UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
2100 RENAISSANCE BLVD., SUITE 100
KING OF PRUSSIA, PA 19406-2713

May 9, 2014

Mr. George H. Gellrich, Vice President
Calvert Cliffs Nuclear Power Plant, LLC
Exelon Generation Company, LLC
1650 Calvert Cliffs Parkway
Lusby, Maryland 20657-4702

SUBJECT: CALVERT CLIFFS NUCLEAR POWER PLANT – NRC INTEGRATED INSPECTION REPORT 05000317/2014002 AND 05000318/2014002

Dear Mr. Gellrich:

On March 31, 2014, 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 23, 2014, 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. On April 1, 2014, the operating licenses for CCNPP and the Calvert Cliffs Independent Spent Fuel Storage Installation held by the Constellation Energy Nuclear Group, LLC (CENG) were transferred to Exelon Generation Company, LLC.

This report documents three violations of NRC requirements all of which were 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.a of the NRC Enforcement Policy. If you contest any NCVs in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at CCNPP. 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 Inspector at CCNPP.

Additionally, as we informed you in the most recent NRC annual assessment letter, cross-cutting aspects identified in the last six months of 2013 using the previous terminology were being converted in accordance with the cross-reference in Inspection Manual Chapter (IMC) 0310. Section 4OA5 of the enclosed report documents the conversion of these cross-cutting aspects which will be evaluated for cross-cutting themes and potential substantive cross-cutting

issues in accordance with IMC 0305 starting with the 2014 mid-cycle assessment review. If you disagree with the cross-cutting aspect assigned, 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 Inspector at the CCNPP.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

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

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

Enclosure: Inspection Report 05000317/2014002 and 05000318/2014002
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos.	50-317 and 50-318
License Nos.	DPR-53 and DPR-69
Report Nos.	05000317/2014002 and 05000318/2014002
Licensee:	Constellation Energy Nuclear Group, LLC
Facility:	Calvert Cliffs Nuclear Power Plant, Units 1 and 2
Location:	Lusby, MD
Dates:	January 1, 2014 through March 31, 2014
Inspectors:	S. Kennedy, Senior Resident Inspector E. Torres, Resident Inspector H. Anagnostopoulus, Health Physicist A. Bolger, Reactor Inspector T. Burns, Reactor Inspector N. Floyd, Reactor Inspector P. Kaufman, Senior Reactor Inspector A. Rosebrook, Senior Project Engineer
Approved by:	Daniel L. Schroeder, Chief Reactor Projects Branch 1 Division of Reactor Projects

TABLE OF CONTENTS

SUMMARY

IR 05000317/2014002, 05000318/2014002; 01/01/2014 – 03/31/2014; Calvert Cliffs Nuclear Power Plant (CCNPP), Units 1 and 2; Operability Determination and Functionality Assessments; Refueling and Other Outage Activities.

The report covered a three-month period of inspection by resident inspectors and announced inspections performed by regional inspectors. Three Green findings, which were non-cited violations (NCVs), were identified. The significance of most findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," dated June 2, 2011. Cross-cutting aspects are determined using IMC 0310, "Aspects Within the Cross-Cutting Areas," dated December 19, 2013. All violations of Nuclear Regulatory Commission (NRC) requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated July 9, 2013. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5.

Cornerstone: Initiating Events

- Green: The inspectors identified a self-revealing NCV of Technical Specification (TS) 5.4.1, "Procedures," for the failure of Constellation Energy Nuclear Group, LLC (CENG) personnel to adequately implement procedures associated with a local leak rate test (LLRT). Specifically, CENG personnel did not isolate the letdown line in accordance with surveillance test procedure (STP)-O-108D-1, "Containment Penetration Local Leak Rate Tests," prior to draining the piping in preparation for an LLRT on chemical and volume control system (CVCS) containment isolation valves. This resulted in inadvertently draining 150 gallons from the reactor coolant system (RCS) while the reactor vessel was in a lowered inventory condition. Immediate corrective actions included entering this issue into their corrective action program (CAP), performing a prompt investigation, and conducting a safety stand-down. In addition, an apparent cause evaluation will be performed to determine any additional corrective actions.

  The finding is more than minor because it is associated with the configuration control attribute of the Initiating Events cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the failure to isolate the letdown line prior to draining resulted in the loss of 150 gallons of RCS inventory and challenged the critical safety function of inventory control while in a lowered inventory condition. Operator actions were required to identify and isolate the leak to prevent further inventory loss. The inspectors evaluated this finding using IMC 0609.04, "Initial Characterization of Findings," issued June 19, 2012, and IMC 0609, Appendix G, "Shutdown Operations Significance Determination Process," issued February 28, 2005, and determined that the issue screened to Green (very low safety significance). Specifically, the inspectors determined that adequate mitigating capability remained available and the finding did not represent a loss of control of RCS level due to less than 2 feet of inventory loss when not in midloop. As a result, a Phase 2 quantitative assessment was not required and the issue screened to Green. The inspectors determined that the finding has a cross-cutting aspect in the area of Human Performance, Teamwork, because CENG individuals and work groups did not adequately communicate and coordinate their activities within and across organizational boundaries to ensure nuclear

safety was maintained. Specifically, a detailed shift turnover between dayshift and nightshift LLRT operators was not completed to ensure that the oncoming operators were aware of the letdown system configuration [H.4]. (Section 1R20)

Cornerstone: Mitigating Systems

- Green: The inspectors identified a self-revealing problem consisting of NCVs of TS 3.7.3, "Auxiliary Feedwater System," and TS 5.4.1, "Procedures," because CENG Operations personnel did not adhere to procedures which resulted in a valve mispositioning event that inadvertently rendered the 11 and 12 turbine driven auxiliary feedwater (AFW) pumps inoperable for approximately 12 hours, a condition prohibited by TSs. Specifically, on February 7, 2014, operators did not perform draining of 11 turbine driven AFW pump steam supply drain line as stated in Operating Instruction (OI)-32A, "Auxiliary Feedwater System," resulting in two main steam (MS) drain valves being left opened. With the drain valves open, an actual auxiliary feedwater actuation system (AFAS) signal would have resulted in steam blowing down into the room via the sump and causing room temperatures to exceed 130°F, the maximum temperature allowed in the room to protect the pump air cooled bearings. Immediate corrective actions included restoring the proper AFW system valve lineup, entering this issue into their CAP, returning the valves to their normal position on Unit 1, and ensuring that similar valves were in the correct position on Unit 2. Planned corrective actions include conducting an apparent cause evaluation to understand the apparent and contributing causes of this event and determine additional corrective actions.

  The problem is more than minor because it is associated with the configuration control attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, Operations personnel lost configuration control of valves MS-225 and MS-228 resulting in the inoperability of the 11 and 12 AFW pumps for approximately 12 hours. The inspectors evaluated the problem using IMC 0609.04, "Initial Characterization of Findings," and IMC 0609, Appendix A, "The Significance Determination Process for Findings at Power," Exhibit 2, "Mitigating Systems Screening Questions," issued June 19, 2012, and determined that the problem represented an actual loss of function of at least a single train for greater than its TS allowed outage time which required a detailed risk evaluation. The senior reactor analyst performed a detailed risk assessment utilizing the CCNPP Unit 1 simplified plant analysis risk model version 8.2.1 and determined that the problem is of very low safety significance (Green). Specifically, given a 12 hour exposure period with both turbine driven AFW pumps assumed to fail-to-run, the change in the internal events core damage frequency (CDF) was calculated to be in the high 10^{-8} range (Green). This problem has a cross-cutting aspect in the area of Human Performance, Procedure Adherence, because CENG personnel did not follow processes, procedures, and work instructions. Specifically, after draining the 11 AFW pump mud leg, CENG plant operators did not restore MS-225 and MS-228 to their required position as stated in procedure OI-32A [H.8]. (Section 1R15)

Cornerstone: Emergency Preparedness

- Green: The inspectors identified an NCV of Title 10 of the *Code of Federal Regulations* (10 CFR) 50.54, "Conditions of Licenses," paragraph (q)(2), because CENG did not maintain the Emergency Plan to adequately meet the standards in 50.47(b)(4). Specifically, following the removal of the Unit 2 letdown radiation monitor for maintenance on October 28, 2013, CENG did not establish adequate compensatory measures to ensure that a fuel clad

degradation emergency action level (EAL) could be assessed in a timely manner as discussed in the Emergency Plan. This could have resulted in an unnecessary delay in the recognition of a Notice of an Unusual Event (NOUE) EAL declaration for elevated coolant reactivity. Immediate corrective actions included restoring the proper valve lineup, entering this issue into their CAP, and implementing compensatory actions, which included the use of a portable radiation monitor with appropriate alarm setpoints to initiate action to sample the RCS to determine if the specified reactor coolant activity limits are exceeded. Planned corrective actions include restoration of the Unit 2 letdown radiation monitor.

This finding is more than minor because it was associated with the emergency response organization performance attribute of the Emergency Preparedness (EP) cornerstone and affected the cornerstone's objective to ensure that CENG is capable of implementing adequate measures to protect public health and safety in the event of a radiological emergency. Specifically, the failure to establish compensatory actions beyond the normal RCS sampling frequency could have resulted in exceeding an NOUE EAL threshold for a degraded fuel clad and the condition not becoming known until the next normal RCS sample or upon further fuel clad degradation requiring escalation under other EALs. In accordance with IMC 0609.04, "Initial Characterization of Findings," issued June 19, 2012, and IMC 0609, Appendix B, "Emergency Preparedness Significance Determination Process," issued February 24, 2012, the inspectors determined the finding is of very low safety significance (Green). Utilizing IMC 0609, Appendix B, the inspectors determined that the finding is associated with an aspect of the Emergency Plan related to the EAL Classification Scheme 10 CFR 50.47(b)(4). The inspectors determined that the EAL was ineffective because it, in and of itself, no longer resulted in a timely and accurate declaration for the initiating condition. Utilizing Figure 5.4.1, the impact of the ineffective EAL is that a NOUE would be declared in a timely manner, which screens as a Green finding. In addition, the finding is similar to a Green finding in Table 5.4.1, "Significance Examples §50.47(b)(4)," in that the EAL classification process is not capable of classifying an Alert or NOUE in a timely and accurate manner. This finding has a cross-cutting aspect in the area of Human Performance, Work Management, because CENG personnel adequately implement a work process that included the identification and management of risk commensurate to the work and the need for coordination with different groups or job activities. Specifically, Operations and Chemistry personnel did not ensure that the assigned tasks were adequate to compensate for the increased in nuclear risk associated with having the letdown radiation monitor out of service [H.5]. (Section 1R15)

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at 100 percent power. On January 21, 2014, the unit tripped automatically on a high pressurizer pressure signal due to a main turbine controls malfunction. Operators commenced a reactor start up on January 24. The unit was synchronized to the grid on January 26. The unit was returned to 100 percent power on January 27. On February 16, operators commenced a unit shutdown to conduct a refueling outage. On March 14, operators commenced a unit start up. On March 16 operators shutdown the unit from 12 percent power due to a high thrust bearing temperature on the main turbine. On March 19, operators commenced a unit start up. On March 20, operators synchronized the unit to the grid. The unit reached 100 percent power on March 28. The unit remained at or near 100 percent power for the remainder of the inspection period.

Unit 2 began the inspection period at 100 percent power. On January 21, 2014, the unit tripped automatically due to the loss of the '21' 13 kilovolt (kV) service bus. Operators commenced a reactor start up on January 25 and the unit was synchronized to the grid later the same day. The unit was returned to 100 percent power on January 26. The unit remained at or near 100 percent power for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01 – 1 sample)

Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

The inspectors performed a review of CENG staff's readiness for a winter weather advisory on February 12, 2014. The inspectors reviewed the implementation of adverse weather preparation procedures before the onset of this adverse weather condition. The inspectors walked down the emergency diesel generators, the 13 kV switchyard, and the intake structure. The inspectors verified that operator actions defined in CENG's adverse weather procedure maintained the readiness of essential systems. The inspectors discussed readiness and staff availability for adverse weather response with operations and work control personnel. Documents reviewed for each section of this inspection report are listed in the attachment.

b. Findings

No findings were identified.

1R04 Equipment Alignment

Partial System Walkdowns (71111.04Q – 3 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the following systems:

- Unit 1 offsite lines following loss of the '21' 13kV Service Bus on January 23, 2014
- Unit 1 shutdown cooling subsystem during Mode 6 on February 19, 2014
- 12 Saltwater (SW) header with the 11 SW header out of service on February 21, 2014

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 Updated Final Safety Analysis Report (UFSAR), TSs, condition reports (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 CENG 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.

1R05 Fire Protection

Resident Inspector Quarterly Walkdowns (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 CENG 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 the area pre-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.

- 2B Emergency diesel generator room, fire area 28, room 416, on January 17, 2014
- Unit 1 and Unit 2 east-west hallway adjacent to the emergency core cooling system pump rooms, fire area 10, room 100, on February 28, 2014
- Unit 1, Containment, fire area CNMT, room 230, on March 12, 2014
- Unit 1, 27' Switchgear room, fire area 19, room 317, on March 20, 2014

- Unit 2, 27' Switchgear room, fire area 18, room 311, on March 20, 2014
- Unit 1, 45' Switchgear room, fire area 34, room 430, on March 20, 2014
- Unit 2, 45' Switchgear room, fire area 25, room 407, on March 20, 2014

b. Findings

No findings were identified.

1R08 In-service Inspection (ISI) Activities (71111.08P – 1 sample)

a. Inspection Scope

From February 17 through February 28, 2014, the inspectors conducted an inspection and review of CENG's implementation of ISI program activities for monitoring degradation of the RCS boundary, risk significant piping and components, and containment systems during the CCNPP Unit 1 refueling outage 1R21.

Steam generator tube inspection was not performed during this outage based on the review and assessment of the previous tube inspection results. CENG personnel performed three technical assessments to support this decision. The inspectors reviewed the previous Degradation Assessment, Operating Assessment, and Condition Monitoring Assessment which gave the basis to conduct eddy current tube examination at the next outage. A review of the Condition Monitoring Assessment indicated minimal change to the steam generator tubes and structural supports.

The ISI sample 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 CENG personnel to verify the NDE activities performed as part of the fourth interval. CCNPP Unit 1 ISI Program, were conducted in accordance with the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, 2001 Edition, 2003 Addenda.

NDE and Welding Activities (IMC Section 02.01)

The inspectors reviewed work instruction packages and records, including both documentation and video records of NDEs. No welding activities were in-process at the time of the inspection; however, previous welding activity documentation was available for review. The inspectors selected welding related activities to include weld procedure specifications, welder qualifications, work orders, and associated weld travelers. Base materials and weld filler metals were reviewed for conformance to appropriate sections of ASME Code, Section XI, repair/replacement requirements, and Section IX, welder and weld procedure qualification requirements.

ASME Code Required Examinations

The inspectors observed portions of bare metal exterior vessel upper head examination where insulation had been removed to facilitate visual examination and confirm that there are no locations which exhibit detectable leakage (active or inactive).

Examinations of various locations of the exterior vessel upper head where the control rod drive mechanisms intersect and penetrate the vessel upper head were visually examined for evidence of leakage. Leakage at these locations is detectable using remote, optical/mechanical tools and techniques after the vessel upper head insulation has been removed. No detectable leakage (active or inactive) was noted during the inspection.

The inspectors performed observation of the automatic ultrasonic testing of the reactor vessel upper head penetration nozzles in the vicinity of the control rod drive mechanism to head welds, including a specific review of the past visual examination history at CCNPP Unit 1. The review revealed no evidence of active or inactive leakage in the vicinity of the vessel head.

The inspectors observed the visual examination of the various portions of the primary containment liner being performed this outage to verify conformance with ASME Code, Section XI, IWE. The areas covered during this inspection included accessible portions of the containment liner, penetrations and attachments to confirm integrity of the containment pressure boundary base material. The review revealed no issues with this inspection.

The inspectors reviewed work package instructions and the procedure for liquid penetrant surface examinations. These instructions and procedure were selected for review of technical adequacy and for conformance with the requirements of ASME Code, Section XI. The inspectors reviewed the liquid penetrant examination of snubber welds 1SNUB1-83-18, 34MS-1202R15/34-EB1-0002R15 from work order C91789346. No recordable indications were identified.

The inspectors performed a documentation review of the magnetic particle examination activity including use of procedure NDE-5140-CC00003 for the non-destructive magnetic particle test of the integral attachment to System 045 Feedwater on component 16-FW-1218-R-3. The review revealed no issues with this test.

The inspectors sampled qualification certificates of NDE examiners performing magnetic particle, liquid penetrant, and ultrasonic testing. The inspectors verified that examinations were performed in accordance with ASME Code, Section XI standards. In addition, the inspector verified that examinations were performed by qualified personnel, and the results were reviewed and evaluated by a certified ASME Level III examiner.

Review of previous indications

The ultrasonic testing results of the testing previously performed (prior outage) identified a number of minor containment liner plate distortions. Selected locations of the distortions were re-examined and evaluated during this outage. These distortions appear to be the result of normal weld shrinkage and are considered not to affect the liner function.

Repair/Replacement Consisting of Welding Activities

The inspectors reviewed the repair/replacement plan 2011-1-080 for the replacement of discharge check valve 1CKVAFW-102 in the AFW system (036). A replacement valve was installed by welding, using WPS P1-TKL (AW), and visually inspected. One valve,

3 inch, carbon steel, ASME Code, Section XI, Class II, was replaced and welds visually inspected (VT-1) with no recordable indications noted.

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

The inspectors verified that the reactor vessel upper head penetration J-groove weld examinations were performed in accordance with requirements of 10 CFR 50.55a and ASME Code Case N-729-1, "Alternative Examination Requirements for PWR Reactor Vessel Upper Heads," to ensure the structural integrity of the reactor vessel head pressure boundary. The inspectors also observed portions of the remote bare metal visual examination of the exterior surface of the reactor vessel upper head to verify that no boric acid leakage or wastage had been observed. The inspectors verified there was no indication of boric acid leakage or head wastage.

Boric Acid Corrosion Control Inspection Activities (IMC Section 02.03)

The inspectors reviewed the boric acid corrosion control program, which is performed in accordance with CENG Engineering Standard 054, "Boric Acid Corrosion Evaluations" and CCNPP administration procedure MN-3-123, "Boric Acid Corrosion Control Program."

The inspectors reviewed photographic inspection records of each identified boric acid leakage location and discussed the mitigation and evaluation plans. The inspectors reviewed a sample of CRs for evaluation and disposition within the CAP. Samples selected were based on component function, significance of leakage, and location where direct leakage or impingement on adjacent locations could cause degradation of safety system function. The inspectors accompanied the boric acid program owner on a walk down of several locations which had not yet been inspected by CENG personnel. The inspectors noted locations which exhibited both active and in-active boric acid leakage. These locations were photographed and identified for recording and disposition within CENG's CAP.

Problem Identification and Resolution (IMC Section 02.05)

The inspectors evaluated whether problems associated with ISI Activities were being identified by CENG personnel at an appropriate threshold and were properly addressed for resolution in CENG's CAP. The inspectors assessed the appropriateness of the corrective actions for problems documented by CENG personnel that involved ISI Activities. The inspectors also assessed CENG processes for applying operating experience to their plant. The inspectors verified that ISI related problems and 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 February 5, 2014, 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 TSs 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 operators in the plant and control room on January 25, 2014, performing startup activities, including rod withdrawal; reactivity management; and steam generator feed pump manipulations. 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 – 6 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 CENG 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 CENG personnel performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When CENG 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 TSs requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

- Unplanned maintenance on 12 charging pump on January 2, 2014
- Unit 1 yellow risk due to 12 SW header out of service on January 7, 2014
- Planned maintenance on 22 emergency core cooling system cooler on January 13, 2014
- Emergent maintenance on 21 service bus on January 21, 2014
- Unit 1 yellow shutdown risk due to RCS lowered inventory on February 19, 2014
- 500 kV switchyard surge arrestor removal on February 26, 2014

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 – 7 samples)

a. Inspection Scope

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

- Letdown monitor out of service without adequate compensatory actions on January 9, 2014 (CR-2013-010044)
- Unit 1 pressurizer safety valve (1RV200) seat leakage on January 21, 2014 (CR-2104-000586)
- 12 condensate storage tank low level and missed TS entry during dual unit trip on January 27, 2014 (CR-2014-000856)
- Spent fuel pool coupon exceeds License Amendment 288 acceptance criteria on February 3, 2014 (CR-2013-009808)
- Containment sump pump valve (1MOV5462) failed to operate on February 5, 2014 (CR-2014-001140)
- Unit 1 AFW MS drain valves found out of position on February 7, 2014 (CR-2014-001244)
- Unit 1 and Unit 2 unfused direct current circuits on March 10, 2014 (CR-2014-002667)

The inspectors selected these issues based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the operability determinations to assess whether TSs 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 CENG'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 CENG. The inspectors determined, where appropriate, compliance with bounding limitations associated with the evaluations.

b. Findings

.1 AFW Turbine Driven Pumps Inoperable

Introduction: The inspectors identified a self-revealing problem consisting of NCVs of TS 3.7.3, "Auxiliary Feedwater System," and TS 5.4.1, "Procedures," because CENG Operations personnel did not adhere to procedures which resulted in a valve mispositioning event that inadvertently rendered the 11 and 12 turbine driven AFW pumps inoperable for approximately 12 hours, a condition prohibited by TSs.

Description: On February 7, 2014, at 10:37 pm, during the performance of STP-O-009, "AFAS Logic Test," Operations personnel discovered MS-225 [steam line condensate collection tank (mud leg) drain valve] and MS-228 (mud leg steam trap bypass valve) were open. Further investigation revealed that these valves were left open during the routine draining evolution of the mud legs performed during the day shift. As a result, 11 and 12 turbine driven AFW pumps were inoperable for approximately 12 hours.

CCNPP's Unit 1 AFW system consists of two turbine driven pumps and one motor driven pump. Each pump is capable of supplying both steam generators. The turbine driven AFW pumps are located in the same room. The motor driven pump is located in a separate room. During each shift, plant operators perform OI-32A, Section 6.7, "Draining AFW Turbine Steam Lines." Subsections performed include 6.7.D, "Draining AFW Turbines;" 6.7.E, "Draining AFW Steam Supply Header;" and 6.7.F, "Draining Steam Line Mud Legs." The purpose of draining the mud legs is to remove condensate from the MS supply line for the turbine driven AFW pumps.

On February 7, 2014, at 10:25 am, plant operators performed subsection 6.7.D and 6.7.F in the Unit 1 AFW pump room. Section 6.7.F, Step 2, stated, in part, drain the AFW mud legs one AFW pump at a time by cycling valves MS-225 and MS-228 for 11 AFW pump. Step 6 required that an independent operator ensure the valves operated in Step 2 were shut. At 10:37 pm, when the steam driven AFW pump steam admission valves were opened as a result of performing STP-O-009, operators observed steam coming from the AFW pump room sump. This resulted in an AFW pump room sump high level alarm and an AFW pump room fire alarm. In response, operators in the control room shut the steam admission valves which terminated the event. Operations personnel declared the pumps inoperable because during the 12 hours that MS-225 and MS-228 were left opened, an actual AFAS signal would have caused steam to blowdown into the room via the sump. This would have resulted in room temperatures exceeding 130°F, the maximum temperature allowed in the room, per the UFSAR, to protect the pump air cooled bearings. In accordance with TS 3.7.3, Condition C, "Two AFW Pumps Inoperable," the required actions included: verify that the other unit's motor driven AFW pump is operable within one hour; and verify, by administrative means, that the cross tie valve to the opposite unit is operable within one hour. These checks were not performed within the required completion time because the issue was discovered after the required completion time had expired.

CENG personnel conducted a prompt investigation for the event. The investigation revealed that plant operators who performed the mud leg draining activity during the morning of February 7, 2014, failed to close the valves, failed to use the procedure, and failed to perform a second independent verification. As immediate corrective actions,

CENG returned the valves to their normal position, conducted a walkdown of Unit 2's mud legs drain and steam trap bypass valves, and entered this issue into their CAP (CR-2014-001244). Planned corrective actions include conducting an apparent cause evaluation to understand the apparent and contributing causes of this event and determine additional corrective actions.

Analysis: The inspectors determined that the failure to implement procedure OI-32A to drain MS line mud legs in the AFW pump room, which resulted in operating for a period of time with two turbine driven AFW pumps inoperable in a mode prohibited by TSs, was a performance deficiency that was within CENG staff's ability to foresee and correct and should have been prevented. The problem is more than minor because it is associated with the configuration control attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, Operations personnel lost configuration control of valves MS-225 and MS-228 resulting in the inoperability of the 11 and 12 AFW pumps for approximately 12 hours. The inspectors evaluated the problem using IMC 0609.04, "Initial Characterization of Findings," and IMC 0609, Appendix A, "The Significance Determination Process for Findings at Power" issued June 19, 2012. In accordance with IMC 0609, Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," Section A, the finding represented an actual loss of function of at least a single train for greater than its TS Allowed Outage time which required a detailed risk evaluation.

A detailed risk assessment was performed utilizing the CCNPP Unit 1 simplified plant analysis risk model version 8.2.1. Given a 12 hour exposure period with both turbine driven AFW pumps assumed to fail-to-run, the change in the internal events CDF was calculated to be in the high 10^{-8} range (Green). The dominant sequences included losses of the 13kV alternating current service bus 11 along with a total loss of cooling to the steam generators and a failure to establish once through cooling. Since the internal events CDF did not exceeded $1x10^{-7}$, an evaluation of external risk and large early release contributors was not conducted.

This problem has a cross-cutting aspect in the area of Human Performance, Procedure Adherence, because CENG personnel did not follow processes, procedures, and work instructions. Specifically, after draining the 11 AFW pump mud leg, CENG plant operators did not restore MS-225 and MS-228 to their required position as stated in procedure OI-32A [H.8].

Enforcement: TS 5.4.1, "Procedures," states, in part, "written procedures shall be established, implemented, and maintained covering the following activities: The applicable procedures recommended by Regulatory Guide (RG) 1.33, Revision 2, Appendix A, February 1978." Section 3 of Appendix A to RG 1.33, "Procedures for Startup, Operations and Shutdown of Safety Related PWR," includes Instructions for energizing, filling, venting, and draining of the AFW System. CENG Procedure OI-32A, Section 6.7, "Draining AFW Turbine Steam Lines," implements this requirement. TS 3.7.3, "Auxiliary Feedwater System," Condition C, "Two AFW pumps inoperable," states in part, verify the other unit's motor-driven AFW pump is operable within one hour; and verify, by administrative means, the cross-tie valve to the opposite unit is operable within one hour. If these actions are not completed within the required completion time, the unit must be in Mode 3 within six hours and Mode 4 within 12 hours. Contrary to the above, on February 7, 2014, CENG staff failed to implement CENG procedure OI-32A,

resulting in two AFW pumps being rendered inoperable. CENG staff failed to perform the required Condition C actions within 1 hour and failed to be in Mode 3 within 6 hours when the turbine driven AFW pumps were rendered inoperable. Thus the plant was operated in a condition prohibited by TS 3.7.3. Specifically, Operations personnel failed to restore the system to its normal configuration following the 11 AFW pump mud leg drain evolution in accordance with Steps 6.7.F.2 and 6.7.F.6 of OI-32A, and the condition was not discovered and corrected for 12 hours. Immediate corrective actions included restoring the proper AFW system valve lineup, entering this issue into their CAP, returning the valves to their normal position on Unit 1, and ensuring that similar valves were in the correct position on Unit 2. Planned corrective actions include conducting an apparent cause evaluation to understand the apparent and contributing causes of this event and determine additional corrective actions. These two violations are being treated as a single problem because they are directly related to the same performance deficiency. Because this problem was of very low safety significance (Green) and was entered into CENG's CAP (CR-2014-001244), the issue is being treated as an NCV, consistent with Section 2.3.2.a of the Enforcement Policy. **(NCV-05000317/2014002-1: 11 and 12 AFW Pumps Inoperable due to Valves Misposition)**

.2 Letdown Radiation Monitor Inadequate Compensatory Actions

Introduction: The inspectors identified a Green NCV of 10 CFR 50.54, "Conditions of Licenses," paragraph (q)(2); because CENG did not maintain the Emergency Plan to adequately meet the standards in 50.47(b)(4). Specifically, following removal of the Unit 2 letdown radiation monitor from service for maintenance on October 28, 2013, CENG did not establish adequate compensatory measures to ensure that a fuel clad degradation EAL could be assessed in a timely manner as discussed in the Emergency Plan.

Description: The fuel clad degradation initiating condition is included as an EAL because it is a precursor of a more serious condition and addresses reactor coolant activity exceeding TS limits. The letdown radiation monitor is equipment required under initiating condition SU7.2 to be available to assess the fuel clad degradation EAL for a NOUE. The letdown radiation monitor gross radiation activity channel continuously monitors the activity in a sample drawn from the RCS and actuates an alarm in the control room if a predetermined activity level is reached. The sensor is a gross-gamma plus specific isotope (I-135) monitor. The system is designed to detect activity released from the fuel to the reactor coolant within 5 minutes of the event. SU7.1 is another initiating condition for the fuel clad degradation EAL. This EAL assesses fuel clad degradation based on a reactor coolant sample greater than a specified coolant activity level. However, the RCS sample is only required to be taken three times each week.

On December 23, 2013, during a control room control board walkdown, the inspectors noted that the Unit 2 letdown radiation monitor was out of service. The inspectors asked control room operators what compensatory actions were established in lieu of the letdown radiation monitor being in service. The operators stated that the compensatory actions were established in accordance with EP-1-109, "Equipment Important to Emergency Preparedness." The inspectors reviewed EP-1-109 and determined that the compensatory actions were to sample the RCS per chemistry procedure (CP)-204, "Specification and Surveillance Primary Systems." However, the inspector noted CP-204 did not establish any additional compensatory actions beyond the normal sampling

frequency of sampling the RCS three times each week. The inspectors concluded that the compensatory actions were inadequate because it was possible for an EAL for a degraded fuel clad to exist for an NOUE and not becoming known until the next RCS sample or until the fuel clad degraded such that the EAL requires escalation. The inspectors noted that adequate equipment and procedures were in place for escalation to Alert, Site Area Emergency, and General Area Emergency for fuel clad degradation under the Fuel Product Barrier Degradation initiating condition.

To determine possible causes of this event, the inspectors reviewed work orders, CRs, and other related documents. In addition, the inspectors discussed the event with CENG EP staff. The inspectors noted that the work order (C91455546) that was used to remove the Unit 2 letdown radiation monitor from service for a calibration check and repair included tasks for Operations and Chemistry personnel to review and implement compensatory actions in accordance with EP-1-109. The inspectors concluded that Operations and Chemistry personnel failed to ensure that the assigned actions were adequate to compensate for the increased in nuclear risk associated with having the letdown radiation monitor out of service.

Immediate corrective actions included placing this issue into their CAP and the use of a portable radiation monitor with appropriate alarm setpoints to initiate action to sample the RCS to determine if the specified reactor coolant activity limits are exceeded for an NOUE. Planned corrective actions include repair of the letdown radiation monitor.

Analysis: The inspectors determined that CENG's failure to establish adequate compensatory measures, after the failure of the Unit 2 letdown radiation monitor, to ensure that a fuel clad degradation EAL could be assessed in a timely manner as discussed in the Emergency Plan is a performance deficiency that was within CENG staff's ability to foresee and correct and should have been prevented. This finding is more than minor because it was associated with the emergency response organization performance attribute of the EP cornerstone and affected the cornerstone's objective to ensure that CENG is capable of implementing adequate measures to protect public health and safety in the event of a radiological emergency. Specifically, the failure to establish compensatory actions beyond the normal RCS sampling frequency could have resulted in exceeding an NOUE EAL threshold for a degraded fuel clad and not become known until the next normal RCS sample or upon further fuel clad degradation requiring escalation under other EALs. In accordance with IMC 0609.04, "Initial Characterization of Findings," and IMC 0609, Appendix B, "Emergency Preparedness Significance Determination Process," the inspectors determined the finding is of very low safety significance (Green). Specifically, utilizing IMC 0609, Appendix B, the inspectors determined that the finding is associated with an aspect of the Emergency Plan related to the EAL Classification Scheme (10 CFR 50.47(b)(4)). The inspectors determined that the EAL was ineffective because it, in and of itself, no longer resulted in a timely and accurate declaration for the initiating condition. Utilizing Figure 5.4.1, the impact of the ineffective EAL is that an NOUE would not be declared in a timely and effective manner, which screens as a Green finding. In addition, the finding is similar to a Green finding in Table 5.4.1, "Significance Examples §50.47(b)(4)," in that the EAL classification process is not capable of classifying an Alert or NOUE in a timely and effective manner.

This finding has a cross-cutting aspect in the area of Human Performance, Work Management, because CENG personnel didn't adequately implement a work process that included the identification and management of risk commensurate to the work and

the need for coordination with different groups or job activities. Specifically, Operations and Chemistry personnel did not ensure that the assigned tasks were adequate to compensate for the increase in nuclear risk associated with having the letdown radiation monitor out of service [H.5].

Enforcement: 10 CFR 50.54, "Conditions of Licenses," paragraph (q)(2) requires, in part, that a licensee "shall follow and maintain in effect emergency plans which meet the standards in 10 CFR 50.47(b) and the requirements in Appendix E of this part." 10 CFR 50.47(b)(4) requires, in part, that "emergency response plans include a standard emergency classification and action level scheme, the bases of which include a standard facility system and effluent parameters. The emergency classification and action level scheme required to be used by the nuclear facility licensee, and state and local response plans, rely on information provided by facility licensees for determination of minimum initial offsite response measures." Contrary to these requirements, between October 28, 2013, and December 23, 2013, CENG did not have an adequate emergency classification and action level scheme in place for the fuel clad degradation initiating condition SU7.2. Specifically, following removal of the Unit 2 letdown radiation monitor from service, CENG did not establish adequate compensatory measures to ensure that a fuel clad degradation initiating condition could be assessed in a timely manner as discussed in the Emergency Plan. This could ultimately delay declaration of an NOUE and impact the ability of the state and local officials to determine initial offsite response measures. Immediate corrective actions included entering this issue into their CAP and implementing compensatory actions, which included the use of a portable radiation monitor with appropriate alarm setpoints to initiate action to sample the RCS to determine if the specified reactor coolant activity limits are exceeded. Planned corrective actions include restoration of the Unit 2 letdown radiation monitor. Because this finding is of very low safety significance (Green) and was entered into CENG's CAP (CR-2013- 010044) this issue is being treated as an NCV consistent with Section 2.3.2.a of the Enforcement Policy. **(NCV 05000318/2014002-02: Inadequate Compensatory Actions for Out of Service Letdown Radiation Monitor)**

1R19 Post-Maintenance Testing (71111.19 – 11 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.

- 23 Containment air cooler starter repair on January 21, 2014
- 21 Service bus repair on January 24, 2014
- 11 AFW pump governor valve overhaul on February 18, 2014
- 11 Iodine removal unit motor replacement on February 20, 2014
- 11 Containment spray pump overhaul on February 22, 2014

- Unit 1 Safety injection minimum flow isolation valve (MOV-659) spring pack replacement on February 23, 2014
- 12A Safety injection loop inlet check valve (SI-237) inspection on February 24, 2014
- 11 MS generator safety relief valve (1RV3998) replacement on February 26, 2014
- 11 MS isolation valve actuator removal and installation on February 28, 2014
- 14 Containment air cooler service water pipe concentric reducer replacement on March 5, 2014
- 14 Containment air cooler motor Surge test/winding resistance measurement on March 8, 2014

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 1 maintenance and refueling outage 1R21, which was conducted February 16 through March 19, 2014. The inspectors reviewed CENG 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

Introduction: The inspectors identified a self-revealing Green NCV of TS 5.4.1, "Procedures," for the failure of CENG personnel to adequately implement procedures associated with an LLRT. Specifically, CENG's personnel did not isolate the letdown line in accordance with STP-O-108D prior to draining the piping in preparation for an LLRT on CVCS containment isolation valves. This resulted in inadvertently draining 150 gallons from the RCS while the reactor vessel was in a lowered inventory condition.

Description: On February 20, 2014, unit 1 was shutdown for refueling outage 1R21. Reactor vessel level was in a lowered inventory, defined as reactor vessel level at or below the reactor vessel flange (44 feet), with RCS time to boil of 22 minutes. At 2:45 am, a Unit 1 containment sump alarm was received. The reactor operator noted a decrease in reactor vessel level. Operators aligned the refueling water tank to the suction of the charging pumps per OI-2A, "Chemical and Volume Control System," to provide a gravity feed flow path from the refueling water tank into the RCS. Operators directed the containment job path manager to investigate for leakage. The containment job path manager notified the control room that the CVCS letdown piping was being drained in containment in preparation for an LLRT. Operators isolated the drain path for letdown and reactor vessel level began to restore. The estimated amount of inventory loss was 150 gallons. During this event, reactor vessel level lowered from 43.25 feet to 43.15 feet. The level remained in the established level control band of 43 feet to 43.5 feet. The refueling cart had low level alarms established in accordance with operating procedure OP-7, "Shutdown Operations."

The inspectors reviewed the prompt investigation associated with this issue. The cause of the loss of RCS inventory was due to the failure to isolate the letdown line in accordance with STP-O-108D-1, "Containment Penetration Local Leak Rate Tests," prior to draining the piping in preparation for an LLRT on CVCS containment isolation valves. Step 6.1.1.3 states, "Isolate and Drain the system volume that is to be tested on both sides of the valves to be tested." The failure to isolate letdown was a result of an inadequate turnover between the oncoming and off-going shifts. The oncoming shift assumed that the letdown line was already isolated and did not verify the system configuration prior to draining. In addition, the draining activity was not approved for lowered inventory; however, the status of the draining activity was not properly statused in the work management software program as in progress. As a result, the Outage Control Center was not aware that an activity was authorized that could negatively impact lowered inventory conditions.

Immediate corrective actions included entering this issue into the CAP as CR-2014-001702, performing a prompt investigation, and conducting a safety stand-down. In addition, an apparent cause evaluation will be performed to determine additional corrective actions.

Analysis: The inspectors determined that the failure to isolate the letdown line in accordance with STP-O-108D-1 prior to draining the piping in preparation for an LLRT on CVCS containment isolation valves was a performance deficiency that was within CENG staff's ability to foresee and correct and should have been prevented. The finding is more than minor because it is associated with the configuration control attribute of the Initiating Events cornerstone objective to limit the likelihood of events that upset plant

stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the failure to isolate the letdown line prior to draining resulted in the loss of 150 gallons of RCS inventory and challenged the critical safety function of inventory control while in a lowered inventory condition. Operator actions were required to identify and isolate the leak to prevent further inventory loss. The inspectors evaluated this finding using IMC 0609.04, "Initial Characterization of Findings," issued June 19, 2012, and IMC 0609, Appendix G, "Shutdown Operations Significance Determination Process," issued February 28, 2005, and determined that the issue screened to Green (very low safety significance). Specifically, in accordance with IMC 0609, Appendix G, Section 3.2, "Objective," the inspectors determined if CENG staff maintained adequate mitigation capability and if the event would be characterized as a loss of control. After the review of Appendix G, Attachment 1, Checklist 3, "Pressurized Water Reactor Cold Shutdown and Refueling Operation with RCS Closed and No Inventory in Pressurizer, Time to Boiling < 2 Hours," the inspectors determined that adequate mitigating capability remained available. Using Appendix G, Table 1, "Losses of Control," the inspectors determined that the finding did not represent a loss of control of RCS level due to less than 2 feet of inventory loss when not in midloop. As a result, a Phase 2 quantitative assessment was not required and the issue screened to Green.

The inspectors determined that the finding has a cross-cutting aspect in the area of Human Performance, Teamwork, because individuals and work groups did not adequately communicate and coordinate their activities within and across organizational boundaries to ensure nuclear safety was maintained. Specifically, a detailed shift turnover between dayshift and nightshift LLRT operators was not completed to ensure that the oncoming operators were aware of the letdown system configuration [H.4].

Enforcement: TS 5.4.1, "Procedures," states, in part, "written procedures shall be established, implemented, and maintained covering the following activities: The applicable procedures recommended by RG 1.33, Revision 2, Appendix A, February 1978." Section 8 of Appendix A to RG 1.33, "Procedures for Control of Measuring and Test Equipment and for Surveillance Tests, Procedures, and Calibrations," includes LLRT surveillance procedures. Contrary to the above, on February 20, 2014, while in a lowered inventory condition with reactor vessel level below the flange, operators did not adequately implement surveillance procedure STP-O-108D in preparation for performing an LLRT on CVCS containment isolation valves. Specifically, operators did not follow Step 6.1.1.3, which stated, "Isolate and Drain the system volume that is to be tested on both sides of the valves to be tested." This resulted in the loss of approximately 150 gallons RCS inventory. Immediate corrective actions included restoring the proper system valve line up, entering this issue into the CAP, performing a prompt investigation, and conducting a safety stand-down. In addition, an apparent cause evaluation will be performed to determine any additional corrective actions. Because this violation was of very low safety significance (Green) and was entered into CENG's CAP (CR-2014-001702), the issue is being treated as an NCV, consistent with Section 2.3.2.a of the Enforcement Policy. **(NCV-05000317/2014002-03: Inadvertent Loss of RCS Inventory During Lowered Inventory Conditions)**

1R22 Surveillance Testing (71111.22 – 11 samples) (1 RCS Leak) (1 CIV) (1 In-Service Testing)

a. Inspection Scope

The inspectors observed performance of surveillance tests and/or reviewed test data of selected risk-significant structures, systems, and components to assess whether test results satisfied TSs, the UFSAR, and CENG 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-8B-2, Test of 2B emergency diesel generator and 4kV bus 24 loss of coolant sequencer on January 31, 2014
- STP-O-66M-1, Cold shutdown operability test of shutdown cooling return isolation valves on February 16, 2014 (in-service test)
- STP-O-66C-1, Feedwater isolation valves operability test on February 17, 2014
- STP-O-67A-1, Safety injection tank outlet check valve stroke test on February 22, 2014
- STP-O-108D-1, Containment penetration LLRTs, Attachment 9, CV-505 on February 22, 2014 (CIV)
- STP-O-67G-1, Safety injection check valve cold shutdown test on March 4, 2014
- STP-O-27-2, RCS leakage evaluation on March 5, 2014 (RCS leak)
- STP-O069-1, Safeguards initiation signal and containment spray actuation signal logic test on March 12, 2014
- STP-M-673A-1, Power operated relief valve response time test on March 13, 2014
- STP-M-520F-1, Automatic removal of pressurizer pressure and steam generator pressure blocking signal verification on March 14, 2014
- STP-O-004B-1, 'B' train integrated engineered safety features test on March 20, 2014

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstone: Public Radiation Safety and Occupational Radiation Safety

2RS1 Radiological Hazard Assessment and Exposure Controls

a. Inspection Scope

During February 25 through 28, 2014, the inspectors reviewed and evaluated CENG's performance in assessing the radiological hazards and exposure control in the workplace.

The inspectors used the requirements in 10 CFR 20 and guidance in RG 8.38, "Control of Access to High and Very High Radiation Areas (VHRAs) for Nuclear Plants;" TSs; and the CENG procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors reviewed reports of operational occurrences related to occupational radiation safety since the last inspection.

Radiological Hazard Assessment

The inspectors conducted walk-downs and independent radiation measurements in the facility; including radioactive waste processing, storage, and handling areas to evaluate material and radiological conditions.

The inspectors selected the following risk-significant work activities that involved exposure to radiation during the Unit 1 refueling outage:

- Removal of the pressurizer man-way
- Removal of insulation from the reactor head
- Replacement of the 1-RV-345 valve internals

For these work activities, the inspectors assessed whether the pre-work surveys performed were appropriate to identify and quantify the radiological hazards 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 observed work in potential airborne radioactivity areas and evaluated whether the air samples from the pressurizer man-way, the reactor head area, and the Unit 1 letdown heat exchanger room, were representative of the breathing air zone and were properly evaluated. The inspectors evaluated whether continuous air monitors were located in areas that achieved the desired sensitivity and were representative of actual work areas. The inspectors evaluated CENG's program for monitoring levels of loose surface contamination in occupied areas of the plant.

Instructions to Workers

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

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

For work activities that could suddenly and severely increase radiological conditions, the inspectors assessed CENG's means to inform workers of these changes.

Radiological Hazards Control and Work Coverage

The inspectors evaluated the adequacy of radiological controls; such as required surveys, radiation protection job coverage, and contamination controls. The inspectors evaluated CENG's use of electronic personal dosimeters in high noise areas of HRAs.

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

- Removal of the Unit 1 pressurizer man-way
- Removal of insulation from the Unit 1 reactor head
- Replacement of the 1-RV-345 valve internals

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

Risk-Significant HRA and VHRA Controls

The inspectors evaluated CENG's controls for VHRAs and areas with the potential to become a VHRA to ensure that an individual was not able to gain unauthorized access to these VHRAs.

Radiation Worker Performance

The inspectors observed the performance of radiation workers with respect to radiation protection 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 those controls.

Radiation Protection Technician Proficiency

The inspectors observed the performance of radiation protection 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. In addition, the inspectors assessed whether technicians behavior was consistent with their training, qualifications, and with respect to the radiological hazards and work activities observed.

Problem Identification and Resolution

The inspectors evaluated whether problems associated with radiation monitoring and exposure control were being identified by CENG personnel at an appropriate threshold

and were properly addressed for resolution in CENG's CAP. The inspectors assessed the appropriateness of the corrective actions for problems documented by CENG personnel that involved radiation monitoring and exposure controls. The inspectors assessed CENG processes for applying operating experience to their plant.

b. Findings

No findings were identified.

2RS2 Occupational As Low As Reasonably Achievable (ALARA) Planning and Controls

a. Inspection Scope

During February 25 through 28, 2014, the inspectors assessed performance with respect to maintaining occupational individual and collective radiation exposures 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 As Low As Is Reasonably Achievable;" RG 8.10, "Operating Philosophy for Maintaining Occupational Radiation Exposure As Low as Is Reasonably Achievable;" TSs; and CENG procedures required by TSs as criteria for determining compliance.

Radiation Worker Performance

The inspectors observed radiation worker and radiation protection 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 ALARA procedure or RWP compliance issues.

b. Findings

No findings were identified.

2RS3 In-Plant Airborne Radioactivity Control and Mitigation

a. Inspection Scope

During February 25 through 28, 2014, 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 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 CENG procedures required by TSs as criteria for determining compliance.

Use of Respiratory Protection Devices

The inspectors selected one work activity where respiratory protection devices were used to limit the intake of radioactive materials, and assessed whether CENG performed an evaluation concluding that further engineering controls were not practical and that the

use of respirators is ALARA. The inspectors also evaluated whether CENG had established means (such as routine bioassay) to determine the level of protection provided by the respiratory protection devices during use was consistent with the assumptions in CENG's work controls and dose assessment.

The inspectors assessed whether respiratory protection devices used to limit the intake of radioactive materials were certified by the National Institute for Occupational Safety and Health/Mine Safety and Health Administration. The inspectors selected one work activity where respiratory protection devices were used, replacement of the 1-RV-345 valve for the U-1 Let-Down Heat Exchanger. The inspector evaluated whether the devices were used consistent with their National Institute for Occupational Safety and Health/Mine Safety and Health Administration certification.

The inspectors selected three individuals qualified to use respiratory protection devices and assessed whether they were deemed qualified to use the devices by successfully passing an annual medical examination, respirator fit-test, and relevant respiratory protection training.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

.1 RCS Specific Activity and RCS Leak Rate (4 samples)

a. Inspection Scope

The inspectors reviewed CENG'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 2013 through December 2013. 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 7. 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

.1 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 CENG personnel 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.

b. Findings

No findings were identified.

4OA3 Follow-Up of Events and Notices of Enforcement Discretion (71153 – 1 sample)

.1 Plant Events

a. Inspection Scope

The inspectors reviewed and/or observed plant parameters, reviewed personnel performance, and evaluated performance of mitigating systems for a dual unit reactor trip that occurred on January 21, 2014. The inspectors communicated the plant event to appropriate regional personnel, and compared the event details with criteria contained in IMC 0309, "Reactive Inspection Decision Basis for Reactors," for consideration of potential reactive inspection activities. As a result of meeting the criteria in IMC 0309 for a reactive inspection, a special inspection was conducted from January 27 through January 31, 2014. The details of the event and the results of the inspection were documented in NRC Special Inspection Report 05000317/2014008 and 05000318/2014008. As applicable, the inspectors verified that CENG staff made appropriate emergency classification assessments and properly reported the event in accordance with 10 CFR 50.72 and 50.73. The inspectors reviewed CENG's follow-up actions related to the events to assure that CENG implemented appropriate corrective actions commensurate with their safety significance.

b. Findings

No findings were identified.

4OA5 Other Activities

.1 Temporary Instruction 2515/182, Phase 2, Buried Piping and Tanks

a. Inspection Scope

The CENG's Buried Piping and Underground Piping and Tanks Program was inspected in accordance with paragraphs 03.02.a of the Temporary Instruction 2515/182, and it was confirmed that activities which correspond to the completion dates, specified in the program, which have passed since the Phase 1 inspection was conducted, have been completed.

The CENG's Buried Piping and Underground Piping and Tanks Program was inspected in accordance with paragraph 03.02.b of the Temporary Instruction and responses to specific questions found in www.nrc.gov/reactors/operating/ops-experience/buried-pipe-ti-phase-2-insp-req-2011-11-16.pdf were submitted to NRC headquarters staff.

b. Findings

No findings were identified.

.2 Temporary Instruction 2515/189, Inspection to Determine Compliance of Dynamic Restraint (Snubber) Program with 10 CFR 50.55a Regulatory Requirements for In-service Examination and Testing of Snubbers

a. Inspection Scope

The inspectors conducted an inspection and review of CCNPP's Snubber Program in accordance with Temporary Instruction 2515/189 to verify that the program was in compliance with the requirements of 10 CFR 50.55a, as discussed in Regulatory Issue Summary 2010-06, "In-service Inspection and Testing of Dynamic Restraints (Snubbers)." The inspectors reviewed CENG's action taken as a result of Regulatory Information Summary 2010-06, which included a relief request submitted to the NRC for its fourth 10-year ISI interval pertaining to the examination and testing requirements of snubbers at CCNPP, Units 1 and 2.

The inspectors selected a sample of fourteen (14) snubbers based on risk-informed insights, performance history, plant conditions, and accessibility. For the selected snubbers, the inspectors reviewed the in-service visual examination records and functional test records during the current 10-year ISI interval, and verified that the personnel performing the tasks were qualified. The inspectors also observed in-process bench testing of one of the selected snubbers and verified that the test parameters met the acceptance criteria specified in the CENG's test procedure. The inspectors reviewed the process for snubber service life monitoring at CCNPP and determined that the selected snubbers were being monitored and maintained. The inspectors also reviewed a sample of CENG corrective action reports identified during the inspection and testing of snubbers and verified that issues were properly evaluated and entered into the CAP for resolution.

b. Findings

No findings were identified.

.3 Cross-Cutting Aspects

The table below provides a cross-reference from the 2013 and earlier findings and associated cross-cutting aspects to the new cross-cutting aspects resulting from the common language initiative. These aspects and any others identified since January 2014, will be evaluated for cross-cutting themes and potential substantive cross-cutting issues in accordance with IMC 0305 starting with the 2014 mid-cycle assessment review.

Finding	Old Cross-Cutting Aspect	New Cross-Cutting Aspect
05000318/2013004-01	P.1.a	P.1
05000317/318/2013005-02	H.2.c	H.7
05000317/318/2013202-01	H.1.b	H.14

4OA6 Meetings, Including Exit

Exit Meeting Summary

On April 23, 2014, the inspectors presented the inspection results to Mr. George Gellrich, Site Vice President, and other members of the CENG staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

ATTACHMENT: SUPPLEMENTARY INFORMATION

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

CENG Personnel
G. Gellrich, Site Vice President
M. Flaherty, Plant General Manager
A. Ball, Supervisor, Radiation Protection Operations
C. Blue, ALARA Supervisor
B. Brown, Senior Engineering Analyst, Engineering Systems
F. Copsey, Mechanic-Nuclear, Maintenance Mechanical
H. Daman, Manager, Maintenance
H. Enoch, Underground Piping & Tanks, Program Owner
B. Erdman, Supervisor, Radiation Protection
J. Gaines, General Supervisor, Shift Operations
S. Henry, Manager, Operations
P. Jones, Radiological Engineer
D. Lauver, Director, Licensing
C. Neyman, Senior Engineering Analyst, Licensing
B. Pickett, Supervisor, Radiation Protection Support
M. Wright, Principal Engineer, Engineering Design
J. Wynn, Principal Engineer, Engineering
J. York, General Supervisor, Radiation Protection

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened and Closed

05000317/2014002-01	NCV	11 and 12 AFW Pumps Inoperable due to Valves Misposition (Section 1R15.1)
05000318/2014002-02	NCV	Inadequate Compensatory Actions for Out of Service Letdown Radiation Monitor (Section 1R15.2)
05000317/2014002-03	NCV	Inadvertent Loss of RCS Inventory During Lowered Inventory Conditions (Section 1R20)

Closed

TI 2515/182	TI	Phase 2, Buried Piping and Tanks (Section 4OA5)
TI 2515/189	TI	Inspection to Determine Compliance of Dynamic Restraint (Snubber) Program with 10 CFR 50.55a Regulatory Requirements for In-service Examination and Testing of Snubbers (Section 4OA5)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures
EP-1-108, Severe Weather Preparation, Revision 00300
ERPIP-3.0, Immediate Actions, Revision 04901
NO-1-119, Seasonal Readiness, Revision 00600
OAP 92-9, Operations Administrative Policy Cold Weather Operations, Change 7

Section 1R04: Equipment Alignment

Procedures
OI-29, Saltwater System, Revision 68
OI-3B, Shutdown Cooling, Revision 29

Drawings
60708sh0002, Circulating Saltwater Cooling System, Revision 112
60708sh0003, Circulating Saltwater Cooling System, Revision 17
60731sh0001, Safety Injection & Containment Spray Systems, Revision 88
60731sh0002, Safety Injection & Containment Spray Systems, Revision 48
61001sh0001, Electrical Main Single Line Diagram, Revision 45

Section 1R05: Fire Protection

Procedures
FP-0002, Fire Hazards Analysis Summary Document, Revision 0
SA-1-100, Fire Prevention, Revision 16

Miscellaneous
Fire Fighting Strategies Manual, Turbine Building 27' Elevation, Revision 00202
Fire Fighting Strategies Manual, Turbine Building 45' Elevation, Revision 00500

Section 1R08: In-Service Inspection Activities

Condition Reports
CR 2014-001446
CR 2014-001451
CR 2014-001469
CR 2014-001469
CR 2014-001506
CR 2014-001506
CR 2014-001649
CR E008710

Procedures
NDE-5140-CC, Magnetic Particle Testing, Revision 03
NDE-5140-CC, Magnetic Particle Examinations, Revision 3
NDE-5240-CC, Penetrant Testing, Revision 04

NDE-5240-CC, Penetrant Examination for Detection of Discontinuities Open to Surface, Revision 4
NDE-5442-CC, UT Thickness Measurement (liner plates), Revision 001
NDE-5449-CC, UT of Austenitic Welds, Revision 002
NDE-5750-CC, Visual Examination VT1, VT3, Revision 03
NDE-5760-CC, Visual Examination for Leakage (VT-2), Revision 0
NDE-5770-CC, Visual Examination – ASME IWE and IWL, Revision 0

Work Orders
WO-120053666
WO-91998089
WO-92574043
WO-C120053666
WO-C9199715
WO-C91997735

Miscellaneous
AREVA Document 51-9174684-001 CC Unit 1, Steam Generator Degradation Assessment, Spring 2012/EOC20
AREVA Document 51-9178583-000 CC Unit 1 Steam Generator Condition Monitoring and Operational Assessment, Spring 2012/EOC20
ASME Code Case N-722-1 Additional Examinations for PWR Pressure Retaining Welds in Class 1 Components Fabricated with Alloy 600/82/182 Materials Section XI, Division 1
Boric Acid Corrosion Control Program MN-3-123, Revision 004
Document 51-9217037-000 Calvert Cliffs Nuclear Power Plant Unit 1, Review of Skip Inspection Determination for U1R22
ES-054 Boric Acid Corrosion Evaluations ES-054, Revision 0
MN-3-110 ISI Outage Examination Plan 1RF021 Final Plan, Revision 0 12/17/2013
Second Interval Containment In-service Inspection Program Plan for CC Unit 1&2, Revision 00100

Drawings
12017-1038SH0001 RPV Closure Head Final Assembly and Machining RV1, Revision 0

Section 1R11: Licensed Operator Requalification Program

Procedures
OI-12A-1, Feedwater System, Revision 52
OI-12A-2, Feedwater System, Revision 43
OP-2-1, Plant Start Up from Hot Standby to Minimum Load, Revision 46
OP-2-2, Plant Start Up from Hot Standby to Minimum Load, Revision 45
OP-3-1, Normal Power Operation, Revision 62
OP-4-1, Plant Shutdown from Power Operations to Hot Standby, Revision 34
OP-4-2, Plant Shutdown from Power Operations to Hot Standby, Revision 19

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures
CNG-OP-4.01-1000, Integrated Risk Management, Revision 01300
EOOS Guidelines – Dominant Risk Activities, Revision 0
EOOS Risk Monitor Guidelines – Senior Reactor Operators, Revision 1

Maintenance Rule Risk Assessment Guideline, Revision 7
OAP 02-02, Protected Equipment Program, Revision 30
OI-29, Saltwater System, Revision 66
OP-7, Shutdown Operations, Revision 53

Section 1R15: Operability Determinations and Functionality Assessments

Procedures
1C03-ALM, Condenstate & Feedwater Control Alarm Manual, Revision 52
2C07-ALM, Chemical and Volume Control Alarm Manual, Revision 38
EP-1-109, Equipment Important to Emergency Preparedness, Revision 00300
ETP-86-003R, Analysis of Neutron Absorbing Material in the Spent Fuel Storage Racks and Management of the Neutron Poison Sample Coupon Trees, Revision 00700
OI-32A, Auxiliary Feedwater System, Revision 25

Condition Reports
CR-2013-008998
CR-2013-009808
CR-2013-010044
CR-2014-000586
CR-2014-000856
CR-2014-001140
CR-2014-001244
CR-2014-002667
IRE-030-406

Drawings
60717sh0001, Well Water, Pretreated Water, Demineralized Water and Condensate Storage System, Revision 101

Miscellaneous
CA03745, Uncertainty Calculation for 12 Condensate Storage Tank Level, Revision 2
CA04978, Evaluation of Vortexing Potential for the AFW Pumps when Pumping from 12 CST, Revision 0
CA06053, Evaluation of Effect of Nitrogen Gas in AFW Inventory on AFW pump performance, Revision 0
EAL-TB, Emergency Action Level Technical Bases Document, Revision 000000
I-87-7, Capacity of Condensate Storage Tank No.12, Revision 0

Work Orders
C91455546

Section 1R19: Post-Maintenance Testing

Procedures
CNG-MN-4.01-1008, Pre/Post Maintenance Testing, Revision 00100
CNG-MN-4.01-GL002, Post Maintenance Test and Post Maintenance Operability Test Requirements Guideline, Revision 00000
CNG-OP-1.01-1007, Clearance & Safety Tagging, Revision 01000
E-003, Disconnect / Reconnect for Motors, Revision 00601
FASTENER-01, Torquing and Fastener Applications, Revision 00300
FTE-29, Acceptance Test and Calibration of Amptectors, Revision 8
FTM-03B, Rotating Equipment Alignment Using Laser Alignment Systems, Revision 00600
MOV-009B, Operating the Crane Nuclear Viper System, Revision 00502

MOV-025A, Limitorque Motor Operated Valve (MOV) Post-Maintenance Requirements for Flow-Isolable Valves, Revision 00401
MOV-10, MOV Spring Pack Testing, Revision 00701
MOV-11, Torque Switch Testing and Adjustment of Limitorque Actuators, Revision 00402
MSIV-4, Disassembly and Reassembly of MSIV, Revision 01100
NO-1-208, Calvert Cliffs Operability and Maintenance Testing, Revision 01900
PACK-1, General Valve Packing Procedure, Revision 20
PUMP-02, Containment Spray Pump Overhaul, Revision 00601
STP-M-003A-0, On-Line Main Steam Safety Valve Testing, Revision 00500
STP-M-548-21, Containment Iodine Removal Filter Test (HEPA), Revision 5
STP-M-549-1, Containment Iodine Removal Filter Test (Charcoal), Revision 00901
STP-O-001-1, MSIV Full Stroke Test, Revision 01402
STP-O-005A-1, Auxiliary Feedwater System Quarterly Surveillance Test, Revision 25
STP-O-066F-1, SI Pump Recirc Valve Operability Test (Mode 5-6), Revision 2
STP-O-067H-1 SIT Out Check Valve Stroke Test, Revision 00400
MSIV-13, MSIV Actuator Removal and Installation, Revision 00900
STP-O-070-1, Monthly Test of "A" Train Containment Cooling Units, Iodine Removal Units, & Penetration Room Exhaust Filter, Revision 01504
STP-O-073M-1, Containment Spray Flow Test, Revision 8
Valve-28, Auxilary Feed Pump Turbine Governor Valve Overhaul, Revision 00301
Valve-29A, Velan Bolted Bonnet Swing Check Valve Inspection and Repair, Revision 0

Work Orders
C91841190
C91953233
C91957315
C91959685
C91978699
C92115090
C92173175
C92384578
C92576121

Condition Reports
CR-2014-000566
CR-2014-000569
CR-2014-000746

Section 1R20: Refueling and Other Outage Activities

Procedure
NO-1-103, Conduct of Lower Mode Operations, Revision 02902
OI-3A-1, Safety Injection and Containment Spray, Revision 26
NO-1-104, Containment Access, Revision 01900
OI-3B-1, Shutdown Cooling, Revision 25
STP-O-108D-1, Containment Penetration Local Leak Rate Tests, Revision 00603
CNG-OM-1.01-1001, Shutdown Safety Management Program, Revision 00400
OP-3-1, Normal Power Operation, Revision 04910
OP-4-1, Plant Shutdown from Power Operation to Hot Standby, Revision 01902
OP-5-1, Plant Shutdown from Hot Standby to Cold Shutdown, Revision 02704
OP-7-1, Shutdown Operations, Revision 04800

OAP-10-03, Operations Refueling Outage Guidelines, Revision 6

Condition Reports
CR-2014-001702

Section 1R22: Surveillance Testing

Procedures
STP-M-520F-1, Automatic Removal of Pressurizer Pressure and Steam Generator Pressure Blocking Signal Verification, Revision 00302
STP-M-673A-1, Power Operated Relief Valve Response Time Test, Revision 00703
STP-O-004B-1, 'B' Train Integrated Engineered Safety Features Test
STP-O-069-1, Steam Generator Isolation Signal and Containment Spray Actuation Signal-3 Logic Test
STP-O-108D-1, Containment Penetration Local Leak Rate Tests, Attachment 9, CV-505, Revision 00603
STP-O-27-2, Reactor Coolant System Leakage Evaluation, Revision 01804
STP-O-66C-1, Feedwater Isolation Valves Operability, Revision 00300
STP-O-66M-1, Cold Shutdown Operability Test of Shutdown Cooling Return Isolation Valves 1-SI-651-MOV/1-SI-652-MOV, Revision 00300
STP-O-67G-1, Safety Injection Check Valve Cold Shutdown Test, Revision 00500
STP-O-67H-1, Safety Injection Tank Outlet Check Valve Stroke Test, Revision 00400
STP-O-8B-2, Test of 2B Diesel Generator and 4kV Bus 24 Loss of Coolant Sequencer, Revision 29

Drawing
OM-39 (60-702-E) Condensate and Feedwater System, Unit 1

Condition Reports
CR-2014-002873

Miscellaneous
CCNPP Unit 1 In-Service Test Basis Document
Engineering Calculation CA04278

Section 2RS1: In-Plant Airborne Radioactivity Control and Mitigation

Procedures
CNG-OP-4.01-1000, Integrated Risk Management, Revision 01300
CNG-RP-1.01-2002, Effective Dose Equivalent – External, Revision 0
NO-1-114, Containment Closure, Revision 01900
RPPG-03-004, Set-up of Outage HEPA and Charcoal Units, Revision 0
RPPG-04-001, AMS-4 Set Up for Refuel Outage, Revision 0
RSP 1-00, RWP Preparation, Revision 02901, Attachments 6 & 7
RSP 1-105, Small Radioactive Particle Control, Revision 1000
RSP 1-115, Radiological Air Sampling Program, Revision 1400
RSP 1-130, Containment RMS Sampling, Revision 401
RSP 1-131, Operation of the AMS-4, Revision 600
RSP 1-132, Job Coverage in Radiologically Controlled Areas, Revision 1601
RSP 1-200, RWP Preparation, Revision 2901
RSP 1-211, Portable HEPA Ventilation, Revision 100

RSP 2-504, Controlled Area Vacuum Cleaners, Revision 5

Corrective Action Document Name
CR-2013-010117
CR-2014-000116
CR-2014-000886
CR-2014-001072
CR-2014-001552
CR-2014-001557
CR-2014-001653
CR-2014-001677
CR-2014-001754

Miscellaneous
ALARA Review 14-01, Revision 0
ALARA Review 14-03, Revision 0
ALARA Review 14-18, Revision 0
ALARA Work In Progress Review for ALARA Plan 14-01, dated 2/24/2014
Calvert Cliffs 2014 Unit 1 RFO Containment Purge Script, Revision 0
Radiation Work Permit 1002, Revision 3
Radiation Work Permit 1007, Revision 0
Radiation Work Permit 1008, Revision 2
Radiation Work Permit 1010, Revision 3
Radiation Work Permit 1017, Revision 2
Radiation Work Permit 1300, Revision 2
TEDE-ALARA Respiratory Protection Evaluation Worksheet for RWP 2014-1007, Task 1
TEDE-ALARA Respiratory Protection Evaluation Worksheet for RWP 2014-1010, Task 1
TEDE-ALARA Respiratory Protection Evaluation Worksheet for RWP 2014-1017, Task 1, 2
TEDE-ALARA Respiratory Protection Evaluation Worksheet for RWP 2014-1300, Task 1

Section 2RS2: Occupational ALARA Planning and Controls

Corrective Action Document Name
CR-2014-001501

Miscellaneous
ALARA Review 14-01, Revision 0
ALARA Review 14-03, Revision 0
ALARA Review 14-18, Revision 0
ALARA Work In Progress Review for ALARA Plan 14-01, dated 2/24/2014
Radiation Work Permit 1002, Revision 3
Radiation Work Permit 1007, Revision 0
Radiation Work Permit 1008, Revision 2
Radiation Work Permit 1010, Revision 3
Radiation Work Permit 1017, Revision 2
Radiation Work Permit 1300, Revision 2
TEDE-ALARA Respiratory Protection Evaluation Worksheet for RWP 2014-1007, Task 1
TEDE-ALARA Respiratory Protection Evaluation Worksheet for RWP 2014-1010, Task 1
TEDE-ALARA Respiratory Protection Evaluation Worksheet for RWP 2014-1017, Task 1, 2
TEDE-ALARA Respiratory Protection Evaluation Worksheet for RWP 2014-1300, Task 1

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

Procedures
RPPG-04-001, AMS-4 Set Up for Refuel Outage, Revision 0
RSP 1-115, Radiological Air Sampling Program, Revision 1400
RSP 1-130, Containment RMS Sampling, Revision 401
RSP 1-131, Operation of the AMS-4, Revision 600

Corrective Action Document Name
CR-2014-001559
CR-2014-001561

Miscellaneous
ALARA Review 14-01, Revision 0
ALARA Review 14-03, Revision 0
ALARA Review 14-18, Revision 0
ALARA Work In Progress Review for ALARA Plan 14-01, dated 2/24/2014
Radiation Work Permit 1002, Revision 3
Radiation Work Permit 1007, Revision 0
Radiation Work Permit 1008, Revision 2
Radiation Work Permit 1010, Revision 3
Radiation Work Permit 1017, Revision 2
Radiation Work Permit 1300, Revision 2
Respiratory Protection Training Lesson Plan
TEDE-ALARA Respiratory Protection Evaluation Worksheet for RWP 2014-1007, Task 1
TEDE-ALARA Respiratory Protection Evaluation Worksheet for RWP 2014-1010, Task 1
TEDE-ALARA Respiratory Protection Evaluation Worksheet for RWP 2014-1017, Task 1, 2
TEDE-ALARA Respiratory Protection Evaluation Worksheet for RWP 2014-1300, Task 1

Section 4OA1: Performance Indicator Verification

Procedure
CP-0204, Specification and Surveillance Primary System, Revision 05200
CP-0401, Nuclear Steam Supply System Sampling, Revision 00800
NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Revision 7
STP-O-027, Reactor Coolant System Leakage Evaluation, Revision 18

Condition Reports
CR-2012-009203

Miscellaneous
Unit 1 & Unit 2 Reactor Coolant System Leakage 4Q 2013 performance indicator
Unit 1 & Unit 2 Reactor Coolant System Activity 4Q 2013 performance indicator

Section 4OA5: Other Activities

Procedures:
M-TEC-6, Velocity Calibration, Revision 5
SNUB-13, Removal and Installation of Small Bore Grinnell/Anvil Snubbers, Revision 00600

SNUB-5, Filling, Purging, Calibrating and Testing of Grinnel Hydraulic Snubbers, Revision 01501
STP-M-011-1, Snubber Functional Test, Revision 00708
STP-M-012-1, Accessible Snubber Visual Inspection, Revision 01701
STP-M-013-1, Inaccessible Snubber Visual Inspection, Revision 02000
STP-M-023-1, Snubber Service Life Review, Revision 4

Drawings:
12600-5346, As-built Snubber No. 1-52-42 & 1-52-42A Sketch, Revision 4
91100SH0002, Safety Injection Piping System - Tank No. 11B, Leg No. 11B, Revision 7

Condition Reports:
CR-2012-002611
CR-2014-001348
CR-2014-001722
CR-2014-001931
CR-2014-002132
CR-2014-002133

Work Orders:
C90952104
C90952262
C91789346

Program Documents
Calvert Cliffs Nuclear Power Plant, 2014 Underground Piping and Tank Management Inspection Plan
Fleet Administrative Procedure, CNG-AM-9.01-1000, Underground Pipe and Tank Management, Revision 00300
Fleet Engineering Standard, CNG-FES-047, Performance of Underground Pipe and Tank Management Program Activities, Revision 1
Program Health Report, Underground Pipe and Tank, 10/1-12/31/2014
System Health Report, Cathodic Protection, 10/1-12/31/2014

Miscellaneous Documents
BP Works 2.1, Computer Program
Calculation Sheet for Unit 1 Snubber Service Life Review, Dated 5-22-2012
Data Sheet for Unit 1 2010 Snubber Functional Tests
Data Sheet for Unit 1 2012 Accessible Snubber Visual Inspection
Data Sheet for Unit 1 2012 Inaccessible Snubber Visual Inspection
Data Sheet for Unit 1 2012 Snubber Functional Tests
DE00609, Memo Regarding Snubbers Service Life, dated 11-20-1991
DE10879, Memo Regarding Snubber PM's and Functional Testing During 2014, dated 06-05-2012
Engineering Change Package ECP-12-000123, Repairs Required for Rear Weld Brackets for Snubbers 1-83-11, -12, -18
EPRI 2010 Technical Report 1016456, Revision 1, Recommendations for an Effective Program to Control the Degradation of Buried and Underground Piping and Tanks
Fourth Interval In-Service Inspection Program Plan for Calvert Cliffs Nuclear Power Plant Units 1 and 2

NEI 09-14, Revision 3, Guideline for the Management of Underground Piping and Tank Integrity, April 2013
NRC Safety Evaluation for Relief Request RR-SNUB-1 for Calvert Cliffs Nuclear Power Plant Units 1 and 2
NRC Temporary Instruction 2515/182, Review of the Implementation of the Industry Initiative to Control Degradation of Underground Piping and Tanks, 08/08/13
Technical Requirements Manual Section 15.7.2 Snubbers

LIST OF ACRONYMS

10 CFR	Title 10 of the *Code of Federal Regulations*
ADAMS	Agency-Wide Documents Access and Management System
AFAS	auxiliary feedwater actuation system
AFW	auxiliary feedwater
ALARA	As Low as is Reasonably Achievable
ASME	American Society of Mechanical Engineers
AOP	abnormal operating procedure
CAP	corrective action program
CCNPP	Calvert Cliffs Nuclear Power Plant
CDF	core damage frequency
CENG	Constellation Energy Nuclear Group, LLC
CP	chemistry procedure
CR	condition report
CVCS	chemical and volume control system
EAL	emergency action level
EP	emergency preparedness
HRA	high radiation area
IMC	Inspection Manual Chapter
ISI	in-service inspection
kV	kilovolt
LLRT	local leak rate test
MS	main steam
NCV	non-cited violation
NDE	non-destructive examination
NOUE	Notice of an Unusual Event
NRC	Nuclear Regulatory Commission
OI	Operating Instruction
PWR	pressurized water reactor
RCS	reactor coolant system
RG	regulatory guide
RWP	radiation work permit
STP	surveillance test procedure
SW	saltwater
TS	technical specification
UFSAR	Updated Final Safety Analysis Report
VHRA	very high radiation area