency in the range of 1 in 16,000,000 years (mid E-8/year). This finding has a cross-cutting aspect in the area of problem identification and resolution, because Constellation did not thoroughly evaluate an equipment malfunction such that the extent of condition was considered and the cause resolved (P.1.c).

Enforcement. 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action" states, in part, that for significant conditions adverse to quality, measures shall be taken to assure that the cause of the condition is determined and corrective action taken to preclude repetition. Contrary to the above, following the identification of a main disc guide out of round being a significant condition adverse to quality for the Unit 1 PORV on February 21, 2006, Constellation did not take corrective actions to preclude recurrence. This led to a stuck open PORV due to the same condition during a Unit 2 reactor trip on November 16, 2006. This issue has been entered in Constellation's CAP as IRE-018-411. Immediate corrective actions for this issue included replacement of the main disc guide and an extent of condition review of the remaining PORVs on Unit 1 and Unit 2. Because this issue is of very low safety significance (Green) and is entered into Constellation's CAP, this violation is being treated as a NCV consistent with Section VI.A.1 of the NRC Enforcement Policy. **(NCV 05000317, 05000318/2007003-03: Failure to Preclude Recurrence of a Significant Condition Adverse to Quality Associated with Power Operated Relief Valves).**

40A3 Event Followup (71153 - One Sample)a. Inspection Scope

On March 28, 2007, during the Unit 2 RFO while in a reduced inventory condition, the inspectors observed control room operators performing a reactor coolant system (RCS) vacuum fill evolution that resulted in a loss of all reactor water level indication. The control room level indication (LI-4139) and the local level indication (LE-4139) both increased approximately 6 feet and then slowly decreased while drawing a vacuum on the RCS in preparation for the vacuum fill of the reactor. Operations investigated and determined that a reactor level instrument inlet valve, normally used during refueling outages, had been left open. This allowed air to enter the operating level instrumentation lines as operators drew a vacuum on the RCS. After operators identified and corrected the mis-positioned valve, both reactor level indicators returned to an accurate reading that was consistent with pressurizer level indication. The inspectors conducted a follow-up inspection to gain an understanding of the event and to assess the appropriateness of operator actions. The inspectors interviewed operators and reviewed Constellation procedures, the prompt investigation, and related supporting documentation.

b. Findings

(1) Failure to follow procedures and maintain configuration control during reactor fill

Introduction. The inspectors identified a very low safety significance (Green) NCV of TS 5.4.1.a, Administrative Controls, because Constellation did not maintain equipment alignment in accordance with procedures during drain and fill of the reactor coolant system (RCS). Specifically, operations personnel did not verify a reactor level instrument inlet valve shut prior to the vacuum fill of the RCS, contrary to operating procedures.

Description. On March 28, 2007, operations began draining Unit 2 reactor vessel in preparation for performing a vacuum fill of the RCS. The plant was in a reduced RCS inventory condition and water level was stable in a 'mid-loop' condition at 38.5 feet. In this condition, Constellation had three wide range level indicators available and functioning properly (LG-4139, LE-4139, and LI-4140). Normally, Constellation would have had ultrasonic narrow range indication available to the operators in the control room (LI-4138), however, LI-4138 failed to function earlier in the RFO and repairs on the instrument were unsuccessful.

From a stable, reactor level mid-loop condition, operators in preparation for the vacuum fill operation, isolated LI-4140 in accordance with OP-7, Shutdown Operations, because LI-4140 was not designed for operations under a vacuum. This left one control room RCS level indicator (LE-4139) and one local RCS level indicator (LG-4139) available to the operators. Additionally, these two indicators share a common variable leg RCS instrument tap with each other. When operators commenced drawing a vacuum on the RCS, the operators noted that both RCS level indications had unexpectedly increased and slowly decreased about 20 minutes after initiating a vacuum. The control room chart recorder indicated that RCS level had increased approximately 6 feet from the expected value of 38.5 feet. With no accurate means of level indication, operators

made the decision to continue to draw a vacuum in order to commence injecting water into the RCS. In parallel, operations investigated the apparent malfunction of the level indicators and evaluated potential sources of water to and from the RCS. Operations also began to monitor "alternate" indications for potential loss of inventory including water source tank levels and shutdown cooling pump cavitation. Operators completed drawing a vacuum and commenced RCS fill approximately two hours after initial level indication problems. Five hours after the initial level indication problems and during the RCS fill operation, operators identified level indicator 2-RC-1238 inlet valve was open contrary to its expected normal position of closed. This mis-positioned inlet valve allowed air to enter the level instrumentation lines as operators drew the vacuum and caused the operating level indicators to respond erroneously since both were from a common RCS instrument tap susceptible to air intrusion through 2-RC-1238 inlet valve. Operators immediately shut the mis-positioned valve and both RCS level indicators responded consistently with expected RCS level.

The inspectors determined that Constellation did not maintain configuration control as required by procedures governing reduced inventory and RCS vacuum fill. Specifically, Step 6.16.A.1 of OP-7, Shutdown Operations, requires that all RCS piping and associated components are aligned per OI-1A, RCS and Pump Operations. Contrary to this step, Constellation did not ensure that 2-RC-1238 was in the proper position. This valve is typically cycled open/close during refueling outages as an additional level indicator. Constellation left 2-RC-1238 opened, which resulted in the loss of all direct means of level indication due to air intrusion for approximately five hours while the reactor vessel was in a reduced inventory condition.

Constellation entered this issue into their CAP as issue reports IRE-021-661 and IRE-022-119. The immediate corrective actions included restoration of RCS level from a reduced inventory condition and a prompt investigation to determine the cause of the loss of all level indication. Inspectors verified during post-event review that there were no indications that reactor water level had ever decreased below the initial level of 38.5 ft.

The performance deficiency is that Constellation did not follow site procedures and maintain equipment alignment during RCS vacuum and fill operations.

Analysis. This finding is greater than minor because it is associated with the Initiating Event cornerstone attribute of configuration control and affects the likelihood of a loss of shutdown cooling event. The inspectors evaluated the significance of the finding using IMC 0609, Appendix G, "Shutdown Operations SDP" and IMC 0609, Appendix H, "Containment Integrity SDP," because the finding represented an actual loss of level indication and did not meet the criteria specified in Attachment 1, of Appendix G. Additionally, the finding required a human error probability (HEP) analysis that was not addressed in the simplified Phase 2 evaluation and was referred to the division of risk assessment in Nuclear Reactor Regulation (NRR) for a Phase 3 analysis as directed by Appendix G, Attachment 2, section 2.2.5. No Low Power/Shutdown (LP/SD) SPAR model exists for CCNPP. Therefore, the at-power CCNPP SPAR model was modified to allow analysis of the loss of all level indication condition.

New event trees were created to analyze the following initiating events:

- Loss of level control at mid loop (LOLC);
- Loss of inventory (LOI);
- Loss of shutdown cooling (LORHR);
- Shutdown cooling isolation (ISOL);
- Loss of offsite power (LOOP); and
- Loss of AC power to the running shutdown cooling train (LOAC).

The impact of the loss of level indication condition impacted the risk by reducing the operators ability to respond to an event (e.g. a loss of level) if one were to occur. This loss of indication was modeled by adjusting the impacted HEPs. The results were dominated by a LOLC. For the plant conditions (mode 5 late, RCS vented and in reduced inventory with the RCS loops open) the dominant contributor was a loss of level control initiating event with the operators failing to diagnose the loss of level control. For this condition that lasted approximately five hours, the cumulative results for all initiators yielded an incremental conditional core damage probability (ICCDP) of 3.6E-7. Therefore, this finding is of very low safety significance (Green) for internal event contributors.

The finding was evaluated for its potential risk contribution due to large early release frequency (LERF) in accordance with IMC 0609, Appendix H. According to section 2.0, only the period within eight days of the beginning of the outage needs to be considered. After eight days, it is assumed that the short-lived, volatile isotopes that are principally responsible for early health effects have decayed sufficiently such that the finding would not contribute to LERF. Since the plant was shutdown for approximately 28 days, the condition did not contribute to LERF. This finding has a cross-cutting aspect in the area of human performance because Constellation did not define and effectively communicate expectations regarding procedural compliance such that personnel follow procedures (H.4.b).

Enforcement. TS 5.4.1.a requires, in part, that written procedures be established, implemented, and maintained for activities described in Appendix A of Regulatory Guide (RG) 1.33, Quality Assurance Program Requirements. Specifically, Section 3 of RG 1.33, Appendix A, includes draining and filling the RCS. Step 6.16.A.1 of OP-7, Shutdown Operations, requires that all RCS piping and associated components are aligned per OI-1A, RCS and Pump Operations. Contrary to this step, on March 28, 2007, Constellation did not appropriately implement OP-7 and OI-1A and verify that 2-RC-1238 was in the proper position as required by OI-1A. Constellation left 2-RC-1238 open, which resulted in the loss of all level indication for approximately five hours while the reactor vessel was in a reduced inventory condition. This issue was entered into the CAP (IRE-021-661) for resolution. Immediate corrective actions included conducting a prompt investigation to determine the cause of the loss of all level indication. Because this issue is of very low safety significance (Green) and is entered into Constellation's CAP (IRE-021-661; IRE-022-119), this violation is being treated as a NCV consistent with Section VI.A.1 of the NRC Enforcement Policy.
(NCV05000318/2007003-04, Failure to follow procedures and maintain configuration control during reactor fill.)

(2) Failure to adequately maintain the RCS reduced inventory procedure

Introduction. The inspectors identified a very low safety significance (Green) NCV of TS 5.4.1.a, Administrative Controls, when Constellation did not ensure an adequate procedure was maintained to drain and fill the RCS. Specifically, OP-7 permitted operation in a reduced RCS inventory condition without ensuring redundant means of level indication contrary to the requirements of NO-1-103, Lower Mode Operations.

Description. The inspectors, during post-event follow-up for a loss of reactor level indication while in a reduced RCS level inventory condition, determined that Constellation is committed to providing at least two independent means of RCS level indication during reduced inventory activities in accordance with GL 88-17, Loss of Decay Heat Removal. This commitment is expressed as a requirement in NO-1-103, Lower Mode Operations, which states that at least two redundant means of level indication shall be provided. The inspectors reviewed OP-7 and identified that it permitted operation in a reduced inventory condition without redundant means of level indication contrary to the requirements of NO-1-103. Specifically, Step 6.16A of OP-7 required that only LE-4139 and LG-4139 be in-service during preparation and performance of the RCS vacuum fill. However, these two indicators share a common variable leg RCS instrument tap and, therefore, are not redundant because a common failure has the potential to make both instruments inoperable as evidenced by the March 28, 2007, event. The inspectors also determined that Step 6.3A of OP-7 permitted several combinations of level indicators that are contrary to NO-1-103 because some of these combinations only consisted of the indicators that shared a common sensing leg. Additionally, the inspectors noted that the vacuum fill section of the OP-7 did not provide the operators with adequate direction on required actions should a level indication malfunction occur.

The performance deficiency is that Constellation did not maintain an adequate procedure for operating in reduced reactor level inventory condition.

Analysis. This finding is greater than minor because if left uncorrected it could lead to a loss of all level indication while in reduced inventory. The finding is associated with the Initiating Event cornerstone attribute of equipment performance and affects the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown operations. Specifically, the inadequate procedure for operation in reduced RCS level inventory increased the likelihood of the loss of RCS level indication and consequently a loss of RHR initiating event. The inspectors evaluated the significance of this finding using IMC 0609, Appendix G, "Shutdown Operations SDP," Figure 1, and determined that this finding was of very low safety significance (Green) because the finding did not require a quantitative assessment based on the review by the SRA. The inspectors determined that this finding had a cross-cutting aspect in the area of human performance because Constellation did not ensure that the procedure for operation with the RCS in a reduced level inventory condition was complete and accurate (H.2.c).

Enforcement. TS 5.4.1.a requires, in part, that written procedures be established, implemented, and maintained for activities described in Appendix A of RG 1.33, Quality Assurance Program Requirements. Specifically, section 3 of RG 1.33, Appendix A, includes draining and filling the RCS. Contrary to the above, the inspectors identified in

April 2007 that OP-7 was not appropriately maintained and permitted reactor operation in reduced level inventory condition without redundant means of level indication contrary to the requirements of NO-1-103, Lower Mode Operations. This issue was entered into the CAP (IRE-021-661) for resolution. Immediate corrective actions included conducting a prompt investigation to determine the cause of the loss of all level indication and suspension of the procedure OP-7. Because this issue is of very low safety significance (Green) and is entered into Constellation's CAP, this violation is being treated as a NCV consistent with Section VI.A.1 of the NRC Enforcement Policy. (NCV05000317/318/2007003-05, Failure to adequately maintain the RCS reduced inventory procedure)

4OA5 Other Activities

.1 (Closed) URI 05000317/2006005-01 Main Steam Safety Valves Maintenance Rule Performance Criteria and Monitoring

An unresolved item (URI) was opened in NRC IR 05000317/2006005 to evaluate Constellation's pending resolution when inspectors questioned the basis of the established performance criteria for the MSSV lift setpoint to determine the acceptability of the MR limits. This issue was resolved as a NCV of 10 CFR 50.65 (a)(2) and is documented in this report, Section 1R12. This URI is closed.

.2 (Closed) URI 05000318/2006005-04 Acoustic Monitors Response

An URI was opened in NRC IR 05000318/2006005 to track the pending resolution of an issue associated with the response of the acoustic monitors following a high pressure reactor trip on November 16, 2006. One PORV, which opened to control RCS pressure, remained open for longer than expected (approximately 90 seconds). In addition, one pressurizer safety valve potentially simmered. Constellation reported that the pressurizer safety valve did not open and the associated pressurizer safety valve acoustic monitoring indication was due to the close proximity of the PORV. The inspectors noted that the acoustic monitors, which are relied on by plant operators during implementation of EOPs, provided potentially ambiguous information. The UFSAR states the requirement to provide the operator with unambiguous indication of RCS safety and relief valve position so that appropriate operator actions can be taken. The inspectors conducted a followup review of this issue to understand the acoustic monitor response associated with event. Following the event, the pressurizer safety valve and the PORV were taken to Wyle lab for analysis. During as-found testing in the lab, the pressurizer safety valve lifted earlier than the lift set point (2415 psia versus 2475 psia). Constellation concluded that it is a good possibility that the safety valve simmered during the reactor trip. Based on the as-found testing information for the safety valve, review of the associated apparent cause evaluation, and discussions with Operations and Engineering, the inspectors determined that the acoustic monitors responded as expected for the plant conditions during the plant transient on November 16, 2006. This URI is closed.

.2 Calvert Cliffs Unit 2 Replacement Reactor Vessel Closure Head (RRVCH) (71007)

a. Inspection Scope

The inspectors reviewed the Unit 2 RRVCH using the guidance in NRC IP 71007, "Reactor Vessel Head Replacement Inspection."

Pre-Service Inspection (PSI) and Baseline Inspections

An inspection was conducted on-site and in-office to evaluate the automated ultrasonic testing (UT) and dye penetrant (PT) baseline examination data records of the Unit 2 RRVCH. The review of selected documentation was to ensure that the non-destructive examinations (NDE) were performed by qualified NDE technicians and in accordance with qualified procedures. The inspectors reviewed a sample of baseline inspection records from the NDE examinations for welds W75-W135 of the Unit 2 reactor vessel head penetration J-groove welds.

The inspectors verified the NDE inspections were performed in accordance with American Society of Mechanical Engineers (ASME) Boiler & Pressure Vessel (B&PV) Code Section XI and met the NRC Order EA-03-009 requirements for dissimilar metal welds. Additionally, the inspectors performed a direct visual inspection of the Unit 2 RRVCH, penetration nozzles and J-groove welds inside the Pre-Assembly Facility.

Post-Modification Testing Verification

The inspectors reviewed the completed post-modification testing and post-construction walkdowns records of the installed component replacements for the Unit 2 RVCH, CEDMs and Enhanced Service Structure (ESS) to verify that the tests and walkdowns were conducted in accordance with approved plans, procedures, and work orders and to verify the functional testing confirmed the design and established baseline measurements. To verify the modifications were properly installed, inspected, tested and met the acceptance criteria, the inspectors reviewed the following documents: 1) repair replacement plan 2006-2-022, Installation of the RRVCH on the Unit 2 Reactor Vessel; 2) maintenance WO 2200504104, Installation of New Unit 2 Reactor Vessel Closure Head; 3) CEDM performance testing; and 4) ESS post modification test - CEDM Cooler Air Flow Test.

The inspectors also reviewed results of ASME, Section XI, VT-2 Visual Examination conducted during a system leakage (Class 1 components) test to verify that no RCS leakage was observed from the Unit 2 RRVCH, head vent line piping and components during Mode 3 walkdowns.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

Integrated Report Exit Meeting Summary

On July 10, 2007, the resident inspectors presented the inspection results to Mr. M. Flaherty and other members of your staff who acknowledged the findings. The inspectors asked Constellation whether any of the material examined during the inspection should be considered proprietary. No proprietary information was identified.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION**KEY POINTS OF CONTACT****Constellation Personnel**

J. Spina, Site Vice President
 J. Pollock, Plant General Manager
 C. Ashley, Engineering Supervisor
 D. Bauder, Operations Manager
 G. Beasley, Systems Manager
 P. Beavers, Engineering supervisor
 R. Bleacher, Operations
 R. Cameron, Senior Engineering Analyst
 R. Conaster, Senior Chemist
 R. Cavedo, PRA
 K. Dougherty, System Engineer
 P. Fatka, Senior System Engineer
 M. Flaherty, Engineering Manager
 P. Furio, Licensing Supervisor
 J. Gaines, Licensing Director
 K. Greene, Senior Engineer
 S. Henry, Engineering Supervisor
 C. Jones, Operations
 T. Konerth, Project Engineer
 D. Murphy, Engineering Supervisor
 K. Nguyen, Systems Engineer
 T. Riti, Operations
 K. Robinson, Engineering
 T. Shearer, Nuclear Fuel Services
 A. Simpson, Licensing
 L. Wegner, System Engineer
 J. Wilson, Operations
 M. Yox, Licensing

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED**Opened and Closed**

05000317/318/2007003-01	NCV	Failure to Implement TS 3.6.3 Required Actions for Containment Isolation Valves
05000317/318/2007003-02	NCV	Failure to Demonstrate that the MSSV Performance Was Being Effectively Controlled per 10 CFR 50.65 (a)(2)
05000317/318/2007003-03	NCV	Failure to Preclude Recurrence of a Significant Condition Adverse to Quality Associated with Power Operated Relief Valves

05000318/2007003-04	NCV	Failure to follow procedures and maintain configuration control during reactor fill
05000317/318/2007003-05	NCV	Failure to adequately maintain the RCS reduced inventory procedure
<u>Closed</u>		
05000317/2006005-01	URI	Main Steam Safety Valves Maintenance Rule Performance Criteria and Monitoring (Section 40A5.1)
05000318/2006005-04	URI	Acoustic Monitors Response (Section 40A5.2)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures

NO-1-119, Seasonal Readiness, Revision 10
 OI-21C, 0C Diesel Generator, Revision 20
 OI-28, Operation of 500kV Switchyard, Revision 14,
 1C01-ALM, Main Generator and Switchyard Control Alarm Manual, Revision 40
 EOP-02, Loss of Offsite Power, Revision 14
 EOP-07, Station Blackout, Revision 16
 Operations Administrative Policy 94-5, Guidelines for Nuclear Plant Operations Support For Electric System Operation and Planning Department Transmission System Operations, Revision 1

Miscellaneous

SD-001, 500kV Switchyard and Generator Step-up Transformer, Revision 5

Section 1R02: Evaluations of Changes, Tests or Experiments

10 CFR 50.59 Safety Evaluations

SE00488, Change in Method of Evaluating Turbine-Generator Missile Probability Risk for New Unit 1 Turbine Low Pressure Rotors, Revision 0
 SE00490, Revise UFSAR Chapter 14.22 to Reflect the Results of Calculation 05994, Revision 0
 SE00491, Evaluation of Unit 2 SFP Reactivity Affects Resulting From TA 1-03-042 - Silica Removal Skid Operations, Revision 0
 SE00492, Unit 1 Cycle 17 Reload 50.59 for Batch 1W Fuel Assemblies, Revision 0
 SE00493, Remove Silica From Unit 1 and Unit 2 Spent Fuel Pools, Revision 1
 SE00496, Evaluation of Unit 2 SFP Reactivity Affects Resulting From TA 1-04-060 - Silica Removal Skid Operations Supporting 2005 Unit 2 RFO, Revision 0
 SE00497, U1C18 Core Reload for All Plant Modes (2006 RFO), Revision 2
 SE00498, U2C17 Core Reload (2007 RFO), Revision 1

10 CFR 50.59 Screenings Associated with the Following Documents

ES199701358-001, 2B Diesel Generator Jacket Cooling Setpoint Changes (2PS4810, 2PS4811, 2PS4812), Revision 2

ES200100966-000, Replace Main Turbine Rotors, Revision 0
ES200300470-000 through 003, Replace Main Turbine Controls
ES200400041-000, Replace Actuator on 1(2)MOV 4045 and 1(2)MOV 4052, Revision 0
ES200400111-000, Mechanical Stress Improvement Process, Revision 1
ES200500477-000, Replace Unit 1 & 2 Steam Generator Blowdown Recovery 1/2RI4095,
Revision 0
ES200400698, U-1 Delta T Calibration Potentiometers, Revision 0
ES200400273, ESFAS Power Supply, Revision 0
ES200400086, ADV Control Relay Change, Revision 0
ES20050457, CET Subcooled Margin Monitor Setpoint, Revision 0
ES200600046, Revise U-1 WRGM Alert Setpoint to 60,000 uCi/sec., Revision 0
ES20060444, Change the Setpoint for 2-RIC-5415 to 82,000 uCi/sec., Revision 0
Temporary Modification 1-06-0003, Remove Battery Monitor Relay
Temporary Modification 1-07-0004, Encapsulate #12 Moisture Separator Reheater Manway
Cover
Temporary Modification 2-04-0002, Raise Setpoints for 2TE5340-6 and 2TE5340-9 to 180 °F
Temporary Modification 2-07-0007, #22 Feed Pump Speed Card Failure
Changes to Procedures OI-21A, STP 0-8A-2, Alarm Manual 1C62/2C62/2C61, 3/2/2005

Calculations

E-89-007-0003, SBO & LOCA Battery Duty Cycle Bus 21, Revision 0
ES200100780 Unit 2 Spent Fuel Pool Criticality Analysis With Soluble Boron and Burnup Credit
But Without Boraflex Credit, Revision 0
CA01311, Uncertainty Calculation for the CET Indicators and Alarms, Revision 0
CA01311-0001, Uncertainty Calculation for the CET System, Revision 0
CA04747-001, Uncertainty Calculation for the Sub-cooled Margin Monitor System, Revision 0
CA04747-0001, Uncertainty Calculation for the Sub-cooled Margin Monitor System, Revision 0

Corrective Action Reports

IRE-011-234
IRE-001-593
IR4-023-643
IRE-015-899

Drawings

15664-0061-SH0001 Wiring Diagram For Battery Voltage Monitor System Panel
#PONLOD3100/MON, Revision 2
12147-0050SH0001, Qualified Replacement In-core Instrument Assembly Unit 1, Revision 0
60632SH0001, Instrument Location In-core Instrumentation Map Unit 1, Revision 4
60933SH0047, Loop Diagram Reactor CET's, Revision 9
62639SH0047, Loop Diagram Reactor CET's, Revision 14
62676SH0001, Instrument Location In-core Instrumentation Map Unit 2, Revision 2
98616SH0001, Loop Diagram Post Accident Monitoring System Channel A, Revision 0
98616SH0002, Loop Diagram Post Accident Monitoring System Channel B, Revision 0
98716SH0001, Loop Diagram Post Accident Monitoring System Channel A, Revision 0
98716SH0002, Loop Diagram Post Accident Monitoring System Channel B, Revision 0

Procedures

QL-2-100, Corrective Action Program, Revision 21
RM-1-104, Updating the Safety Analysis Report (UFSAR, USAR), and the Technical
Specification Bases (TSB), Revision 9

EN-1-102, 10CFR50.59/10 CFR 72.48 Reviews, Revision 11
CNG-CA-1.01, Corrective Action Program, Revision 1
ER-1-103, Maintenance Rule Program Implementation, Revision 1

Completed Surveillance Procedures

STP M-527A-1, Post Accident Monitoring System Channel A Calibration Checks, Completed
5/17/06 & 5/18/06
STP M-527B-1, Post Accident Monitoring System Channel B Calibration Checks, Completed
5/23/06
STP M-527A-2, Post Accident Monitoring System Channel A Calibration Checks, Completed
4/6/07
STP M-527B-2, Post Accident Monitoring System Channel B Calibration Checks, Completed
5/25/05
STP O-63-1, Remote Shutdown and Post Accident Monitoring Instrument Channel Check,
Completed 3/31/07

Engineering Service Packages & 50.59 Safety Evaluations

ES199900772, Change Operability Criteria for STP O-063, 7/21/99
SE00366, (For ES19990772-000), Change Operability Criteria for STP O-063, 9/17/99
SE00498, (For ES200500079-000), 50.59 Evaluation for U2C17 Core Reload (2007 RFO),
Revision 1

Operator Training

Unit 2 Cycle 17, Reload Core Design (2007 Refueling Outage)

Operability Determination

RECO for IRE-014-572, Unit 1 Exhibits a CET Reading Temperature Bias of ~ 25F On
Average, 9/26/06
Operability Evaluation, For Increased Core Bypass Flow (IRE-021-445)

System Description

SD-78B, In-core Instrumentation System, Revision 2
SD-114, Post Accident Monitoring System, Revision 0

Condition Reports

IRE-011-711
IRE-014-572
IRE-017-174
IRE-017-175
IRE-018-411
IRE-018-803
IRE-018-804
IRE-021-445
IRE-022-285

Miscellaneous

Constellation Letter, Closure of 3R2006002210 TS Basis 3.3.10 & UFSAR Section 7.5.9.3 Do
Not Reflect the Current Criteria for Operability, 12/8/2006
ES200500079-000, U2C17 Core Reload (2007 RFO)
Technical Specification, Section 3.3.10, Post Accident Monitoring Instrumentation
Technical Specification, Section B.3.3.10, Post Accident Monitoring Instrumentation Bases

UFSAR, Section 7.5.4, In-core Instrumentation
UFSAR, Section 7.5.9, Inadequate Core Cooling Instrumentation
Westinghouse Issue Report, #06-152-W001
Westinghouse Letter, Justification of Past and Continued Operation for Calvert Cliffs 1 Cycle
18: 0.2% Increase In-core Bypass Flow, 3/19/07

Section 1R04: Equipment Alignment

Procedures

OI-28, Operation of 500kV Switchyard, Revision 1
OI-22C, ECCS Pump Room Ventilation, Revision 9
OI-32A-2, Auxiliary Feedwater System, Revision 17
OI-21A-1, 1A Diesel Generator, Revision 19
OI-03A-1, Safety Injection and Containment Spray, Revision 20

Drawings

61420, 500kV Switchyard Bay#2 Breaker 21, 22, & 23 Schematic Diagram, Revision 19
61001SH0001, Electrical Main Single Line Diagram, Revision 42
61419SH0001, 500kV Switchyard Bay#2, Circle #1L Waugh Chapel Line #5051, Revision 12
60722SH0001, Auxiliary Building Ventilation System, Revision 59
60731SH0001, Safety Injection and Containment Spray, Revision 79

Condition Reports

IRE-021-913
IRE-022-711
IRE-023-194

Work Orders and Clearance Numbers

MO#1200701708
CID#2200700187

Miscellaneous

SD-001, 500kV Switchyard and Generator Step-up Transformer, Revision 5
SD-032, Auxiliary Building Ventilation System, Revision 4
SD-052, Safety Injection and Containment Spray, Revision 3
Operability Determination (OD) Number 07-003
Event No. 4147, Final Reportability Review of IRE-021-913, dated June 4, 2007.
NRC Generic Letter 91-08, Removal of Component Lists From Technical Specifications, dated
May 6, 1991
NRC Information Notice 1986-38, Deficient Operator Actions Following Dual function Valve
Failures, dated May 20, 1986
NRC Information Notice 2006-29, Potential Common Cause Failure of Motor-Operated Valves
As A Result of Stem Nut Wear, dated December 14, 2006
Operations Script for Breaker 21 Replacement / 12 Service Bus Inspection / P1300-2 Revenue
Metering Work
NPOSSO-07-02, Revision 0, Application of Tech Spec 3.6.3 to Expanded Containment Isolation
Valve List per Figure 5-10 as Compensatory Measure Until Necessary Procedure
Controls Have Been Incorporated

Section 1R05: Fire Protection

Procedures

SA-1, Fire Protection Program, Revision 6
SA-1-102, Fire Protection/Appendix R Compensatory Actions, Revision 2
SA-1-100, Fire Prevention, Revision 13
SA-1-101, Fire Fighting, Revision 3
FP-0002, Fire Hazards Analysis Summary Document, Revision 0
Fire Fighting Strategies Manual, Revision 0
STP F-591-1, Inspection of Fire Doors, Watertight Doors, and Dampers in Fire Rated Barriers, Revision 8
STP-F-592-1, Penetration Fire Barrier Inspection, Revision 7

Drawings

60-447-C SH1, Fire Damper Installation Auxiliary Building, Revision 2
60-447-B SH10, Fire Damper Installation Auxiliary Building, Revision 0
62148SH0002, Mechanical Seal Details - Appendix "R" Fire Barriers and HELB Barriers

Condition Reports

IRE-023-352

Miscellaneous

FA-07-001, Functionality Assessment For Unit 1 and Unit 2 Fire Dampers
CCNPP Updated Final Safety Analysis Report, Revision 35
NFPA 90A, Standard for the Installation of Air Conditioning and Ventilating Systems, dated 1999
Renewed Facility Operating License Nos. DPR-53 and DPR-69, Amendment Nos. 237 and 211

Section 1R06: Flood Protection Measures

Miscellaneous

CCNPP UFSAR, Revision 37

Section 1R07: Heat Sink Performance

Procedures

EN-1-327, Service Water Reliability Program (Generic Letter 89-13), Revision 4
SRWHX-4, Service Water Heat Exchanger Cleaning and Inspection, Revision 9

Section 1R11: Licensed Operator Requalification Program

NO-1-200,, Control of Shift Activities, Revision 32
NO-1-103, Conduct of Lower Mode Operations, Revision 24
OP-18, Evaluated Scenario, Revision 5

Condition Reports

IRE-023-297

Section 1R12: Maintenance Effectiveness

Procedures

NO-1-115, Operations Maintenance Coordination, Revision 7
NO-1-203, Operations Section Performance Evaluation, Revision 12

Drawings

61403BSH00134, Main Steam Safety Valves, Revision 0

Condition Reports

IRE-006-806
IRE-011-601
IRE-018-931
IRE-019-211
IRE-019-372
IRE-021-038
IRE-021-913
IRE-023-728

Work Orders

2200702483
1200606506
1200702935

Maintenance Rule Documents

(A)(3) Periodic Assessment of Maintenance Rule Program, Calvert Cliffs Nuclear Power Plant, October 2004 through September 2006
Calvert Cliffs Nuclear Power Plant (CCNPP) Maintenance Rule (MR) Scoping Document, Revision 26

Health Reports

Auxiliary Building And Radwaste Heat & Ventilation Systems, Unit 1 & 2, 4th Quarter 2006
Auxiliary Feed Water System, Units 1 & 2, 4th Quarter 2006

Miscellaneous Documents

NRC Information Notice 2006-24, Recent Operating Experience Associated with Pressurizer and Main Steam Safety/Relief Valve Lift SetPoints, dated November 14, 2006
NRC Information Notice 1986-56, Reliability of Main Steam Safety Valves, dated July 10, 1986
Calvert Cliffs Maintenance Rule Indicator, (a)(1) SSCs, January 2007
List of Risk Significant System Functional Failures That Occurred January 1, 2005 Through December 30, 2006
Maintenance Rule Unavailability Report, dated 1/17/2007

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures

MN-1-123, Integrated Work Planning, Revision 17
NO-1-117, Integrated Risk Management, Revision 19
OI-27B, 13.8kV System, Revision 16
OI-27C, 4.16kV System, Revision 23
OI-22F, Control Room and Cable Spreading Room Ventilation, Revision 24

Integrated Work Schedule

Integrated Work Schedule Week 715

Integrated Work Schedule Week 716

Integrated Work Schedule Week 717

Section 1R15: Operability Evaluations

Operability Determination

IRE-021-790

IRE-021-445

IRE-022-288

IRE-022-258

IRE-022-177

IRE-021-806

IRE-023-352

Procedures

NO-1-200, Control of Shift Activities, Appendix CMF, Component Manipulation Form, Revision 31

NO-1-106, Functionality Evaluation/Operability Determination, Revision 10

Drawings

62467SH0001, Starting Air System Diesel Generator Building 1EDG, Revision 3

Calculation

ES200100656-000, Total Loop Uncertainty For The Plant Computer
Determination Of Maintenance Feedwater Flow, Revision 0

Calculation No. D-92-014, HVAC-Diesel Generator Heating Requirements

ES200500079, Core Bypass with Thimble Replacement for Calvert Cliffs Units, Revision 0

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NF-CC1-07-5, Justification of Past and Continued Operation for Calvert Cliffs 1 Cycle 18: 0.2%
Increase in Core Bypass Flow, dated March 19, 2007.

UFSAR Section 3.5.4, Revision 37

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CA06437, ECCS Pump Room Transient Heatup Calculation, Revision 0

E-93-016, 125VDC Station Battery Discharge Times, Revision 1

ES199701358-000, Replace Peaking Load Control Unit in Woodward Governor of EDG with
DRU, Revision 0

ES200400041-000, Replace Actuator on 1(2)MOV 4045 and 1(2)MOV 4052, Revision 0

ES200400698, U-1 Delta T Calibration Potentiometers, Revision 0

ES200400273, ESFAS Power Supply, Revision 0

ES200400086, ADV Control Relay Change, Revision 0

ES20050457, CET Subcooled Margin Monitor Setpoint, Revision 0

ES200600046, Revise U-1 WRGM Alert Setpoint to 60,000 uCi/sec., Revision 0

ES20060444, Change the Setpoint for 2-RIC-5415 to 82,000 uCi/sec., Revision 0

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CA04747, Uncertainty Calculation for the Subcooled Margin Monitor System, Revision 0
CA06250, Qualification of Sub-Panel Within Diesel Panel 1C62B, Revision 0
E-89-005, SBO & LOCA Battery Duty Cycle - 125VDC Bus 11, Revision 3
SQ00100, Seismic Qualification of the EDG Digital Reference Unit (DRU), 2301A Load Sharing
& Speed Controls, and EGB-13P Governor Actuator, Revision 1
SQ00138, Seismic Qualification of a Fairbanks Morse Magnetic Pick-Up (Speed Probe) and
Bracket Assembly, Revision 0

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IRE-003-287
IRE-022-244*
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IRE-006-287
IRE-019-028
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IRE-002-317
IR4-018-402
IR4-023-643
IRE-022-246*
*NRC Identified During Inspection

Drawings

12310-0009SH0003-2004SH0002, Replace EDG 2B PLC and EGA Systems, Revision 0
60626SH0008-2002SH0002, Replace EDG 2B PLC and EGA Systems, Revision 0
61024SH0002, Diesel Generator Project Single Line Diagram DG1A 125V DC System Bus 14,
Revision 3
61024SH0003, Single Line Diagram DGOC 125V DC System Bus 15, Revision 3
61030, Single Line Diagram Vital 120V AC & 125V DC Emergency 250V DC FSAR
Fig. No. 8-5, Revision 31
63086SH0013-2001SH0002, Replace the EDG 2B PLC and EGA Systems, Revision C
63086SH0010-2008SH0002, Replace EDG 2B PLC and EGA Systems, Revision 0
61069-2003SH0001, Schematic Diagram Turbine Steam Dump and Bypass Controls, Revision
20
63069-2005SH0001, Schematic Diagram Turbine Steam Dump and Bypass Controls, Revision
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61069-2003SH0002, Schematic Diagram Turbine Steam Dump and Bypass Controls, Revision
20
63069-2005SH0002, Schematic Diagram Turbine Steam Dump and Bypass Controls, Revision
17
86923SH0001X-2003SH001Reactor Regulation System Cabinet Schematic, Unit 1 x 1C31,
Revision 2
62024-ESH3, Diesel Generator Project Single Line Diagram DCOC 125VDC System Bus 15,
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61087SH010F, Schematic Diagram - Annunciator EDG Alarms, Rev 6

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1C06-ALM, RCS Control Alarm Manual, Revision 47
MOV-10, MOV Spring Pack Testing, Revision 6
MOV-025A, Limitorque Motor Operated Valve (MOV) Post-Maintenance Requirements for Flow Isolable Valves, Revision 3
OI-21B, 2B Diesel Generator, Revision 18
OI-27B, 13.8 KV System, Revision 16
OP-1, Plant Startup from Cold Shutdown, Revision 23
STP-O-8B-2, Test of 2B DG and 4 KV Bus 24 LOCI Sequencer, Revision 25
OI-16, Calvert Cliffs Unit 1, Component Cooling System, Revision 31
OI-16, Calvert Cliffs Unit 2, Component Cooling System, Revision 28
Engineered Test Procedure 06-004, 2B DG Speed Control Mod PMT, Revision 0
STP O-4B-2, B Train Integrated Engineered Safety Features Test, Revision 27, Performed 3/29/07.

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NO-1-208, Nuclear Operations (NO) Post Maintenance Testing, Revision 11
MD-1-100, Temporary Alterations, Revision 13
CNG-HU-1.01-1002, Pre-Job Briefings and Post-Job Critiques, Revision 1
Lube-02, General Lubrication Procedure, Revision 2
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60723SH0004, Ventilation Systems Control Room and Cable Spreading Room HVAC, Revision 50
12310-0080SH0002B-1001SH0002, Revision 1
61086SH00031-2006SH0002, Revision 12

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IRE-021-559

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MO#2200700152
MO#1200603098
MO#1200700305
MO#0200700815
MO#2199801933
MO#2200503868
MO#2200503578

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2200700187
1200700127
1200600974

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SD-083A, Main Steam System, Revision 3
SD-030, Control Room Ventilation System, Revision 4
PMB0015, Main Steam Isolation Valve, Revision 2
PMB0739, Control Room HVAC, Revision 0
ES200400055-000, Impact of changing 500kV Circuit Breakers from GE ATB-3 Circuit to ABB Type 500 Circuit Breakers, Revision 1
ES200200409-000, 12 CR HVAC Supply Fan Motor Vibrates Above Normal, Revision 0
VTM-15224-002, Thomas Flexible Couplings, Revision 2

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STP-O-90-1, AC Sources and Onsite Power Distribution Systems 7 Day Operability Verification, Revision 22
STP-O-27-2, Reactor Coolant System Leakage Evaluation (RCS Leakage), Revision 17
STP-O-73B-1, Service Water Pump Quarterly Test (IST), Revision 11
STP-M-220G-1, 11 & 14 4kV Undervoltage Relay Functional Test, Revision 1

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MD-1-100, Temporary Alterations, Revision 13
EN-1-102, 10CFR 50.59 / 10 CFR 72.48 Reviews, Revision 10
OI-6, Reactor Protection System, Revision 17
STP-M-515A-2, RTD Time Response Data Collection Test, Revision 4

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62729SH001, Reactor Coolant System, Revision 96

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TA-2-07-0011, Remove Temperature Element (2-TE-112HC) Input to Reactor Protection System, Revision 0
SD-058, Reactor Protective System, Revision 4
SD-064A, Reactor Coolant System Instrumentation, Revision 3

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EOP-00, Post Trip Immediate Actions, Revision 10
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Calvert Cliffs Emergency Plan and Implementing Procedures

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IRE-023-297

Section 2PS1: Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems

Calvert Cliffs Technical Procedures:

STP-M-564-1, Rev 11, Unit 1 Wide Range Noble Gas Monitor Calibration Check
STP-M-564-2, Rev 13, Unit 2 Wide Range Noble Gas Monitor Calibration Check
STP-M-567-0, Rev 4, Gaseous and Liquid Waste Discharge Radiation Monitors Calibration Check
STP-M-567-1, Rev 4, Unit 1 Steam Generator Blowdown Recovery Radiation Monitor and Loop Flow Channel Calibration
STP-M-567-1, Rev 5, Unit 1 Steam Generator Blowdown Recovery Radiation Monitor and Loop Flow Channel Calibration
STP-M-567-2, Rev 4, Unit 2 Steam Generator Blowdown Recovery Radiation Monitor and Loop Flow Channel Calibration
STP-M-569-1, Rev 1, Unit 1 Main Vent Gaseous Radiation Monitor Channel Calibration
STP-M-569-2, Rev 1, Unit 2 Main Vent Gaseous Radiation Monitor Channel Calibration
STP-M-548-1, Rev 5, Unit 1 Containment Iodine Removal Filter Test (HEPA)
STP-M-549-2, Rev 10, Unit 2 Containment Iodine Removal Filter Test (Charcoal)
STP-M-540A-0, Rev 1, #11 Control Room Post LOCI Exhaust Filter Test
STP-M-546-2, Rev 7, Unit 2 ECCS Pump Room Exhaust Filter Test (HEPA)
STP-M-547-2, Rev 11, Unit 2 ECCS Pump Room Exhaust Filter Test (Charcoal)
STP-M-544A-2, Rev 0, Unit 2 #21 Penetration Room Exhaust Filter Test

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IRE 013-157
IRE 015-129
IRE 020-798
IRE 008-942
IRE 009-325
IRE; 009-703
IRE; 010-929
IRE 017-254
IRE 019-041
IRE 012-979
IRE 017-261
IRE 012-847
IRE 019-931

Liquid Radioactive Release Permits: 70023; 70024

Gaseous Radioactive Waste Release Permits:70037; 70014
Tritium Groundwater Protection Action Plan, Rev 0

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STP-O-27-2, Reactor Coolant System Leakage Evaluation (RCS Leakage), Revision 17
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RM-1-104, Updating the Safety Analysis Report (UFSAR, USAR), and the Technical
Specification Bases (TSB), Revision 9

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IRE-014-572
IRE-017-174
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IRE-021-445
IRE-011-711
IRE-018-411
IRE-018-803
IRE-018-804
IRE-022-285

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STP M-527A-1, Post Accident Monitoring System Channel A Calibration Checks, Revision 7
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STP M-527A-2, Post Accident Monitoring System Channel A Calibration Checks, Revision 6
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STP O-63-1, Remote Shutdown and Post Accident Monitoring Instrument Channel Check,
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CA 01311, Uncertainty Calculation for the CET Indicators and Alarms, Revision 0
CA 01311-0001, Uncertainty Calculation for the CET System, Revision 1
CA 04747-001, Uncertainty Calculation for the Sub-cooled Margin Monitor System, Revision 1
CA 04747-0001, Uncertainty Calculation for the Sub-cooled Margin Monitor System, Revision 0

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12147-0050SH0001, Qualified Replacement In-core Instrument Assembly Unit 1, Revision 0
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60933SH0047, Loop Diagram Reactor Core CETs, Revision 9
62639SH0047, Loop Diagram Reactor CETs, Revision 14
62676SH0001, Instrument Location In-core Instrumentation Map Unit 2, Revision 2
98616SH0001, Loop Diagram Post Accident Monitoring System Channel A, Revision 0
98616SH0002, Loop Diagram Post Accident Monitoring System Channel B, Revision 0

98716SH0001, Loop Diagram Post Accident Monitoring System Channel A, Revision 0
98716SH0002, Loop Diagram Post Accident Monitoring System Channel B, Revision 0

Engineering Service Packages & 50.59 Safety Evaluations

ES199900772, Change Operability Criteria for STP O-063, 7/21/99
SE00366, (For ES19990772-000), Change Operability Criteria for STP O-063, 9/17/99
SE00498, (For ES200500079-000), 50.59 Evaluation for U2C17 Core Reload (2007 RFO),
Revision 1

Operator Training

Unit 2 Cycle 17, Reload Core Design (2007 Refueling Outage)

Operability Determination

RECO for IRE-014-572, Unit 1 Exhibits a CET Reading Temperature Bias of ~ 25°F On
Average, 9/26/06
Operability Evaluation, For Increased Core Bypass Flow (IRE-021-445)

System Description

SD-78B, In-core Instrumentation System, Revision 2
SD-114, Post Accident Monitoring System, Revision 0

Miscellaneous

Constellation Letter, Closure of 3R2006002210 TS Basis 3.3.10 & UFSAR Section 7.5.9.3 Do
Not Reflect the Current Criteria for Operability, 12/8/2006
ES200500079-000, U2C17 Core Reload (2007 RFO)
Technical Specification, Section 3.3.10, Post Accident Monitoring Instrumentation
Technical Specification, Section B.3.3.10, Post Accident Monitoring Instrumentation Bases
UFSAR, Section 7.5.4, In-core Instrumentation
UFSAR, Section 7.5.9, Inadequate Core Cooling Instrumentation
Westinghouse Issue Report, #06-152-W001
Westinghouse Letter, Justification of Past and Continued Operation for Calvert Cliffs 1 Cycle
18: 0.2% Increase In-core Bypass Flow, 3/19/07
Calvert Cliffs Nuclear Power Plant Maintenance Rule Scoping Document, Revision 26
Event Notification 42995
LER 05000318/2006-001, Reactor Trip During Performance of Maintenance Clearance Order,
Revision 1
Risk Informed Inspection Notebook for Calvert Cliffs Nuclear Plant Units 1 and 2, Revision 2.01
Technical Specification, 3/4.4.10, Pressurizer Safety Valves
Technical Specification, 3/4.4.11, Pressurizer Power-Operated Relief Valves

Section 4OA3: Event Followup

Procedures

CNG-HU-1.01-1000, Attachment 3, Prompt Investigation, Revision 1
CNG-HU-1.01-1002, Attachment 2, Pre-Job Brief Checklist, Revision 1
NO-1-117, Att 9 , High Risk Activity Plan 07-05, Revision 18
NO-1-117, Att 9, High Risk Activity Plan 07-11, Revision 18
NO-1-117, Attachment 13, Determination and Processing of Infrequent Tests or Evolutions,
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NO-1-103, Conduct of Lower Mode Operations, Revision 24

NO-1-207, Attachment 23, Minimum Essential Equipment for Unit 2 in Reduced Inventory, Revision 38
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AOP-3B, Abnormal Shutdown Cooling Conditions, Revision 21
AOP-3F, Loss of Offsite Power while in Modes 3, 4, 5 or 6, Revision 12
OP-7 Shutdown Operations, Revision 32
2C09-ALM, ESFAS 22 Alarm Manual, Revision 35
2C10-ALM, ESFAS 23 Alarm Manual, Revision 38

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IRE-021-661
IRE-022-119
IRE-022-121

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62731, Safety Injection & Containment Spray Systems, Revision 79
62730, Chemical and Volume Control System, Revision 54
62729, Reactor Coolant System, Revision 96

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Calvert Cliffs UFSAR Section 7.5.9.4, Reduced Reactor Coolant Inventory, Instrumentation
Various Letters Relating to Generic Letter 88-17 and Associated Control Room Narrative Log
for Period of Interest.
MN-1-110, Attachment PC-1, Procedurally Controlled Temporary Configuration Change Form
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OP-7 Shutdown Operations Recent Revision History
CNG-HU-1.01-1002, Attachment 2, Pre-Job Brief Checklist (As Completed), , Revision 1
Calvert Cliffs Unit Two Refueling Outage 2007 Water Level Script, , Revision 1
OE Time Line for Last Years U-1 Reduced Inv/vacuum Fill of the RCS
NUMARC 91-06, Guidelines for Industry Actions to Assess Shutdown Management
Generic Letter 88-17, Loss of Decay Heat Removal
Information Notice 88-70, Reliance on Water Level Instrumentation with a Common Leg
Work Order #0200700232, RCS Narrow Range Level Monitor

Section 40A5: Other Activities

Repair Replacement Plan 2006-2-022, Installation of the RRVCH on the Unit 2 Reactor Vessel,
dated 2/14/2007
Maintenance Work Order 2200504104, Install New Unit 2 Reactor Vessel Closure Head, step
100, post maintenance testing, VT-2 visual examinations by NDE personnel, dated 3/31/2007
Technical Procedure, Engineering Test Procedure 99-015R, Unit 0, CEDM Performance
Testing, for test dated 4/1/2007, Revision 3
Technical Procedure, Engineering Test Procedure, Unit 2 ETP 06-007, Enhanced Service
Structure Post Modification Test: CEDM Cooler Air Flow Test, Revision 0, for test dated
3/29/2007
ESP Nos. ES200200485/ES200300312, Form 4s, Record of Walkdowns and Form 18,
Modification Turnover Checklist, dated 3/31/2007
Sample of PT and UT Examination Data Sheets for Weld Numbers W75-W135

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
B&PV	Boiler and Pressure Vessel
CAP	Corrective Action Program
CCNPP	Calvert Cliffs Nuclear Power Plant
CEA	Control Element Assembly
CEDM	Control Element Drive Mechanism
CET	Core Exit Thermocouple
CFR	Code of Federal Regulations
CIV	Containment Isolation Valve
CR	Condition Report
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
EOP	Emergency Operating Procedure
EP	Emergency Preparedness
EPRI	Electric Power Research Institute
ESS	Enhanced Service Structure
GL	Generic Letter
HEP	Human Error Probability
ICCDP	Incremental Conditional Core Damage Probability
ICI	In-Core Instrumentation
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IPE	Individual Plant Examination
kV	Kilovolt
LCO	Limiting Condition of Operation
LER	Licensee Event Report
LERF	Large Early Release Frequency
LOAC	Loss of Alternate Current
LOI	Loss of Inventory
LOLC	Loss of Level Control
LOOP	Loss of Offsite Power
LORHR	Loss of Shutdown Cooling
LPSI	Low Pressure System Injection
MFIV	Main Feedwater Isolation Valve
MO	Maintenance Order
MR	Maintenance Rule
MSSV	Main Steam Safety Valve
NCV	Non-Cited Violation
NDE	Non-Destructive Examination
NFPA	National Fire Protection Association
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
ODCM	Offsite Dose Calculation Manual

OI	Operating Instruction
OP	Operating Procedure
PARS	Publicly Available Records
PI	Performance Indicator
PORV	Power Operated Relief Valve
PT	Dye Penetrant
QA	Quality Assurance
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RECO	Reasonable Expectation for Continued Operability
RETS	Radiological Effluent Technical Specification
RFO	Refueling Outage
RG	Regulatory Guide
RHR	Residue Heat Removal
RMS	Radiation Monitoring System
RRVCH	Replacement Reactor Vessel Closure Head
SDP	Significance Determination Process
SE	Safety Evaluation
SGFP	Steam Generator Feed Pump
SORV	Stuck Open Relief Valve
SRA	Senior Risk Analyst
SSC	Structures, Systems, and Components
TRM	Technical Requirement Manual
TS	Technical Specification
TSP	Thimble Support Plate
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
UT	Ultrasonic Testing