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

August 2, 2017

Mr. Bryan C. Hanson
Senior Vice President, Exelon Generation Company, LLC
President and Chief Nuclear Officer, Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: CALVERT CLIFFS NUCLEAR POWER PLANT – INTEGRATED INSPECTION REPORT 05000317/2017002 AND 05000318/2017002

Dear Mr. Hanson:

On June 30, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Calvert Cliffs Nuclear Power Plant (CCNPP), Units 1 and 2. On July 26, 2017, the NRC inspectors discussed the results of this inspection with Mr. Mark Flaherty, Site Vice President, and other members of your staff. The results of this inspection are documented in the enclosed report.

The NRC inspectors did not identify any finding or violation of more than minor significance.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at http://www.nrc.gov/reading-rm/adams.html and the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Anthony Dimitriadis, 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 05000317/2017002 and
05000318/2017002
w/Attachment: Supplementary Information

cc w/encl: Distribution via ListServ

SUBJECT: CALVERT CLIFFS NUCLEAR POWER PLANT – INTEGRATED INSPECTION REPORT 05000317/2017002 AND 05000318/2017002 DATED AUGUST 2, 2017

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DOCUMENT NAME: G:\DRP\BRANCH1\Calvert_Cliffs\Inspection Reports\CC IR 2017-002\2017-002 Calvert Final.docx
ADAMS ACCESSION NUMBER: ML17219A107

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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.	05000317/2017002 and 05000318/2017002
Licensee:	Exelon Generation Company, LLC (Exelon)
Facility:	Calvert Cliffs Nuclear Power Plant, Units 1 and 2
Location:	Lusby, MD
Dates:	April 1, 2017, through June 30, 2017
Inspectors:	R. Clagg, Senior Resident Inspector C. Roettgen, Resident Inspector M. Hardgrove, Acting Resident Inspector . J. Furia, Senior Health Physicist H. Gray, Senior Reactor Inspector P. Meier, Resident Inspector, Seabrook M. Orr, Reactor Inspector M. Patel, Operations Engineer S. Pindale, Senior Reactor Inspector A. Rosebrook, Senior Project Engineer A. Siwy, Project Engineer
Approved by:	Anthony Dimitriadis, Chief Reactor Projects Branch 1 Division of Reactor Projects

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SUMMARY

Inspection Report 05000317/2017002, 05000318/2017002; 4/01/2017 – 6/30/2017; Calvert Cliffs Nuclear Power Plant (CCNPP), Units 1 and 2; Routine Integrated Inspection Report.

This report covers a three-month period of inspection by resident inspectors and announced baseline inspections performed by regional inspectors. No findings were identified. The Nuclear Regulatory Commission's (NRC) program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at 100 percent power. On June 22, 2017, operators reduced power to 85 percent for main turbine valve testing. On June 23, the unit was restored to 100 percent power. 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. The unit remained at or near 100 percent power for the entire inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01 – 4 samples)

.1 Readiness for Seasonal Extreme Weather Conditions (1 sample)

a. Inspection Scope

The inspectors reviewed Exelon's readiness for the onset of seasonal high temperatures. The review focused on the emergency diesel generator (EDG) and intake structure. The inspectors reviewed the Updated Final Safety Analysis Report (UFSAR), technical specifications (TSs), control room logs, and the corrective action program (CAP) to determine what temperatures or other seasonal weather could challenge these systems, and to ensure Exelon personnel had adequately prepared for these challenges. The inspectors reviewed station procedures, including Exelon's seasonal weather preparation procedure and applicable operating procedures. The inspectors performed walkdowns of the selected systems to ensure station personnel identified issues that could challenge the operability of the systems during hot weather conditions. Documents reviewed for each section of this inspection report (IR) are listed in the Attachment.

b. Findings

No findings were identified.

.2 Summer Readiness of Offsite and Alternate Alternating Current (AC) Power Systems (1 sample)

a. Inspection Scope

The inspectors reviewed plant features and procedures for the operation and continued availability of the offsite and alternate AC power system to evaluate readiness of the systems prior to seasonal high grid loading. The inspectors reviewed Exelon's procedures affecting these areas and the communications protocols between the transmission system operator and Exelon. This review focused on changes to the established program and material condition of the offsite and alternate AC power equipment. The inspectors assessed whether Exelon established and implemented appropriate procedures and protocols to monitor and maintain availability and reliability of both the offsite AC power system and the onsite alternate AC power system. The

inspectors evaluated the material condition of the associated equipment by interviewing the responsible system manager, reviewing condition reports and open work orders (WOs), and walking down portions of the offsite and AC power systems including the 500 kilovolt (kV) and 220 kV switchyards.

b. Findings

No findings were identified.

.3 Readiness for Impending Adverse Weather Conditions (2 samples)

a. Inspection Scope

The inspectors reviewed Exelon's preparations for the impending adverse weather conditions listed below. The inspectors reviewed the implementation of adverse weather preparation procedures and conducted plant walkdowns before the onset of and during these adverse weather conditions. The inspectors verified that operator actions defined in Exelon'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.

- Forecasted high winds, April 6, 2017
- Severe thunderstorms and forecasted high winds, May 5, 2017

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial System Walkdowns (71111.04Q – 4 samples)

a. Inspection Scope

The inspectors performed partial walkdowns of the systems listed below. The inspectors selected these systems based on their risk-significance relative to the reactor safety cornerstones at the time they were inspected. The inspectors reviewed applicable procedures, system diagrams, the UFSAR, TSs, WOs, action requests (ARs), and the impact of ongoing work activities on redundant trains of equipment in order to identify conditions that could have impacted the system's performance of its intended safety functions. The inspectors also performed field walkdowns of accessible portions of the systems to verify that system components and support equipment were properly aligned and 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 Exelon staff had properly identified equipment issues and entered them into the CAP for resolution with the appropriate significance characterization.

- 12 emergency core cooling system (ECCS) train during 1A EDG maintenance outage, April 26, 2017
- 12A/12B service water (SRW) heat exchanger (HX) while the 11A/11B SRW HX was out of service for maintenance, May 4, 2017

- 12 main control room (MCR) heating, ventilation, and air conditioning (HVAC) while the 11 MCR HVAC was out of service for maintenance, May 25, 2017
- 22/23 saltwater (SW) pump while the 21 SW pump was out of service for maintenance, May 31, 2017

b. Findings

No findings were identified.

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

a. Inspection Scope

On June 26, 2017, the inspectors performed a complete system walkdown of accessible portions of the Unit 2 low pressure safety injection system during normal operation, to verify the existing equipment lineup was correct. The inspectors reviewed operating procedures, surveillance tests, drawings, equipment line-up check-off lists, and the UFSAR to verify the system was aligned to perform its required safety functions. The inspectors also reviewed electrical power availability, component lubrication and equipment cooling, hanger and support functionality, and operability of support systems. The inspectors performed field walkdowns of accessible portions of the systems to verify as-built system configuration matched plant documentation, and that system components and support equipment remained operable. The inspectors confirmed that systems and components were aligned correctly, free from interference from temporary services or isolation boundaries, environmentally qualified, and protected from external threats. The inspectors also examined the material condition of the components for degradation and observed operating parameters of equipment to verify that there were no deficiencies. Additionally, the inspectors reviewed a sample of related condition reports and WOs to ensure Exelon appropriately evaluated and resolved any deficiencies.

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 Exelon 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.

- Unit 2, 21 ECCS Pump Room, Fire Area 1, April 26, 2017
- Unit 2, 22 ECCS Pump Room, Fire Area 2, April 26, 2017
- Intake Structure, Intake Structure Outside and Intake Structure Pump Room, Fire Area IS, June 5, 2017
- Unit 1, 12 ECCS Pump Room, Fire Area 3, June 7, 2017
- Unit 1, 11 ECCS Pump Room, Fire Area 4, June 7, 2017
- Unit 2, East Electrical Penetration Room, Fire Area 26, June 7, 2017
- Unit 2, West Electrical Penetration Room, Fire Area 27, June 7, 2017

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 2 samples)

.1 Internal Flooding Review

a. Inspection Scope

The inspectors reviewed the UFSAR, the site flooding analysis, and plant procedures to identify internal flooding susceptibilities for the site. The inspectors review focused on the auxiliary building basement (-15' and -10' elevations), corridor 100 and room 1000. It verified the adequacy of equipment seals located below the flood line, floor and water penetration seals, watertight door seals, common drain lines and sumps, sump pumps, level alarms, control circuits, and temporary or removable flood barriers. It assessed the adequacy of operator actions that Exelon had identified as necessary to cope with flooding in this area and also reviewed the CAP to determine if Exelon was identifying and correcting problems associated with both flood mitigation features and site procedures for responding to flooding.

b. Findings

No findings were identified.

.2 Annual Review of Cables Located in Underground Bunkers/Manholes

a. Inspection Scope

The inspectors conducted an inspection of underground bunkers/manholes subject to flooding that contain cables whose failure could affect risk-significant equipment. The inspectors performed walkdowns of risk-significant areas, including manholes 1MH21, 1MH24, 1HH25, and 1HH26 containing offsite power cables from the start-up transformer, to verify that the cables were not submerged in water, that cables and/or splices appeared intact, and to observe the condition of cable support structures. When applicable, the inspectors verified proper sump pump operation and verified level alarm circuits were set in accordance with station procedures and calculations to ensure that the cables will not be submerged. The inspectors also ensured that drainage was provided and functioning properly in areas where dewatering devices were not installed.

b. Findings

No findings were identified.

1R07 Heat Sink Performance

Triennial Heat Sink Performance (71111.07T – 2 samples)

a. Inspection Scope

Triennial Heat Sink and Heat Exchanger Sample Selection

Based on Units 1 and 2 risk ranking of safety-related HXs, past triennial heat sink inspections, recent operational experience, and resident inspector input, the inspectors selected Unit 2 SW ultimate heat sink and Unit 1 11 shutdown cooling (SDC) HX for inspection samples. The 2017 triennial heat sink inspection was complimentary to the 2014 inspection in that the corresponding HXs for the opposite units were included in the inspection sample plus the Unit 1 12 component cooling water (CC) HX.

For the samples selected, the inspectors reviewed program reports, daily HX status and trend flow and differential pressure data, self-assessments, and maintenance methods (inspection, cleaning, maintenance, and performance monitoring) used to ensure heat removal capabilities for the safety-related HXs and ultimate heat sinks and compared them with Exelon's commitments made in the revised response to Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment," dated June 30, 1994.

Unit 2 SW System (Ultimate Heat Sink Sample)

The inspectors completed an inspection of the Unit 2 SW system in accordance with the applicable steps of Inspection Procedure 71111.07. The Unit 2 SW system transfers heat from the CC HXs, the SRW HXs, and the ECCS room coolers to the ultimate heat sink, the Chesapeake Bay.

The inspectors reviewed recent buried piping inspections to assess the condition and structural integrity of the SW piping. The inspectors reviewed a sample of SW pipe nondestructive examination records, intake structure silt inspections, structures monitoring inspection results, and associated engineering evaluations to ensure that Exelon staff was appropriately addressing observed degradation in SW piping and the intake structure. The inspectors observed that the SW unavailability has been historically very low, and that the system had been available to perform its ultimate heat sink safety function.

The inspectors reviewed the operation of the SW system. The review included system design changes, system procedures, intake structure operating procedures, abnormal SW operating procedures, loss of the SW intake structure operating procedure, adverse weather condition procedures, and SW leak isolation procedures. The inspectors verified that the Exelon staff was maintaining design drawings, design basis calculations, and operating procedures consistent with their design and licensing basis and that plant operators could reasonably implement the procedures. The inspectors performed a walkdown of the accessible portions of the SW system and the intake structure to verify that instrumentation relied upon by operators for decision making tasks was available and functional. The inspectors verified that the SW piping had been analyzed to demonstrate resistance to water hammer susceptibility. Also, the inspectors verified Exelon's in-service testing procedures tested for the correct operation of the SW pump discharge check valves, precluding the potential for weak-pump/strong-pump interaction during system operation. Also, susceptibility of the SW system to weak pump/strong

pump interaction is further reduced because station operating procedures preclude operation with adjacent pumps operating at the same time.

The inspectors reviewed the visual inspection records and eddy current inspection records from recent cleanings of the CC HXs, which were performed to verify the structural integrity and fouling condition of the HXs. Additionally, the CC HXs and the CC system are protected from corrosive degradation by hydrazine chemical treatment.

The SRW HXs are also cooled by the SW system. These HXs are plate and frame type HXs which are subject to clogging and fouling resulting from close clearances between the HX plates. The inspectors reviewed the results of periodic flow tests of the SRW HXs to assess the level of flow blockage and/or fouling. The inspectors determined that if significant fouling is evident, Exelon staff disassembles the HX and cleans the plates to restore flow and heat removal capability. During these cleanings, Exelon staff performs visual inspections for degradation which could affect structural integrity. Performance of eddy current testing is not possible on these HXs because they do not have separate integral tubes.

The inspectors reviewed Exelon staff's disposition process for active thru wall SW piping leaks, including structural evaluations and completed and/or planned corrective actions. The SW piping is rubber lined, carbon steel piping, and has experienced few leaks. Exelon engineering evaluations have not determined a dominant corrosion mechanism for the leaks which have occurred. Leaks do occur in piping segments where the inside of the piping has not been completely coated and the carbon steel piping material has been exposed to saltwater. The SW piping is monitored by the flow accelerated corrosion program and erosion/corrosion effects have not been evident. Microbiologically induced corrosion has not been evident in the SW piping systems at CCNPP. Ultrasonic testing examinations were appropriately performed in accordance with American Society of Mechanical Engineers (ASME), Section XI, Boiler and Pressure Vessel Code, and ASME Code Case N-513-2. The inspectors concluded that the engineering evaluations and the ultrasonic testing examinations demonstrated that structural integrity was maintained.

The inspectors verified that Exelon staff established appropriate chemistry procedures to control, detect, and prevent system degradation due to macrofouling of the SW pumps, valves, and piping. Biocide treatments of the SW system were controlled, monitored, trended, and evaluated to ensure adequate biotic control. The inspectors reviewed the SW system performance testing, SW flow balance test results, and flow balance calculations to verify that the minimum calculated SW flow rates were maintained to essential equipment and met the acceptance criteria in the UFSAR.

The inspectors performed a walkdown of the intake building (including the trash racks, SW pumps, SW traveling water screens, and structural supports), and the accessible areas of the intake building containing SW piping to look for indications of piping leakage and/or degradation. The inspectors verified that intake structure pump bay silt accumulation was monitored, trended, and maintained at an acceptable level. The inspectors interviewed the cognizant system engineers, reviewed silt deposition inspection records, and the results of past bay silt measurements.

Unit 1 - 11 SDC HX (HX sample)

The inspectors reviewed the 11 SDC HX in accordance with the applicable steps of Inspection Procedure 71111.07. The 11 SDC HX is cooled by the CC system. The

chemistry of the 11 SDC HX (primary side) was maintained at primary water chemistry quality to prevent corrosive degradation. The CC system was also treated with similar chemistry to prevent corrosive degradation. The 11 SDC HX has 859 tubes with no plugged tubes. The CC system is a closed cooling system that accepts heat from both of the SDC HXs.

The inspectors reviewed the design basis heat removal calculation for the 11 SDC HX. The CC system cools the 11 SDC HX and transfers the heat load to the Unit 1 SW system and the Chesapeake Bay which is the ultimate heat sink. The inspectors reviewed the design basis heat capacity calculation for this system. During operation, Exelon staff relied upon maintenance of primary water chemistry in the SDC HXs to ensure that system heat removal capability was maintained.

The inspectors verified that the 11 SDC HX condition and operation were consistent with design assumptions in the plant's heat transfer calculations. The design and operation of each of the two SDC HXs has been analyzed for potential water hammer effects and plant operating procedures for CC assure that the HX does not experience damage due to water hammer conditions. Similarly, design analysis determined the flow rates which could cause excessive flow-induced vibration and plant operating procedures restricted SDC HX flow rates to acceptable levels to avoid excessive tube vibration and wear.

The inspectors concluded that the 11 SDC HX was effectively protected from degradation as evidenced by no tubes being plugged in either of the two SDC HXs. The SDC HXs operated at a pressure of 80 psi and the CC system operates at 45 psi to prevent leakage from the CC system into the SDC HXs during operation.

The SDC HXs are only used for plant cooldown. The inspectors reviewed recent flow tests and verified that 11 SDC HX has successfully completed the cooldown of the plant during recent plant outages. The inspectors reviewed the most recently completed inspection/cleaning WOs to verify that the as-found and as-left condition of the CC system HXs was bounded by assumptions in the engineering analyses and provided reasonable assurance of continued operability. The inspectors compared recent CC system HX surveillance test data with the established acceptance criteria to verify that the results were acceptable and that operation was consistent with design. The inspectors reviewed the 11 SDC HX flow balance calculation to verify that the minimum calculated CC system flow rate, in conjunction with the heat transfer capability of the CC system HXs, would support the minimum heat transfer rates assumed during accident and transient conditions described in the UFSAR.

Problem Identification and Resolution

The inspectors selected and reviewed a sample of CAP reports related to the heat sink equipment and HX samples chosen for this inspection. The review was performed to determine whether Exelon staff were appropriately identifying, characterizing, and correcting problems related to these systems and components, and that the planned or completed corrective actions for the reported issues were appropriate.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program and Licensed Operator Performance (71111.11Q – 4 samples)

.1 Quarterly Review of Licensed Operator Requalification Testing and Training (2 samples)

a. Inspection Scope

The inspectors evaluated operator performance during the simulated event and verified completion of risk significant operator actions, including the use of alarm response and normal operating procedures. The inspectors assessed the clarity and effectiveness of communications, implementation of actions in response to alarms and plant conditions, and the oversight and direction provided by the control room supervisor. Additionally, the inspectors assessed the ability of the crew and training staff to identify and document crew performance problems. The inspectors observed simulator training sessions below:

- On June 6, 2017, a training session involving a loss of load, manual reactor trip, main turbine failure, and loss of normal heat sink.
- On June 8, 2017, a training session involving a grid disturbance, trip of the opposite unit, loss of a motor-generator set, and unit trip due to degraded grid voltage.

b. Findings

No findings were identified.

.2 Quarterly Review of Licensed Operator Performance in the MCR

a. Inspection Scope

The inspectors observed infrequently performed test or evolution briefings, pre-shift briefings, and reactivity control briefings to verify that the briefings met the criteria specified in Exelon procedures, OP-AA-103-102, “Watch Standing Practices,” Revision 16, and HU-AA-1211, “Pre-Job Briefings,” Revision 11. Additionally, the inspectors observed evolution performance to verify that procedure use, crew communications, and coordination of activities between work groups similarly met established expectations and standards. The inspectors observer licensed operator performance in the MCR during the activities listed below.

- During the week of June 5, 2017, the inspectors observed and reviewed MCR scheduled activities during 0C diesel generator maintenance outage.
- June 22-23, 2017, the inspectors observed and reviewed MCR scheduled activities for a planned Unit 1 down power and surveillance of the main turbine valves and moderator temperature coefficient on June 22-23, 2017

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12Q – 3 samples)

a. Inspection Scope

The inspectors reviewed the samples listed below to assess the effectiveness of maintenance activities on structure, system, and component (SSC) performance and reliability. The inspectors reviewed system health reports, CAP documents, maintenance WOs, and maintenance rule basis documents to ensure that Exelon was identifying and properly evaluating performance problems within the scope of the maintenance rule. For each sample selected, the inspectors verified that the structure, system, or component SSC was properly scoped into the maintenance rule in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 50.65 and verified that the (a)(2) performance criteria established by Exelon staff was reasonable. As applicable, for SSCs classified as (a)(1), the inspectors assessed the adequacy of goals and corrective actions to return these SSCs to (a)(2). Additionally, the inspectors ensured that Exelon staff was identifying and addressing common cause failures that occurred within and across maintenance rule system boundaries.

- Maintenance rule unavailability hours exceeded for Unit 2 auxiliary/main high pressure safety injection (AR03960990)
- Electrohydraulic control leak on 21 main turbine governor valve (IR03949100)
- 21 charging pump failed to start (AR04007660)

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed station evaluation and management of plant risk for the maintenance and emergent work activities listed below to verify that Exelon 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 determined that Exelon performed risk assessments as required by 10 CFR 50.65(a)(4) and that the assessments were accurate and complete. When Exelon 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 that plant conditions were consistent with the risk assessment. The inspectors also reviewed the TS requirements and inspected portions of redundant safety systems, when applicable, to verify risk analysis assumptions were valid and applicable requirements were met.

- Units 1 and 2, updated maintenance risk assessment due to 1A EDG inoperable, April 17, 2017
- Units 1 and 2, maintenance risk assessment for 1A EDG out of service for maintenance, April 24, 2017
- Units 1 and 2, updated maintenance risk assessment for Yellow risk condition due to forecasted high winds, May 5, 2017
- Units 1 and 2, maintenance risk assessment for 0C diesel generator out of service for maintenance, June 5, 2017

- Unit 2, maintenance risk assessment for 22 boric acid pump out of service for maintenance, June 14, 2017
- Unit 1, maintenance risk assessment for 11 charging pump internal check valves replacement, June 21, 2017
- Unit 2, maintenance risk assessment for boric acid supply 2-MOV-514 valve maintenance, June 27, 2017

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 degraded or non-conforming conditions listed below based on the risk significance of the associated components and systems. The inspectors evaluated the technical adequacy of the operability determinations to assess whether TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred. The inspectors compared the operability and design criteria in the appropriate sections of the TS and UFSAR to Exelon staff's evaluations to determine whether the components or systems were operable. The inspectors confirmed, where appropriate, compliance with bounding limitations associated with the evaluations. Where compensatory measures were required to maintain operability, such as in the case of operator work arounds, the inspectors evaluated whether the measures in place would function as intended and were properly controlled by Exelon staff.

- Unit 1 auxiliary feedwater (AFW) air conditioner not maintaining room temperature (IR02639867)
- 1A EDG relay failed calibration (AR04002125)
- 22 charging pump making abnormal oscillating noise (IR04004217)
- 21 charging pump failed to start (IR04007660)
- Suspect 11 AFW pump auto drain strainer clogged (AR04001488)
- Coupling excitements are present on 23 auxiliary feed pump (IR02740873)
- Review operator work around program

b. Findings

No findings were identified.

1R17 Evaluations of Changes, Tests, or Experiments (71111.17T – 29 samples)

a. Inspection Scope

Three inspectors from the NRC Region I Office completed an inspection April 17-20, 2017, at CCNPP to verify that Exelon staff performed screens and evaluations of changes and tests in accordance with regulatory requirements and Exelon implementing guidance. The team reviewed nine safety evaluations to evaluate whether the changes to the facility or procedures, as described in the UFSAR, had been reviewed and documented in accordance with 10 CFR 50.59 requirements. The safety evaluations were sampled from those completed by Exelon staff since the last NRC inspection of this area and had not been previously reviewed by NRC inspectors. In

addition, the team evaluated whether Exelon staff had been required to obtain NRC approval prior to implementing the changes. The team interviewed Exelon staff and reviewed supporting information including calculations, analyses, design change documentation, procedures, the UFSAR, TS, and plant drawings to assess the adequacy of the safety evaluations. The team compared the safety evaluations and supporting documents to the guidance and methods provided in Nuclear Energy Institute (NEI) 96-07, "Guidelines for 10 CFR 50.59 Evaluations," as endorsed by NRC Regulatory Guide 1.187, "Guidance for Implementation of 10 CFR 50.59, Changes, Tests, and Experiments," to determine the adequacy of the safety evaluations.

The team also reviewed a sample of 20 screenings and applicability determinations for which Exelon staff had concluded that a 50.59 safety evaluation was not required to be performed. These reviews were performed to assess whether Exelon's threshold for performing safety evaluations was consistent with 10 CFR 50.59. The sample included design changes, calculations, and procedure changes. The screenings and applicability determinations were selected based on the safety significance, risk significance, and complexity of the change to the facility.

In addition, the team compared Exelon's implementing administrative procedures used to control the screening, preparation, review, and approval of safety evaluations to the guidance in NEI 96-07 to evaluate whether those procedures adequately implemented the requirements of 10 CFR 50.59. The reviewed safety evaluations, screenings, and applicability determinations are listed in the Attachment.

The team verified that Exelon entered performance issues concerning its 50.59 program into its CAP. The team verified that Exelon staff developed appropriate corrective actions to address those issues.

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18 – 1 sample)

Permanent Modifications

a. Inspection Scope

The inspectors evaluated a modification, ECP-14-000069, NFPA 805 LAR #17: Addition of uninterrupted power supply and backup instrument air to cable spreading room (CSR) dampers (WO C92894350, C92341252), and verified that the design basis, licensing basis, and performance capability of the affected systems were not degraded by the modification. In addition, the inspectors reviewed modification documents associated with the upgrade and design change. The inspectors also reviewed revisions to the control room alarm response procedure and interviewed engineering and operations personnel to ensure the procedure could be reasonably performed.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 8 samples)

a. Inspection Scope

The inspectors reviewed the post-maintenance tests for the maintenance activities listed below to verify that procedures and test activities adequately tested the safety functions that may have been affected by the maintenance activity, that the acceptance criteria in the procedure were consistent with the information in the applicable licensing basis and/or design basis documents, and that the test results were properly reviewed and accepted and problems were appropriately documented. The inspectors also walked down the affected job site, observed the pre-job brief and post-job critique where possible, and confirmed work site cleanliness was maintained. Additionally, the inspectors witnessed the test or reviewed test data to verify quality control hold points were performed and checked, and ensured that results demonstrated adequate restoration of the affected safety functions.

- WO C93434451-110, calibrate protective relays 1A EDG, April 27, 2017
- WO C93619629, 2 reactor protection system AD matrix test module matrix relay lights bright, May 1, 2017
- WO C91418496-175, remove 75% of cylinder head, pistons, and liners 1A EDG, May 5, 2017
- WO C92894350, task 100, install backup instrument air to CSR dampers in accordance with EFP-14-000069, June 4, 2017
- WO C92341252, tasks 830, 840 and 850, NFPA 805 – install uninterruptible power supply to CSR dampers, June 4, 2017
- WO C93618090, replace valves on 11 charging pump based on 3,000 run hours, June 27, 2017
- WO C93415552, 0C EDG maintenance, June 29, 2017
- WO C93627448, 11 heater drain tank normal level control valve, June 29, 2017

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 6 samples)

a. Inspection Scope

The inspectors observed performance of a surveillance test and reviewed test data of selected risk-significant SSCs to assess whether test results satisfied TS, the UFSAR, and Exelon procedure requirements. The inspectors verified that test acceptance criteria were clear, the test demonstrated operational readiness, and was consistent with design documentation. Additionally, the inspectors ensured that the test instrumentation had current calibrations and the range and accuracy for the application, the test was performed as written, and applicable test prerequisites were satisfied. Upon test completion, the inspectors considered whether the test results supported that the equipment was capable of performing the required safety functions. The inspectors reviewed the following surveillance test:

- STPO-5A21-2, “21 Auxiliary Feedwater Pump Quarterly Surveillance Test,” Revision 4, May 3, 2017
- STPO-73C-2, “Component Cooling Pump Quarterly Test,” May 15, 2017 (in-service test)

- STPO-8B-2, “Test of 2B DG and 4kV Bus 24 UV,” May 16, 2017
- STPO-8A-1, “Test of 1A DG and 11 kV Bus UV,” May 23, 2017
- PSTP-04, “Variable Tavg Testing,” June 22-23, 2017
- OI-U3C-1, “Main Turbine Performance Evaluation Checks,” June 23, 2017

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06 – 1 sample)

Training Observation

a. Inspection Scope

The inspectors observed a simulator training evolution for licensed operators on June 15, 2017, which required emergency plan implementation by an operations crew. Exelon planned for this evolution to be evaluated and included in performance indicator data regarding drill and exercise performance. The inspectors observed event classification and notification activities performed by the crew. The inspectors also attended the post-evolution critique for the scenario. The focus of the inspectors’ activities was to note any weaknesses and deficiencies in the crew’s performance and ensure that Exelon’s evaluators noted the same issues and entered them into the corrective action program.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstone: Occupational and Public Radiation Safety

2RS8 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation (71124.08 – 6 samples)

a. Inspection Scope

The inspectors verified the effectiveness of Exelon’s programs for processing, handling, storage, and transportation of radioactive material. The inspectors used the requirements of Part 49 CFR, “Transportation,” parts 170-177, “Hazardous Materials Regulations;” 10 CFR Part 20, “Standards for Protection Against Radiation,” 10 CFR Part 61, “Licensing Requirements for Land Disposal of Radiative Waste;” and 10 CFR Part 71; “Packaging and Transportation of Radioactive Material;” applicable industry standards; regulatory guides; and procedures required by TSs as criteria for determining compliance.

Inspection Planning

The inspectors conducted an in-office review of the solid radioactive waste system description in the UFSAR, the process control program, and the recent radiological

effluent release report for information on the types, amounts, and processing of radioactive waste disposed. The inspectors reviewed the scope of quality assurance audits performed for this area since the last inspection.

Radioactive Material Storage (1 sample)

The inspectors observed radioactive waste container storage areas and verified the postings and controls and that Exelon had established a process for monitoring the impact of long-term storage of the waste.

Radioactive Waste System Walkdown (1 sample)

The inspectors walked down the following:

- Accessible portions of liquid and solid radioactive waste processing systems to verify current system alignment and material condition
- Abandoned in place radioactive waste processing equipment to review the controls in place to ensure protection of personnel
- Changes made to the radioactive waste processing systems since the last inspection
- Processes for mixing and transferring radioactive waste resin and/or sludge discharges into shipping/disposal containers
- Current methods and procedures for dewatering waste

Waste Characterization and Classification (1 sample)

The inspectors identified radioactive waste streams and reviewed radiochemical sample analysis results to support radioactive waste characterization. The inspectors reviewed the use of scaling factors and calculations to account for difficult-to-measure radionuclides.

Shipment Preparation (1 sample)

The inspectors reviewed the records of shipment packaging, surveying, labeling, marking, placarding, vehicle checks, emergency instructions, disposal manifest, shipping papers provided to the driver, and licensee verification of shipment readiness.

Shipping Records (1 sample)

The inspectors reviewed selected non-excepted package shipment records.

Problem Identification and Resolution (1 sample)

The inspectors assessed whether problems associated with radioactive waste processing, handling, storage, and transportation were identified at an appropriate threshold and properly addressed in Exelon's CAP.

b. Findings

No findings were identified.

4OA1 Performance Indicator Verification (71151)

Safety System Functional Failures (2 samples)

a. Inspection Scope

The inspectors sampled Exelon's submittals for the Safety System Functional Failures performance indicator for both Unit 1 and Unit 2 for the period of April 1, 2016, through March 31, 2017. To determine the accuracy of the performance indicator data reported during those periods, inspectors used definitions and guidance contained in NEI Document 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, and NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 10 CFR 50.73." The inspectors reviewed Exelon's operator narrative logs, operability assessments, maintenance rule records, maintenance WOs, condition reports, event reports, and NRC integrated IRs to validate the accuracy of the submittals.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 2 samples)

.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 determine if Exelon entered issues into the CAP at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and addressed adverse trends. In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the CAP and periodically attended AR screening meetings. The inspectors also confirmed, on a sampling basis, that, as applicable, for identified defects and non-conformances, Exelon staff performed an evaluation in accordance with 10 CFR Part 21.

b. Findings

No findings were identified.

.2 Annual Sample: Review of Spurious Trip of 11 Steam Generator High Level in 'B' Engineered Safety Features Actuation System (ESFAS)

a. Inspection Scope

The inspectors performed an in-depth review of Exelon's CAP classification, evaluation, and corrective actions to address the failure of the 11 steam generator under voltage logic module which resulted in a turbine trip and reactor trip of Unit 1 on May 31, 2016.

The inspectors assessed Exelon's problem identification threshold, cause analyses, extent of condition reviews, compensatory actions, and the prioritization and timeliness of Exelon's corrective actions to determine whether Exelon was appropriately identifying,

characterizing, and correcting problems associated with this issue and whether the planned or completed corrective actions were appropriate. The inspectors compared the actions taken to the requirements of Exelon's CAP and 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Actions." In addition, the inspectors performed field walkdowns and interviewed engineering personnel to assess the effectiveness of the implemented corrective actions.

b. Findings and Observations

No findings were identified.

On May 31, 2016, at 1626, the Calvert Cliffs Unit 1 turbine tripped due to a spurious trip of the 11 steam generator level high module in the ESFAS 'B' logic, causing the Unit 1 main turbine to trip, resulting in an automatic reactor trip.

Exelon conducted a prompt post trip review of all plant systems to verify proper plant response to the event, and wrote ARs 02676079 and 02676088. Exelon replaced the faulty under voltage logic with a refurbished under voltage logic module. The failed under voltage logic module was sent to a laboratory for failure analysis. Unit 1 was returned to Mode 1 at 2040 on June 1, 2016, with the unit returning to full power on June 2, 2016 at 1040.

The evaluation of the failed under voltage logic module determined two most probable causes. The first most probable cause was an intermittent failure of an integrated circuit of the under voltage logic module. The second most probable cause was due to an inadvertent solder bridge between pin 6 on U5 chip and the board. The spurious high level trip signal resulted in an automatic reactor protection system actuation due to loss of load following the main turbine trip.

The inspectors found that Exelon implemented reasonable corrective actions following the May 2016 failed under voltage module leading to the Unit 1 reactor trip. Exelon planned corrective action to prevent recurrence is to replace the current ESFAS with a system that will eliminate single point vulnerabilities within ESFAS.

.3 Annual Sample: Review of the Unit 1 Main Stack Wide Range Noble Gas Monitor (WRNGM) Functionality While Unit 1 Main Stack Flow Rates Were Out of Specification from 2011-2014

a. Inspection Scope

The inspectors performed an in-depth review of Exelon's CAP classification, evaluation, and corrective actions to address functionality of the Unit 1 WRNGM while Unit 1 main stack flow rates were out of specification from approximately 2011-2014 due to a failed exhaust damper restricting flow.

The inspectors assessed Exelon's problem identification threshold, cause analyses, extent of condition reviews, compensatory actions, and the prioritization and timeliness of Exelon's corrective actions to determine whether Exelon was appropriately identifying, characterizing, and correcting problems associated with this issue and whether the planned or completed corrective actions were appropriate. The inspectors compared the actions taken with the requirements of Exelon's CAP and 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Actions." In addition, the inspectors performed field

walkdowns and interviewed engineering personnel to assess the effectiveness of the implemented corrective actions.

b. Findings and Observations

No findings were identified.

At the CCNPP, the WRNGM measures release of noble gases out of each main stack. The WRNGM consists of an isokinetic sample line and a flow meter (stack flow velocity). The sample line has two flow paths consisting of an isolation valve, purge value, a pump, a flow control valve, and a low range detector in one path and a medium and high range detector in the other path. An RM-80 unit takes the output of the three detectors (Channel's one, two, and three), selects the most accurate channel based upon measured radiation levels and sends the input to the effluent channel (channel four). Channel four takes the selected channel's input and an input from either the main stack flow meter or a static pre-set flow value in order to calculate a release rate in units of micro Curie per second. Channel four is then transmitted to an RM-23 unit and displayed in the MCR. CCNPP emergency action level's (EAL's) list the WRNGM in Table R-1, "Effluent Monitor Classification Threshold," as a threshold for declaring a Notification of Unusual Event (RU1.1), an Alert (RA1.1), a Site Area Emergency (RS1.1), and a General Emergency (RG1.1). The General Emergency WRNGM limits in Table R-1 correspond to the release rate which under worst case atmospheric conditions would result in a dose rate at the site boundary that would be at the Federal Emergency Management Agency Protective Action Guidance limits for requiring an evacuation of the public.

In April 2000 and June 2000, CCNPP completing a modification to the WRNGM for Units 1 and 2 respectively, resulting in the replacement of flow instrumentation and an upgrade to the RM-80 database hardware and software. This upgrade introduced a mode of operation referred to as SPEC mode. SPEC mode is a sample flow control mode where the flow control valve would throttle to control flow at a preset level when main stack flow fell below 30% of nominal or isokinetic sample flow conditions could not be maintained. This mode of operation would not affect the release rate displayed in the MCR.

In 2014, NRC Health Physics inspectors identified that the annual main stack flow surveillance did not have an acceptance criteria to ensure an Offsite Dose Calculation Manual requirement to reevaluate offsite dose calculations if stack flow changed +/- 10%. The procedure was revised and on the next performance of the surveillance, it was discovered that Unit 1 stack flow rate was 31% below nominal. Review of previous surveillance data identified that Unit 1 main stack flow rate would have failed in 2011, 2012, and 2013 as well. The stack flow issue was determined to have been a control damper that had failed, resulting in restricting flow. Exelon wrote AR02437002 and conducted an apparent cause evaluation (ACE) to determine the impact of the condition on the Radiological Environmental Monitoring Program, and the implementation of the Emergency Preparedness Program. The ACE incorrectly determined that the WRNGM had been operating permanently in SPEC mode since the modification. Additionally, the ACE incorrectly described that when stack flow dropped below 88,000 cubic feet per minute (CFM) (27% less than nominal), the RM-80 would substitute a static value for actual main stack flow input to channel 4 and would result in an overly conservative release rate being displayed in the MCR. This could have resulted in corrective actions for the ACE included revising the Annual Effluent Reports for 2011, 2012, and 2013 and updating the data for 2014 to remove the overly conservative data and reflect actual

release rates. The ACE also had an action to review the impact of the error on the EALs. The review determined that the overly conservative indications would not have had an adverse impact on the implementation of the EALs.

In 2017, the inspectors reviewed Exelon's corrective actions and determined the issue was a minor violation of health physics requirements; however, they questioned the conclusion of the EAL impact review. Prior to this PI&R sample, Exelon staff identified an error in the ACE and wrote AR03980152 and AR03989206. These ARs documented that the 2014 ACE incorrectly described the condition and that the WRNGM being in the SPEC mode of operation would not have impacted displayed release rates indicated in the MCR, thus concluding that there would be no impact on the EALs. This is because the SPEC mode only impacts sample flow rate not process flow rate which is used to calculate indicated effluent release rate.

NRC inspectors reviewed the original 2014 ACE, the new ARs, vendor technical manuals, and operating instructions. The inspectors determined that although ARs 03980152 and 03989206 were correct with regard to how the instrument worked in SPEC mode, the 2014 ACE was actually describing a different "mode" of operation. The RM-80 channel four can either receive flow input from the main stake monitor or from a fixed flow value from its database. The 2014 ACE refers to the WRNGM being placed permanently in "SPEC mode" since at least 2003, the evaluators were actually referring to this feature (which is not SPEC mode). When in this mode, the RM-80 logic would not see actual flow indication but rather the fixed flow indication. While the ACE concluded that WRNGM was always in this mode since 2003, system calibration records between 2010 and 2014 showed the RM-80 was properly configured to use actual flow rates vice the fixed flow rate input.

The 2014 ACE incorrectly assumed that when stack flow dropped below 88,000 CFM, that the RM-80 automatically substitutes a fixed value for process flow, when in fact it automatically shifts to SPEC flow mode which controls sample flow at a fixed value vice attempting to maintain isokinetic flow control. At 88,000 CFM, the RM-80 also shifts from normal mode to accident mode and references different logic points for high and low process flow setpoints, however at CCNPP, these values were identical so there was no impact.

The inspectors did determine that the RM-80 does have a low process flow setpoint alarm (setpoint 108,000 CFM or -10% of nominal flow) and a loss of process flow alarm (setpoint 88,000 CFM or -30% of nominal flow) which should have identified the actual Unit 1 main stack low flow condition between 2011 and 2014. However this alarm is a local indication and is displayed as a four digit code. As a result, the low flow condition was not identified in a timely manner. The 2014 ACE also did not identify this failure to identify the low stack flow condition.

The inspectors evaluated the issue using NRC Inspection Manual Chapter 0612, Appendix B, "Issue Screening," and determined the issues were minor since the associated Emergency Preparedness and Public Radiation Safety cornerstone objectives were not adversely affected. The inadequate ACE, unnecessary corrective actions, and untimely identification of a condition adverse to quality are minor violations of NRC requirements and licensee CAP procedures. These issues were documented in Exelon's CAP as AR03980152 and AR03989206.

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

a. Inspection Scope

On March 25, 2017, Exelon submitted Event Notification Report 52640 to the NRC for the inadvertent lowering of the Unit 2 refueling water tank (RWT) to below the TS required limit. Exelon retracted the Event Notification on March 30, after performing an analysis which concluded that the water level in the RWT did not go below the TS required limit. On April 4, the inspectors reviewed Exelon's analysis to determine if the Event Notification retraction was properly made.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

Exit Meeting Summary

On April 25, 2017, the inspectors presented the inspection results to Mr. Mark Flaherty, Site Vice President, and other members of the Exelon 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

Licensee Personnel
M. Flaherty, Site Vice President
T. Tierney, Plant General Manager
D. Baker, Senior Engineering Manager
P. Bourdeau, Senior Engineer
R. Courtney, Supervisor, Radiation Protection
P. Darby, Senior Engineer
J. Delgado, Senior Engineer
A. Drake, Senior Engineer
M. Fick, Principal Engineer, Regulatory Assurance
J. Gines, Senior Engineer
K. Greene, Principal Engineer, Regulatory Assurance
E. Hussain, Senior Engineer
C. Jackson, Engineering Manager
C. Junge, Engineer 3
S. Loeper, Senior Staff Engineer
M. Salehi, Senior Engineer
L. Smith, Manager, Site Regulatory Assurance
R. Stark, Senior Staff Engineer
A. Van Amberg, Engineer 2A
B. Wright, Engineering Analyst 3

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

None

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures
ERPIP-3.0, Immediate Actions (Severe Weather), Revision 5902
OP-CA-108-111-1001, Severe Weather Preparation, Revision 1
SA-AA-116-2124, Job Hazard Analysis, Revision 5

Section 1R04: Equipment Alignment

Procedures
MN-1-122, Insulation Control, Revision 00700
OI-3A, Safety Injection and Containment Spray, Revision 03404

Drawings
60710SH0001, Component Cooling System, Revision 46
60731SH0001, Safety Injection and Containment Spray Systems, Revision 92
60731SH0003, Safety Injection and Containment Spray Systems, Revision 33
62-731-E, Safety Injection and Containment Spray Systems
83240 (M-605), Thermal Insulation for Piping and Equipment, Revision 18
92769 (M-601), Piping Class Summary Sheets, Revision 50

Miscellaneous
MN-1-1222 Attachment 2, Insulation Control Log, April 28, 2017
SD 052-061, Safety Injection and Containment Spray Systems System Description, Revision 7

Section 1R06: Flood Protection Measures

Calculations
M-90-167, Internal Plant Flooding for the (-10) and (-15) Ft. Levels, Revision 0

Miscellaneous
ES-001, Flooding, Revision 4

Section 1R07: Heat Sink Performance

Procedures
CY-AA-120-400, Hydrazine Based Program Control Parameters for Closed Cooling Water, Revision 19, page 12
ER-AA-340, 1003, GL 89-13 Program Performance Indicators. Revision 6
ER-AA-340, GL 89-13 Program Implementing Procedure, Revision 7
ER-AA-340-1001, GL 89-13 Program Implementation Instructional Guide, Revision 9
ER-AA-340-1002, Service Water Heat Exchanger Inspection Guide, Revision 6
OI-15, Unit 1, Service Water System Operation, Revision 04600
OI-16, Unit 1, Component Cooling System Operation, Revision 35
OI-3A, Unit 2, Safety Injection and Containment Spray Operation, Section 6.24 on flush of 21 SDC HX and ECCS piping, Revision 03404

Action Requests

AR02589313	IR2589313	IR4008807
IR04021717	IR2682392	IR4008917
IR04021739	IR4004987	

Miscellaneous
11 Salt Water Header HX Trends Report for 6/12/2017
Chemistry Measurements of CCNPP U1 Component Cooling water from July 2015 to April 2017
Drawings for the Salt Water (012), Service Water (011) and Component Cooling Water (015) Systems
ECCS Fan Cooler Heat Exchanger Tubing Specification Sheet, dated 3/12/1974
ECP-14-000406, Engineering Evaluation of the Thermal Performance Test for the 12 and 22 CCHXs performed in 2012 and 2011.
EPRI NP-7552, dated Dec 1991, Heat Exchanger Performance Monitoring Guidelines
Exelon Self-Assessment report on the Heat Sink Performance, AR 03948188, dated 4/28/2017
PM 10152026 {B}, Perform Eddy Current Test on 1HXCC12
SRW HXs Status and Trends Report dated 6/12/2017
Work Order C93299055, Perform ECT on 1HXCC12

Section 1R11: Licensed Operator Requalification Program

Procedures
OP-AA-101-113, Operator Fundamentals, Revision 10
OP-AP-300-1003, PWR Reactivity Maneuver, Revision 9

Section 1R12: Maintenance Effectiveness

Procedures
ER-AA-200, Preventive Maintenance Program, Revision 2
ER-AA-2001, Equipment Classification, Revision 2
ER-AA-310, Implementation of the Maintenance Rule, Revision 10
ER-AA-310, Implementation of the Maintenance Rule, Revision 10
ER-AA-310-1001, Maintenance Rule - Scoping, Revision 4
ER-AA-310-1004, Maintenance Rule - Performance Monitoring, Revision 13
ER-AA-310-1005, Maintenance Rule - Disposition Between (a)(1) and (a)(2), Revision 7
MA-AA-716-011, Work Execution and Close Out, Revision 23
PI-AA-125-1001, Root Cause Analysis Manual, Revision 3
SD-093-2C, U-2 Main Turbine Control and Protection System Description, Revision 2

Action Requests
AR01859652
AR03949100
AR03955195
AR03960990

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures
AD-AA-3000, Nuclear Risk Management Process, Revision 1
MA-CE-716-010, Maintenance Planning, Revision 3
OP-AA-108-117, Protected Equipment Program, Revision 4
WC-AA-101, On-line Work Control Process, Revision 26
WC-AA-104, Integrated Risk Management, Revision 24

Miscellaneous
Calvert Cliffs Nuclear Power Plant Technical Requirements Manual
WO C93418258
WO C93601607
WO C93611524
WO C93618090

Section 1R15: Operability Determinations and Functionality Assessments

Procedures
OP-AA-102-103-1001, Operator Burden and Plant Significant Decisions Impact Assessment Program, Revision 7
PI-AA-120, Issue Identification and Screening Process, Revision 7

Action Requests
AR03963357
AR03976015

Drawings
180002-0083SH0052, Elementary Diagram Set Ready to Load Signal Voltage/Frequency Faults, Revision 3

Miscellaneous
ECP-17-000293, Technical Evaluation for 1RYD1/181-1 Failure, Revision 0

Section 1R17: Evaluations of Changes, Tests, or Experiments

Procedures
AOP-3G, Unit 2, Malfunction of Main Feedwater System, Revision 14
AOP-7D-1, Unit 1 Loss of Instrument Air, Revision 16
EOP05, Unit 1, Loss of Coolant Accident, Revision 29
EOP-8-1, Unit 1 Functional Recovery Procedure, Revision 40
FTM-02, Relief Valve Testing and Setting, Revision 02801
LS-AA-104, Exelon 50.59 Review Process, Revision 10
LS-AA-104-1000, Exelon 50.59 Resource Manual, Revision 10
LS-AA-104-1006, Exelon 50.59 Training and Qualification, Revision 4
OI-21D, Unit 1 and 2 Fuel Oil Storage and Supply, Revision 11
OI-29, Unit 1 Saltwater System, Revision 07600
OI-32A-1, Unit 1 Auxiliary Feedwater System, Revision 37
OI-32A-2, Unit 2 Auxiliary Feedwater System, Revision 30
OI-33, Unit 1 and 2 Auxiliary Steam Generating System, Revision 3
OP-CA-102-106, Operator Response Time Program at Calvert Cliffs, Revision 2
PI-AA-125, Corrective Action Program Procedure, Revision 5
STP O-73A-1, Unit 1 Saltwater Pump and Check Valve Quarterly Operability Test, Revision 27
STP O-73A-2, Unit 2 Saltwater Pump and Check Valve Quarterly Operability Test, Revision 22
STP O-73H-1, AFW Pump Large Flow Test, Revision 9

Action Requests

AR02385374	AR02584978	AR03999484*
AR02439913	AR02616133	AR03999641
AR02440197	AR02616134	AR04000050*
AR02460661	AR02620284	AR04000430*
AR02528693	AR02620312	CR-2012-007619
AR02529191	AR02670672	
AR02537177	AR02670714	
CR-2012-010304		

*Action Request written as a result of this inspection

Drawings
60708sh0002, U1 Circulating Salt Water Cooling System, Revision 116
60710sh0002, U1 Component Cooling System, Revision 43
60736sh0001, Fuel Oil Storage System, Revision 55
61-035-E, Logic Diagram Diesel Generators UFSAR Fig. No. 8-6, Revision 20
61086sh0013, Schematic Diagram Diesel Generator No. 1B Engine Control, Revision 48

62429sh0001, U1 HVAC Systems, Revision 6
62429sh0002, U1 HVAC Systems, Revision 3
62708sh0002, U2 Circulating Water Cooling System, Revision 116
62731sh0003, U2 Containment Spray Pumps Seal Cooler Replacement, Revision 28
62731sh0003, U2 Safety Injection and Containment Spray Systems, Revision 30
63080sh0016, U2 Cooling Water System Control Valves, Revision 9
63086sh0027, Schematic Diagram Diesel Generator 2A Engine Control, Revision 13
91298sh0003, Safety Injection System (Tank No. 22A Leg 22A), Revision 15
BGEDRWG # 12131-0014, Dimensional Outline - Control Element Assembly, Revision 2
BGEDRWG # 12131-0172, Guide Tube Assembly Details, Revision 8
R-1815-1-15, Coupling Guard, Revision 1
S-0B, South Wing Bulkhead Wall 12-31-14 Anchors As-Built, dated 4/6/15
S-1B, Overall South Wing Bulkhead Repair Plan, Revision 1
S-2B, South Wing Wall Bulkhead Repairs Part Plan, Revision 1

Calculations
11865-P0044, ASME Class 1 Stress Analysis of U2 Safety Injection Line - Tank 22A, Revision 0
CA10117, Structural Evaluation of 11 FOST for Tornado Wind Loads, Revision 1

Miscellaneous
CE NPSD-951-A, RTB Surveillance Frequency Extension Final Report, Revision 1
LS-AA-017-1001 Attachment 1, UFSAR Change Request UCR 00929, dated 12/8/15
LS-CA-1000 Attachment 1, TS Bases Change Request Package UCR 00895, dated 2/9/15
NRC 16003, Report of Changes, Tests, and Experiments, dated 2/26/16
NRC 17006, Report of Changes, Tests, and Experiments, dated 2/1/17
OE-2009-003595, Actuator Structural Capacity Exceeded by Hammering, dated 2/2/10
SP-724, Design Specification for Safety-Related HVAC Fans for DG Project, Revision 2

10 CFR 50.59 Evaluations
SE00535, ECP-15-000583, Diesel Fuel Oil Header Isolation Function, dated 12/8/15
SE00537, ECP-14-000734, 1B, 2A, 2B Diesel Generator Rooms Mixing Damper Control Air Modification, dated 10/6/14
SE00540, ECP-15-000138, Accept As-Is, Lock Wire FME in Reactor after Failed Retrieval Attempt, dated 3/6/15
SE00541, Replacement CEAs for Calvert Cliffs Unit 1 and Unit 2, dated 10/1/15
SE00543, Evaluation of CCW System Performance for Certain Single Failure Scenarios during a LOCA, dated 7/2/15
SE00544, Evaluation of the Scheduling Requirement Change for SR 3.3.3.1/2, dated 6/23/15
SE00545, Temporary Powering of CEA #18 Lower Gripper Coil to De-energize the Upper Gripper Coil, dated 7/26/15
SE00557, Revised Analyses for Pressurizer Safety Valve Implementation, dated 1/31/17
SE00558, Automatic Closure of the RWT Outlet Valve MOVs, dated 1/10/17

10 CFR 50.59 Screened-out Evaluations
AOP-03G-2, Malfunction of Main Feedwater System, dated 11/13/15
ECP-11-000629-5059-01, Install Temperature Monitoring for Containment Sump Recirculation Lines, dated 7/21/15
ECP-12-000301, Swap Function of CC HX Valves 2CV5206 and 2HVSW-254, dated 2/27/17
ECP-12-001006-5059-01, Remove Snubber SK-2-18713 (on Safety Injection Line in Containment) from Service, dated 12/18/12
ECP-14-000159-5059-01, AFW Emergency Ventilation System Upgrade, dated 12/27/15
ECP-14-000380, Approve permanent repair options to stabilize and prevent future corrosion damage to the Unit 1 and Unit 2 Intake Structure Wing Walls, dated 6/29/15

ECP-14-000552, Reinstate the Intended Fail Safe Position on Loss of Control Signal for 1MO10542, 1MO10546, and 1MO10552 in 1A Diesel Generator Building, dated 6/25/14
ECP-14-000580, Containment Spray Pumps Seal Coolers Replacement, dated 7/29/15
ECP-14-000621-50.59-001, Modify the Radiator Fan Shroud Guards/Coupling Guards and Reduction Gear Boxes on the 0C & 1A EDG Radiator Fans, dated 7/23/14
ECP-14-000743-5059-01, Mount Air-Powered Fuel Transfer Pump to the Floor Inside 21 FOST, dated 12/10/14
ECP-14-000808, Repair of 2B DG Water Jacket Cooling Exhaust Belt, dated 10/28/14
ECP-14-000818, Approve MOBILGEAR 600XP Series Lubricants in place of MOBILGEAR 600 (7 Grades), dated 10/28/14
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NRC Regulatory Guide 1.9, Selection, Design, Qualification, and Testing of EDG Units used as Class 1E Onsite Electric Power Systems at Nuclear Power Plants, Revision 3
Safety Guide 9, Selection of DG Set Capacity for Standby Power Supplies, dated 8/10/71
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CNG-FES-010, Engineering Change Package Installation and Testing Instructions, Revision 1

Action Requests
IR04017775

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Procedures
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Procedures
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PSTP-04, Variable Tavg Testing, Revision 04800
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Action Requests
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Section 1EP6: Drill Evaluation

Procedures
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Procedures
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RP-AA-600-1010, Use and Operation of WMG Software for Creating Containers, Samples, Waste Streams and Waste Types, Revision 2
RP-AA-601, Surveying Radioactive Material Shipments, Revision 20
RP-AA-602, Packaging of Radioactive Material Shipments, Revision 20
RP-AA-602-1001, Packaging of Radioactive Material/Waste Shipments, Revision 17
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Action Requests

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Section 4OA2: Problem Identification and Resolution

Procedures

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ERPIP-821, Accidental Radioactivity Release Monitoring and Sampling Methods, Revision 5
ERPIP-822, Initial Dose Assessment Manual Calculation Methods, Revision 4
OP-AA-108-115, Operability Determinations
PI-AA-120, Issue Identification and Screening Process, Revision 7
PI-AA-125, Corrective Action Program (CAP) Procedure, Revision 5
PI-AA-125-1001, Root Cause Analysis Manual, Revision 3
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Action Requests

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Calvert Cliffs Offsite Dose Calculation Manual, Revision 00900
Drawing 03721001, Monitor Item Data Base Description, Revision A
EP-CALC-00004, CCNPP Wide Range Nobel Gas Monitor (WRNGM) Emergency Action Level Thresholds, Revision 0
Manual 12284-010-1001, Description of WRNGM

Manual 12284-010-1002, Principles of Operation for the WRNGM
Manual 12284-010-1004, Operating Instructions for the WRNGM
Manual 12284-010-1078, Velocity Probe Assembly
Manual 12284-010-1083, Configuration/Flow Diagram of WRNGM
Manual 12284-012, Vendor Tech Manual for Model RM-23 Readout
Manual 12284-013-1001, Model RM-23 Readout Equipment Manual
Manual 12284-040-1001, RMS Data Base Description Calvert Cliffs, Revision A
Master Calibration Data Sheet (MCDS) for 1-RIC-5414, Plant Vent Nobel Gas Radiation Monitor, Revisions 2, 3, 4, 5

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

Action Requests
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AR03992282

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ECP-17-000232-309-101-01, Engineering Technical Evaluation, Revision 0
I-94-003, Refueling Water Tank Level, Revision 3
STP-O-87-2, Borated Water Source 7 Day Operability Verification, Revision 21
TS-02.01 AVBASIS, RWT Volume (>OR=400,000 Gallons), Revision 2

LIST OF ACRONYMS

10 CFR	Title 10 of the *Code of Federal Regulations*
AC	alternating current
ACE	apparent cause evaluation
ADAMS	Agencywide Documents Access and Management System
AFW	auxiliary feedwater
AR	action request
ASME	American Society of Mechanical Engineers
CAP	corrective action program
CC	component cooling water
CCNPP	Calvert Cliffs Nuclear Power Plant
CFM	containment failure mode
CSR	cable spreading room
EAL	emergency action level
ECCS	emergency core cooling system
EDG	emergency diesel generator
ESFAS	engineered safety features actuation system
Exelon	Exelon Generation Company, LLC
HVAC	heating, ventilation, and air conditioning
HX	heat exchanger
IR	inspection report
kV	Kilovolt
MCR	main control room
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
RWT	refueling water tank
SDC	shutdown cooling
SRW	service water
SSC	structure, system, and component
SW	saltwater
TS	technical specification
UFSAR	Updated Final Safety Analysis Report
WO	work order
WRNGM	wide range noble gas monitor