



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
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November 09, 2009

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 05000317/2009004 AND 05000318/2009004

Dear Mr. Spina:

On September 30, 2009, 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 October 14, 2009, with you and other members of your staff.

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

This report documents one NRC-identified finding of very low safety significance (Green). This finding was determined to involve a violation of NRC requirements. However, because the finding is of very low safety significance and because it is entered into your corrective action program (CAP), the NRC is treating this finding as a non-cited violation (NCV) consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest any NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region 1, the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Calvert Cliffs. In addition, if you disagree with the characterization of any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region 1, and the NRC Resident Inspector at CCNPP. The information you provide will be considered in accordance with Inspection Manual Chapter (IMC) 0305.

J. Spina

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Sincerely,

/RA/

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

Docket Nos.: 50-317, 50-318

License Nos.: DPR-53, DPR-69

Enclosure: Inspection Report 05000317/2009004 and 05000318/2009004
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 No.: 05000317/2009004 and 05000318/2009004

Licensee: Constellation Generation Group, LLC (Constellation)

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

Location: Lusby, MD

Dates: July 1, 2009 through September 30, 2009

Inspectors: S. Kennedy, Senior Resident Inspector
M. Davis, Resident Inspector
R. Rolph, Health Physicist
J. Tomlinson, Operations Engineer
D. Schroeder, Senior Resident Inspector
M. Halter, Reactor Inspector
T. Hoeg, Senior Resident Inspector, Region II
S. Sanchez, Resident Inspector, Region II

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

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SUMMARY OF FINDINGS

IR 05000317/2009004, 05000318/2009004; 7/1/09 – 9/30/09; Calvert Cliffs Nuclear Power Plant (CCNPP), Units 1 and 2: Post-Maintenance Testing.

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

Cornerstone: Mitigating Systems

Green. The inspectors identified an NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for Unit 2 because Constellation did not adequately implement the corrective action program (CAP) requirements contained in CNG-CA-1.01-1000, "Corrective Action Program." Specifically, Constellation did not initiate condition reports (CRs) for conditions adverse to quality during maintenance activities after operators identified that the No. 21 saltwater (SW) pump pit flooded. As a result, Constellation did not initiate CRs for a failed radial bearing, three of the four bearing housing bolts being corroded beyond repair, a clogged floor drain in the SW pump pit, and the No. 21 SW pump pit being flooded. Constellation entered this issue into their CAP for resolution as CR-2009-006077. Constellation corrected these deficiencies when maintenance personnel drained the SW pit and overhauled the No. 21 SW pump on December 22, 2008.

This finding is more than minor because, if left uncorrected, this finding would have the potential to lead to a more significant safety concern. Specifically, Constellation relies on their CAP to ensure that issues potentially affecting nuclear safety and equipment reliability are promptly identified, fully evaluated, and actions taken to prevent recurrence. The failure to initiate CRs when required could result in less than adequate corrective action response to nuclear safety issues in a timely manner. The inspectors determined that the finding is of very low safety significance because it is not a design or qualification deficiency, did not represent a loss of a safety function of a system or a single train greater than its Technical Specification (TS) allowed outage time, and did not screen as potentially risk significant due to external events. This finding has a cross-cutting aspect in the area of problem identification and resolution because Constellation did not adequately implement the CAP to identify issues completely, accurately, and in a manner commensurate with their safety significance (P.1.a of IMC 0305). (Section 1R19)

Other Findings

None

REPORT DETAILS

Summary of Plant Status

Calvert Cliffs Unit 1 began the inspection period at 100 percent power. On July 10, 2009, operators reduced power to 93 percent to clean condenser waterboxes. Operators returned the unit to 100 percent power on July 11. On July 15, operators commenced a shutdown of the unit to repair the No. 11 containment air cooler (CAC). Operators returned the unit to 100 percent power on July 21. On July 24, operators reduced power to 93 percent to perform repairs on the No.16A traveling screen. Operators returned the unit to 100 percent power on the same day. The unit remained at 100 percent power for the remainder of the inspection period.

Calvert Cliffs Unit 2 began the inspection period at 100 percent power. On July 31, 2009, operators reduced power to 85 percent to perform power up-rate software testing and to clean condenser waterboxes. Operators returned the unit to 100 percent power on August 1. On August 13, operators implemented the 1.38 percent power up-rate. The unit remained at 100 percent power until August 28, when operators reduced power to 90 percent to clean condenser waterboxes. Operators returned the unit to 100 percent power on August 29. On September 12, operators reduced power to 86 percent to conduct main turbine valve testing. Operators returned the unit to 100 percent power on the same day. The unit remained at 100 percent power for the remainder of the inspection period.

1. REACTOR SAFETY**Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity**

1R01 Adverse Weather Protection (71111.01 – Two Samples)

a. Inspection Scope

The inspectors reviewed the adverse weather preparations and mitigating strategies for impending adverse weather conditions associated with a severe thunderstorm watch on July 17, 2009, and a tornado warning on July 29, 2009. These reviews included an assessment of the Emergency Preparedness (EP) Procedure EP-1-108, "Severe Weather Preparation," and the Emergency Response Plan Implementation Procedure (ERPIP) 3.0, "Immediate Actions," Attachment 20, "Severe Weather." The inspectors verified that the operator actions specified in the associated procedures maintained readiness of essential systems to preclude weather induced initiating events.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

Partial Walkdown (71111.04Q – Three Samples)a. Inspection Scope

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

- No. 21 component cooling (CC) subsystem due to planned maintenance on the 23 CC pump breaker;
- No. 11 service water (SRW) subsystem due to planned maintenance on the 12B SRW heat exchanger (HX); and
- No. 21 containment spray (CS) system due to planned maintenance on the No. 22 CS system.

1R05 Fire Protection

.1 Fire Protection Tours (71111.05Q – Five Samples)

a. Inspection Scope

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

- Unit 2 battery room No. 21, fire area 17A, room 305.
- Unit 1 12-foot elevation turbine building (TB) general area, fire area TB, rooms 601 and 607.
- Unit 2 12-foot elevation TB general area, fire area TB, room 606.
- Unit 1 battery rooms No. 11 and 12, fire area 16A, rooms 301 and 304.
- Unit 1 boric acid storage tank room, fire area 11, room 217.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors observed a fire brigade drill scenario conducted on September 17, 2009, that involved the Sewage Treatment Plant. The inspectors evaluated the readiness of the plant fire brigade to fight fires. The inspectors verified that Constellation personnel identified deficiencies, openly discussed them in a self-critical manner at the debrief, and took appropriate corrective actions as required. The inspectors evaluated specific attributes as follows: (1) proper wearing of turnout gear and self-contained breathing apparatus; (2) proper use and layout of fire hoses; (3) employment of appropriate fire fighting techniques; (4) sufficient fire fighting equipment brought to the scene; (5) effectiveness of command and control; (6) search for victims and propagation of the fire into other plant areas; (7) smoke removal operations; (8) utilization of pre-planned strategies; (9) adherence to the pre-planned drill scenario; and (10) drill objectives met. The inspectors verified that fire brigade actions were in accordance with Constellation's fire fighting strategies. Following the drill, the inspectors reviewed the post drill debriefing conducted between the assessment team and the fire brigade members.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06 – Two Samples)

a. Inspection Scope

The inspectors reviewed Constellation's flooding mitigation plans and equipment associated with internal flooding events at CCNPP. The Engineering Standard Summary (ES)-001, "Flooding", the Updated Final Safety Analysis Report (UFSAR), and the Unit 1 and Unit 2 Total Risk Model Results described these internal flooding events. The inspectors reviewed the documents and performed walkdowns of two areas that contain risk significant systems and components. The areas are as follows:

- Unit 2 SW intake structure; and
- Unit 1 CC water pump room.

b. Findings

Introduction. The inspectors identified an unresolved item (URI) associated with an internal flooding event involving the No. 21 SW pump pit that occurred on December 10, 2008.

Description. On December 10, 2008, operators observed several feet of SW in the No. 21 SW pump pit. Operations secured the No. 21 SW pump and requested maintenance personnel to evaluate and perform repairs as necessary. Following the flooding event, maintenance personnel identified a clogged floor drain in the SW pump pit, degraded packing gland bolts and a failed radial bearing. The inspectors reviewed the initial CR describing an excessive packing leakage on the No. 21 SW pump, the maintenance

work activity, and the flooding analysis for the intake structure. The inspectors questioned if the submergence event caused the lower radial bearing failure since Constellation did not include this degraded condition in their CAP. The inspectors also questioned the validity of the flooding analysis since the SW pump pits have design considerations and provisions to ensure the pumps would not be submerged. The inspectors reviewed the design considerations and provisions, the maintenance order used to overhaul the No. 21 SW pump, and supporting operability documents for the pump. Constellation provided information about the effect of Intake Structure flooding on the SW pumps. The inspectors reviewed the information and had additional questions on the supporting information used to support the operability basis of the SW pump and the design considerations associated with the SW pump pit.

This item is unresolved pending further review and investigation of Constellation's design considerations, provisions, and additional supporting information of the intake structure flooding of the SW pump pits such that the inspectors can determine if there is a performance deficiency associated with design control of the pump operating in a submerged environment. **(URI 05000318/2009004-01, Saltwater Pump Pit Flooding Event Issue)**

1R11 Licensed Operator Requalification Program

Resident Inspector Quarterly Review (71111.11Q - One Sample)

a. Inspection Scope

On August 10, 2009, the inspectors observed a licensed operator requalification scenario to assess operator performance and the adequacy of the licensed operator-training program. The scenario involved equipment malfunctions, operator challenges, and emergency response issues that required operators to implement the alarm response manual, operating instructions, abnormal operating procedures (AOPs), emergency operating procedures (EOPs), and emergency action level (EAL) criteria. The inspectors focused on high-risk operator actions performed during the implementation of AOPs and EOPs. The inspectors verified the clarity and formality of communications, the completion of appropriate operator actions in response to alarms, the performance of timely control board operations and manipulations, and the oversight and direction provided by the shift manager were in accordance with Constellation's administrative and technical procedures.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12Q – Three Samples)Quarterly Reviewa. Inspection Scope

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

- Unit 2 SRW system (CR-2008-001663).
- No. 22 CS pump (CR-2009-002116).
- Unit 1 high pressure safety injection (HPSI) pumps (CR-2009-001664/CR-2009-004518).

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – Four Samples)a. Inspection Scope

The inspectors reviewed the following activities to verify that Constellation performed the appropriate risk assessments for planned maintenance of out of service (OOS) equipment and emergent work. For the emergent work activities performed by station personnel, the inspectors verified that Constellation promptly reassessed and managed the plant risk. The inspectors compared the risk assessments and risk management actions with station procedure NO-1-117, "Integrated Risk Management," and Constellation's risk assessment tools to the requirements of 10 CFR Part 50.65(a)(4) and the recommendations of the Nuclear Management and Resources Council 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." In addition, the inspectors assessed the adequacy of Constellation's identification and resolution of problems associated with maintenance risk assessments and emergent work activities.

- Emergent risk assessment due to the No. 11 CAC breaker tripping on July 13, 2009.
- Planned maintenance on the No. 12 penetration room exhaust fan with emergent maintenance on the No. 11 charging pump on July 23, 2009.
- Planned maintenance on 12 SRW HX, 1B emergency diesel generator (EDG), and No. 11 125-volt direct current (VDC) battery on August 12, 2009.

- Emergent risk assessment due to the No. 11 and No. 23 charging pumps being OOS for low suction stabilizer pressure on August 17, 2009.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15 – Five Samples)

a. Inspection Scope

The inspectors reviewed operability evaluations and/or CRs to verify that the identified conditions did not adversely affect safety system operability or plant safety. The evaluations were reviewed using criteria specified in NRC Regulatory Issue Summary 2005-20, "Revision to Guidance formerly contained in NRC Generic Letter 91-18, Information to Licensees Regarding two NRC Inspection Manual Sections on Resolution of Degraded and Nonconforming Conditions and on Operability" and IMC Part 9900, "Operability Determinations and Functionality Assessments for Resolution of Degraded or Nonconforming Conditions Adverse to Quality or Safety." In addition, where a component was inoperable, the inspectors verified the TS limiting condition for operation implications were properly addressed. The inspectors performed field walkdowns, interviewed personnel, and reviewed the following items:

- No. 11 and No. 13 SW pumps in the alert condition for low differential pressure (d/p) measured during the surveillance test (CR-2009-004676/CR-2009-004677);
- No. 12 fire pump diesel engine degraded crankcase heater (CR-2009-00425/FA-09-004);
- Unit 1 and 2 non-conservative containment peak pressure and temperature data for loss of coolant accident (CR-2009-002919/OD-09-005);
- Pressurizer safety valves temperature profile (CR-2009-003660/OD-09-006, Revision 3); and
- No. 11 125- volt direct current (VDC) battery room high temperature (CR-2009-00005495).

b. Findings

No findings of significance were identified.

1R18 Plant Modifications (71111.18 – Two Samples)

a. Inspection Scope

The inspectors reviewed the plant modifications listed below to verify that the modifications did not affect the safety functions of systems that are important to safety. The inspectors verified that the system design and licensing basis did not degrade due to the modifications to ensure that the system maintained its availability, reliability, and functional capability. The inspectors conducted walkdowns of accessible portions of the modifications to verify that the proper configuration control was maintained to ensure

that the plant was not placed in an unsafe condition and that the modifications were implemented in accordance with Constellation procedures.

- A permanent modification to remove and replace the liquid waste processing discharge monitor (0-RE-2201) (ES200500476-000).
- A permanent modification to add a SW catchment device on control valve 2-SW-5154 (EC20080052-000).

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

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

- Calibration and replacement of the I/P for the No. 11 CC HX SW outlet control valve 1-CV-5206 (Work Order (WO) #C120083729).
- An overhaul of the No. 23 CC pump disconnect switch (WO #C220074883).
- A complete replacement of a set of plates for the No. 12B SRW HX (WO #C120072608).
- No. 21 SW pump pit floor drain maintenance (WO #C220084074).
- Replacement of the 15-VDC power supply due to failure (WO #90636701/CR-2009-006230).
- No. 23 CC pump motor and breaker inspection due to a faulty relay (WO #C220083722).

b. Findings

Introduction: The inspectors identified a finding of very low safety significance (Green) associated with an NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," because Constellation did not adequately implement the CAP requirements contained in CNG-CA-1.01-1000, "Corrective Action Program." Specifically, Constellation did not initiate CRs for conditions adverse to quality during maintenance activities after operators identified that the No. 21 SW pump pit had flooded with SW. As a result, Constellation did not initiate CRs for a failed radial bearing, three of the four bearing housing bolts being corroded beyond repair, a clogged floor drain in the SW pump pit, and the No. 21 SW pump pit being flooded.

Description: On December 7, 2008, operators identified that the No. 21 SW pump had excessive packing leakage. Operations initiated a CR and determined that the No. 21 SW pump was operating at normal temperature and pressure. Three days later, operators observed several feet of water in the No. 21 SW pump pit. Operations secured the No. 21 SW pump and requested maintenance personnel to evaluate and perform repairs as necessary. The inspectors determined that when operators observed the No. 21 SW pump under several feet of SW that this condition met the threshold criteria described in Constellation procedure CNG-CA-1.01-1000 for the initiation of a CR. However, the inspectors noted that operators did not generate a CR to capture this problem in their CAP.

During the maintenance activities, station personnel identified several conditions adverse to quality that also met the threshold criteria described in Attachment 2 of Constellation procedure CNG-CA-1.01-1000. On December 11, 2008, after the saltwater had dissipated from the SW pump pit, maintenance personnel found the floor drain in the SW pump pit completely clogged. Several days later, on December 18, 2008, maintenance personnel attempted to repair the packing gland of the No. 21 SW pump and discovered a failed radial bearing and three of the four bearing housing bolts corroded beyond repair. However, maintenance personnel did not initiate condition reports to document, evaluate, or take adequate corrective actions to preclude repetition of these degraded conditions. The inspectors identified these issues after a review of an apparent cause evaluation for separate pump issues and previous SW pump maintenance activities. The inspectors determined that a performance deficiency existed in that Constellation did not initiate CRs as specified in Section 5.1, "Initiation of Condition Reports," of CNG-CA-1.01-1000. Section 5.1.A, states, in part, that a CR shall be initiated following the initiation threshold criteria whenever an individual identifies an event, condition or problem. The inspectors concluded that site personnel did not adequately implement the Constellation CAP as intended and did not meet requirements of CNG-CA-1.01-1000. Constellation entered this issue into their CAP as CR-2009-006077. Constellation corrected these deficiencies when maintenance personnel drained the SW pit and overhauled the No. 21 SW pump on December 22, 2008.

Analysis: The performance deficiency is that Constellation did not adequately implement the CAP requirements contained in procedure CNG-CA-1.01-1000, "Corrective Action Program." Specifically, Constellation did not initiate CRs for conditions adverse to quality during maintenance activities after operators identified that the No. 21 SW pump pit had flooded with saltwater. The finding is more than minor because, if left uncorrected, the performance deficiency would have the potential to lead to a more significant safety concern. Specifically, Constellation relies on their CAP to ensure that issues potentially affecting nuclear safety are promptly identified, fully evaluated, and actions taken to prevent recurrence. The failure to initiate CRs when required could result in less than adequate corrective action response to nuclear safety issues in a timely manner. The inspectors evaluated this finding using IMC 0609 Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings." The inspectors determined that the finding is of very low safety significance because it is not a design or qualification deficiency, did not represent a loss of a safety function of a system or a single train greater than its TS allowed outage time, and did not screen as potentially risk significant due to external events. This finding has a cross-cutting aspect in the area of problem identification and resolution because Constellation did not adequately

implement the CAP to identify issues completely, accurately, and in a manner commensurate with their safety significance (P.1.a of IMC 0305).

Enforcement: 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires, in part, "that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings." Constellation's CAP procedure CNG-CA-1.01-1000, "Corrective Action Program," is a procedure affecting quality that provides the requirements to identify, document, evaluate, correct and trend conditions and events, including actions to prevent recurrence. Section 5.1 of CNG-CA-1.01-1000 requires Constellation personnel to initiate CRs whenever an individual identifies an event, condition or problem.

Contrary to the above, as of December 10, 2008, Constellation did not adequately implement procedure CNG-CA-1.01-1000 requirements. Specifically, site personnel did not initiate CRs for conditions adverse to quality during maintenance activities after operators identified that the No. 21 saltwater pump pit had flooded with saltwater. Because this violation is of very low safety significance (Green) and Constellation entered this issue into their CAP as CR-2009-006077, this violation is being treated as a NCV consistent with Section VI.A.1 of the NRC Enforcement Policy. **(NCV 05000318/2009004-02: Did Not Implement CAP Procedure Requirements).**

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

a. Inspection Scope

The inspectors reviewed the activities associated with the Unit 1 forced outage due to the No. 11 CAC breaker trip on July 13, 2009. During the outage, the inspectors examined the following activities: shutdown of the plant; cool-down; heat-up; dilution to criticality; and rise to full power operations. The inspectors reviewed applicable procedures, observed control room activities, conducted walkdowns, and interviewed key personnel. The inspectors evaluated the activities against TS requirements, site procedures, and other applicable guidance and requirements.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22 – Six Samples)

a. Inspection Scope

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

- SW pump and check valve quarterly operability test (STP-O-73A-1).
- No. 11 station battery service test (STP-M-552-1).
- No. 21 station battery pilot cell check (STP-M-152-2).
- Auxiliary feedwater (AFW) steam generator (SG) logic testing (STP-O-09A-2).
- Engineered safety features actuation system logic testing (STP-O-07A-2).
- AFW system quarterly surveillance test (STP-O-05A-1).

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 and evaluated a licensed operator requalification scenario on August 10, 2009. This training scenario focused on equipment failures and operator challenges that could typically exist during a complicated plant trip that may require an emergency response. The inspectors verified that the classification and notification were accurate and timely. Additionally, the inspectors assessed the ability of Constellation's evaluators to address operator performance deficiencies identified during the scenario.

The inspectors also evaluated an EP drill on September 15, 2009. This EP drill focused on equipment failures and operator challenges that could typically exist during a complicated plant trip. The inspectors observed the Emergency Response Organization performance onsite at the Technical and Operational Support Centers. The inspectors verified that the classification, notification, and protective action recommendations were accurate and timely. Additionally, the inspectors assessed the ability of Constellation's critique to address emergency preparedness performance deficiencies identified during the exercise.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Public Radiation Safety

2PS3 Radiological Environmental Monitoring Program (REMP) and Radioactive Material Control Program (71122.03 – Ten Samples)

a. Inspection Scope

The inspectors reviewed the current Annual Radiological Environmental Operating Report and Constellation's assessment results to verify that Calvert Cliffs implemented the REMP as required by the TS and the Offsite Dose Calculation Manual (ODCM).

The review included changes to the ODCM with respect to the environmental monitoring commitments in terms of sampling locations, monitoring and measurement frequencies, land use census, inter-laboratory comparison program, and analysis of data. The inspectors also reviewed the ODCM to identify environmental monitoring stations. In addition, the inspectors reviewed the following: Constellation's self-assessments and audits, event reports, inter-laboratory comparison program results, the UFSAR for information regarding the environmental monitoring program and meteorological monitoring instrumentation, and the scope of the audit program to verify that it met the requirements of 10 CFR 20.1101.

The inspectors conducted walkdowns of the following locations: four air particulate and iodine sampling stations; two composite water-sampling locations; five ground water monitoring wells; and six thermoluminescence dosimeter (TLD) / optically stimulated dosimeter monitoring locations.

The inspectors observed the collection and preparation of air samples, simulated TLD/optically stimulated dosimeter sample collections and simulated soil and vegetation sampling. The inspectors verified that the environmental sampling was representative of the release pathways as specified in the ODCM and that sampling techniques were in accordance with station procedures.

Based on direct observation and review of records, the inspector verified that the primary meteorological tower instruments were operable, calibrated, and maintained in accordance with guidance contained in the UFSAR and station procedures. The inspectors verified that the meteorological data readout and recording instruments in the control room were operable.

The inspectors reviewed each event documented in the annual REMP that involved a missed sample, inoperable sampler, lost TLD, or anomalous measurement for the cause and corrective actions. The inspector conducted a review of Constellation's assessments of any positive sample results.

The inspectors reviewed any significant changes made to the ODCM by Constellation as the result of changes to the land census or sampler station modifications since the last inspection.

The inspectors reviewed the calibration and maintenance records for air samplers. The inspectors also conducted a review of results from Constellation's contractor to verify the adequacy of environmental sample analyses performed by the contractor. The inspectors reviewed the quality control evaluation of the inter-laboratory comparison program and the corrective actions for any deficiencies, determination of any bias to the data and the overall effect on the REMP, and Quality Assurance audit results of the program to determine whether Calvert Cliffs met the TS/ODCM requirements. The inspectors verified that the appropriate detection sensitivities were utilized for counting samples with respect to TS/ODCM.

The inspectors observed personnel and equipment exiting the radiologically controlled area (RCA) at the main control point and at the material processing area control point.

The inspectors verified the adequacy of the controls and surveys used for release of materials and personnel from these areas.

The inspectors verified that the radiation monitoring instrumentation used for the release of material from the RCA was appropriate for the radiation types present and was calibrated with appropriate radiation sources. The inspector reviewed Constellation's equipment to ensure the radiation detection sensitivities were consistent with the NRC guidance. The inspectors reviewed station procedures for release of material from the RCA.

The inspectors reviewed Constellation's audits and self-assessments related to the REMP since the last inspection to determine if identified problems were entered into the CAP, as appropriate. Selected corrective action CRs for the REMP and the radioactive material control program were reviewed since the last inspection to determine if Constellation identified problems, accurately characterize the causes, and corrective actions were assigned to each commensurate with their safety significance. The inspectors also reviewed nonconformance reports from Constellation's vendor laboratory. Any repetitive deficiencies were also assessed to ensure that Constellation's self-assessment activities were identifying and addressing these deficiencies.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES (OA)

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

Mitigating Systems

a. Inspection Scope

The inspectors reviewed Constellation's PI program for Units 1 and 2 to evaluate, collect and report information on Mitigating Systems Performance Index (MSPI). The MSPI systems were reviewed for the period of July 2008 through September 2009. The inspectors used the guidance provided in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment PI Guideline," to assess the accuracy of PI data collected and reported. The inspectors reviewed system unavailability data, monitored component demands, demand failure data, and the consolidated data entry MSPI derivation reports for both unavailability index and unreliability index. Additionally, the inspectors reviewed the equipment OOS logs, operating logs, and the maintenance rule database to determine the accuracy and completeness of the reported unavailability data.

- High pressure injection system.
- Emergency alternate current (AC) power system.
- Low pressure safety injection (LPSI) or residual heat removal (RHR) system.
- Cooling water systems.
- AFW or heat removal system.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152 – Two Samples)

.1 Reviews of Items Entered Into the CAP

a. Inspection Scope

The inspectors performed a daily screening of items entered into Constellation's CAP as required by 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 CR and attending screening meetings.

b. Findings

No findings of significance were identified.

.2 Review of Operator Work-Arounds

a. Inspection Scope

The inspectors performed an in-depth review of operator work-arounds for CCNPP Units 1 and 2. This included an evaluation of the potential cumulative affects of all outstanding work-arounds to determine whether or not they could affect the reliability, availability, and potential for misoperation of a mitigating system; affect multiple mitigating systems; or affect the ability of operators to respond in a correct and timely manner to plant transients and accidents. The inspectors discussed these potential effects with control room licensed operators. The inspectors' evaluation followed the guidelines in IP 71152, paragraph 03.02b, and assessed potential work-arounds not evaluated by station personnel, work-arounds that have been formalized as long-term corrective actions, and work-arounds that increase the potential for human performance errors.

b. Findings

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

.3 Degraded Fuel Assemblies

a. Inspection Scope

This inspection focused on Constellation's evaluation and resolution of identified degraded fuel assemblies during core shuffles and mast fuel sipping for both Unit 1 and Unit 2 refueling outages. Constellation initiated several CRs and performed a number of extent condition reviews to assess the condition of the degraded fuel assemblies. The

inspectors selected the degraded fuel for review based on the number of identified degraded fuel assemblies. The fuel assemblies provide one of the primary barriers for fission product releases.

The inspectors reviewed Constellation's CRs, root cause evaluations, proposed interim corrective actions, and the long term plan for permanent corrective actions associated with the degraded fuel assemblies. The inspectors also interviewed plant personnel and reviewed vendor audit information. The inspectors conducted the review of the degraded fuel over several operating cycles.

b. Findings

No findings of significance were identified.

The inspectors concluded that Constellation exhibited a proactive approach to zero tolerance for degraded fuel. Constellation implemented corrective actions associated with core design strategy to reduce the likelihood of degraded fuel assemblies. The inspectors determined that Constellation had taken appropriate short term and long term corrective actions to prevent reoccurrence. The inspectors confirmed that Constellation implemented a change to the core design such that the differences in power level that each individual fuel bundle experiences from cycle to cycle in more susceptible core locations was limited. The inspectors also confirmed that Constellation worked with its fuel vendor to reduce the enrichment in fuel rods located closest to the control rod guide tubes. These locations in individual fuel assemblies were found to be more susceptible to degradation. The inspector determined that Constellation had strong oversight of the fuel vendor's manufacturing process regarding steps to reduce/prevent manufacturing defects. For example, Constellation issued a stop work order to the fuel vendor and provided additional quality assurance oversight at the fuel fabrication facility, following identification of a manufacturing defect that resulted in a degraded fuel assembly.

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

.1 (Closed) Licensee Event Report (LER) 05000317/2009-001-00, Reactor Coolant Pump (RCP) Starts not in Accordance With Technical Specifications

On February 23, 2009, the inspectors identified a discrepancy between the RCP starting requirements described in the operating instructions (OIs) and the RCP starting requirements listed in the TS for loop operability. Specifically, the OI did not provide operators with adequate procedural guidance to meet the Mode 3, 4, and 5 TS RCP starting requirements prior to starting RCPs. As a result, the inspectors identified that in the past several years Constellation did not comply with the required starting conditions for RCPs during several plant startups on Unit 1. The issue and associated NCV were discussed in NRC inspection report 2009002 as NCV 05000317/2009002-03. The inspectors performed a follow-up inspection to review and assess the causes of the issues identified in the LER. The inspectors reviewed Constellation's evaluation, changes to procedures, and training conducted on the event to assess if the actions taken would address the issue. Constellation documented this issue in CR-2009-002841. No new findings of significance were identified. This LER is closed.

4OA5 Other Activities

Quarterly Resident Inspector Observations of Security Personnel and Activities

a. Inspection Scope

During the inspection period, the inspectors conducted observations of security force personnel and activities to ensure that the activities were consistent with Constellation's security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both normal and off-normal plant working hours.

These quarterly resident inspectors' observations of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status reviews and inspection activities.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

Exit Meeting Summary

On October 14, 2009, the resident inspectors presented the inspection results to Mr. James Spina and other members of licensee staff who acknowledged the findings. The inspectors asked Constellation whether any of the material examined during the inspection should be considered proprietary. There was no proprietary information identified.

ATTACHMENTS: SUPPLEMENTAL INFORMATION

ATTACHMENT 1

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Constellation Personnel

J. Spina, Site Vice President
D. Trepanier, Plant General Manager
B. Allen, Senior Engineer
A. Ball, Radiological Supervisor
A. Barnett, Environmental Laboratory Technician
L. Bartal, Laboratory Manager, Fort Smallwood
H. Evans, Radiological Supervisor
P. File, Engineering Supervisor, Nuclear Fuel Management
J. Gaines, Licensing Supervisor
K. Gould, General Supervisor Radiation Protection
C. Neyman, Licensing Engineer
B. Nuse, Environmental Licensing Engineer
S. Sanders, Chemistry Supervisor
P. Wengowski, General Supervisor, Nuclear Fuels Services

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000318/2009004-01	URI	Saltwater Pump Pit Flooding Event (Section 1R06)
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Opened and Closed

05000318/2009004-02	NCV	Did Not Implement Corrective Action Program Procedure Requirements (Section 1R19)
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Closed

05000317/2009-001-00	LER	Reactor Coolant Pump Starts Not in Accordance With Technical Specifications (Section 4OA3)
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LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures

ERPIP 3.0, Immediate Actions, Attachment 20, Severe Weather, Revision 44
EP-1-108, Severe Weather Preparation, Revision 0
NO-1-119, Seasonal Readiness, Revision 2

Section 1R04: Equipment Alignment

Procedures

OI-15-1, Service Water System, Revision 62
OI-16-2, Component Cooling System, Revision 32
OI-03A-2, Safety Injection and Containment Spray, Revision 25

Drawings

62710SH0001, Component Cooling System, Revision 38
60706SH0002, Service Water Cooling System, Revision 75

Miscellaneous

SD-015, Component Cooling System Description, Revision 5
SD-011, Service Water System Description, Revision 4

Section 1R05: Fire Protection

Procedures

SA-1-100, Fire Prevention, Revision 14
SA-1, Fire Protection Program, Revision 6
SA-1-105, Fire Drill Scenario, Revision 1

Miscellaneous

FP00002, Fire Hazards Analysis Summary Document, Revision 0
Fire Fighting Strategies Manual, Revision 2
Calculation CA02243, Combustion Loading Analysis Report, Revision 1
UFSAR Section 9.9, Calvert Cliffs Power Plant Fire Protection Program, Revision 39

Section 1R06: Flood Protection Measures

Procedures

ES-001, Flooding, Revision 0

Condition Reports

IR3-042-672
CR-2008-002770
CR-2009-006077

Miscellaneous

NCR #11726

Section 1R11: Licensed Operator Regualification Program

Procedures

NO-1-200, Control of Shift Activities, Revision 38
EOP-4, Excessive Steam Demand, Revision 17
EOP-8, Functional Recovery Procedure, Revision 32

Miscellaneous

LOR Scenario
Emergency Response Drill Scenario

Section 1R12: Maintenance Effectiveness

Procedures

ER-1-103, Maintenance Rule Program Implementation, Revision 3

Condition Reports

CR-2008-001663 CR-2009-001664
CR-2009-002116 CR-2009-004518

Miscellaneous

CCNPP Maintenance Rule Scoping Document, Revision 28

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures

Maintenance Rule Risk Assessment Guideline, Revision 7
NO-1-117, Integrated Risk Management, Revision 19

Section 1R15: Operability Evaluations

Procedures

CNG-OP-1-01-1002, Conduct of Operability Determinations/Functionality Assessments,
Revision 0

Condition Reports

CR-2009-004676 CR-2009-002919
CR-2009-004677 CR-2009-003660
CR-2009-004254 CR-2009-00005495

Miscellaneous

FA-09-004, Functionality Assessment for the No. 12 Fire Pump Diesel Engine Degraded
Crankcase Heater, Revision 0
OD-09-005, Operability Determination for the Unit 1 and 2 Non-conservative Containment Peak
Pressure and Temperature Data for Loss of Coolant Accident, Revision 0
OD-09-006, Operability Determination for the Pressurizer Safety Valves Temperature Profiles,
Revision 3

Section 1R18: Plant Modifications

Procedures

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

Miscellaneous

ES200500476-000, Replace the Liquid Waste Processing Discharge Monitor, Revision 0
EC-20080052-000, Develop a Leak Deflector Shield Design for SW Valves, Revision 0

Section 1R19: Post-Maintenance Testing

Procedures

CNG-CA-1.01-1000, Corrective Action Program, Revision 2
CNG-MN-4.01-1008, Pre/Post-Maintenance Testing, Revision 0

Condition Reports

CR-2009-006077	IRE-029-699
CR-2009-006230	IRE-026-454
CR-2008-003181	IRE-019-231
CR-2008-002770	

Work Orders

WO #C120083729	WO #C220083722
WO #C220074883	WO #C220084074
WO #C120072608	WO #C90636701

Miscellaneous

EC20080280-000, Provide Temporary Means of Compressing Pump Shaft Packing due to Failed Bolting, Revision 2
AMBD-0045, Saltwater Cooling System, Revision 1

1R20: Refueling and Other Outage Activities

Procedures

OP-1, Plant Startup from Cold Shutdown, Revision 26
OP-2, Plant Startup from Hot Standby to Minimum Load, Revision 44
OP-3, Normal Power Operation, Revision 46
OP-4, Plant Shutdown from Power Operation to Hot Standby, Revision 18
OP-5, Plant Shutdown from Hot Standby to Cold Shutdown, Revision 24

Condition Reports

CR-2009-004927	CR-2009-005092
CR-2009-005092	CR-2009-005104
IRE-019-020	CR-2009-005118
IRE-019-208	

Section 1R22: Surveillance Testing

Procedures

STP-O-73A-1, Saltwater Pump and Check Valve Quarterly Operability Test, Revision 19
STP-O-09A-2, Auxiliary Feedwater Steam Generator Logic Testing, Revision 10
STP-O-07A-2, Engineered Safety Features Actuation System Logic Testing, Revision 59
STP-O-05A-1, Auxiliary Feedwater System Quarterly Surveillance Test, Revision 22
STP-M-552-1, No. 11 Station Battery Service Test, Revision 10
STP-M-152-2, No. 21 Station Battery Pilot Cell Check, Revision 6

Condition Reports

CR-2009-004676
CR-2009-004677

Miscellaneous

Fourth-Ten-Year Plan, Pump and Valve Inservice Testing Program

Section 1EP6: Drill Evaluation

Procedures

ERPIP-3.0, Immediate Actions, Attachment 1, Emergency Action Level Criteria, Revision 44

Condition Reports

Miscellaneous

Calvert Cliffs Emergency Response Drill Scenario
Calvert Cliffs Emergency Response Drill Manual
Calvert Cliffs ERO Facility Drill Critique
NEI 99-01, Methodology for Development of Emergency Action Levels, Revision 4

Section 2PS3: REMP and Radioactive Material Control Program

Procedures

CP-224, Monitoring Radioactivity in Systems Normally Uncontaminated, Revision 15
CP-234, Specification and Surveillance for the Radiological Environmental Monitoring Program,
Revision 6
CP-438, Operation of the Environmental Trailers and Sampling of Intake and Outfall, Revision 8
RSP 1-113, Release of Items, Material and Vehicles from a Contaminated or Radiologically
Controlled Area, Revision 01000
II-1, Beta Counting Using the Tennelec LB 5100, Revision 6
II-2, Gamma Counting Using a Ge (Li) or HPGE Detector with the Genie PC Counting System,
Revision 7

Condition Reports

CR-2008-000428	CR-2009-004588	CR-2009-005248
CR-2008-002802	CR-2009-004795	CR-2009-005537
CR-2009-003924	CR-2009-004904	

Audits and Assessments

SA-200600161-001/SA200700086-002, Radiological Environmental Monitoring Program (REMP)

Report of Audit CHE-09-01-C, Calvert Cliffs Chemistry Program, May 15, 2009
2009 NRC (Nonconformance Report) 813,814,815,816,817,818

Section 4OA1: Performance Indicator Verification

Procedures

CNG-AM-1.01-1004, Equipment Reliability Reporting, Revision 44

Condition Reports

IRE-032-517

CR-2009-001292

CR-2008-002234

CR-2008-000934

Miscellaneous

CCNPP Mitigating System Performance Index (MSPI) Basis Document, Revision 1

CCNPP – MSPI Emergency AC – Unit 1

CCNPP – MSPI Cooling Water – Unit 2

CCNPP – MSPI Residual Heat Removal – Unit 2

Section 4OA2: Identification and Resolution of Problems

Procedures

CNG-CA-1.01-1000, Corrective Action Program, Revision 2

CNG-FM-1.01-1000, Control of Core Reload Design, Revision 1

CNG-FM-1.01-1001, Nuclear Fuel Reliability and Failed Fuel Management, Revision 0

EN-1-110, Control of Reload Core Design, Revision 2

CNG-CM-1.01-1003, Design Engineering and Configuration Control, Revision 0

CNG-CA-1.01-1004, Root Cause Analysis, Revision 2

Condition Reports

IRE-032-727

CR-2009-002040

CR-2008-002819

CR-2009-001922

CR-2009-001785

CR-2009-001785

CR-2009-001922

CR-2009-002271

CR-2009-001746

CR-2009-002272

Operating Experience Reports

Fuel Failures Discovered During 2009 RFO Category I Root Causal Analysis, CR 2009-002040

Root Cause Analysis Report CAPs-RCA-09-120-C002, Calvert Cliffs 2 Cycle 17, Revision 0

Root Cause Analysis Report CAPs-RCA-08-067-C002, Leaking Turbo Fuel in Calvert Cliffs Unit 1 Cycle 18, Revision 0

CA07087, Unit 1 Cycle 20 Physics Groundrules, Revision 1

CC-FE-0226, Core Design Guidelines for Calvert Cliffs, Revision 8, dated April 9, 2008

CC-FE-0226, Core Design Guidelines for Calvert Cliffs, Revision 9, dated April 24, 2009

CC-FE-0226, Core Design Guidelines for Calvert Cliffs, Revision 10, dated July 17, 2009

Calvert Cliffs Fabrication Transition Business Case, October 20, 2007

Calvert Cliffs Nuclear Power Plant Unit 1 Refueling Outage 2010 Work Plan Fuel Inspections/
Reconstitution, Revision 0

Calvert Cliffs Nuclear Fuel Reliability Overview, September 2009

Presentation to MRC on Closure of CA-2009-000293, September 2009

Miscellaneous

Shift Turnover Information Sheet for Operator Work-Arounds/Challenges/Comp Actions

Operations Administration Policy 04-01, Revision 5

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

Procedures

OI-1A, Reactor Coolant Systems and Pump Operations, Revision 33

OP-1, Unit 1 Plant Startup from Cold Shutdown, Revision 57

OP-1, Unit 2 Plant Startup from Cold Shutdown, Revision 26

AOP-3E, Unit 1 Loss of All RCP Flow, Modes 3, 4, or 5, Revision 8

AOP-3F, Unit 1 Loss of Offsite Power while in Modes 3, 4, 5, or 6, Revision 15

Condition Reports

CR-2009-002841

Section 4OA5: Other Activities

Procedures

SE-2, Security Program, Revision 3

SE-1-100, Fitness for Duty Program, Revision 15

LIST OF ACRONYMS

AC	Alternating Current
ADAMS	Agency-Wide Documents Access and Management System
AFW	Auxiliary Feedwater
AOP	Abnormal Operating Procedure
CAC	Containment Air Cooler
CAP	Corrective Action Program
CC	Component Cooling
CCNPP	Calvert Cliffs Nuclear Power Plant
CFR	Code of Federal Regulations
CR	Condition Reports
CS	Containment Spray
d/p	Differential Pressure
EAL	Emergency Action Level
EDG	Emergency Diesel Generator
EOP	Emergency Operating Procedure
EP	Emergency Preparedness
ERPIP	Emergency Response Plan Implementing Procedure
ES	Engineering Standard Summary
HPSI	High Pressure Safety Injection
HX	Heat Exchanger
IMC	Inspection Manual Chapter
LER	Licensee Event Report
LOR	Licensed Operator Requalification
LPSI	Low Pressure Safety Injection
MSPI	Mitigating Systems Performance Index
MW	Megawatt Thermal
NEI	Nuclear Energy Institute
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
OI	Operating Instruction
OOS	Out Of Service
PARS	Publicly Available Records
RCA	Radiologically Controlled Area
RCP	Reactor Coolant Pump
REMP	Radiological Environmental Monitoring Program
RHR	Residual Heat Removal
SDP	Significance Determination Process
SSC	Structure, System, Component
SRW	Service Water
SW	Saltwater
TB	Turbine Building
TLD	Thermoluminescent Dosimeter
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
VDC	Volt Direct Current
WO	Work Order