



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

October 21, 2014

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

SUBJECT: CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT NOS. 1 AND 2 -
ISSUANCE OF AMENDMENTS REGARDING ENHANCEMENTS TO DIESEL
GENERATOR SURVEILLANCE REQUIREMENTS (TAC NOS. ME9832 AND
ME9833)

Dear Mr. Gellrich:

The Commission has issued the enclosed Amendment No. 307 to Renewed Facility Operating License No. DPR-53 and Amendment No. 285 to Renewed Facility Operating License No. DPR-69 for the Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2. These amendments consist of changes to the Technical Specifications (TSs) in response to your application transmitted by letter dated October 16, 2012, as supplemented by letters dated July 12, 2013, May 30, 2014, and September 3, 2014.

These amendments revise TS 3.8.1, "AC [Alternating Current] Sources-Operating" by adding Surveillance Requirement (SR) 3.8.1.17, and modifying SRs 3.8.1.8, 3.8.1.11, and 3.8.2.1. The revisions are related to diesel generator (DG) testing duration, loading requirements, and frequency of DG sequencer testing.

G. Gellrich

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A copy of the related Safety Evaluation is enclosed. A Notice of Issuance will be included in the Commission's next regular biweekly *Federal Register* notice.

Sincerely,

A handwritten signature in black ink, appearing to read 'Nadiyah S. Morgan', with a long horizontal flourish extending to the right.

Nadiyah S. Morgan, Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-317 and 50-318

Enclosures:

1. Amendment No. 307 to DPR-53
2. Amendment No. 285 to DPR-69
3. Safety Evaluation

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT 1

CALVERT CLIFFS NUCLEAR POWER PLANT, LLC

EXELON GENERATION COMPANY, LLC

DOCKET NO. 50-317

Amendment No. 307
Renewed License No. DPR-53

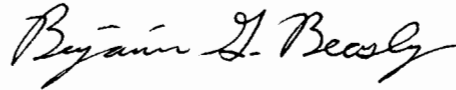
1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Exelon Generation Company, LLC (Exelon, the licensee) dated October 16, 2012, as supplemented by letters dated July 12, 2013, May 30, 2014, and September 3, 2014, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Renewed Facility Operating License No. DPR-53 is hereby amended to read as follows:

2. Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 307, are hereby incorporated into this license. Exelon Generation shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 30 days after the end of the 2015 refueling outage.

FOR THE NUCLEAR REGULATORY COMMISSION



Benjamin G. Beasley, Chief
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the License and Technical
Specifications

Date of Issuance: October 21, 2014



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT 2

CALVERT CLIFFS NUCLEAR POWER PLANT, LLC

EXELON GENERATION COMPANY, LLC

DOCKET NO. 50-318

Amendment No. 285
Renewed License No. DPR-69

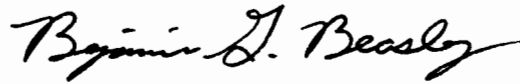
1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Exelon Generation Company, LLC (Exelon, the licensee) dated October 16, 2012, as supplemented by letters dated July 12, 2013, May 30, 2014, and September 3, 2014, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Renewed Facility Operating License No. DPR-69 is hereby amended to read as follows:

2. Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 285, are hereby incorporated into this license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 30 days after the end of the 2015 refueling outage.

FOR THE NUCLEAR REGULATORY COMMISSION



Benjamin G. Beasley, Chief
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the License and
Technical Specifications

Date of Issuance: October 21, 2014

ATTACHMENT TO LICENSE AMENDMENTS

AMENDMENT NO. 307 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-53

AMENDMENT NO. 285 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-69

DOCKET NOS. 50-317 AND 50-318

Replace the following page of the Renewed Facility Operating License with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

Remove Page
3

Insert Page
3

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove Pages
3.8.1-13
3.8.1-14
3.8.1-17
3.8.2-4

Insert Pages
3.8.1-13
3.8.1-14
3.8.1-17
3.8.2-4

- (4) Exelon Generation pursuant to the Act and 10 CFR Parts 30, 40, and 70, to receive, possess, and use, in amounts as required, any byproduct, source, and special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and
 - (5) Exelon Generation pursuant to the Act and 10 CFR Parts 30 and 70 to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.
- C. This license is deemed to contain and is subject to the conditions set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act, and the rules, regulations, and orders of the Commission, now or hereafter applicable; and is subject to the additional conditions specified and incorporated below:
- (1) Maximum Power Level

Exelon Generation is authorized to operate the facility at steady-state reactor core power levels not in excess of 2737 megawatts-thermal in accordance with the conditions specified herein.
 - (2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 307, are hereby incorporated into this license. Exelon Generation shall operate the facility in accordance with the Technical Specifications.

 - (a) For Surveillance Requirements (SRs) that are new, in Amendment 227 to Facility Operating License No. DPR-53, the first performance is due at the end of the first surveillance interval that begins at implementation of Amendment 227. For SRs that existed prior to Amendment 227, including SRs with modified acceptance criteria and SRs whose frequency of performance is being extended, the first performance is due at the end of the first surveillance interval that begins on the date the Surveillance was last performed prior to implementation of Amendment 227.
 - (3) Additional Conditions

The Additional Conditions contained in Appendix C as revised through Amendment No. 305 are hereby incorporated into this license. Exelon Generation shall operate the facility in accordance with the Additional Conditions.
 - (4) Secondary Water Chemistry Monitoring Program

Exelon Generation shall implement a secondary water chemistry monitoring program to inhibit steam generator tube degradation. This program shall include:

- (4) Exelon Generation pursuant to the Act and 10 CFR Parts 30, 40, and 70, to receive, possess, and use, in amounts as required, any byproduct, source, and special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and
 - (5) Exelon Generation pursuant to the Act and 10 CFR Parts 30 and 70 to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.
- C. This license is deemed to contain and is subject to the conditions set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act, and the rules, regulations, and orders of the Commission, now and hereafter applicable; and is subject to the additional conditions specified and incorporated below:
- (1) Maximum Power Level

Exelon Generation is authorized to operate the facility at reactor steady-state core power levels not in excess of 2737 megawatts-thermal in accordance with the conditions specified herein.
 - (2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 285 are hereby incorporated into this license. The licensee shall operate the facility in accordance with the Technical Specifications.

 - (a) For Surveillance Requirements (SRs) that are new, in Amendment 201 to Facility Operating License No. DPR-69, the first performance is due at the end of the first surveillance interval that begins at implementation of Amendment 201. For SRs that existed prior to Amendment 201, including SRs with modified acceptance criteria and SRs whose frequency of performance is being extended, the first performance is due at the end of the first surveillance interval that begins on the date the Surveillance was last performed prior to implementation of Amendment 201.
 - (3) Less Than Four Pump Operation

The licensee shall not operate the reactor at power levels in excess of five (5) percent of rated thermal power with less than four (4) reactor coolant pumps in operation. This condition shall remain in effect until the licensee has submitted safety analyses for less than four pump operation, and approval for such operation has been granted by the Commission by amendment of this license.
 - (4) Environmental Monitoring Program

If harmful effects or evidence of irreversible damage are detected by the biological monitoring program, hydrological monitoring program, and the

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.8	Verify interval between each sequenced load block is within $\pm 10\%$ of design interval for each emergency and shutdown load sequencer.	24 months
SR 3.8.1.9	<p>-----NOTE----- All DG starts may be preceded by an engine prelube period. -----</p> <p>Verify each DG starts from standby condition and achieves, in ≤ 10 seconds, voltage > 4060 V and frequency > 58.8 Hz, and after steady state conditions are reached, maintains voltage ≥ 4060 V and ≤ 4400 V and frequency of > 58.8 Hz and ≤ 61.2 Hz.</p>	184 days
SR 3.8.1.10	Verify manual transfer of AC power sources from the normal offsite circuit to the alternate offsite circuit.	24 months

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.11 -----NOTE-----</p> <ol style="list-style-type: none"> 1. Momentary transients outside the load and power factor limits do not invalidate this test. 2. If performed with the DG synchronized with offsite power, the surveillance test shall be performed at the required power factor. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition, the power factor shall be maintained as close to the limit as practicable. <p>-----</p> <p>Verify each DG, operating at a frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and an appropriate accident load power factor operates for ≥ 4 hours while loaded to ≥ 4000 kW for DG 1A and ≥ 3000 kW for DGs 1B, 2A, and 2B.</p>	<p>24 months</p>
<p>SR 3.8.1.12 Verify each DG rejects a load ≥ 500 hp without tripping.</p>	<p>24 months</p>

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.8.1.16 For the LCO 3.8.1.c AC electrical sources, SR 3.8.1.1, SR 3.8.1.2, SR 3.8.1.3, SR 3.8.1.5, SR 3.8.1.6, and SR 3.8.1.7 are required to be performed.</p>	<p>In accordance with applicable Surveillance Requirements</p>
<p>SR 3.8.1.17 -----NOTE----- Momentary transients outside the load and power factor limits do not invalidate this test. -----</p> <p>Verify each DG operates for ≥ 24 hours:</p> <p>a. For ≥ 2 hours of the test loaded to ≥ 4200 kW for DG 1A, and ≥ 3150 kW and ≤ 3300 kW for DGs 1B, 2A, and 2B, and</p> <p>b. For the remaining hours of the test loaded to ≥ 3600 kW for DG 1A, and ≥ 2700 kW and ≤ 3000 kW for DGs 1B, 2A, and 2B.</p>	<p>24 months</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.2.1 -----NOTE----- The following Surveillance Requirements (SRs) are not required to be performed: SR 3.8.1.11, SR 3.8.1.12, SR 3.8.1.14, and SR 3.8.1.17. ----- For the LCO 3.8.2.a and LCO 3.8.2.b AC sources required to be OPERABLE, the SRs of Specification 3.8.1, "AC Sources-Operating," except SR 3.8.1.4, SR 3.8.1.8, SR 3.8.1.10, SR 3.8.1.13, 3.8.1.15, and SR 3.8.1.16, are applicable.</p>	<p>In accordance with applicable SRs</p>
<p>SR 3.8.2.2 For the LCO 3.8.2.c and LCO 3.8.2.d AC sources required to be OPERABLE, the SRs required by SR 3.8.1.16, are applicable.</p>	<p>In accordance with applicable SRs</p>



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO

AMENDMENT NO. 307 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-53

AMENDMENT NO. 285 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-69

CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT NOS. 1 AND 2

EXELON GENERATION COMPANY, LLC

DOCKET NOS. 50-317 AND 50-318

1.0 INTRODUCTION

By application dated October 16, 2012 (Agencywide Documents Access and Management System Accession (ADAMS) No. ML122910955), as supplemented by letters dated July 12, 2013 (ADAMS Accession Number ML13197A411) May 30, 2014 (ADAMS Accession Number ML14153A562), and September 3, 2014 (ADAMS Accession Number ML14251A228), Calvert Cliffs Nuclear Power Plant, LLC, the licensee, submitted a request to the U.S. Nuclear Regulatory Commission (NRC) for changes to the Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2 (Calvert Cliffs), Technical Specifications (TSs). The NRC staff published a proposed no significant hazards consideration determination in the *Federal Register* (FR) on March 4, 2013 (78 FR 14130). The supplements dated July 12, 2013, May 30, 2014, and September 3, 2014, provided additional information that clarified the application, but did not expand the scope of the application as originally noticed, and did not change the NRC staff's original proposed no significant hazards consideration determination.

The proposed changes would revise TS surveillance requirements (SRs) associated with diesel generator (DG) testing duration, loading requirements, and frequency of DG sequencer testing.

2.0 REGULATORY REQUIREMENTS

2.1 Description of System

The alternating source (AC) sources to the Calvert Cliffs Class 1E Electrical Power Distribution System, consisting of the offsite power sources and the onsite DGs, are discussed in the Updated Final Safety Analysis Report (UFSAR), Chapter 8. The offsite power source consists of two 500 kilovolt (kV) circuits, each connected to a 500 kV/14 kV plant service transformer. Each 500 kV/14 kV plant service transformer is capable of supplying the total (two unit) plant auxiliary loads. The auxiliary power distribution system voltage is maintained within acceptable

Enclosure

limits by 13.8 kV voltage regulators. Calvert Cliffs has two Class 1E DGs for each unit. These DGs provide a dependable standby onsite electrical power source that is capable of supplying the essential electrical loads necessary to safely shutdown the plant and maintain it in a safe shutdown condition under all design bases accidents. Three of the four Class 1E DGs (DGs 1B, 2A and 2B) have a nominal continuous rating of 3000 kilowatts (kW), while the fourth DG (DG 1A) has a nominal continuous rating of 5400 kW. Each DG is aligned to a separate safety-related 4.16 kV electrical bus and is capable of providing sufficient power for the required engineered safety features (ESF) loads for that unit. The DGs have two different load sequencing methods. For an accident condition with a simultaneous loss of offsite power, the loss-of coolant incident (LOCI) sequencers load the DGs sequentially. A shutdown sequencer is used for a non-accident related unit shutdown. The LOCI sequencers initially block the Safety Injection Actuation Signal (SIAS) and the containment spray actuation signal to the equipment to be sequenced and then unblock them in the programmed steps.

2.2 Proposed TSs Changes

- SR 3.8.1.8 requires verification of the interval between each sequenced load block of the DG load sequencer to be within +/- 10% of design interval. The licensee proposed to change the surveillance frequency from 31 days to 24 months and include the shutdown sequencer as part of the surveillance.
- SR 3.8.1.11 requires verification of each DG, operating at a power factor of ≤ 0.84 for DG 1A and ≤ 0.83 for DGs 1B, 2A, and 2B, to operate for ≥ 60 minutes while loaded to ≥ 4000 kW for DG 1A and ≥ 3000 kW for DGs 1B, 2A, and 2B. The licensee proposed to change the test duration from 60 minutes to 4 hours as follows:

Verify each DG, operating at a frequency ≥ 58.8 Hz and ≤ 61.2 Hz and an appropriate accident load power factor operates for ≥ 4 hours while loaded to ≥ 4000 kW for DG 1A and ≥ 3000 kW for DGs 1B, 2A, and 2B.

The test frequency remains every 24 months, but the power factor parameters will be maintained in a licensee-controlled document.

- SR 3.8.1.17 is to include a new requirement to verify operation of each DG for 24 hours as follows:

Verify each DG operates for ≥ 24 hours:

- a) For ≥ 2 hours of the test loaded to ≥ 4200 kW for DG 1A, and ≥ 3150 kW and ≤ 3300 kW for DGs 1B, 2A, and 2B, and
- b) For the remaining hours of the test loaded to ≥ 3600 kW for DG 1A, and ≥ 2700 kW and ≤ 3000 kW for DGs 1B, 2A and 2B

2.3 Regulatory Requirements and Guidance

The construction permits for Calvert Cliffs were issued by the Atomic Energy Commission (AEC) on July 7, 1969, and the operating licenses were issued on July 31, 1974 for Unit No.1 and August 13, 1976 for Unit No.2. The AEC published the final rule that added Title 10 of the *Code*

of *Federal Regulations* (10 CFR) Part 50, Appendix A, "General Design Criteria [GDC] for Nuclear Power Plants," in the *Federal Register* (36 FR 3255) on February 20, 1971, with the rule effective on May 21, 1971. As stated in SECY-92-223, dated September 18, 1992, the Commission decided not to apply the Appendix A GDC to plants with construction permits issued prior to May 21, 1971. The Calvert Cliffs UFSAR states that the plant was designed and constructed to meet the intent of the GDC published in July 1967. The plant GDC is discussed in the UFSAR Appendix 1C, "AEC Proposed General Design Criteria for Nuclear Power Plants."

The regulatory requirements and guidance documents which the NRC staff used in the review of the application are listed below:

The GDC 17, "Electric power systems," of Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50, requires, in part, that nuclear power plants have onsite and offsite electric power systems to permit the functioning of structures, systems, and components that are important to safety.

The GDC 18, "Inspection and Testing of Electric Power Systems," requires, in part, that electric power systems important to safety shall be designed to permit appropriate periodic inspection and testing of important areas and features, such as wiring, insulation, connections, and switchboards, to assess the continuity of the systems and the condition of their components.

The regulations at 10 CFR 50.36(c)(3), "Technical Specifications," requires, in part, that TSs include SRs relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met.

Revision 1 of Regulatory Guide (RG) 1.108, "Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants."

Revision 4 of RG 1.9, "Selection, Design, Qualification, and Testing of Emergency Diesel Generator Units Used as Class 1E Onsite Electric Power Systems at Nuclear Power Plants."

NUREG-1432, "Standard Technical Specifications" for Combustion Engineering Plants.

NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Section 8.3.1, "AC Power Systems (Onsite)," provides guidance to determine whether the AC onsite power system satisfies the requirements of GDCs 17 and 18, and will perform its intended functions during all plant operating and accident conditions.

3.0 TECHNICAL EVALUATION

3.1 Evaluation of Proposed Changes

3.1.1 Proposed Revision to SR 3.8.1.8

The SR 3.8.1.8 is required to be performed every 31 days to provide verification that each sequenced load block is within $\pm 10\%$ of design interval for the load sequencer. Under accident and loss of offsite power conditions, load sequencers are relied on to automatically sequentially connect loads to the bus.

The licensee proposed change would revise SR 3.8.1.8 by adding “each emergency and shutdown” to the description of load sequencer that will be verified. The licensee stated that this will clarify that the SR applies to both the emergency and shutdown load sequencer and that both are to be tested. Furthermore, the licensee proposed to modify SR 3.8.1.8 by changing the frequency from 31 days to 24 months. The licensee stated that the refueling interval (24 months) frequency is consistent with the interval in the Standard Technical Specifications and the recommendations of RG 1.108, Revision 1.

In response to a NRC staff question regarding the number of automatic load sequencers, the licensee, in letter dated July 12, 2013, stated that there is one load sequencer per safety-related bus that sequentially connects the loads to the bus during an accident concurrent with a loss of offsite power event. Also, the accident and shutdown sequencers have one module. The licensee stated, “Different inputs will actuate different portions of the module. If a Safety Injection Actuation Signal is present with an Undervoltage signal, then the accident function is actuated (six steps). If only an Undervoltage signal is present, then the shutdown function is actuated (three steps).”

The NRC staff requested details of any failures of the load sequencers within the last five years. In the letter dated July 12, 2013, the licensee stated that only two failures of the load sequencers were observed over the last five years. These failures were related to the timing sequence being outside the 10 percent allowed tolerance. The NRC staff reviewed this response and requested further information on the frequency of the testing of the LOCI sequencer and the shutdown sequencer. In its May 30, 2014, letter, the licensee stated that the LOCI sequencers have been tested every 31 days in accordance with SR 3.8.1.8 and the shutdown portion of the sequencers have been tested every six months since mid-2012 with no failures other than the two discussed above. Based on the reliability of the existing sequencer modules to consistently load the DGs in a prescribed manner, the NRC staff finds that the proposed reduction in sequencer surveillance to once every 24 months is acceptable. The inclusion of the shutdown sequencer into TS SR 3.8.1.8 meets the requirements in 10 CFR 50.36(c)(3) and is therefore acceptable.

3.1.2 Proposed Revision to SR 3.8.1.11

The SR 3.8.1.11 is required to be performed every 24 months to provide verification that each DG operating, at a power factor and kW load value equal to or higher than the minimum specified for each DG, will function satisfactorily for at least 60 minutes. The SR 3.8.1.11 includes two Notes. Item 1 of the Note states that, “momentary transients outside the load and power factor limits do not invalidate the test.” Item 2 of the Note states that the surveillance test

shall be performed at the required power factor, unless the grid conditions do not permit it. "Under this condition, the power factor shall be maintained as close to the limit as possible."

Initially, the licensee proposed to revise SR 3.8.1.11 by increasing the load duration from at least 60 minutes to no less than 24 hours, which would consist of a 2-hour phase of DGs operating at 105 – 110 percent of continuous service rating and a 22-hour phase of DGs operating at 90 – 100 percent of continuous service rating. These test phases were proposed to be performed in either order. The licensee stated that the proposed SR change is consistent with the recommendations of RG 1.9, Revision 4. Also, the licensee proposed removal of the power factor aspect for the surveillance test and Note 2, which addressed the appropriate power factor.

In its application and in response to the NRC staff request for additional information, the licensee stated that in order to perform the surveillance test at the most limiting power factor during the 24-hour DG surveillance run, the voltage regulators associated with offsite power transformers must be placed in the manual mode of operation. In this operation mode, the safety bus voltage tracks the variations in the grid voltage and has the potential to place equipment at greater risk during degraded grid voltage conditions. The licensee stated that, with the change from a 1-hour to 24-hour surveillance test, the exposure time with the voltage regulator in manual is significant. In addition, the licensee stated that depending on the 4 kV bus voltage at the time of the test, the DG voltage regulator range might not be sufficient to achieve the required power factor. The licensee performs the 24-hour endurance test when the unit is operating. The associated 4kV bus is placed in a limiting condition of operation when the voltage regulator is in the manual mode, and therefore, the licensee wanted to delete the requirement for power factor testing.

The NRC staff disagreed with the proposal to remove power factor testing requirements and indicated to the licensee that power factor testing is an important parameter to validate the capability of the exciter and the generator systems to generate reactive power and carry the required current for an extended duration. The NRC staff does recognize that, in some cases, the grid voltage conditions may not permit DG operation at the required power factor for the total 24-hour test period.

By letter dated September 3, 2014, the licensee proposed that the existing SR 3.8.1.11 be split into two separate SRs, one that demonstrates the ability of the DGs to operate at appropriate accident load power factor and a separate SR to demonstrate the ability of the DGs to operate for 24 hours. The licensee proposed a new SR 3.8.1.17 to demonstrate that the DG can start and run continuously at full load capability for an interval of not less than 24 hours.

According to the proposed SR 3.8.1.11, the DG surveillance will verify the capability of the DG to operate at or above accident load and appropriate power factor for at least 4 hours. The licensee has indicated that the required power factor values will be maintained in licensee-controlled documents. Also, the DG will be verified to be operating at frequency ≥ 58.8 Hertz (Hz) and ≤ 61.2 Hz. This test will be performed during refueling outages when the automatic voltage regulators can be maintained in manual mode for the proposed 4 hour duration. The NRC staff finds this change to be acceptable, as the duration of the test will provide assurance that the DG has achieved steady state and equilibrium conditions and has the capability to provide the reactive power requirements of accident loads.

3.1.3 Proposed New SR 3.8.1.17

In its application dated October 16, 2012, the licensee proposed a new SR 3.8.1.17 that would verify additional features associated with DG operation in emergency mode. Specifically, the SR would verify that, on an actual or simulated loss of offsite power signal, the following design functions were confirmed:

- a) De-energization of emergency buses,
- b) Load shedding from emergency buses,
- c) DG auto-starts from standby condition and:
 - 1. Energizes permanently connected loads in ≤ 10 seconds.
 - 2. Energizes auto-connected shutdown loads through automatic load sequencer,
 - 3. Maintains steady state voltage ≥ 4060 V and ≤ 4400 V.
 - 4. Maintains steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and
 - 5. Supplies permanently connected and auto-connected shutdown loads for ≥ 5 minutes.

By letter dated September 3, 2014, the licensee withdrew the proposed change from consideration. After additional review, the licensee concluded that the existing process of testing the shutdown sequencer satisfies the requirements of SR 3.8.1.8 and no additional SR is needed. In addition, the licensee has stated that verification of DG loading and operation of both modules (shutdown and LOCI) of the sequencers are validated through existing surveillances. The NRC staff did not review the adequacy of all the SRs that demonstrate the adequacy of logic circuits associated with the ESF of the plant, as it is beyond the scope of this evaluation. The NRC staff accepted the licensee's withdrawal of the proposed surveillances.

As discussed previously, by letter dated September 3, 2014, the licensee proposed that the existing SR 3.8.1.11 be split into two separate SRs. The letter proposed a new SR 3.8.1.17 to demonstrate that the DG can start and run continuously at full load capability for an interval of not less than 24 hours.

The new SR 3.8.1.17 is dedicated to the 24-hour endurance test. This test will be performed without the power factor requirement. In its application, the licensee proposed to perform the 2-hour test (DGs operating at 105 – 110 percent of continuous service rating) and the 22-hour tests (DGs operating at 90 – 100 percent of continuous service rating) in any sequence. The NRC staff requested the basis for performing the 2-hour test after the 22-hour test. In its July 12, 2013, letter, the licensee stated that a higher test load, at the end of an endurance run, can more closely model the bus loading that could be experienced during an event. The NRC staff reviewed DG loading data provided by the licensee and noted that the highest loading on the DGs occurred within the first 75 minutes, after a large break loss-of-coolant accident. The NRC staff requested further clarification by letter dated March 20, 2014 (ADAMS Accession Number ML14065A321). In its May 30, 2014, letter, the licensee agreed to perform the 2-hour overload test prior to the 22-hour endurance test, and submitted a revised SR that indicates this specific sequence. The NRC staff finds this to be acceptable, as the proposed testing: (1) closely simulates the postulated accident loading of the DGs; (2) is in accordance with

NUREG-1432; and (3) the 24-hour duration of the test is considered to be a reasonable period to identify capability of the DGs to operate for an extended period.

3.1.4 Proposed Revision to SR 3.8.2.1

The licensee's proposed change to SR 3.8.2.1 adds SR 3.8.1.17 to the list of SRs that are not required to be performed in Modes 5 and 6 when the plant is in cold shutdown and/or refueling. The licensee stated that several of the SRs in 3.8.1 are not required to be met (excepted) because the number of required AC sources and the operating conditions for those sources are different in Modes 5 and 6 and during movement of irradiated fuel assemblies for TS 3.8.2. Also the licensee stated the some of the SRs are required to be met, but not required to be performed due to the limited AC sources available in Modes 5 and 6 and during movement of irradiated fuel.

In its September 3, 2014, letter, the licensee elaborated on the requirements for DGs during Modes 5 and 6. The licensee stated that due to the reduced pressure and temperature conditions of the reactor coolant system during shutdown conditions, events that may lead to potential radioactive releases develop more slowly and the results are less severe than the events which occur at full power. Plant operators have adequate time to evaluate plant conditions and take corrective actions. Onsite power protective systems and the ESF components (including a DG) can be manually started as required to successfully mitigate the consequences of the event.

The NRC staff agrees that events in Modes 5 and 6 are slow to develop and there may be adequate time for operator action to evaluate plant conditions and take corrective actions. The current exemptions in SR 3.8.2.1 include a similar surveillance conducted under SR 3.8.1.11.

TS 3.8.2 requires a DG to be OPERABLE when the plant is in Modes 5 or 6. Operability of DG is verified through several SRs in TS 3.8 for electrical power systems, including SR 3.8.1.11 and proposed SR 3.8.1.17. The NRC staff agrees that the performance of SRs 3.8.1.11 and 3.8.1.17 is not needed when the plant is in Modes 5 and 6, but they still have to be met.

The revision to the "NOTE" in SR 3.8.2 assumes that the last time these surveillances were performed, the equipment had passed all the acceptance criteria in the SR, and nothing has failed since the performance of the SR that would cause the SR to 'not be met' if re-performed. The "NOTE" in SR 3.8.2 may not be used to exempt the DG from operability requirements as specified elsewhere in the TS

Based on the above discussion, the NRC staff finds that the proposed change, to include revised SR 3.8.1.11 and new SR 3.8.1.17 requirements in the "NOTE" section of SR 3.8.2, is acceptable.

4.0. STATE CONSULTATION

In accordance with the Commission's regulations, the Maryland State official was notified of the proposed issuance of the amendments. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and SRs. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding, published in the FR on March 4, 2013 (78 FR 14130), that the amendments involve no significant hazards consideration, and there has been no public comment on such finding. Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner; (2) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations; and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: S. Basturescu

Date: October 21, 2014

DATED: October 21, 2014

AMENDMENT NO. 307 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-53
CALVERT CLIFFS UNIT 1

AMENDMENT NO. 285 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-69
CALVERT CLIFFS UNIT 2

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G. Gellrich

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A copy of the related Safety Evaluation is enclosed. A Notice of Issuance will be included in the Commission's next regular biweekly *Federal Register* notice.

Sincerely,

/RA/

Nadiyah S. Morgan, Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-317 and 50-318

Enclosures:

1. Amendment No. 307 To DPR-53
2. Amendment No. 285 To DPR-69
3. Safety Evaluation

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**See dated memo

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