



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I**
2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

May 2, 2013

Mr. George H. Gellrich, Vice President
Calvert Cliffs Nuclear Power Plant, LLC
Constellation Energy Nuclear Group, LLC
1650 Calvert Cliffs Parkway
Lusby, Maryland 20657-4702

**SUBJECT: CALVERT CLIFFS NUCLEAR GENERATING STATION – NRC INTEGRATED
INSPECTION REPORT 05000317/2013002 AND 05000318/2013002**

Dear Mr. Gellrich:

On March 31, 2013, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Calvert Cliffs Nuclear Power Plant (CCNPP), Units 1 and 2. The enclosed inspection report documents the inspection results, which were discussed on April 19, 2013, 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). These findings were determined to involve violations of NRC requirements. However, because of the very low safety significance, and because they are entered into your corrective action program, the NRC is treating these findings as non-cited violations (NCVs) consistent with Section 2.3.2 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 Inspectors at Calvert Cliffs. In addition, if you disagree with the cross-cutting aspect assigned to any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region I; and the NRC Resident Inspectors at Calvert Cliffs.

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

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Sincerely,

/RA/

Daniel L Schroeder, Chief
Reactor Projects Branch 1
Division of Reactor Projects

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

Enclosure: Inspection Report 05000317/2013002 and 05000318/2013002
w/Attachment: Supplementary Information

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ADAMS ACCESSION NUMBER: **ML13122A358**

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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.: 05000317/2013002 and 05000318/2013002

Licensee: Constellation Energy Nuclear Group, LLC

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

Location: Lusby, MD

Dates: January 1, 2013 through March 31, 2013

Inspectors: S. Kennedy, Senior Resident Inspector
E. Torres, Resident Inspector
T. Burns, Senior Project Engineer
R. Rolph, Health Physicist
A. Rosebrook, Senior Project Engineer
S. Shaffer, Senior Project Engineer

Approved by: Daniel L. Schroeder, Chief
Reactor Projects Branch 1
Division of Reactor Projects

Enclosure

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SUMMARY

IR 05000317/2013002, 05000318/2013002; 01/01/2013 – 03/31/2013; Calvert Cliffs Nuclear Power Plant (CCNPP), Units 1 and 2: Equipment Alignment and Surveillance Testing

The report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. Two Green findings, which were non-cited violations (NCVs), were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," (SDP) dated June 2, 2011. The cross-cutting aspects for the findings were determined using IMC 0310, "Components Within the Cross-Cutting Areas," dated October 28, 2011. All violations of NRC requirements are dispositioned in accordance with the NRC Enforcement Policy, dated January 28, 2013. 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 50, Appendix B, Criterion III, "Design Control," because Constellation failed to provide design control measures to assure appropriate specifications were translated into procedures for diesel fuel oil (DFO) in the No.11 fuel oil storage tank (FOST). Specifically, Constellation's cloud point maximum specification for DFO is above historical minimum temperatures recorded in the vicinity of CCNPP. The inspectors determined that Constellation did not have adequate measures in place such as a calculation, temperature monitoring, and/or procedures to assess the operability of the DFO transfer system from the No. 11 FOST for sustained outdoor temperatures below the cloud point specification temperature but above the minimum expected temperature the site may experience. Constellation entered this issue in their corrective action program (CAP). Immediate corrective actions included adding a note in Operations turnover sheet to determine No.11 FOST DFO operability if ambient temperatures dropped below 10°F at the site. Planned corrective actions include performing a calculation to determine cold weather effects on the No.11 FOST.

This finding is more than minor because it is associated with the protection against external factors attribute of the Mitigating Systems cornerstone and affects the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, a reasonable doubt of operability existed because the minimum temperature limits and duration of low temperature had not been established for diesel generator operability and historical low temperatures have been below the cloud point of the DFO. If left uncorrected, the performance deficiency has the potential to lead to a more significant safety concern because an inadequate cloud point specification could impact emergency diesel generator (EDG) and/or station blackout (SBO) diesel operation during an actual event during extreme low temperature conditions. The inspectors evaluated the significance of this finding using IMC 0609 Appendix A, "The Significance Determination Process (SDP) for Findings at Power," Exhibit 2, "Mitigating Systems Screening Questions." The inspectors determined that this finding was of very low safety significance (Green) because the finding is a deficiency affecting the design or qualification of a mitigating structure, system, and component (SSC); however, the SSC maintained its operability or functionality. This finding

did not have a cross-cutting aspect because the most significant contributor of the performance deficiency was not reflective of current licensee performance. Specifically, the most reasonable opportunity to identify this issue was in 1994 when Constellation reviewed this issue in response to Information Notice (IN) 94-19, "Emergency Diesel Generator Vulnerability to Failure from Cold Fuel Oil." (Section 1R04)

- Green: The inspectors identified an NCV of Technical Specification (TS) surveillance requirement (SR) 3.8.1.7 because Constellation failed to adequately perform SR associated with the DFO transfer system. Specifically, since approximately 1996, Constellation did not test the 2A EDG fuel oil transfer system aligned to the No. 21 FOST. The No. 21 FOST is the credited tank in the plant's licensing bases. Immediate corrective actions included entering this issue into the CAP and entering TS SR 3.0.3 for a missed surveillance which required performing a probabilistic risk assessment and performing the missed surveillance within 31 days. Corrective actions planned includes revising the quarterly EDG surveillance procedure to test the 2A EDG while aligned to the No. 21 FOST and develop and implement a testing program to periodically test each EDG aligned to the normal and alternate FOSTs.

This finding is more than minor because it is associated with the equipment performance attribute of the Mitigating System cornerstone and affects the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, Constellation's testing program did not provide assurance that no obstruction exists in the DFO transfer system. If left uncorrected, this issue potentially would result in a greater safety concern in that an obstruction could exist would not be identified until an actual event requiring the 2A EDG to be aligned to the No. 21 FOST as described in the safety analysis. In accordance with IMC 0609.04, "Initial Characterization of Findings" and Exhibit 2 of IMC 0609, Appendix A, "Significance Determination Process For Findings At-Power," issued June 19, 2012, the inspectors determined that this finding is of very low safety significance (Green) because the performance deficiency was not a design or qualification deficiency; did not represent a loss of system and/or function; did not represent an actual loss of function of at least a single train for greater than its TS allowed outage time; and did not represent an actual loss of function of one or more non-TS trains of equipment designated as high safety significance. The inspectors determined that the finding has a cross-cutting aspect in the area of Problem Identification and Resolution, CAP, because Constellation did not ensure that issues potentially impacting nuclear safety are promptly identified, fully evaluated, and that actions are taken to address safety issues in a timely manner, commensurate with their significance. Specifically, Constellation did not take appropriate corrective actions to address safety issues and adverse trends in a timely manner associated with previously identified inadequate testing programs of risk significant equipment [P.1(d)] (Section 1R22)

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at 100 percent power. The unit remained at or near 100 percent power throughout the inspection period.

Unit 2 began the inspection period at 100 percent power. On February 12, 2013, operators reduced power to 93 percent to perform main steam safety valve testing and auxiliary feedwater (AFW) pump large flow test. Operators returned the unit to 100 percent power on February 13. On February 17, operators shut down the unit for a refueling outage reaching mode 5 on the same day. On March 24, a reactor startup was commenced and on March 25, operators synchronized the unit to the grid. The unit reached 100 percent power on March 29. The unit remained at or near 100 percent power for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection (71111.01 – 2 samples)

.1 Evaluate Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

The inspectors reviewed Constellation's adverse weather preparations and mitigating strategies for impending adverse weather conditions associated with a severe weather alert on January 25, 2013. This review included an assessment of what the predicted conditions were and of the actions taken by site personnel. The inspectors verified that the operator actions specified in the associated procedures maintained readiness of essential equipment and systems to minimize and mitigate weather induced initiating events. Documents reviewed for each section of this inspection report are listed in the Attachment.

b. Findings

No findings were identified.

.2 External Flooding

a. Inspection Scope

On January 30, 2013, the inspectors performed an inspection of the external flood protection measures for Calvert Cliffs Units 1 and 2. The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), Chapters 2.5 and 2.8, which depicted the design flood levels and protection areas containing safety-related equipment to identify areas that may be affected by external flooding. The inspectors conducted a general site walkdown of all external areas of the plant, including the intake structure and the auxiliary building exterior wall to ensure that Constellation erected flood protection measures in accordance with design specifications. In addition, the

inspectors reviewed condition reports (CRs) related to CCNPP flood hazard re-evaluation report.

b. Findings

No findings were identified

1R04 Equipment Alignment

.1 Partial Walkdowns (71111.04Q – 3 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- No.11 component cooling (CC) heat exchanger (HX) during No.12 CC HX maintenance on January 8, 2013
- No. 21 steam generator (SG) AFW train during maintenance on No. 22 SG AFW flow control valve on February 7, 2013
- Shutdown cooling alignment prior to core reload on March 7, 2013

The inspectors selected these systems based on their risk-significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors reviewed applicable procedures, system diagrams, the UFSAR, TSs, CRs, and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted system performance of their intended safety functions. The inspectors also performed field walkdowns of accessible portions of the systems to verify system components and support equipment were aligned correctly and were operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. The inspectors also reviewed whether Constellation staff had properly identified equipment issues and entered them into the CAP for resolution with the appropriate significance characterization.

b. Findings

No findings were identified.

.2 Full System Walkdown (71111.04S – 1 sample)

a. Inspection Scope

On February 4, 2013, the inspectors performed a complete system walkdown of accessible portions of the DFO system, to verify the existing equipment lineup was correct. The inspectors reviewed operating procedures, surveillance tests, drawings, equipment line-up check-off lists, and the UFSAR to verify the system was aligned to perform its required safety functions. The inspectors also reviewed electrical power availability, component lubrication and equipment cooling, hangar and support functionality, and operability of support systems. The inspectors performed field walkdowns of accessible portions of the systems to verify system components and

support equipment were aligned correctly and operable. The inspectors examined the material condition of the components and observed operating parameters of equipment to verify that there were no deficiencies. Additionally, the inspectors reviewed a sample of related CRs and work orders to ensure Constellation staff appropriately evaluated and resolved any deficiencies.

b. Findings

Introduction: The inspectors identified a Green NCV of 10 CFR 50, Appendix B, Criterion III, "Design Control," because Constellation failed to provide design control measures to assure appropriate specifications were translated into procedures for DFO in No.11 FOST. Specifically, Constellation's cloud point maximum specification for DFO is above historical minimum temperature recorded in vicinity of CCNPP.

Description: On February 4, 2013, the inspectors identified that Constellation did not have a calculation to ensure the DFO cloud point specification for the No.11 FOST DFO was appropriate for operability of the DFO transfer system. The American Society for Testing and Materials (ASTM) 975-96, "Standard Specification for Diesel Fuel Oils," defines cloud point as the temperature at which a cloud or haze of wax crystals appears in the oil under prescribed test conditions which generally relates to the temperature at which wax crystals begin to precipitate from the oil in use. DFO under cloud point conditions affects the operation of the DFO transfer pumps by clogging the DFO filters with precipitated wax from the fuel.

Calvert Cliffs DFO system for the Fairbanks Morse EDGs consists of two above ground FOSTs. The No. 21 FOST is enclosed in a concrete structure. The No.11 FOST is not in an enclosed structure. Constellation used ASTM 975-96 to establish the maximum allowed DFO cloud point specification. The standard stated in part, "satisfactory operation should be achieved in most cases if the cloud point (or wax appearance point) is specified at 6°C above the tenth percentile minimum ambient temperature for the area." It also stated, "This guidance is general. Some equipment designs or operation may allow higher or require low cloud point fuels. Appropriate low temperature operability properties should be agreed upon between the fuel supplier and purchaser for the intended use and expected ambient temperatures." For the State of Maryland, ASTM 975-96 defined the minimum tenth percentile temperature as -12°C (10.4°F). Thus, Calvert Cliffs cloud point is specified at less than or equal to -6°C (21.2°F).

On March 16, 1994, the NRC issued IN 94-19, "Emergency Diesel Generator Vulnerability to Failure from Cold Fuel Oil," to address the common mode failure to EDGs as a result of temperature related changes in the DFO. The IN discussed that Vermont Yankee procured DFO that was within the specifications established in ASTM D-975-68 but higher than the minimum recorded outdoor temperature noted in the final safety analysis report. As a result of this IN, Constellation initiated CR IR0-0168-486; performed calculation CA04606, "No. 21 Fuel Oil Storage Tank Bldg, Minimum Temperature During Winter;" and performed an evaluation to determine if the No. 11 FOST is susceptible to extreme cold weather conditions. Constellation performed a qualitative analysis and concluded that the cloud point specification was adequate and installed a heat trace system for the DFO piping above ground from the No.11 FOST.

However, Constellation did not determine the minimum temperature limit and duration of low temperature for diesel operability as recommended by the CR. Calvert Cliffs UFSAR

does not have a minimum recorded outdoor temperature. However, Safety Analysis Evaluation Report, "Calvert Cliffs Independent Spent Fuel Storage Installation Materials License No. SNM-2505," dated November 25, 1992, stated that the minimum expected temperature at the site based on historical data recorded at Patuxent Naval Air Station is -19.4°C (-3°F). Similarly, an independent search by the inspectors revealed a minimum temperature of -20°C (-4°F) based on historical data from the National Oceanic and Atmospheric Administration station at Solomon's Island, Maryland. Thus, the cloud point specification of -6°C (21.2°F) in CP-0226, "Specification and Surveillance – Diesel Fuel Oil," was significantly higher than the minimum expected outdoor temperature of -19.4°C (-3°F).

An internal memorandum, between J.F. Lohr and T.L. Sydnor, subject "Closure of PDR 199500029, Milestone 8," dated on October 30, 1998, stated in part that a sample of CCNPP's fuel oil and an EDG filter was sent to Southwest Research Institute for testing. The results of this test indicated the filter fouling occurred 1°C below the cloud point. The inspectors determined that Constellation did not have adequate measures in place such as a calculation, temperature monitoring, and/or procedures to assess the operability of the DFO transfer system when aligned to the No. 11 FOST for sustained outdoor temperatures below the cloud point specification temperature but above the minimum expected temperature the site may experience.

Constellation entered this issue in their CAP (CR-2013-001208). Immediate corrective actions included adding a note in Operations turnover sheet to determine No.11 FOST DFO operability if ambient temperatures dropped below 10°F at the site. The inspectors determined that this action was acceptable based on the actual cloud point for the DFO in No.11 FOST is -16°C (3.2°F). Planned corrective actions include performing a calculation to determine cold weather effects on the No.11 FOST.

Analysis: Constellation's failure to provide design control measures to assure appropriate specifications were translated into procedures for the DFO transfer system when aligned to the No.11 FOST was a performance deficiency that was within the Constellation's ability to foresee and correct and should have been prevented. This finding is more than minor because it is associated with the protection against external factors attribute of the Mitigating Systems cornerstone and affects the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, a reasonable doubt of operability existed because the minimum temperature limits and duration of low temperature had not been established for diesel generator operability and historical low temperatures have been below the cloud point of the DFO. If left uncorrected the performance deficiency has the potential to lead to a more significant safety concern because an inadequate cloud point specification could impact EDG and/or SBO diesel operation during an actual event during extreme low temperature conditions due to the DFO transfer system becoming inoperable. The inspectors evaluated the significance of this finding using IMC 0609 Appendix A, "The Significance Determination Process (SDP) for Findings at Power," Exhibit 2, "Mitigating Systems Screening Questions." The inspectors determined that this finding was of very low safety significance (Green) because the finding is a deficiency affecting the design or qualification of a mitigating SSC; however, the SSC maintained its operability or functionality since the design conditions were not actually reached. This finding did not have a cross-cutting aspect because the most significant contributor of the performance deficiency was not reflective of current licensee performance. Specifically, the most

reasonable opportunity to identify this issue was in 1994 when Constellation reviewed this issue in response to NRC IN 94-19.

Enforcement: 10 CFR 50, Appendix B, Criterion III, "Design Control," states, in part, "measures shall be established to assure that applicable regulatory requirements and the design basis, as defined in § 50.2 and as specified in the license application, for those structures, systems, and components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions." Contrary to the above, prior to February 4, 2013, Constellation failed to provide design control measures to assure appropriate specifications were translated into procedures for DFO transfer system when aligned to the No.11 FOST. As a result, DFO cloud point temperature could be above outdoor temperature during extreme cold weather conditions and impact EDG operability due to the DFO transfer system being rendered inoperable. Immediate corrective actions included adding a note in Operations turnover sheet to determine No.11 FOST DFO and DFO transfer system operability if ambient temperatures dropped below 10°F at the site. Planned corrective actions include performing a calculation to determine cold weather effects on the No.11 FOST. Because this violation was of very low safety significance (Green) and has been entered into Constellation's CAP (CR-2013-001208), this violation is being treated as an NCV, consistent with Section 2.3.2.a of the NRC Enforcement Policy. **(NCV 05000317; 05000318/2013002-01: Failure to Establish Adequate Design Control Measures for Diesel Fuel Oil Cloud Point)**

1R05 Fire Protection

Quarterly Inspection (71111.05Q – 7 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 Constellation controlled combustible materials and ignition sources in accordance with administrative procedures. The inspectors verified that fire protection and suppression equipment was available for use as specified in Constellation's fire plan, and passive fire barriers were maintained in good material condition. The inspectors also verified that station personnel implemented compensatory measures for out of service, degraded or inoperable fire protection equipment, as applicable, in accordance with procedures.

- Unit 1 CC room, fire area 15, room 228 on January 16, 2013
- Unit 2 CC room, fire area 12, room 201 on January 16, 2013
- Unit 1 27' east penetration room, fire area 11, room 316 on January 17, 2013
- Unit 2 27' east penetration room, fire area 11, room 310 on January 17, 2013
- Unit 1 27' switchgear room, fire area 19, room 317 on February 1, 2013
- Unit 1 45' switchgear room, fire area 34, room 430 on February 1, 2013
- Unit 2 containment, fire area CNMT, room 229 on February 19, 2013

b. Findings

No findings were identified.

1R08 Inservice Inspection Activities (71111.08 – 1 sample)a. Inspection Scope

From February 25 – March 1, 2013, the inspectors conducted a review of Constellation's implementation of inservice inspection (ISI) program activities for monitoring degradation of the reactor coolant system (RCS) boundary, risk significant piping and components, and containment systems during the CCNPP Unit 2 refueling outage (2R20). The sample selection was based on the inspection procedure objectives and risk priority of those pressure retaining components in systems where degradation would result in a significant increase in risk. The inspectors observed in-process non-destructive examinations (NDE), reviewed documentation, and interviewed licensee personnel to verify that the NDE activities performed as part of the fourth interval, second period, of the Calvert Cliffs ISI program were conducted in accordance with the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI, 2004 Edition, No Addenda.

NDE and Welding Activities (IMC Section 02.01)

The inspectors performed direct observations of NDE activities in process and reviewed records of NDEs listed below:

ASME Code Required Examinations:

- Direct field observation of a manual volumetric ultrasonic examination, ASME Class 2, pipe to elbow butt weld of the safety injection system and record review of the examination report.
- Direct field observation of the visual examination and record review of the primary containment liner examination report(s) of accessible portions on the 45, 69 and 118 foot elevations. The inspectors reviewed CRs 2013-001475, 001823 and 001807, which identified a slight wavy appearance in the metallic liner at various locations. The inspectors noted that this condition was being evaluated by further visual examination and ultrasonic testing of selected areas which exhibited this appearance to verify liner integrity.
- Record review of the magnetic particle surface examination of feedwater system nozzle to vessel weld (Report CC13-IM-002) to confirm the inspection procedure and the examiner were qualified in accordance with the requirements of ASME Section XI.
- Record review of visual examination reports of the reactor pressure vessel internals to include shroud tie rods, core support barrel, shroud alignment lugs, core barrel outlet nozzles, and barrel flange and core support barrel alignment keys.

The inspectors reviewed qualification certificates of the NDE examiners performing the nondestructive testing. The inspectors verified that examinations were performed in accordance with ASME Section XI procedures and the results were reviewed and evaluated by certified ASME Level III personnel.

Review of Originally Rejectable Indications Accepted by Evaluation

There were no ASME Section XI NDE indications from previous outages that required follow-up inspection during 2R20.

Repair/Replacement Consisting of Welding Activities

The inspectors performed a record review of the work package instructions for the replacement activity, by welding, of a twelve inch valve in the low pressure core injection system line to the shutdown cooling HXs. Replacement of the twelve inch valve (2MOV658) was performed using work order C91397749 in accordance with the requirements of ASME Section XI, Class 2.

In addition, the inspectors reviewed work order C220081856 for the repair/installation of a high point vent in the Unit 2 hot leg injection flow path low pressure safety injection (LPSI) discharge header. Liquid penetrant testing was performed on the shop and field welds of the high point vent installation. The inspectors reviewed the NDE inspection reports to verify installation was in compliance with the ASME Code, Section XI and met the specified acceptance criteria.

The inspectors reviewed work orders C91397749 and C220081856 to verify compliance with the requirements of ASME Section XI, Class 2. The inspectors reviewed the applicable weld procedures, procedure qualification records, and welder qualification records. Also, the inspectors verified the applicable weld hold points were specified in the work package. The specified NDE procedure and acceptance criteria were also reviewed for ASME code compliance.

Pressurized Water Reactor Vessel Upper Head Penetration Inspection Activities (IMC 02.02)

The Calvert Cliffs Unit 2 reactor pressure vessel head, including the control rod drive mechanism penetrations, was replaced in 2007 and subsequently inspected for leakage. Constellation reported that no leakage was identified following the replacement and testing of the new reactor pressure vessel head in 2007. A visual inspection was not required during this outage.

Boric Acid Corrosion Control (BACC) Inspection Activities (IMC Section 02.03)

The inspectors reviewed the BACC program, which is performed in accordance with Constellation's procedures and discussed the program requirements with the boric acid program owner. The inspectors reviewed the previous self assessment of the program and also reviewed photographic inspection records of several samples of both active and inactive boric acid leakage. This leakage was identified on safety significant piping and components during walkdowns conducted by Constellation personnel. The inspectors reviewed a sample of CRs for evaluation and disposition within the CAP. Samples selected were based on component function and their location where direct leakage or impingement on adjacent locations could cause degradation of safety system function.

SG Tube Inspection Activities (IMC Section 02.04)

No SG tube inspections were performed during this refueling outage.

The inspectors reviewed the SG operational assessments from the previous refueling outage to confirm that not performing the SG tube inspections during the current outage was warranted based on supporting technical analysis of previous examination history and degradation assessments. Also, that the omission of this inspection was in accordance with the TS requirements and Electric Power Research Institute guidelines.

Identification and Resolution of Problems (IMC Section 02.05)

The inspectors reviewed a sample of CRs which identified NDE indications, boric acid leakage, other deficiencies and nonconforming conditions since the previous refueling outage. The inspectors verified that nonconforming conditions were properly identified, characterized and evaluated for disposition within the CAP.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program (71111.11Q – 2 samples)

.1 Quarterly Review of Licensed Operator Requalification Testing and Training

a. Inspection Scope

The inspectors observed licensed operator simulator training on January 16, 2013, which included shutdown operations, and implementation of Abnormal Operating Procedure (AOP) -3B, "Abnormal Shutdown Cooling Conditions." The inspectors evaluated operator performance during the simulated events and verified completion of risk significant operator actions, including the use of AOPs and emergency operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and degrading plant conditions, and the oversight and direction provided by the control room supervisor. The inspectors verified the accuracy and timeliness of the emergency classification made by the shift manager and the TS action statements entered by the shift technical advisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems.

b. Findings

No findings were identified.

.2 Quarterly Review of Licensed Operator Performance in the Main Control Room

a. Inspection Scope

The inspectors observed and reviewed various activities conducted in the main control room, including: Unit 2 reactor shutdown to mode 3 and cooldown to mode 5 for a refueling outage on February 17, 2013. Additionally, the inspectors observed procedure

use and adherence, crew communications, and coordination of activities between work groups to verify that established expectations and standards were met.

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 7 samples)

a. Inspection Scope

The inspectors reviewed station evaluation and management of plant risk for the maintenance and emergent work activities listed below to verify that Constellation performed the appropriate risk assessments prior to removing equipment for work. The inspectors selected these activities based on potential risk significance relative to the reactor safety cornerstones. As applicable for each activity, the inspectors verified that Constellation personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When Constellation performed emergent work, the inspectors verified that Operations personnel promptly assessed and managed plant risk. The inspectors reviewed the scope of maintenance work and discussed the results of the assessment with the station's probabilistic risk analyst to verify plant conditions were consistent with the risk assessment. The inspectors also reviewed the TS requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

- Planned maintenance on Unit 1 'B' emergency core cooling train on January 8, 2013
- Severe weather alert during 1B EDG 24 hour run on January 17, 2013
- Emergent risk assessment due to No. 24 containment air cooler (CAC) failure on January 24, 2013
- Unplanned maintenance on No. 22 SG AFW flow control valve on February 7, 2013
- Unit 2 decay heat removal and inventory control yellow shutdown risk due to lowered RCS inventory on February 21, 2013
- Unit 2 yellow shutdown risk due to P-13000-2 13 kilovolt (kV) transformer outage on March 5, 2013
- Unit 2 yellow shutdown risk due to No. 22 saltwater header and the 120V vital alternating current bus 2Y02 maintenance on March 7, 2013

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 8 samples)

a. Inspection Scope

The inspectors reviewed operability determinations (ODs) for the following degraded or non-conforming conditions:

- Heat trace controllers on DFO lines from No. 11 FOST appear to be malfunctioning on January 10, 2013 (CR-2012-011422)
- No. 21 and No. 22 LPSI pump motor bearings mixed grease on January 14, 2013 (CR-2013-000252)
- 2B EDG low speed relay energized in excess of expected time on January 25, 2013 (CR-2013-000676)
- 1B EDG fuel oil day tank high level alarm on January 25, 2013 (CR-2013-000688)
- No. 11 boric acid pump motor high vibrations on February 4, 2013 (CR-2013-000931)
- Pressurizer pressure relief valve block valve (2MOV403) did not develop required minimum thrust on February 26, 2013 (CR-2013-001806)
- Containment sump outlet isolation valve (2MOV4144) was over thrust into the seat on February 27, 2013 (CR-2013-001870)
- Design deficiency associated with 4 kV breakers spring charging motor circuit on March 7, 2013 (CR-2013-002205)

The inspectors selected these issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the ODs to assess whether TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TSs and UFSAR to Constellation's evaluations to determine whether the components or systems were operable. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled by Constellation. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 – 2 samples)

.1 Temporary Modifications

a. Inspection Scope

The inspectors reviewed the temporary modification, Unit 2 pressurizer vapor vent path isolation, tagout clearance number 2-064-0117, to determine whether the modification affected the safety functions of systems that are important to safety. The inspectors reviewed 10 CFR 50.59 documentation and post-modification testing results, and conducted field walkdowns of the modifications to verify that the temporary modifications did not degrade the design bases, licensing bases, and performance capability of the affected systems.

b. Findings

No findings were identified.

.2 Permanent Modifications

a. Inspection Scope

The inspectors reviewed a permanent modification to replace low pressure electro-hydraulic controls with electrical actuator controls for SG feed pumps (ECP-17-000520) to determine whether the modifications affected the safety functions of systems that are important to safety. The inspectors verified that the design bases, licensing bases, and performance capability of the affected systems were not degraded by the modification. In addition, the inspectors reviewed modification documents associated with the upgrade and design change, including operational impact design evaluation, installation and testing instructions, and drawings changes associated with the modifications.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 10 samples)

a. Inspection Scope

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

- No. 12 CC HX salt water outlet valve pressure regulator (1PCV5208) replacement on January 23, 2013
- Repair of the No. 22 SG AFW flow control valve (2CV4512) on February 8, 2013
- No. 23 high pressure safety injection (HPSI) pump inboard and outboard bearing replacement on March 13, 2013
- No. 21 LPSI pump motor replacement on March 14, 2013
- Disassemble and inspect containment sump outlet check valve (2CKVSI-4148) on March 19, 2013
- Inspection and repair 21 'A' loop inlet check valve (2-SI-227) on March 7, 2013
- No. 22 steam driven AFW pump bearing replacement on March 20, 2013
- Overhaul of No. 24 CAC emergency discharge valve actuator (2CV1593) on March 8, 2013
- No. 24 CAC motor replacement on March 23, 2012
- Disassembly and inspection of refueling water tank outlet, check valve (2-SI-4146) on March 7, 2013

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20 – 1 sample)

a. Inspection Scope

The inspectors reviewed the station's work schedule and outage risk plan for the Unit 2 maintenance and refueling outage 2R20, which was conducted February 17 through March 25, 2013. The inspectors reviewed Constellation development and implementation of outage plans and schedules to verify that risk, industry experience, previous site-specific problems, and defense-in-depth were considered. During the outage, the inspectors observed portions of the shutdown and cooldown processes and monitored controls associated with the following outage activities:

- Configuration management, including maintenance of defense-in-depth, commensurate with the outage plan for the key safety functions and compliance with the applicable TSs when taking equipment out of service
- Implementation of clearance activities and confirmation that tags were properly hung and that equipment was appropriately configured to safely support the associated work or testing
- Installation and configuration of reactor coolant pressure, level, and temperature instruments to provide accurate indication and instrument error accounting
- Status and configuration of electrical systems and switchyard activities to ensure that TSs were met
- Monitoring of decay heat removal operations
- Impact of outage work on the ability of the operators to operate the spent fuel pool cooling system
- Reactor water inventory controls, including flow paths, configurations, alternative means for inventory additions, and controls to prevent inventory loss
- Activities that could affect reactivity
- Maintenance of containment closure as required by TSs
- Refueling activities, including fuel handling and fuel receipt inspections
- Fatigue management
- Tracking of startup prerequisites, walkdown of the primary containment to verify that debris had not been left which could block the emergency core cooling system suction strainers, and startup and ascension to full power operation
- Identification and resolution of problems related to refueling outage activities

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 9 samples)

a. Inspection Scope

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk-significant systems, structures, and components to assess whether test results satisfied TSs, the UFSAR, and Constellation procedural requirements. The inspectors verified that test acceptance criteria were clear, tests demonstrated operational readiness and were consistent with design documentation, test

instrumentation had current calibrations and the range and accuracy for the application, tests were performed as written, and applicable test prerequisites were satisfied. Upon test completion, the inspectors considered whether the test results supported that equipment was capable of performing the required safety functions. The inspectors reviewed the following surveillance tests:

- STP-O-08B-2, Test of 2B EDG and 4 kV bus loss of coolant incident sequencer on January 25, 2013
- STP-M-33-0, Inspection of 12 condensate storage tank vacuum breaker valves on February 11, 2013
- ETP 13-0001R, Differential pressure testing of 2MOV659 and 2MOV660 on March 6, 2013
- STP-0-73G-2, HPSI pump, large flow test on February 22, 2013
- STP-O-108C-2, Local leak rate test, penetration 41 (shutdown cooling) on March 5, 2013 (CIV)
- STP-O-027-2, RCS leakage evaluation on March 21, 2013 (RCS leak)
- STP-O-04A-2, 'A' train integrated engineering safety features test on March 14, 2013
- STP-M-003A-0, On-line main steam safety valve testing on March 25, 2013
- Review of CR 2012-005253 on November, 2, 2012 related to inadequate surveillance testing

b. Findings

Introduction: The inspectors identified a Green NCV of TS SR 3.8.1.7 because Constellation failed to adequately perform SR associated with the DFO transfer system.

Description: On November 2, 2012, during a review of EDG surveillance testing, the inspectors identified that Constellation did not adequately perform TS-required testing associated with the DFO transfer system. CCNPP has two FOSTs, No. 11 and No. 21. Although, the No. 11 FOST is seismically qualified, it is not missile protected and is not credited by the safety analysis. Because the No. 21 FOST is credited by the safety analysis, TS Bases Document stated that the No. 21 FOST is the credited tank for the 1B, 2A, and 2B EDGs. The 2A EDG is normally aligned to the No. 11 FOST and the 2B EDG is normally aligned to the No. 21 FOST. TS SR 3.8.1.7, stated, "Verify the fuel oil transfer system operates to automatically transfer fuel oil from the storage tank(s) to the day tank." The frequency of this SR is 31 days. Since at least 1996, Constellation performed this surveillance with 2A EDG aligned to the No. 11 FOST. The last known performance of the test of the DFO transfer system with 2A aligned to FOST 21 was prior to 1996 when Constellation added the 1A EDG and 0C diesel; made changes to EDG configuration and lineups; and made changes to the TSs in response to the SBO Rule. The inspectors concluded that Constellation is required to perform SR 3.8.1.7 with the 2A EDG aligned to the No. 21 FOST because the No. 21 FOST is the tank that is credited by the safety analysis. As stated in the TS Bases, this SR 3.8.1.7 provides assurance that the fuel delivery piping system is intact and the fuel delivery piping is not obstructed.

In addition, because 2A EDG is normally aligned to the No. 11 FOST, Constellation is required to test this alignment periodically in accordance with 10 CFR 50, Appendix B, Criterion XI, "Test Control," which states, in part, "A test program shall be established to assure that all testing required to demonstrate that SSCs will perform satisfactorily in

service is identified and performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in applicable design documents.”

The inspectors determined that Constellation had a reasonable recent opportunity to identify this issue. In May 2012 following the inspectors’ identification of testing issues associated with the AFW system emergency air accumulators and the EDG shutdown sequencers, Constellation initiated CR-2012-005253 to identify any additional inadequate test programs. In support of this review, Constellation selected the top ten risk significant systems which included the EDGs and formed a multi-discipline team of Operations, Maintenance, System Engineering, and Design Engineering personnel to review each selected system. Constellation completed the review without identifying any additional testing issues. Subsequent to this review, the inspectors identified that the EDG surveillance test (SR 3.8.1.7) was inadequate.

Immediate corrective actions included entering this issue into the CAP and entering TS SR 3.0.3 for a missed surveillance which required performing a probabilistic risk assessment and performing the missed surveillance within 31 days. Corrective actions planned includes revising the quarterly EDG surveillance procedure to test the 2A EDG while aligned to the No. 21 FOST and develop and implement a testing program to periodically test 1B, 2A, and 2B EDGs on the No. 11 FOST.

Analysis: Constellation’s failure to adequately perform SR 3.8.1.7 for the DFO transfer system was a performance deficiency that was within Constellation’s ability to foresee and correct and should have been prevented. This finding is more than minor because it is associated with the equipment performance attribute of the Mitigating System cornerstone and affects the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, Constellation’s testing program did not provide assurance that no obstruction exists in the DFO transfer system. If left uncorrected, this issue potentially would result in a greater safety concern in that an obstruction that could exist would not be identified until an actual event requiring the 2A EDG to be aligned to the No. 21 FOST per the safety analysis.

In accordance with IMC 0609.04, “Initial Characterization of Findings” and Exhibit 2 of IMC 0609, Appendix A, “Significance Determination Process For Findings At-Power,” issued June 19, 2012, the inspectors determined that this finding is of very low safety significance (Green) because the performance deficiency was not a design or qualification deficiency; did not represent a loss of system and/or function; did not represent an actual loss of function of at least a single train for greater than its TS allowed outage time; and did not represent an actual loss of function of one or more non-TS trains of equipment designated as high safety significance.

The inspectors determined that the finding has a cross-cutting aspect in the area of Problem Identification and Resolution, CAP, because Constellation did not ensure that issues potentially impacting nuclear safety are promptly identified, fully evaluated, and that actions are taken to address safety issues in a timely manner, commensurate with their significance. Specifically, Constellation did not take appropriate corrective actions to address safety issues and adverse trends in a timely manner associated with inadequate testing programs of risk significant equipment. [P.1(d)]

Enforcement: TS SR 3.8.1.7, states, “Verify the fuel oil transfer system operates to automatically transfer fuel oil from the storage tank(s) to the day tank.” TS Bases Document and UFSAR Chapter 8 stated that the No. 21 FOST is the credited tank for the 2A EDG. Contrary to the above, between approximately 1996 and November 2, 2012, Constellation did not verify that the fuel oil transfer system operated to automatically transfer fuel oil from the No. 21 FOST to the 2A EDG day tank. As a result, Constellation’s testing program did not provide assurance that no obstruction existed in the DFO transfer system. Immediate corrective actions included entering this issue into the CAP and entering TS SR 3.0.3 for a missed surveillance which required performing a probabilistic risk assessment and performing the missed surveillance within 31 days. Corrective actions planned includes revising the quarterly EDG surveillance procedure to test the 2A EDG while aligned to the No. 21 FOST and develop and implement a testing program to periodically test 1B, 2A, and 2B EDGs on the No. 11 FOST. Because this violation was of very low safety significance (Green) and has been entered into Constellation’s CAP (CR-2012-010027), this violation is being treated as an NCV, consistent with Section 2.3.2a of the NRC Enforcement Policy (**NCV 05000317; 05000318/2013002-02: Inadequate Technical Specification Surveillance Testing of the Diesel Fuel Oil Transfer System**)

2. RADIATION SAFETY

Cornerstone: Public Radiation Safety and Occupational Radiation Safety

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01)

a. Inspection Scope

During February 25 through March 1, 2013, the inspectors reviewed and assessed Constellation performance in assessing the radiological hazards and exposure control in the workplace. The inspectors used the requirements in 10 CFR 20 and guidance in Regulatory Guide (RG) 8.38, “Control of Access to High and Very High Radiation Areas for Nuclear Plants;” TSs; and Constellation procedures required by TS as criteria for determining compliance.

Inspection Planning

The inspectors reviewed the results of Radiation Protection (RP) program audits. The inspectors reviewed any reports of operational occurrences related to occupational radiation safety since the last inspection.

Radiological Hazard Assessment

The inspectors determined if there have been changes to plant operations since the last inspection that may result in a significant new radiological hazard for onsite workers or members of the public. The inspectors evaluated whether Constellation assessed the potential impact of these changes and has implemented periodic monitoring, as appropriate, to detect and quantify the radiological hazard.

The inspectors conducted walk-downs and independent radiation measurements in the facility, including the containment, to evaluate material and radiological conditions.

The inspectors selected the following risk-significant work activities that involved exposure to radiation:

- Reactor coolant pump maintenance
- Safety Injection Valve (2-SI-658) replacement
- General Safety Initiative (GSI) - 191

For these work activities, the inspectors assessed whether the pre-work surveys performed were appropriate to identify and quantify the radiological hazard and to establish adequate protective measures. The inspectors evaluated the radiological survey program to determine if radiological hazards were properly identified (e.g., discrete radioactive hot particles, transuranics and hard to detect nuclides in air samples, transient dose rates and large gradients in radiation dose rates). The inspectors evaluated whether continuous air monitors were located in areas with low background radiation to minimize false alarms and were representative of actual work areas. The inspectors evaluated Constellation's program for monitoring levels of loose surface contamination in areas of the plant with the potential for the contamination to become airborne.

Instructions to Workers

The inspectors reviewed the following radiation work permits (RWPs) used to access high radiation areas (HRA) and evaluated if the specified work control instructions and control barriers were consistent with TS requirements for HRA.

- 2013-2003 GSI-191 Project, excluding cavity drain line modification, Revision 1
- 2013-2005 Cavity Drain Line Modification, Revision 1
- 2013-2004 Reactor coolant pump maintenance during U-2 Refueling Outage, Revision 1

For these RWPs, the inspectors assessed whether allowable stay times or permissible dose for radiologically significant work under each RWP was clearly identified. The inspectors evaluated whether electronic personal dosimeter (EPD) alarm set-points were in conformance with survey indications and plant procedural requirements.

The inspectors reviewed two occurrences where a worker's EPD noticeably malfunctioned or alarmed. The inspectors evaluated whether workers responded appropriately to the off-normal condition. The inspectors assessed whether the issue was included in the CAP and whether compensatory dose evaluations were conducted as appropriate.

For work activities that could suddenly and severely increase radiological conditions, the inspectors assessed Constellation's methods to inform workers of these changes that could significantly impact their occupational dose.

Contamination and Radioactive Material Control

The inspectors observed two locations where Constellation staff monitors potentially contaminated material leaving the radiological control area and inspected the methods used for control, survey, and release of these materials from these areas. The

inspectors observed the performance of personnel surveying and releasing material for unrestricted use and evaluated whether the work was performed in accordance with plant procedures. The inspectors assessed whether the radiation monitoring instrumentation used for equipment release and personnel contamination surveys had appropriate sensitivity for the type(s) of radiation present.

The inspectors reviewed Constellation's criteria for the survey and release of potentially contaminated material. The inspectors evaluated whether there was guidance on how to respond to an alarm that indicates the presence of licensed radioactive material.

The inspectors reviewed Constellation's procedures and records to verify that the radiation detection instrumentation was used at its typical sensitivity level based on appropriate counting parameters.

Radiological Hazards Control and Work Coverage

The inspectors evaluated ambient radiological conditions and performed independent radiation measurements during walk-downs of the facility. The inspectors assessed whether the conditions were consistent with applicable posted surveys, RWPs, and associated worker briefings.

The inspectors evaluated the adequacy of radiological controls, such as required surveys, RP job coverage and contamination controls. The inspectors evaluated Constellation's use of EPDs in high noise areas that were also HRAs or locked high radiation areas (LHRA).

The inspectors assessed whether radiation monitoring devices were placed on the individual's body consistent with Constellation procedures. The inspectors assessed whether the dosimeter was placed in the location of highest expected dose or that Constellation properly implemented an NRC-approved method of determining effective dose equivalent.

The inspectors reviewed the application of dosimetry to effectively monitor exposure to personnel in high-radiation work areas with significant dose rate gradients.

The inspectors reviewed the following RWPs for work within airborne radioactivity areas with the potential for individual worker internal exposures.

- 2013-2003 GSI-191 Project, excluding cavity drain line modification, Revision 1
- 2013-2005 Cavity Drain Line Modification, Revision 1
- 2013-2022 Safety Injection Valve (2-SI-658) replacement, Revision 2

For these RWPs, the inspectors evaluated airborne radioactive controls and monitoring, including potential for significant airborne levels. The inspectors assessed applicable containment barrier integrity and the operation of temporary high-efficiency particulate air ventilation systems.

The inspectors examined Constellation's physical and programmatic controls for highly activated or contaminated materials stored within spent fuel and other storage pools. The inspectors assessed whether appropriate controls were in place to preclude inadvertent removal of these materials from the pool.

The inspectors examined the posting and physical controls for selected HRAs, LHRAs and very high radiation areas to verify conformance with the occupational performance indicator.

Radiation Worker Performance

The inspectors observed the performance of radiation workers with respect to stated RP work requirements. The inspectors assessed whether workers were aware of the radiological conditions in their workplace and the RWP controls/limits in place, and whether their behavior reflected the level of radiological hazards present.

The inspectors reviewed two radiological problem reports since the last inspection that attributed the cause of the event to human performance errors. The inspectors evaluated whether there was an observable pattern traceable to a similar cause. The inspectors assessed whether this perspective matched the corrective action approach taken by Constellation to resolve the reported problems.

RP Technician Proficiency

The inspectors observed the performance of the RP technicians with respect to controlling radiation work. The inspectors evaluated whether technicians were aware of the radiological conditions in their workplace and the RWP controls/limits, and whether their behavior was consistent with their training and qualifications with respect to the radiological hazards and work activities.

The inspectors reviewed two radiological problem reports since the last inspection that attributed the cause of the event to RP technician error. The inspectors evaluated whether there was an observable pattern traceable to a similar cause. The inspectors assessed whether this perspective matched the corrective action approach taken by Constellation to resolve the reported problems.

Problem Identification and Resolution

The inspectors evaluated whether problems associated with radiation monitoring and exposure control were being identified by Constellation at an appropriate threshold and were properly addressed for resolution in Constellation's CAP. The inspectors assessed the appropriateness of the corrective actions for a selected sample of problems documented by Constellation that involve radiation monitoring and exposure controls. The inspectors assessed Constellation's process for applying operating experience to their plant.

b. Findings

No findings were identified.

2RS2 Occupational ALARA Planning and Controls (71124.02)

a. Inspection Scope

During February 25, 2013 through March 1, 2013, the inspectors assessed performance with respect to maintaining occupational individual and collective radiation exposures as low as is reasonably achievable (ALARA). The inspectors used the requirements in 10

CFR 20, RG 8.8, "Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Plants will be ALARA;" RG 8.10, "Operating Philosophy for Maintaining Occupational Radiation Exposure ALARA;" TSs; and Constellation procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors reviewed pertinent information regarding Calvert Cliffs' collective dose history, current exposure trends, and ongoing or planned activities in order to assess current performance and exposure challenges. The inspectors reviewed the plant's three year rolling average collective exposure.

The inspectors compared the site-specific trends in collective exposures against the industry average values and those values from similar vintage reactors. In addition, the inspectors reviewed any changes in the radioactive source term by reviewing the trend in average contact dose rate with reactor coolant piping.

The inspectors reviewed site-specific procedures associated with maintaining occupational exposures ALARA, which included a review of processes used to estimate and track exposures from specific work activities.

Radiological Work Planning

The inspectors selected the following work activities that had the highest exposure significance:

- GSI – 191, Estimated at 51.680 Person-Rem
- Scaffold, Estimated at 7.700 Person-Rem
- Reactor Coolant Pump Maintenance, Estimated at 5.100 Person-Rem
- Mechanical Maintenance, Estimated at 6.610 Person-Rem

The inspectors reviewed the ALARA work activity evaluations, exposure estimates, and exposure reduction requirements. The inspectors determined whether Constellation reasonably grouped the radiological work into work activities, based on historical precedence, industry norms, and/or special circumstances.

The inspectors assessed whether Constellation's planning identified appropriate dose reduction techniques; considered alternate dose reduction features; and estimated reasonable dose goals. The inspectors evaluated whether Constellation's ALARA assessment had taken into account decreased worker efficiency from use of respiratory protective devices and/or heat stress mitigation equipment. The inspectors determined whether Constellation work planning considered the use of remote technologies as a means to reduce dose and the use of dose reduction insights from industry operating experience and plant-specific lessons learned. The inspectors assessed the integration of ALARA requirements into work procedure and RWP documents.

Verification of Dose Estimates and Exposure Tracking Systems

The inspectors reviewed the assumptions and basis for the current annual collective dose estimate for accuracy. The inspectors reviewed applicable procedures to

determine the methodology for estimating exposures from specific work activities and for department and station collective dose goals.

The inspectors evaluated whether Constellation had established measures to track, trend, and if necessary, to reduce occupational doses for ongoing work activities. The inspectors assessed whether dose threshold criteria were established to prompt additional reviews and/or additional ALARA planning and controls.

The inspectors evaluated Constellation's method of adjusting exposure estimates, or re-planning work, when unexpected changes in scope or emergent work were encountered. The inspectors assessed whether adjustments to exposure estimates were based on sound RP and ALARA principles or if they were just adjusted to account for failures to plan/control the work.

Source Term Reduction and Control

The inspectors used Constellation's records to determine the historical trends and current status of plant source term known to contribute to elevated facility collective dose. The inspectors assessed whether Constellation had made allowances or developed contingency plans for expected changes in the source term as the result of changes in plant fuel performance issues or changes in plant primary chemistry.

Radiation Worker Performance

The inspectors observed radiation worker and RP technician performance during work activities being performed in radiation areas, airborne radioactivity areas, and HRAs. The inspectors evaluated whether workers demonstrated the ALARA philosophy in practice and whether there were any procedure or RWP compliance issues.

Problem Identification and Resolution

The inspectors evaluated whether problems associated with ALARA planning and controls are being identified by Constellation staff at an appropriate threshold and were properly addressed for resolution in Constellation's CAP. The inspectors assessed Constellation's process for applying operating experience to their plant.

b. Findings

No findings were identified.

2RS3 In-Plant Airborne Radioactivity Control and Mitigation (71124.03)

a. Inspection Scope

During February 25, 2013 through March 1, 2013, the inspectors verified in-plant airborne concentrations are being controlled consistent with ALARA principles and the use of respiratory protection devices on-site does not pose an undue risk to the wearer. The inspectors used the requirements in 10 CFR Part 20, the guidance in RG 8.15, "Acceptable Programs for Respiratory Protection;" RG 8.25, "Air Sampling in the Workplace;" NUREG-0041, "Manual of Respiratory Protection Against Airborne

Radioactive Material;" TSS; and Constellation procedures required by TSS as criteria for determining compliance.

Inspection Planning

The inspectors reviewed the UFSAR to identify areas of the plant designed as potential airborne radiation areas and any associated ventilation systems or airborne monitoring instrumentation. This review included instruments used to identify changing airborne radiological conditions such that actions to prevent an internal uptake may be taken.

Engineering Controls

The inspectors reviewed Constellation's use of permanent and temporary ventilation to determine whether Constellation uses ventilation systems as part of its engineering controls to control airborne radioactivity. The inspectors reviewed procedural guidance for use of installed plant systems to reduce dose and assessed whether the systems are used, to the extent practicable, during high-risk activities.

The inspectors selected one installed ventilation system used to mitigate the potential for airborne radioactivity. The inspectors evaluated whether the ventilation system operating parameters were consistent with maintaining concentrations of airborne radioactivity in work areas below the concentrations of an airborne radioactivity area.

The inspectors selected two temporary ventilation system setups used to support work in contaminated areas. The inspectors assessed whether the use of these systems was consistent with Constellation procedural guidance and the principles of ALARA.

The inspectors reviewed airborne monitoring protocols by selecting one installed system used to monitor and warn of changing airborne concentrations in the plant. The inspectors evaluated whether the alarms and setpoints are sufficient to prompt licensee/worker action to ensure that doses are maintained within the limits of 10 CFR 20 and ALARA.

The inspectors assessed whether Constellation had established threshold criteria for evaluating levels of airborne beta-emitting and alpha-emitting radionuclides.

b. Findings

No findings were identified.

2RS4 Occupational Dose Assessment (71124.04)

a. Inspection Scope

During February 25, 2013 through March 1, 2013, the inspectors verified that occupational dose is appropriately monitored, assessed and reported by Constellation. The inspectors used the requirements in 10 CFR 20; the guidance in RG 8.13, "Instructions Concerning Prenatal Radiation Exposures;" RG 8.36, "Radiation Dose to Embryo Fetus;" RG 8.40, "Methods for Measuring Effective Dose Equivalent from External Exposure;" TSS; and Constellation's procedures required by TSS as criteria for determining compliance.

Inspection Planning

The inspectors reviewed the results of Constellation RP program audits related to internal and external dosimetry.

A review was conducted of Constellation procedures associated with dosimetry operations, including issuance/use of external dosimetry, and assessments of external and internal dose for radiological incidents.

The inspectors evaluated whether Constellation had established procedural requirements for determining when external dosimetry and internal dose assessments are required.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

RCS Specific Activity and RCS Leak Rate (4 samples)

a. Inspection Scope

The inspectors reviewed Constellation's submittal for the RCS specific activity (BI01) and RCS leak rate (BI02) performance indicators for both Unit 1 and Unit 2 for the period of January 2011 through December 2012. To determine the accuracy of the performance indicator data reported during those periods, the inspectors used definitions and guidance contained in Nuclear Energy Institute document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspectors also reviewed RCS sample analysis and control room logs of daily measurements for RCS leakage, and compared that information to the data reported by the performance indicator. Additionally, the inspectors observed surveillance activities that determined the RCS identified leakage rate, and chemistry personnel taking and analyzing an RCS sample.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152)

Routine Review of Problem Identification and Resolution Activities

a. Inspection Scope

As required by Inspection Procedure 71152, "Problem Identification and Resolution," the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that Constellation entered issues into the CAP at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and

addressed adverse trends. In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the CAP and periodically attended CR screening meetings.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

Exit Meeting Summary

On April 19, 2013, the inspectors presented the inspection results to George Gellrich, Site Vice President, and other members of the Constellation staff. The inspectors verified that no proprietary information was retained by the inspectors or would be documented in this report.

ATTACHMENT: SUPPLEMENTARY INFORMATION

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

G. Gellrich, Site Vice President
 M. Flaherty, Plant General Manager
 A. Ball, Supervisor, Radiation Protection Operations
 J. Beasley, Supervisor, Engineering
 K. Bodine, Supervisor, Engineering
 J. Gaines, General Supervisor, Shift Operations
 K. Gould, General Supervisor, Radiation Protection
 S. Henry, Manager, Operations
 D. Lauver, Director, Licensing
 S. Loeper, Principal Engineer
 D. Moore, Senior Engineering Analyst
 C. Neyman, Senior Engineering Analyst, Licensing
 B. Rudell, Principal Engineer
 A. Simpson, Supervisor, Licensing
 J. Stanley, Manager Engineering Services

LIST OF ITEMS OPENED, CLOSED, DISCUSSED, AND UPDATEDOpened/Closed

05000317; 05000318/2013002-01	NCV	Failure to Establish Adequate Design Control Measures for Diesel Fuel Oil Cloud Point (Section 1R04)
05000317; 05000318/2013002-02	NCV	Inadequate Technical Specification Surveillance Testing of the Diesel Fuel Oil Transfer System (Section 1R22)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures

NO-1-119, Seasonal Readiness, Revision 00601
AOP-7M, Major Grid Disturbance, Revision 1
OAP- 92-9, Cold Weather Operations, Change 7
ERPIP-3.0, Immediate Actions, Revision 05101

Condition Reports

CR-2013-000153

Section 1R04: Equipment Alignment

Procedures

OI-3B-2, Shutdown Cooling, Revision 25
OI-16-1, Component Cooling System, Revision 32
OI-21D, Fuel Oil Storage and Supply, Revision 8
CP-0996, Determination of Bacterial Growth and Biodiesel, Revision 00401
ASTM 975-96, Standard Specification for Diesel Fuel Oils
CP-0226, Specification and Surveillance-Diesel Fuel Oil, Revision 01400
CP-1006, Determination of Biodiesel in Diesel Fuel Oil, Revision 00000

Condition Reports

CR-2012-010027
CR-2010-006572
CR-2013-001208

Drawings

60710sh0002, Component Cooling System, Revision 39
62731sh0001, Safety Injection & Containment Spray Systems, Revision 77
62731sh0002, Safety Injection & Containment Spray Systems, Revision 44
60736sh0001, Fuel Oil Storage System, Revision 50

Miscellaneous

Southwest Research Institute® Project No.08.17252.01.001, entitled, "SwRI Review of Report MPR-3643, January 2012, Evaluation of Ultra Low Sulfur Diesel for CCNPP EDGs and SBO Diesel," April 5, 2012
ECP-11-000303, MPR-3643, Evaluation of Ultra Low Sulfur Diesel Fuel for CCNPP and SBO Diesel
BGE Memorandum, Closure of PDR 199500029, Milestone 8, October 30, 1998

Section 1R05: Fire Protection

Procedures

FP-0002, Fire Hazards Analysis Summary Document, Revision 0
SA-1-100, Fire Prevention, Revision 01800
SA-1-102, Fire Protection/Appendix R Compensatory Actions, Revision 00400
SA-1-105, Fire Brigade Training, Revision 00300
OI-20A, Fire Protection Performance Evaluations and Fire Systems Inspections, Revision 01801

Section 1R08: Inservice Inspection ActivitiesCondition Reports

CR-2013-001802
 CR-2013-001273
 CR-2011-006089
 CR-2013-001245
 CR-2013-001807
 CR-2013-001475
 CR-2013-001823

Procedures

NDE-5240-CC R4 Penetrant Testing, ASME Section XI examination of systems, components and appurtenances
 NDE-5140-CC R3 Magnetic Particle Testing, ASME Section XI examination of components, piping, vessels and other structural steel.
 NDE-5449-CC R1 UT Testing of ASME Section XI examination of austenitic piping welds
 NDE-5715-CC R2 Visual Examination of Reactor Vessel and Internals as required by ASME Section XI and the reactor vessel internals program
 NDE-5750-CC R3 Visual Examination of General mechanical and structural integrity of component supports
 MN-3-123 R3 Boric Acid Corrosion Control Program

Work Orders

C92191245	C22081856	C91513296	C90915920
C91513280	C91513314	C91397749	

Inspection Reports (NDE)

CC13-IM-002 Magnetic Particle examination of feedwater nozzle to vessel weld
 CC13-IP-007 Liquid Penetrant examination of integrally welded attachment to safety injection, system 052
 CC13-IV-140 Visual Examination (VT-3) of pipe hanger component support
 CC11-IV-197 Visual Examination (VT-3) of reactor vessel core shroud tie rods
 CC11-IV-200 General Visual Examination of the reactor vessel and internals
 CC11-IV-201 Visual Examination (VT-3) of in vessel components including barrel outer nozzle, barrel flange top and ledge
 CC13-IU-028 Ultrasonic Test of stainless pipe to elbow in safety injection system
 CC11-BP016 Liquid Penetrant examination of high point vent shop welds
 CC11-BP-004 Liquid Penetrant examination of high point vent field welds

Miscellaneous

NDE Outage Schedule for period Feb 18 through Mar 1, 2013
 NDE Plan of the Day (POD) for period Feb 25, 26 and 27th, 2013
 Weld Procedure Specification P8T, stainless pipe welding on hi point vent
 Weld Procedure Specification P8-T/LH Rev 22 for replacement valve 2MOV658
 Repair/Replacement Plan (2012-2-108) -Replace 12" Velan Valve Assembly
 Repair/Replacement Plan (2010-2-045) –Install high point vent in LPSI low pressure safety injection)
 Weld Authorization Traveler CCNPP/2/052 Safety Injection high point vent line Modification

Section 1R11: Licensed Operator Requalification Program

Procedures

AOP-3B, Shutdown Cooling Abnormal Conditions, Revision 02301

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures

Maintenance Rule Risk Assessment Guideline, Revision 7

CNG-OP-4.01-1000, Integrated Risk Management, Revision 00900

CNG-OP-4.01-1000 Attachment 9, High Risk Activity Plan, Dated 7/28/2011

CNG-OM-1.01-1001, Shutdown Safety Management Program, Revision 00200

NO-1-103, Conduct of Lower Mode Operations, Revision 02901

NO-1-200, Control of Shift Activities, Revision 04902

EP-1-108, Severe Weather Preparation, Revision 00600

Condition Reports

CR-2013-001025

Section 1R15: Operability Determinations and Functionality Assessments

Procedures

CNG-OP-1.01-1002, Conduct of Operability Determinations / Functionality Assessments,
Revision 00200

Condition Reports

CR-2012-011422

CR-2013-000252

CR-2013-000676

CR-2013-000688

CR-2013-000931

CR-2013-001806

CR-2013-001870

CR-2013-002205

Drawing

62731sh0001, Safety Injection & Containment Spray Systems, Revision 77

62731sh0002, Safety Injection & Containment Spray Systems, Revision 44

62731sh0003, Safety Injection & Containment Spray Systems, Revision 28

60736sh0001, Fuel Oil Storage System, Revision 50

Miscellaneous

ECP-13-000209, 2MOV-4144 Over Thrust Evaluation

CA03528, Thrust Calculation for Unit 2 Generic Letter 89-10 MOVs, Revision 0004

SP-0885, Motor-Operated PORV Block Valve 1(2) MOV403 & 405, Revision 0002

CA06000, Maximum Line Differential Pressure 2MOV403 & 405 May Experience During
Operation

Section 1R18: Plant Modifications

Procedure

CNG-CM-1.01-1004, Temporary Plant Configuration Change Process, Revision 00201
NEI 96-07, Guidelines for 10 CFR 50.59 Implementation, Revision 1
CNG-CM-1.01-1003, Design Engineering and Configuration Control, Revision 00500

Drawing

60724sh0001, Reactor Coolant & Waste Process Sample System, Revision 59

Miscellaneous

Tagout clearance number 2-064-0117
ECP-12-000520, No. 21 and No. 22 Steam Generator Feedwater Pup Lovejoy Controls
Replacement, Revision 0000

Section 1R19: Post-Maintenance Testing

Procedures

CNG-OP-1.01-1007, Clearance & Safety Tagging, Revision 01000
CNG-MN-4.01-GL002, Post Maintenance Test and Post Maintenance Operability Test
Requirements Guideline, Revision 00000
NO-1-208, Calvert Cliffs Operability and Maintenance Testing, Revision 01700
STP-M-025-0, Velan Check Valve Inspection, Revision 00100
STP-O-005A-2, Auxiliary Feedwater System Quarterly Surveillance Test, Revision 02402
STP-O-065C-2, 22 SRW Subsystem Valve Quarterly Operability Test, Revision 00420
STP-O-065P-1, 12 Saltwater Subsystem Valve Quarterly Operability Test, Revision 00821
STP-O-067E-2, Containment Sump Check Valve Operability Test, Revision 00504
STP-O-67H-2, SIT Check Valve Stroke Test, Revision 00208
STP-O-71-2, Monthly Test of "B" Train Containment Cooling Units, Iodine Removal Units, &
Penetration Room Exhaust Filter, Revision 01604
STP-O-073I-2, HPSI Pump and Check Valve Quarterly Operability Test, Revision 01103
STP-O-073L-2, LPSI Pump Performance Test, Revision 01000

Condition Reports

CR-2013-002320
CR-2011-009787

Work Orders

C91766181
C91519896
C91510102
C91759540
C91635375

Drawings

60712sh0003, Compressed Air System Instrument Air & Plant Air, Revision 111
60712sh0007, Compressed Air System Instrument Air & Plant Air, Revision 4

Miscellaneous

CA01318, Salt Water Air Compressor Load, Revision 3

Section 1R20: Refueling and Other Outage Activities

Procedure

OP-3-2, Normal Power Operation, Revision 04910
OP-4-2, Plant Shutdown from Power Operation to Hot Standby, Revision 01902
OP-5-2, Plant Shutdown from Hot Standby to Cold Shutdown, Revision 02704
OP-7-2, Shutdown Operations, Revision 04800
NO-1-103, Conduct of Lower Mode Operations, Revision 02902
OI-3A, Safety Injection and Containment Spray, Revision 26
CNG-OM-1.01-1001, Shutdown Safety Management Program, Revision 00400
OAP-10-03, Operations Refueling Outage Guidelines, Revision 6
NO-1-104, Containment Access, Revision 01900
OI-3B-2, Shutdown Cooling, Revision 25

Section 1R22: Surveillance Testing

Procedures

ETP-13-0001R, Differential Pressure Testing of 2MOV659 and 2MOV660, Revision 00000,
STP-M-003A-0, On-Line Main Steam Safety Valve Testing, Revision 00500
STP-M-033-0, Inspection of 12 CST Vacuum Breaker Valves, Revision 0003
STP-O-004A-2, A Train Integrated Engineering Safety Features Test, Revision 30
STP-O-8B-2, Test of 2B DG and 4kV Bus 24 LOCI Sequencer, Revision 27
STP O-27-2, Reactor Coolant System Leakage Evaluation, Revision 1803
STP-O-73G, HPSI Pump Large Flow Test, Revision 7
STP-O-108C-2, Local Leak Rate Test, Penetration 41 (Shutdown Cooling), Revision 00311

Work Orders

C9119909166
C1200604765
C219914686
C119909167
C219914689

Condition Reports

CR-2012-010978

Drawing

15294-0002, Assembly 6" CV1-L ASME-Section III, Class 3 Anderson, Greenwood & CO, Rev 6

Miscellaneous

CA03528, Thrust Calculation for Unit 2 Generic Letter 89-10 MOVs, Revision 0004
ECP-13-000113, 1(2) MOV659/660 Spring Pack Replacement
CA07965, Actuator Capability for Motor Operated Valves 1(2)MOV659/660, Revision 0
M-84-29, Condensate Storage Tank 12 Design Pressure Chance Includes CST-11, CST-21,
DWST-11
SP-488, ASME Section III Class 2 & 3 Relieve Valves and Vacuum Breakers

Section 2RS1: Radiological Hazard Assessment and Exposure Controls

Procedures

NO-1-110, Calvert Cliffs Key and Lock Control, Revision 00802
RSP-1-104, Area Posting and Barricading, Revision 02500
RSP-1-113, Release of Items, Material and Vehicles from a contaminated or Radiologically Controlled Area, Revision 01100
RSP-1-132, Job Coverage in Radiologically Controlled Areas, Revision 01600
RSP-1-200, RWP Preparation, Revision 02700
RSP-1-203, Temporary Shielding, Revision 01600
RSP-1-210, Hot Spot Reduction, Revision 00100

Audits, Self-Assessments, and Surveillances

Q&PA Assessment Report #2012-019, CCNPP – Use of Alternative Monitoring Equipment for Dose Assessment, June 29, 2012
Q&PA Assessment Report #2012-045, CCNPP – Backshift Observation, September 25, 2012
Q&PA Assessment Report #2012-048, CCNPP – Fleet Type II on Performance Improvement Coordinator (PC) Trending, November 13, 2012
Q&PA Assessment Report #2012-053, CCNPP – QPA Review of CRs Assigned to Radiation Protection (RP), September 21, 2012
SA-2012-00051, ALPHA Monitoring and Control Program, September 21, 2012

Corrective Action Documents

CR-2012-006024
CR-2012-006187
CR-2012-006632
CR-2012-006732
CR-2012-007821
CR-2012-008445
CR-2012-011044
CR-2013-000572
CR-2013-001333
CR-2013-001479

Section 2RS2: Occupational ALARA Planning and Controls

Procedures

CNG-RP-1.01-1001, Station ALARA Committee, Revision 00000
CNG-RP-1.01-2003, Operational ALARA Planning and Controls, Revision 00000
CNG-RP-1.01-3001, ALARA Monitoring and Control, Revision 00000
RP-1-101, ALARA, Revision 00501

Condition Reports

CR-2012-007094
CR-2012-008718
CR-2012-009470
CR-2012-010292

<u>ALARA Review #</u>	<u>RWP #</u>	<u>Description</u>	<u>Revision/Date</u>
13-02	2013-2000	RP Activities	Revision 0
13-10	2013-2010	Mechanical Maintenance	Revision 1
13-14	2013-2400	Scaffold	Revision 1
13-27	2013-2016	RCP Maintenance	Revision 1
GSI-191	2013-2003/2005/2007	General Safety Initiative	Revision 1

Section 2RS3: In-Plant Airborne Radioactivity Control and Mitigation

Procedures

RSP-1-115, Radiological Air Sampling Program, Revision 01400

RSP-1-131, Operation of the AMS-4, Revision 00500

Condition Reports

CR-2012-011044

Section 2RSO4: Occupational Dose Assessment

Procedures

RSP-3-102, Personnel Dose Control, Revision 01201

Section 4OA1: Performance Indicator Verification

Procedures

CNG-NL-1.01-1010, NRC and INPO Performance Indicator Reporting, Revision 00600

STP O-27-1, Reactor Coolant System Leakage, Revision 2002

STP O-27-2, Reactor Coolant System Leakage, Revision 1803

Condition Reports

CR-2012-009203

LIST OF ACRONYMS

ADAMS	Agency-Wide Documents Access and Management System
AFW	auxiliary feedwater
ALARA	as low as is reasonably achievable
AOP	abnormal operating procedure
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
BACC	boric acid corrosion control
CAC	containment air cooler
CAP	corrective action program
CC	component cooling
CCNPP	Calvert Cliffs Nuclear Power Plant
CFR	<i>Code of Federal Regulations</i>
CR	condition report
DFO	diesel fuel oil
ECP	engineering change procedure
EDG	emergency diesel generator
EPD	electronic personal dosimeter
FOST	fuel oil storage tank
GSI	general safety initiative
HPSI	high pressure safety injection
HRA	high radiation area(s)
HX	heat exchanger
IMC	Inspection Manual Chapter
IN	information notice
ISI	inservice inspection
kV	kilovolt
LHRA	locked high radiation area
LPSI	low pressure safety injection
NDE	nondestructive examination
NCV	non-cited violation
NRC	Nuclear Regulatory Commission
OD	operability determination
PARS	publicly available records
RG	regulatory guide
RCS	reactor coolant system
RFO	refueling outage
RP	radiation protection
RWP	radiation work permit
SBO	station blackout
SDP	significance determination process
SG	steam generator
SR	surveillance requirement
SSC	structure, system, and component
TS	technical specifications
UFSAR	updated final safety analysis report