

July 21, 2006

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 05000317/2006003 AND 05000318/2006003

Dear Mr. Spina:

On June 30, 2006, the US Nuclear Regulatory Commission (NRC) completed an inspection at your Calvert Cliffs Nuclear Power Plant Units 1 and 2. The enclosed inspection report documents the inspection results, which were discussed on July 12, 2006, with you and other members of your staff.

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

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

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 Samuel L. Hansell For/

Brian McDermott, Chief
Projects Branch 1
Division of Reactor Projects

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

Enclosure: Inspection Report 05000317/2006003 and 05000318/2006003
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. 05000317/2006003 and 05000318/2006003

Licensee: Constellation Generation Group, LLC

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

Location: Lusby, MD

Dates: April 1, 2006 through June 30, 2006

Inspectors: Mark A. Giles, Senior Resident Inspector
Marlone Davis, Resident Inspector
John R. McFadden, Health Physicist
Nancy T. McNamara, EP Inspector
Anne DeFrancisco, Reactor Inspector
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Approved by: Brian McDermott, Chief
Projects Branch 1
Division of Reactor Projects

Enclosure

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SUMMARY OF FINDINGS

IR 05000317/2006-003, 05000318/2006-003; 04/01/06 - 06/30/06; Calvert Cliffs Nuclear Power Plant, Units 1 and 2; Surveillance Testing, Public Radiation Safety.

The report covered a three-month period of inspection by resident inspectors and announced inspections performed by reactor and emergency preparedness inspectors and a health physicist. The inspection identified two Green findings 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 3, dated July 2000.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating System

- Green. The inspectors identified a non-cited violation of 10 CFR 50.55a, Codes and Standards, because Constellation did not establish new reference values or reconfirm the previous reference values following maintenance that affected hydraulic or mechanical parameters on the auxiliary feedwater (AFW) and emergency core cooling system (ECCS) pumps as required by the American Society of Mechanical Engineers (ASME) Operation and Maintenance (OM) Code for inservice testing. Constellation entered this issue into their corrective action program as IRE-014-764. The planned corrective action include a review of maintenance and IST data to determine whether new reference values are needed or reconfirm existing reference values for the AFW and ECCS pumps.

This finding is more than minor because the same issue affected a number of safety-related pumps tested, the issue was repetitive and if left uncorrected the finding could become a more significant safety concern. The finding has a very low safety significance because the condition did not result in an actual failure of the AFW and ECCS pumps or result in systems being declared inoperable for greater than their allowed Technical Specification outage time. A contributing cause of the finding is related to the cross-cutting aspect in the area of problem identification and resolution (PI&R) because Constellation did not periodically trend and assess information to identify programmatic and common cause problems. (Section 1R22)

Cornerstone: Public Radiation Safety

- Green. The inspectors identified a non-cited violation of 10 CFR 20.1501 for failure to make surveys of the radioactivity in a "sink hole" to assure compliance with 10 CFR 20.1301(a)(1) regarding the total effective dose equivalent limit for individual members of the public from licensed operations, specifically regarding assessing dose for batch releases of liquid radioactive waste and assessing

annual dose. Constellation entered this issue into their corrective action program as IRE-010-005. Constellation created a detailed action plan for this issue to find the leaking component, fix the leaking component, determine the extent of contamination, map the plume, and evaluate the need for remediation.

This violation is more than minor because it is associated with the cornerstone attribute of maintaining a program and process to estimate offsite dose due to abnormal releases and to record and report on such releases and because it affected the Radiation Safety/Public Radiation Safety Cornerstone's objective to ensure the adequate protection of public health and safety from exposure to radioactive materials released into the public domain. The violation is of very low significance because, while it did impair Constellation's ability to assess the timing of dose consequence and the accuracy of the batch and annual effluent release dose records and reports due to the large difference in transit times for the permitted and non-permitted discharge pathways to the bay, Constellation did account for all released radioactivity and did assess the cumulative doses from their effluent releases. Additionally, the unanalyzed non-permitted pathway (i.e., via groundwater to the bay) did not impact private property, and the assessed doses did not exceed the dose values in Appendix I to 10 CFR 50. (Section 40A2.4)

B. Licensee-Identified Violations

None

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period in a refueling outage. On April 14, 2006, the unit returned to full power operation (100 percent) and remained unchanged throughout the inspection period.

Unit 2 began the inspection period at 100 percent reactor power and remained unchanged until May 20 when power was reduced to 85 percent for main turbine control valve testing. Following the completion of the test the unit was restored to 100 percent power and remained there the rest of the inspection period.

1. REACTOR SAFETY

Cornerstone: Initiating Events, Mitigating Systems, Barrier Integrity

1R04 Equipment Alignment (71111.04Q - 5 samples)

Partial Walkdown

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 Constellation had properly identified and resolved equipment alignment problems that could cause initiating events or potentially impact the availability of associated mitigating systems. The applicable documents used for this inspection are located in the Attachment. The inspectors performed a partial walkdown for the following activities.

- 13.8kV during internal inspection and testing of the 2H2103 voltage regulator
- 1B emergency diesel generator (EDG) walkdown during maintenance on the 1A EDG
- 4.16kV service transformers during the transfer of the 4kV unit busses from their normal to alternate supply
- Unit 1 service water (SRW) system equipment alignment walkdown during maintenance on the 13 SRW pump breaker
- 21 vital 125 Vdc bus being attached and removed from the 125 Vdc reserve battery

b. Findings

No findings of significance were identified.

Enclosure

1R05 Fire Protection (71111.05Q - 10 samples)Fire Protection - Toursa. Inspection Scope

The inspectors conducted a tour of accessible portions of the ten 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 inspectors also reviewed administrative procedure SA-1-100, Fire Fighting, and the Fire Fighting Strategies Manual were referenced for this inspection activity. The ten areas are as follows:

- Unit 1 main steam isolation valve room
- Unit 2 main steam isolation valve room
- Unit 1 cable spreading room
- Unit 2 cable spreading room
- Unit 1 4 kV service transformers
- Unit 2 4 kV service transformers
- Unit 1 turbine building basement
- Unit 2 turbine building basement
- Unit 1 intake structure (inside)
- Unit 2 intake structure (inside)

b. Findings

No findings of significance were identified.

1R06 Flood Protection (71111.06 - 2 internal flooding samples)a. Inspection Scope

The inspectors reviewed flood protection measures associated with internal flood events. These events were described in the Calvert Cliffs' Engineering Standard on flooding, the Individual Plant Examination (IPE) report and the Updated Final Safety Analysis Report (UFSAR). The inspectors performed a walkdown of the Unit 1 and Unit 2 service water pumps rooms (rooms 226 and 205) which contain risk significant systems and components. The inspectors observed the condition of watertight doors, drain systems and sumps, penetrations in floors and walls, and safety related instrumentation located in these areas. In addition, the inspector reviewed operating procedures and related internal flooding industry operating experience (OE).

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11Q - 1 sample)

a. Inspection Scope

The inspectors observed a licensed operator simulator training scenario conducted on May 18, 2006, in order to assess operator performance and the adequacy of licensed operators training program. The training scenario involved a condensate header rupture that resulted in a loss of main feed event causing the operators to perform a manual reactor trip. Following the trip, equipment failures occurred ultimately resulting in a loss of all feedwater. During this inspection, the inspectors focused on high-risk operator actions performed during implementation of the abnormal and emergency operating procedures, emergency plan (EP) implementation, and classification of the event. The inspectors evaluated the clarity and formality of communications, the implementation 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 supervisor. The inspectors also reviewed simulator fidelity to evaluate the degree of similarity to the actual control room, especially regarding recent control board modifications.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

Quarterly Review (71111.12Q - 2 samples)

a. Inspection Scope

The inspectors reviewed Constellation effectiveness in performing routine maintenance activities. This review included an assessment of Constellation's practices pertaining to the identification, scoping, and handling of degraded equipment conditions, as well as common cause failure evaluations, and the resolution of historical equipment problems. For those systems, structures, and components (SSC) scoped in the maintenance rule per 10 CFR 50.65, the inspectors verified that reliability and unavailability were properly monitored and that 10 CFR 50.65 (a)(1) and (a)(2) classifications were justified in light of the reviewed degraded equipment condition. The inspectors conducted this inspection for the following equipment issues:

- Unit 1 auxiliary feedwater isolation control valves CV-4511 and CV-4512
- 11 condensate storage tank (CST) rupture valve

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 - 8 samples)

a. Inspection Scope

The inspectors reviewed Constellation's assessments concerning the risk impact of removing from service those components associated with the work items listed below. This review primarily focused on activities determined to be risk significant within the maintenance rule. 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, Revision 2, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," and approved station procedures.

The inspectors compared the assessed risk configuration to actual plant conditions to evaluate whether the assessment was accurate and comprehensive. In addition, the inspectors assessed the adequacy of Constellation's identification and resolution of problems associated with maintenance risk assessments and emergent work activities. The inspectors reviewed the following selected work activities:

- 11A service water basket strainer cleaning
- 12 containment air cooler repair (reverse flow in fast speed)
- 21 vital 125 Vdc bus being attached and removed from the 125 Vdc reserve battery
- 13.8kV during internal inspection and testing of the 2H2103 voltage regulator
- 1A emergency diesel generator for planned maintenance
- 22 switchgear Heating Ventilation and Air Conditioning (HVAC) inspection and lubrication
- 23 auxiliary feedwater pump maintenance to replace the breaker hand switch
- 11 and 14 4kV busses during maintenance on the 14 4kV bus normal feeder breaker

b. Findings

No findings of significance were identified.

1R14 Operator Performance During Non-Routine Plant Evolutions and Events
(71111.14 - 2 samples)

a. Inspection Scope

Untrippable Control Element Assembly

The inspectors assessed operator performance associated with a Unit 1 event that involved a misaligned control element assembly (CEA) while performing low power physics testing. On April 8, 2006, at approximately 6:35 p.m., control room operators (CRO) began to insert regulating group 2 after testing groups 5, 4 and 3 with no position anomalies. When regulating group 2 was inserted, the operators received a deviation alarm in the control room. The alarm was due to regulating group 2, CEA #21, stopping and being misaligned with the other CEA's in that group, which was greater than the allowable technical specification deviation. At approximately 6:45 p.m., the Unit 1 CRO entered the Abnormal Operating Procedure AOP-1B, CEA Malfunction, to establish group realignment and maintain reactivity control. A troubleshooting plan was developed and further reactivity controls were performed through dilution and boration of the reactor coolant while the investigation of the misaligned CEA continued. However, the CEA did not respond to initial insertion signal and the electrical traces taken on the drive mechanism during insertion attempts indicated abnormal responses to the lower and upper gripper coil. This prompted the operators to declare CEA #21 untrippable. At 10:45 p.m., the operators exited low power physics testing and then manually tripped the reactor. Although CEA #21 did not insert, the rest of the rods did insert to provide adequate shutdown margin. On April 09, 2006, at approximately 1:20 a.m., Unit 1 was in Mode 3 and the operators had exited AOP-1B.

The inspectors assessed the plant response and conditions specific to the event and evaluated the performance of licensed operators. The inspectors also reviewed control room procedures and operator logs to determine if operators performed the appropriate actions in accordance with their training and established station procedures.

Unit 1 Main Turbine Control Valve Oscillations

The inspectors assessed operator performance associated with a Unit 1 main turbine startup after the installation of a new turbine control system. On April 11, 2006, at 2:30 a.m., Unit 1 main turbine control valves experienced high frequency valve oscillations when the turbine reached 1800 revolutions per minute. The rapid cycling of the control valves created excessive vibrations in the Electro Hydraulic Control (EHC) piping system. This excessive vibration was reported to the control room and the operators immediately tripped and secured the main turbine. When the main turbine was tripped, the vibration of the EHC piping stopped.

The inspectors assessed the plant response and conditions specific to the event, and evaluated the performance of licensed operators. The inspectors also reviewed control room procedures and operator logs to determine if operators performed the appropriate actions in accordance with their training and established station procedures.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15 - 6 samples)a. Inspection Scope

The inspectors reviewed six operability determinations to verify that the operability of systems important to safety were properly established and that affected components or systems remained capable of performing their intended safety function. The inspectors reviewed the selected operability determinations to verify they were performed in accordance with NO-1-106, "Functional Evaluation - Operability Determination," and QL-2-100, "Issue Reporting and Assessment." The following operability evaluations were reviewed:

- 12 containment air cooler repair (reverse flow in fast speed)
- 11, 12, and 13 high pressure safety injection pumps
- 12 containment spray pump overhaul following pump bearing failure
- #21 control element assembly testing
- #8 control element assembly testing
- 12 component cooling water heat exchanger due to saltwater pin hole leak on temperature probe

b. Findings

No findings of significance were identified

1R19 Post-Maintenance Testing (71111.19 - 9 samples)a. Inspection Scope

The inspectors observed and/or reviewed post-maintenance tests associated with the following nine work activities to verify that equipment was properly returned to service and that appropriate testing was specified and conducted to ensure that the equipment was operable and could perform its intended safety function following the completion of maintenance. Post-maintenance testing activities were conducted as specified in station procedure MN-1-101, "Control Of Maintenance Activities." Post-maintenance test results associated with the maintenance activities listed below were reviewed.

- 12 containment air cooler repair (reverse flow in fast speed)
- 12 auxiliary feedwater pump
- #21 control element assembly testing
- Unit 2 main steam safety valve lift settings test
- 13.8kV during internal inspection and testing of the 2H2103 voltage regulator

- 1A emergency diesel generator for after planned maintenance
- Unit 2 containment isolation valves
- 22 switchgear hvac inspection and lubrication
- 23 auxiliary feedwater pump

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22 - 9 samples)

a. Inspection Scope

The inspectors observed and/or reviewed the nine surveillance tests listed below associated with selected risk-significant SSCs to verify TS compliance and that test acceptance criteria was 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 O-8A-1, Test Of 1A DG and 11 4KV bus LOCI sequencer
- STP O-073G-1, HPSI Pump Large Flow Test
- STP O-073L-1, LPSI Pump Large Flow Test
- STP O-073M-1, Containment Spray Flow Test
- STP O-029-1, Monthly CEA Partial Movement
- STP —662-1, Integrated Leak Rate Test Unit 1 Containment
- STP O-5A-1, Auxiliary Feedwater System Quarterly Surveillance Test
- STP O-035-2, Safety Injection Tank Outlet Isolation Valve Test
- STP M-3A-0, On line main steam safety valve testing

b. Findings

Introduction. The inspectors identified a non-cited violation of 10 CFR 50.55a, Codes and Standards, because Constellation did not establish new reference values or reconfirm the previous reference values following maintenance that affected hydraulic or mechanical parameters on the AFW and emergency core cooling pumps.

Description. In May of 2002, the NRC granted Constellation a relief request (PR-12) to perform the inservice testing of the AFW and ECCS pumps in accordance with the 1995 Edition of the American Society of Mechanical Engineers (ASME) Code through the 1996 Addenda of the ASME Operation and Maintenance (OM) Code. The ASME OM Code, Subsection ISTB, requires, in part, that when a reference value or set of reference values that may have been affected by repair, replacement, or routine servicing of a pump, a new reference value or set of values shall be determined or previous values reconfirmed by an inservice test run before declaring the pump operable.

The inspectors identified maintenance activities that would have affected the hydraulic or mechanical characteristics of the AFW and ECCS pumps. However, no new reference values were established or the previous values reconfirmed before declaring the pumps operable. For example, the 12 containment spray (CS) pump was overhauled in May of 2002 and March of 2006 with maintenance activities that affected the hydraulic (larger impeller) and mechanical (thrust bearing) parameters respectively. Subsequent testing performed for the 12 CS pump did not establish new reference values or validate existing values; therefore, Constellation could not demonstrate that the pump performance curve or the mechanical parameters did not change following maintenance activities. Furthermore, a number of the ECCS pumps have exceeded inservice testing (IST) acceptance criteria for their surveillance test procedure. This could be contributed to the fact that new reference values were not established or the existing values reconfirmed after maintenance that affected the hydraulic or mechanical parameters for their IST reference values.

Constellation entered this issue into their corrective action program as IRE-014-764. Additionally, to assess the extent of condition, Constellation conducted a more detailed review of the maintenance performed prior to May 2002 on all the AFW and ECCS pumps. This review will determine whether or not the maintenance activities performed required a new reference value to be developed or if the existing values were valid.

Analysis. The inspectors concluded that a performance deficiency existed because Constellation did not establish new reference values or reconfirm the previous reference values following maintenance that affected hydraulic or mechanical parameters on the AFW and ECCS pumps. The finding is more than minor because the same issue affected a number of pumps tested, the issue was repetitive and if left uncorrected the finding could become a more significant safety concern due to the potential to not detect pump degradation which could impact pump operability. This finding has a very low safety significance because the conditions did not result in an actual failure of the AFW and ECCS pumps or result in systems being declared inoperable for greater than their allowed Technical Specification outage time. The planned corrective actions included a review of maintenance and IST data to determine whether new reference values are needed or if there is a need to reconfirm existing reference values for the AFW and ECCS pumps. The inspectors identified that a contributing cause of this finding was related to the cross-cutting aspect of PI&R because Constellation did not periodically trend and assess information to identify programmatic and common cause problems.

Enforcement. Title 10 of the Code of Federal Regulations (10 CFR), Section 50.55a, Codes and Standards, requires, in part, that testing of safety related pumps meet the requirements of the ASME OM Code. The ASME Code, Subsection ISTB, states that when a reference value or set of reference values that may have been affected by repair, replacement, or routine servicing of a pump, a new reference value or set of values shall be determined or previous values reconfirmed by an inservice test run before declaring the pump operable. Contrary to the above, Constellation did not establish new vibration or hydraulic reference values or reconfirm the previous values were acceptable following maintenance that affected the reference values of the AFW and ECCS pumps. This violation is documented in Constellation's corrective action

program as IRE-014-764 and is being treated as a non-cited violation consistent with Section VI.A.1 of the NRC Enforcement Policy: **NCV 05000317 and 318/2006003-01, Failure to establish appropriate reference values or reconfirm previous values for AFW and ECCS pumps.**

Cornerstone: Emergency Preparedness (EP)

1EP4 Emergency Action Level and Emergency Plan (E-Plan) Changes (71114.04 - 1 sample)

a. Inspection Scope

During the period of September 2005 - February 2006, the NRC received changes made to Constellation Nuclear's E-Plan in accordance with 10 CFR 50.54(q). Constellation Nuclear determined the changes did not decrease the effectiveness of the E-Plan and also that the E-Plan continued to meet the requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50. A selected sample of E-Plan changes were reviewed in-office by the inspector. This review does not constitute approval of the changes and, as such, the changes and the associated 10 CFR 50.54(q) reviews are subject to future NRC inspection. The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 4.

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation (71114.06 - 1 sample)

Simulator Exercises

a. Inspection Scope

The inspectors observed control room simulator training exercises conducted on May 18, 2006, to assess licensed operators' performance in the area of emergency preparedness. This training exercise focused on equipment failures and operator challenges that would typically exist during an anticipated transient without scram (ATWS) and total loss of feedwater event. The required procedural transitions and associated event classification was observed and evaluated by the inspectors.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety (OS)

2OS1 Access Control to Radiologically Significant Areas (71121.01 - 7 samples)

a. Inspection Scope

The inspector reviewed radiological work activities and practices and procedural implementation during observations and tours of the facilities and inspected procedures, records, and other program documents to evaluate the effectiveness of Constellation's access controls to radiologically significant areas. This inspection activity represents the completion of seven (7) samples relative to this inspection area (i.e., inspection procedure sections 02.02.d thru f, 02.03.a, and 02.05.a thru c) and partially fulfills the annual inspection requirements.

Plant Walk Downs and RWP Reviews (02.02.d, e, and f)

During this inspection and the previous 2006 inspection during the Unit 1 refueling outage the inspector reviewed radiation work permits (RWPs) for airborne radioactivity areas with the potential for individual worker internal exposures of greater than 50 millirems Committed Effective Dose Equivalent (CEDE). For these selected airborne radioactive material areas the inspector examined the performance of controls, such as use of containments, ventilation systems, and procedural processes. Also, the inspector discussed with radiation protection personnel their experience with uptakes of radioactive material since the last inspection. The inspector reviewed and assessed the adequacy of Constellation's internal dose assessment for the highest actual internal exposure which was less than 50 millirems CEDE. The inspection also examined Constellation's physical and programmatic controls for highly activated or contaminated materials (non-fuel) stored within spent fuel and other storage pools.

PI&R (02.03.a)

The inspector discussed with Constellation their schedule for self-assessments and audits. The inspector reviewed one recent self-assessment on shutdown source term management. The inspector also examined the plan for a corporate radiological release audit which was scheduled for Calvert Cliffs in the near future. The inspector's review of condition reports in the corrective action program indicated that problems in the occupational radiation safety area were being identified.

High Risk Significant, High Dose Area and Very High Radiation Area (VHRA) Controls (02.05.a, b, and c)

The inspector met with the Radiation Protection Manager (RPM) and discussed high-dose-rate (HDR) high radiation areas and VHRA's and the procedures and controls for these areas. The inspector did not identify any significant procedural changes since the

last inspection which would substantially reduce the effectiveness and level of worker protection. The inspector discussed with several first-line Health Physics (HP) supervisors the controls in place for special areas that have the potential to become VHRA's during certain plant operations. Also, during tours inside the radiologically controlled area during this and the previous inspection, the inspector verified adequate posting and locking of selected entrances to HDR high radiation areas and VHRA's.

Related Activities

The inspector performed a selective examination of documents (as listed in the List of Documents Reviewed section) to evaluate the adequacy of radiological controls.

The review in this area was against criteria contained in 10 CFR 19.12, 10 CFR 20 (Subparts D, F, G, H, I, and J), Technical Specifications, and procedures.

b. Findings

No findings of significance were identified.

2OS2 As Low As Reasonably Achievable (ALARA) Planning and Controls (71121.02 - 6 samples)

a. Inspection Scope

The inspector reviewed the effectiveness of Constellation's program to maintain occupational radiation exposure ALARA. This inspection activity represents the completion of six (6) samples relative to this inspection area (i.e., inspection procedure sections 02.01.a, c, and d, 02.02.c, and 02.03.a and b) and partially fulfills the biennial inspection requirements.

Inspection Planning (02.01.a, c, and d)

The inspector reviewed pertinent information regarding plant collective exposure history, current exposure trends, and ongoing or planned activities in order to assess current performance and exposure challenges. The inspector determined the plant's current 3-year rolling average collective exposure. The inspector examined the source term measurements which Constellation had collected for trending purposes. Additionally, the inspector reviewed the site specific procedures associated with maintaining occupational exposures ALARA. These procedures covered the processes used to estimate and track work activity specific exposures.

Radiological Work Planning (02.02.c)

The inspector compared selected person-rem results achieved during the recent Unit 1 refueling outage with the estimated doses established in Constellation's ALARA planning for these work activities. The inspector selected the refueling outage tasks with the highest person-rem results and/or with the largest inconsistencies between intended

and actual work activity doses. For the selected jobs the inspector reviewed documentation and discussed the results with ALARA personnel to determine the reasons for the inconsistencies.

Verification of Dose Estimates and Exposure Tracking Systems (02.03.a and b)

The inspector reviewed the assumptions and basis for the current annual collective exposure estimate. Also, the inspector discussed Constellation's methodology for estimating work-activity-specific exposures and the intended dose outcomes with ALARA personnel. The inspector evaluated both the dose rate and man-hour estimates for reasonable accuracy. The inspector also reviewed Constellation's method for adjusting exposure estimates, or re-planning work, when unexpected changes in scope or emergent work are encountered in order to determine if adjustments to estimated exposure (intended dose) were based on sound radiation protection and ALARA principles.

Related Activities

The inspector performed a selective examination of documents (as listed in the List of Documents Reviewed section) for regulatory compliance and for adequacy of control of radiation exposure.

The review was against criteria contained in 10 CFR 20.1101 (Radiation protection programs), 10 CFR 20.1701 (Use of process or other engineering controls) and procedures.

b. Findings

No findings of significance were identified.

2OS3 Radiation Monitoring Instrumentation and Protective Equipment (71121.03 - 3 samples)

a. Inspection Scope

The inspector reviewed the program for health physics instrumentation and protective equipment to determine the accuracy and operability of the instrumentation and equipment. This inspection activity represents the completion of three (3) samples relative to this inspection area (i.e., inspection procedure sections 02.04.a and 02.06.a and b) and partially fulfills the biennial inspection requirements.

PI&R (02.04.a)

The review of internal exposures was accomplished during the inspection activity documented in Section 2OS1 (02.02.e).

Self-Contained Breathing Apparatus (SCBA) Maintenance and User Training (02.06.a and b)

The inspector reviewed the status and surveillance records of SCBA staged and ready for use in the plant. Also, the inspector examined Constellation's capability for refilling and transporting SCBA air bottles to and from the control room and operations support center during emergency conditions. The inspector conducted an examination of records and had discussions with cognizant personnel to determine that control room operators and other emergency response and radiation protection personnel (assigned in-plant search and rescue duties or as required by Emergency Operating Procedures (EOP) or the EP) were trained and qualified in the use of SCBA (including air bottle change-out). The inspector also determined that personnel assigned to refill bottles were trained and qualified for that task. The inspector determined that only personnel who possessed manufacturer-certified training/qualifications were allowed to perform maintenance and repairs on SCBA components vital to the unit's function. The inspector reviewed selected records for the testing and maintenance of these SCBA components and checked for the required, periodic hydrostatic testing and marking for a number of air bottles.

Related Activities

The inspector performed a selective examination of documents (as listed in the List of Documents Reviewed section) for regulatory compliance and adequacy.

The review was against criteria contained in 10 CFR 20.1501, 10 CFR 20 Subpart H, Technical Specifications (TS), and procedures.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES (OA)40A1 Performance Indicator Verification (71151 - 8 samples)a. Inspection Scope

The inspectors reviewed Constellation's program to gather, evaluate and report information on the following four performance indicators (PIs). The inspectors used the guidance provided in NEI 99-02, Revision 3, "Regulatory Assessment Performance Indicator Guideline" to assess the accuracy of Constellation's collection and reporting of PI data for the period April 2005 through March 2006. The inspectors reviewed licensee

event reports (LERs), monthly operating reports, Calvert Cliffs Nuclear Power Plant (CCNPP) power history charts, NRC inspection reports, and operator narrative logs.

- Unit 1 and 2 Unplanned Scrams per 7000 Critical Hours
- Unit 1 and 2 Unplanned Scrams with Loss of Normal Heat Removal
- Unit 1 and 2 Unplanned Power Changes per 7000 Critical Hours
- Unit 1 and 2 Safety System Functional Failures

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems

.1 Corrective Action Review by Resident Inspectors

a. Inspection Scope

Continuous Review

The inspectors performed a daily screening of items entered into Constellation's corrective action program as required by Inspection Procedure 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. It was accomplished by reviewing each issue report and attending screening meetings, and accessing Constellation's computerized database.

.2 Semi-Annual PI&R Review

The inspectors performed an in-depth, semi-annual, PI&R review of Constellation documents written from January 2006 through June 2006 to verify that Constellation is identifying issues at the appropriate threshold, entering them into the corrective action program, and ensuring that there are no significant adverse trends outside of the corrective action program which would indicate the existence of a more significant safety issue.

The inspectors reviewed Constellation PIs, self-assessment reports, quality assurance audit/surveillance reports, corrective action reports, and system health reports and compared the results of the review with results reported in the NRC baseline inspection program. Additionally, the inspectors evaluated the reports against the requirements of the Constellation Nuclear's CAP as delineated in QL-2, "Self-Assessment/Corrective Action Program."

b. Findings

No findings of significance were identified.

.3 Identification and Resolution of Problems - Occupational Radiation Safety (71121.01, .02, and .03)

a. Inspection Scope

The inspector selected three issues identified in the CAP for review (i.e., Issue Report (IR) Nos. IRE-012-638, -012-716, and -013-639). The issues were associated with radiography boundaries, intermittent tele-dosimetry contact, and the year-end collective radiation exposure goal, respectively. The documented reports for the issues were reviewed to determine whether the full extent of the issues was identified, an appropriate evaluation was performed, and appropriate corrective actions were specified and prioritized.

b. Findings

No findings of significance were identified.

.4 Annual sample review - Elevated Levels of Tritium Found in #11 Piezometer Tube

a. Inspection Scope

The inspectors selected the issue of elevated levels of tritium found in a groundwater sample collected on Calvert Cliffs site property for a detailed review. Routine annual groundwater samples from four piezometer tubes (40 to 50 feet deep) were collected on December 3, 2005. Three of the four samples did not indicate any radioactivity. Samples from #11 piezometer tube, however, indicated 1800 picocuries per liter (pCi/l) of tritium in the groundwater. No gamma-emitting radioactivity was detected in any samples. The previous annual samples for these four tubes did not identify any plant-related radioactivity. Issue Report (IR) IRE-010-005 was written to identify this issue, and the NRC was notified. The IR was categorized as requiring an apparent causal evaluation. The last sample for #11 piezometer tube, which measured positive for tritium, was taken on December 21, 2005. Monthly samples since then have not indicated any plant-related radioactivity.

During this inspection, the inspectors discussed this issue with cognizant personnel and reviewed the following:

- the Action Plan for Tritium in Groundwater (Updated as of April 17, 2006),
- the positive sample results for #11 piezometer tube,
- the negative sample results from the thirteen onsite deep wells (approximately 460 feet) available for supplying site drinking water and makeup water, from the onsite storm drains, from the onsite subsurface drains (SSDs), and from the piezometer tubes (other than #11),

- the input to the 10 CFR 50.75(g) file,
- OE21958 - low levels of tritium found in groundwater at Calvert Cliffs,
- the Tritium and Generic Implications Presentation prepared for the site's Nuclear Safety Review Board, and
- the Corporate Radiological Release Audit Project Plan.

b. Findings

Introduction. A Green Non-Cited Violation (NCV) was identified for failure to make surveys of the radioactivity in a large "sink hole" in order to make an evaluation in accordance with 10 CFR 20.1501(a) to assure compliance with 10 CFR 20.1301(a)(1) regarding the total effective dose equivalent limit for individual members of the public from the licensed operations.

Description. Routine annual liquid samples from four piezometer tubes (40 to 50 feet deep) were collected on December 3, 2005. These piezometer tubes were installed during the site hydrology study prior to plant construction. Their purpose was for measurement of ground water depth at the site. A piezometer consists of a small-diameter steel pipe equipped with a well point or perforated PVC pipe. Three of the four liquid samples indicated no activity. Multiple samples from #11 piezometer tube, however, indicated 1800 picocuries per liter (pCi/l) of tritium in the groundwater. For comparison, these sample results are below the Environmental Protection Agency's drinking water standard for tritium which is 20,000 pCi/l. No gamma-emitting radioactivity was detected in any samples. The previous annual samples for these four tubes did not identify any plant-related radioactivity. IR IRE-010-005 was written to identify this issue and the NRC was notified. The IR was categorized as requiring an apparent causal evaluation. The last sample for #11 piezometer tube, which measured positive for tritium, was taken on December 21, 2005. Monthly samples since then have not indicated any plant-related radioactivity.

Upon identification of this issue Constellation recognized the need to investigate the source of the tritium and effect corrective actions. Their documented action plan for this issue (updated as of April 17, 2006) included multiple stages, including finding the leaking component, fixing the leaking component, determining the extent of contamination, mapping the plume, and evaluating the need for remediation. The plan included 36 action items, each with an assigned responsible individual and with an estimated completion date. Action items which have been initiated included increasing the number of sampling points and sampling frequencies for groundwater monitoring, contracting for the services of an experienced hydrologist/geologist for consultation, attempting to "age" the tritium samples, and obtaining site drawings showing the location and arrangement of building foundations, tanks, pools, and underground piping to evaluate systems as potential sources of the tritium.

As of January 3, 2006, the investigation indicated that a previously-ruptured, underground pipe, plugged in 2001, was partially or wholly responsible for the tritium contamination. By design, the circulating water discharge conduits (CWDCs) accept normal, permitted, liquid radioactive waste discharges and dilute the liquid waste prior to

discharges to the Chesapeake Bay. At a point downstream of the liquid radioactive waste connection to the CWDC #22, this conduit, by design, was connected to a subsurface drain (SSD) system by a section of underground piping. This piping connection allowed circulating water (containing tritium) to enter the SSD system (essentially a large, industrial French drain) and the circulating water (saltwater) corroded the metal piping connection to the French drain. The corroded section of underground piping to the French drain allowed a pathway for circulating water to leak to the soil approximately 50 feet from # 11 piezometer tube. The circulating water leakage washed out soil in that area which eventually resulted in a large "sink hole" that opened and revealed itself on February 26, 2001. This "sink hole" was oval-shaped, measured approximately 6 feet by 4 feet in cross-section and approximately 11 feet deep, and required 800 cubic feet of dirt to fill. To stop the circulating water from entering the corroded section of underground piping to the French drain, the connection to the CWDC #22 was plugged in April of 2001.

As of April 20, 2006, the station is still continuing actions to verify that there are no additional sources contributing to this contamination to determine the extent of contamination and to map the plume. Also, the station is currently evaluating the need to drill additional monitoring wells. The investigation is ongoing.

Based on the above and only assessing the time period from December 3, 2005, to the present time the station's problem identification, classification, and prioritization of this issue and the identification of needed corrective actions appear timely and adequate for this point in their investigation. Constellation's action plan acknowledged that there were further evaluations and actions which still needed to be completed.

However, during the time period from the appearance of the "sink hole" to the plugging of the underground pipe connection to CWDC #22 and the backfill of the "sink hole," no radiation surveys of the contents of the "sink hole" were performed to ascertain the nature and extent of radioactive contamination or the possibility of a ground water plume. This was the case even though the "sink hole" was created by the action of circulating water containing radioactive material from routine, permitted, plant discharges of liquid radioactive waste. Thus, such a survey would have been reasonable and appropriate under the circumstances. Thus, for an unknown period of time, some portions of routine permitted liquid radioactive waste discharges to CWDC #22 were inadvertently released on site into the ground instead of being released as planned and permitted into the Chesapeake Bay. Based on information in Section 2.5, Hydrology, of the site's Undated Final Safety Analysis Report (UFSAR), these portions would flow to the bay via shallow groundwater flow (i.e., a non-permitted pathway) within the site's boundaries; the transit time for groundwater flow to the bay is much longer than that for permitted discharges via the CWDC which transit time is a matter of seconds or minutes.

Analysis. The performance deficiency was that no radiation surveys of the contents of the "sink hole" were performed. This was a violation of 10 CFR 20.1501 and is more than minor because it is associated with the cornerstone attribute of maintaining a program and process to estimate offsite dose due to abnormal releases and to properly report such releases, and because it affected the Radiation Safety/Public Radiation

Safety Cornerstone's objective to ensure the adequate protection of public health and safety from exposure to radioactive materials released into the public domain. This finding did not meet the criteria for traditional enforcement. Using Manual Chapter 0609, Appendix D, the Public Radiation Safety Significance Determination Process (SDP), it was determined that this violation did not involve the radioactive material control or environmental monitoring program branches but did involve the SDP's radioactive effluent release program branch. Further, it was determined that this violation was of very low significance based on the fact that while it did impair Constellation's ability to assess the timing of dose consequence and the accuracy of the batch and annual effluent release dose records and reports due to the large difference in transit times for the permitted and non-permitted discharge pathways to the bay, Constellation did account for all released radioactivity and did assess the cumulative doses from their effluent releases. Additionally, the violation is of very low significance because the involved radioactivity had been addressed in Constellation permits prior to release, the unanalyzed non-permitted pathway (i.e., via groundwater to the bay) did not impact private property, and the dose consequences would not differ significantly from those calculated in Constellation's release permits, and the assessed doses did not exceed the dose values in Appendix I to 10 CFR 50. Therefore, the finding is Green.

Enforcement. 10 CFR 20.1501 requires that each licensee make or cause to be made surveys that may be necessary for Constellation to comply with the regulations in Part 20 and that are reasonable under the circumstances to evaluate the extent of radiation levels, concentrations or quantities of radioactive materials, and the potential radiological hazards that could be present. Contrary to the above, as of February 26, 2001, Constellation did not make surveys to assure compliance with 10 CFR 20.1301(a)(1) regarding the dose limit for individual members of the public from licensed operations. Specifically, for an unknown period of time, some portions, of routine permitted liquid radioactive waste discharges to CWDC #22, were inadvertently released into the ground instead of being released as planned and permitted into the Chesapeake Bay. Based on information in Section 2.5, Hydrology, of the site's UFSAR, these portions would flow to the bay via shallow groundwater flow (i.e., a non-permitted pathway) within the site's boundaries. The transit time for groundwater flow to the bay is much longer than that for permitted discharges via the CWDC's which transit time is a matter of seconds or minutes and Constellation did not accurately assess, record, and report the annual dose to individual members of the public during that time period. Because this failure to meet a survey requirement is of very low safety significance and has been entered into the corrective action program (CAP) Condition Report (CR) IRE-014-244, this violation is being treated as a Non-Cited Violation (NCV), consistent with Section VI.A of the NRC Enforcement Policy: **NCV 05000317, 05000318/2006003-02, Failure to perform an adequate survey for radioactivity.**

4OA3 Event Followup(Closed) LER 05000317/2006-002 Control Element Assembly Determined to be Untrippable

On April 8, 2006, while performing low power physic testing, CEA 21 stopped inserting at approximately 134 inches. Upon further attempts to troubleshoot the situation, CEA 21 was determined to be untrippable. Operators then commenced a shutdown and placed the unit in Mode 3 in accordance with station procedures and TS Limiting Condition for Operation (LCO) 3.1.4.F. Following the shutdown, testing was performed on CEA 21 and all other CEAs. The LER was reviewed by the inspectors and no findings of significance were identified, and no violation of NRC requirements occurred. Constellation documented the event in their corrective actions program as IRE-013-755. This LER is closed.

4OA5 Other ActivitiesImplementation of Temporary Instruction (TI) 2515/165 - Operational Readiness of Offsite Power and Impact on Plant Riska. Inspection Scope

The objective of TI 2515/165, "Operational Readiness of Offsite Power and Impact on Plant Risk," was to gather information to support the assessment of nuclear power plant operational readiness of offsite power systems and impact on plant risk. The inspectors evaluated Constellation procedures against the specific offsite power, risk assessment and system grid reliability requirements of TI 2515/165. They also discussed the attributes with Constellation personnel.

The information gathered while completing this TI was forwarded to the Office of Nuclear Reactor Regulation for further review and evaluation.

b. Findings

No findings of significance were identified.

.2 4R01 Reactor Vessel Head Replacement Inspection (71007 - 1 sample)a. Inspection Scope

The scope covers onsite and in-office review of post-installation, testing and storage activities that occurred during the refueling outage.

Post-Installation Testing

Post-installation verification and testing inspections were reviewed in the following areas:

- Constellation's post-installation inspections and verifications program and its implementation.
- The conduct of reactor coolant system leakage testing and review the test results.
- The procedures for equipment performance testing required to confirm the design and to establish baseline measurements and the conduct of testing.
- Compliance with regulatory requirements including the incorporation of inservice inspection requirements of 10 CFR 50.55a (g).
- Adherence to and reconciliation of code requirements.

Specifically, the inspector reviewed Constellation's inspection results for component alignment, cleanliness, foreign material exclusion (FME) and parts inventory for the new reactor head and enhanced service structure, as documented in the "Post Construction Record of Walkdown," and discussed the walkdown with knowledgeable members of plant staff. In addition, the results of several types of tests conducted at the conclusion of the outage were reviewed by the inspector, including: the polar crane post maintenance testing (mechanical and non-destructive examination (NDE), control rod drop time tests, and visual testing (VT-2) performed on the reactor coolant system (RCS) to confirm no leakage was observed.

Storage

The inspector directly observed the storage package on the old head and the security barriers present at the storage location. The radiological surveys taken for contact and general area dose rates were reviewed. The inspector verified that access to the storage area was properly controlled and did not create the potential for an unmonitored effluent release pathway and that external radiation levels at the perimeter would be below applicable limits, and dose rates at the perimeter were below applicable limits.

TSP Modifications

The last report referenced Constellation's efforts to align the new thimble support plate (TSP) onto the upper guide structure in the vessel. Constellation documented a condition report on the installation process in their corrective action program (IRE-012-607). During the third phase of onsite inspection the inspector reviewed an independent assessment of whether the modifications to the TSP could affect design basis structural analysis and loading conditions. The inspector also reviewed FME controls implemented during the outage while the TSP was being modified, as well as the operational decision making checklist. At the time of the inspection exit, Constellation was compiling design and condition report information to incorporate into a root cause report and determine the applicability of these issues to the upcoming TSP replacement planned for Unit 2.

Enclosure

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

Exit Meeting Summary

On July 12, 2006, the resident inspectors presented the inspection results to yourself 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. Adams, Constellation, TSP Engineering/Installation
R. Conatser, Chemist
B. Dansberger, Health Physics Work Leader (Materials Processing Facility)
S. Etnoyer, Plant Health Physicist
H. Evans, Health Physics Work Leader (Dosimetry)
J. Johnson, Engineering Analyst
V. Johnson, Health Physics Technician
G. Joy, Training, Fire Brigade SCBA
G. Khouri, Component Replacement Engr
T. Kirkham, Health Physics Supervisor (Operations)
T. Konerth, Fab PM/Project Engineer
W. Lankford, Operations, Fire Brigade
J. Lenhart, Health Physics Work Leader (Operations)
P. Lombardi, Maintenance
K. Prescott, Admin assist
J. Remenuik, ESS Task Manager/P.E., PMP
I. Rice, Health Physics Technician
E. Roach, General Supervisor of Health Physics
G. B. Rudell, Engineering Programs.Quinn, Installation TM
J. Branyan, Functional Surveillance Test Coordinator
M. Flaherty, Engineering Services Manager
L. Larragoite, Constellation Licensing Director
D. Bauder, Operations Manager
A. Simpson, Sr. Licensing Engineer
M. Stanley, Operations, Fire Brigade
D. Taylor, Administrative Assistant
B. Tench, Acting Director, RVH Project
L. Williams, System Manager
M. Yox, Engineering Analyst

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened and Closed

05000317-318/2006003-01	NCV	Failure to establish appropriate reference values or reconfirm previous values reference values for the AFW and ECCS pumps (Section 1R22)
05000317-318/2006003-02	NCV	Failure to perform an adequate survey for radioactivity (Section 4OA2)

Closed

05000317/2006-002	LER	Control Element Assembly Determined to be Untrippable (section 4OA3)
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LIST OF DOCUMENTS REVIEWED

Section 1R04: Equipment Alignment

13.8kV during internal inspection and testing of the 2H2103 voltage regulator

Maintenance Order (MO) 2200401489
 Operating Instruction (OI) 27B, 13.8 kV System
 Drawing 61001SH001
 Clearance Order 2200500173
 Clearance Order 2200500602

1B emergency diesel generator (EDG) walkdown during maintenance on the 1A EDG

Operating Instruction (OI) 21B-1, 1B Diesel Generator

4.16kV service transformers

Maintenance Order (MO) 1200503371
 Operating Instruction (OI) 27C, 4.16 kV System

13 SRW pump breaker equipment alignment

Operating Instruction (OI) 15-1, Service Water System
 Maintenance Order (MO) 1200501844
 Drawing 61080SH0003

21 vital 125 Vdc bus being attached and removed from the 125 Vdc reserve battery

Operating Instruction (OI) 26A, 125 Volt Vital DC System

Maintenance Order (MO) 2200502563

Section 1R05: Fire Protection

IRE-013-795

Calvert Cliffs UFSAR Section 9.9, CCNPP Fire Protection Program, Rev. 37
FP-00002, Fire Hazards Analysis Summary Document, Rev. 0

Section 1R06: Flood Protection Measures

ES-001, Flooding, Rev. 2

Calvert Cliffs Nuclear Power Plant Probabilistic Risk Assessment Individual Plant Examination
Summary Report, dated December 1993

AOP-7A, Unit 1 Loss of Saltwater Cooling, Rev. 14

AOP-7A, Unit 2 Loss of Saltwater Cooling, Rev. 12

OI-29, Unit 2 Saltwater System, Rev. 52

OI-45, Unit 2 Service Water System, Rev. 44

Information Notice No. 83-44, Supplement 1: Potential Damage to Redundant Safety Equipment
as a Result of Backflow Through the Equipment and Floor Drain System, dated 8/30/90

Information Notice No. 83-44: Potential Damage to Redundant Safety Equipment as a Result of
Backflow Through the Equipment and Floor Drain System, dated 7/1/83

Section 1R11: Licensed Operator Requalification Program

Licensed Operator Requalification Training Program Manual

OP-24, Simulator Operating Examination for the Licensed Operator Training Program at the
Calvert Cliffs Nuclear Power Plant

Section 1R12: Maintenance Effectiveness

Unit 1 auxiliary feedwater isolation control valves CV-4511 and CV-4512

IRE-015-024

Maintenance Order (MO) 1200602819

STP O-5A-1, Auxiliary Feedwater System Quarterly Surveillance Test

11 condensate storage tank rupture valve

IRE-009-227

Maintenance Order (MO) 1200504137

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

11A service water basket strainer cleaning:

Maintenance Order (MO) 1200504373
Maintenance Order (MO) 1200504765
Maintenance Order (MO) 1200503808
Maintenance Order (MO) 1200603151
IRE-015-188

12 containment air cooler repair (reverse flow in fast speed):

IRE-014-186, U1 containment temperature is relatively high for this time of year
10CFR50.59/10CFR72.48 screening form, dated 8/15/2001
Drawing 61076SH0011D, Schematic Diagram Containment Cooling Fan 12
Containment temperature profile graphs (4/28/06 - 5/4/06)
MN-1-110, Troubleshooting control form, dated 5/10/06

21 vital 125 Vdc bus being attached and removed from the 125 Vdc reserve battery

Maintenance Order (MO) 2200502563
STP M 552-2, 21 Station Battery Service Test

13.8kV internal inspection and testing of the 2H2103 voltage regulator

Maintenance Order (MO) 2200401489
Operating Instruction (OI) 27B, 13.8 kV System
Drawing 61001SH001
Clearance Order 2200500173
Clearance Order 2200500602

1A emergency diesel generator for planned maintenance

IRE-014-223
Maintenance Order (MO) 1200602153
Maintenance Order (MO) 1200500480
Maintenance Order (MO) 1200504037
Maintenance Order (MO) 1200504044
Maintenance Order (MO) 1200504093

22 switchgear hvac inspection and lubrication

Performance Evaluation (PE) 2-023-02-0-M
Maintenance Order (MO) 2200504655

Maintenance Order (MO) 2200504679
Maintenance Order (MO) 2200501668

23 auxiliary feedwater pump maintenance to replace the breaker hand switch

Maintenance Order (MO) 220043186
Clearance Order 2200600130
Drawing 61087SH0010A

11 and 14 4kV busses during maintenance on the 14 4kV bus normal feeder breaker

Maintenance Order (MO) 1200503371
Operating Instruction (OI) 27C, 4.16 kV System
Drawing 61052SH0004

Section 1R15: Operability Evaluations

12 containment air cooler repair (reverse flow in fast speed):

IRE-014-186
10CFR50.59/10CFR72.48 screening form, dated 8/15/2001
Drawing 61076SH0011D, Schematic Diagram Containment Cooling Fan 12
Containment temperature profile graphs (4/28/06 - 5/4/06)
MN-1-110, Troubleshooting control form, dated 5/10/06

#21 control element assembly testing

Operability Determination (OD) 06-002
License Event Report (LER) 2006-002
PSTP-02, Initial Approach to Criticality and Low Power Physics Testing, Rev.
AOP-1B, Control Element Assembly (CEA) Malfunctions, Rev.
Maintenance Order (MO) 1200601808
IRE-013-755

Section 1R19: Post-Maintenance Testing

12 containment air cooler repair (reverse flow in fast speed):

IRE-014-186, U1 containment temperature is relatively high for this time of year
10CFR50.59/10CFR72.48 screening form, dated 8/15/2001
Drawing 61076SH0011D, Schematic Diagram Containment Cooling Fan 12
Containment temperature profile graphs (4/28/06 - 5/4/06)
MN-1-110, Troubleshooting control form, dated 5/10/06

Section 1R22: Surveillance Testing

HPSI Pump Large Flow Test

IRE-011-980
IRE-011-986
IRE-011-991
(ES) 2004000048-000

LPSI Pump Large Flow Test

IRE-014-764

Containment Spray Flow Test

IRE-014-764

Monthly CEA #21 Partial Movement

IRE-013-755
Tech Spec 3.1.4

Integrated Leak Rate Test Unit 1 Containment

Maintenance Order (MO) 1200404741
Integrated Leak Rate Outage Plan 2006

Auxiliary Feedwater System Quarterly Surveillance Test

IRE-015-024
Maintenance Order (MO) 1200602819

Safety Injection Tank Outlet Isolation Valve Test

IRE-014-969
Maintenance Order (MO) - 2200602819

Section EP4: Emergency Action Level and Emergency Plan (E-Plan) Changes

Calvert Cliffs Emergency Plan and Implementing Procedures

Section 2OS1: Access Control to Radiologically Significant Areas

Procedure RSP-1-101, Rev. 22, Routine radiological surveys
Procedure RSP-1-106, Rev. 10, Special work permit administration
Procedure RSP-1-117, Rev. 11, Issuance and wearing of respiratory protection

devices used to protect against airborne radioactivity
Procedure RSP-1-132, Rev. 9, Job coverage in radiologically controlled areas
Focused self-assessment on shutdown source term management at Calvert Cliffs

Section 2OS2: ALARA Planning and Controls

Procedure RP-1-100, Rev. 8, Radiation Protection
Procedure RSP-1-200, Rev. 22, ALARA planning and SWP preparation
ALARA packages for SWPs
20061351, Rev. 2, Demolish thimble support pate/guide tubes
20061358, Rev. 0, Surface destruction activities to remove interference
from new TSP
20061373, Rev. 0, Remove TSP cut up station
20061420, Rev. 2, Half nozzle replacements on the reactor coolant
system hot legs
20061423, Rev. 2, Mechanical stress improvement process

Section 2OS3: Radiation Monitoring Instrumentation and Protective Equipment

Procedure RSP-2-301, Rev. 14, Respiratory protection device maintenance
Procedure RSP-2-304, Rev. 0, Operation of the Bauer breathing air compressor
Procedure OI-20A, Rev. 12, Fire protection performance evaluations and fire
system inspections

Section 4OA2: Identification and Resolution of Problems (paragraph 02.02 - Selected Issue Follow-up Inspection)

Action Plan for Tritium in Groundwater (Updated as of April 17, 2006),
OE21958 - Low Levels of Tritium Found in Groundwater at Calvert Cliffs,
Tritium and Generic Implications Presentation prepared for the site's Nuclear
Safety Review Board, and
Corporate Radiological Release Audit Project Plan.
Procedure CP-224, Rev. 13, Monitoring radioactivity in systems normally
uncontaminated
Procedure CP-501, Rev. 10, Liquid and steam sampling techniques
Procedure QL-2-100, Rev. 20, Corrective Action Program

Section 4OA5: Other Activities

Implementation of Temporary Instruction (TI) 2515/165 - Operational Readiness of Offsite
Power and Impact on Plant Risk

AOP-7M, "Major Grid Disturbances", Rev 1
OAP 91-09, "Communications for Load Reduction or Outage"
OAP 94-5, "Guidelines for Nuclear Plant Operations Support for Electric System Operation and
Planning Department", Rev 10
OCP--3, "Planning and Scheduling", Rev 0

Operations Coordination and Interconnection Agreement between Baltimore Gas and Electric Company and Constellation Power Source Generation, INC., May 1 2003
NO-1-117, "Integrated Risk Management", Rev 15

4R01Reactor Vessel Head Replacement Inspection

Post-Installation Testing:

MO# 1200404115, Containment Polar Crane 180/25 TON/Periodic Inspection
CCNPP Technical Procedure HE-05
CCNPP Technical Procedure HE-55
Visual Examination for Leakage(VT-2), Report No. CC06-BV-079
CCNPP Technical Procedure, ETP99-015R, U0, CEDM Performance Testing, Rev. 3, for test dated 4/7/06
ESP No. ES200200485/ES200300312, various supplements, Form 4, Record of Walkdown

Storage:

Storage of U-1 Old Reactor Vessel Head (ORVH), Map Rev. 0

TSP Modifications:

Presentation, RV TSP 2006 RFO Modification Summary
MPR Associates Inc., April 4, 2006 letter to Constellation Energy Group, Calvert Cliffs Unit 1
Closeout Letter for Independent Review of Thimble Support Plate Modifications
Constellation letter, 3/31/2006, Exemption of Class B Requirements for the RCS
Operational Decision-Making Checklist, RFO IRT Issues/Hot Particles and FME
Procedure Field Change Request, Field Change No. FCR-013, Traveler for Installation of the
Replacement TSP and Thimble at Calvert Cliffs

Condition Reports:

IRE-012-607
IRE-012-644
IRE-012-737
IRE-013-293
IRE-012-917
IRE-011-923

Other:

Calvert Cliffs UFSAR, Table 4-2, Reactor Vessel Parameters
AREVA Letter of Qualification Waiver, 3/10/2006

LIST OF ACRONYMS

ADAMS	Agencywide Documents Access and Management System
ASME	American Society of Mechanical Engineers
AFW	Auxiliary Feedwater
ALARA	As Low As Reasonably Achievable
AOP	Abnormal Operating Procedure
ATWS	Anticipated Transient Without Scram
CAP	Corrective Action Program
CCNPP	Calvert Cliffs Nuclear Power Plant
CEA	Control Element Assembly
CEDE	Committed Effective Dose Equivalent
CEDM	Control Element Drive Mechanism
CFR	Code of Federal Regulations
CR	Condition Report
CRO	Control Room
CS	Containment Spray
CWDC	Circulating Water Discharge Conduit
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
EHC	Electro Hydraulic Control
EOP	Emergency Operating Procedure
EP	Emergency Preparedness
EP	Emergency Plan
E-Plan	Emergency Plan
FME	Foreign Material Exclusion
HDR	High Dose Rate
HP	Health Physics
HVAC	Heating, Ventilation, and Air Conditioning
IMC	Inspection Manual Chapter
IPE	Individual Plant Examination
IR	Issue Report
IST	InService Testing
LER	Licensee Event Report
LCO	Limiting Condition Operation
NCV	Non-Cited Violation
NDE	Non Destructive Examination
NRC	Nuclear Regulatory Commission
OA	Other Activities
OM	Operation and Maintenance
ORVH	Old Reactor Vessel Head
OS	Occupational Safety
PARS	Publicly Available Records
PI	Performance Indicators
PI&R	Problem Identification & Resolution
pCi/l	Pico-curies per Liter

RCS	Reactor Coolant System
RPM	Radiation Protection Manager
RWP	Radiation Work Permit
SCBA	Self-Contained Breathing Apparatus
SDP	Significance Determination Process
SRW	Service Water
SSC	Systems, Structures, and Components
SSD	Sub-Surface Drain
TI	Temporary Instruction
TSP	Thimble Support Plate
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report
VHRA	Very High Radiation Area