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CENG
a joint venture of
Constellation Energy · EDF

CALVERT CLIFFS
NUCLEAR POWER PLANT

October 16, 2012

U. S. Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Document Control Desk

SUBJECT: Calvert Cliffs Nuclear Power Plant
Unit Nos. 1 & 2; Docket Nos. 50-317 & 50-318
License Amendment Request re: Enhancements to Diesel Generator Surveillance Requirements

REFERENCE: (a) NUREG-1432, Standard Technical Specifications, Combustion Engineering Plants, Revision 4.0, March 2012

The Calvert Cliffs Nuclear Power Plant, LLC hereby requests an Amendment to its Renewed Operating License Nos. DPR-53 and DPR-69 for Calvert Cliffs Unit Nos. 1 and 2, respectively, with the submittal of these proposed changes to the Technical Specifications.

Calvert Cliffs Nuclear Power Plant has determined that the existing Surveillance Requirements of Technical Specification 3.8.1, AC Sources, could be enhanced to provide additional assurance that the AC Sources relied upon to ensure the availability of necessary power to the Engineered Safety Features systems are capable of performing their specified safety function if needed. The proposed changes would amend the existing Surveillance Requirements and add a new Surveillance Requirement to Technical Specification 3.8.1, "AC Sources – Operating." The proposed changes substantially conform to Reference (a).

Attachment (1) contains the evaluation of the proposed changes and Attachment (2) has the marked up Technical Specification pages. Attachment (3) contains the marked up Technical Specification Bases pages for your information.

Approval of the proposed amendment is requested by September 30, 2013, with implementation at the end of the 2014 refueling outage. The implementation schedule was chosen because the proposed additional Surveillance Requirement is normally performed during a refueling outage. For the new Surveillance Requirement, the first performance is due at the end of the first surveillance interval that begins at the implementation of the approved license amendment request. For Surveillance Requirements

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that currently exist, but whose acceptance criteria is changed or frequency of performance is 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 this approved license amendment request.

There are no regulatory commitments identified in this letter.

Should you have questions regarding this matter, please contact Mr. Douglas E. Lauver at (410) 495-5219.

Very truly yours,

STATE OF MARYLAND :
: **TO WIT:**
COUNTY OF CALVERT :

I, George H. Gellrich, being duly sworn, state that I am Vice President - Calvert Cliffs Nuclear Power Plant, LLC (CCNPP), and that I am duly authorized to execute and file this License Amendment Request on behalf of CCNPP. To the best of my knowledge and belief, the statements contained in this document are true and correct. To the extent that these statements are not based on my personal knowledge, they are based upon information provided by other CCNPP employees and/or consultants. Such information has been reviewed in accordance with company practice and I believe it to be reliable.

Subscribed and sworn before me, a Notary Public in and for the State of Maryland and County of St. Mary's, this 16th day of October, 2012.

WITNESS my Hand and Notarial Seal:

Janet L. Scully
Notary Public

My Commission Expires:

March 14 2015
Date

GHG/PSF/bjd

Attachments: (1) Evaluation of the Proposed Change
(2) Marked Up Technical Specification Pages
(3) Marked Up Technical Specification Bases Pages

cc: N. S. Morgan, NRC
W. M. Dean, NRC
Resident Inspector, NRC
S. Gray, DNR

ATTACHMENT (1)

EVALUATION OF THE PROPOSED CHANGE

TABLE OF CONTENTS

1.0 SUMMARY DESCRIPTION

The proposed change would revise the Renewed Operating Licenses to amend the existing Surveillance Requirements and add a new Surveillance Requirement to Technical Specification 3.8.1, "AC Sources – Operating." In addition, conforming changes are proposed for Surveillance Requirement 3.8.2.1. The proposed changes would substantially conform to Reference 1.

2.0 DETAILED DESCRIPTION

Calvert Cliffs Nuclear Power Plant (CCNPP) has determined that the existing Surveillance Requirements (SRs) of Technical Specification 3.8.1 could be enhanced to provide additional assurance that the Alternating Current (AC) Sources relied upon to ensure the availability of necessary power to the Engineered Safety Features (ESF) systems are capable of performing their specified safety function, if needed.

To that end, the following Technical Specification changes are proposed for the diesel generators (DGs). The marked up Technical Specification pages are provided in Attachment 2.

- Existing SR 3.8.1.8 – Clarify that the SR applies to both the emergency and shutdown load sequencer and change the Frequency from 31 days to the Improved Technical Specifications (ITS, Reference 1) recommended Frequency of 24 months (refueling interval).
- Existing SR 3.8.1.11 – Twenty four (24) hour testing is proposed as recommended in Regulatory Guide 1.9, Revision 4 (Reference 2). The 24 hour test is broken into two phases, a 2 hour operating period at a higher load and a 22 hour period at a lower load as described in the ITS (Reference 1). The test phases can be performed in either order. Note 2 would be removed from the SR.
- New SR 3.8.1.17 – This SR demonstrates the operation of the DGs during a loss of the offsite power source. It is similar to ITS 3.8.1.11 (Reference 1).
- Existing SR 3.8.2.1 – Address the new SR 3.8.1.17 in this SR. This SR provides the surveillance requirements for Operable DGs in Modes 5, 6 and during movement of irradiated fuel assemblies. It references the SRs from Technical Specification 3.8.1.

3.0 TECHNICAL EVALUATION

The AC sources to the Class 1E Electrical Power Distribution System consist of the offsite power sources starting at the 4.16 kV ESF buses and the onsite DGs. The design of the AC electrical power system has sufficient independence and redundancy to ensure an electrical power source to the ESFs assuming a single failure. The emergency power sources are designed to furnish onsite power (upon a loss of normal supplies of power) to reliably shut down the plant and maintain it in a safe shutdown condition under all conditions, including accidents. The emergency power sources are part of the ESF electrical system and are designed as Class 1E systems.

The diesel generator sets selected for use as standby power supplies have the capability to: (1) power the ESF in rapid succession, and (2) supply continuously the sum of the loads needed to be powered at any one time. The DGs are designed to provide a dependable onsite power source capable of starting and supplying the essential loads necessary to safely shut down the plant and maintain it in a safe shutdown condition under all conditions. Four DGs are provided for the plant although each Unit requires only one DG to supply the minimum power requirements for its ESF equipment. The DGs are started by either a 4.16 kV bus undervoltage or a Safety Injection Actuation Signal (SIAS); however, in the latter case, actual transfer to the bus is not made until the preferred source of power is actually lost. When all four

DGs are available, the design provides two independently capable and concurrently-operating systems for safety injection, containment spray, and miscellaneous 480 Volt auxiliary devices for the unit incurring the accident. In addition, the design provides power to operate two sets of equipment for shutting down the non-accident unit; including, for example, two saltwater pumps, two service water pumps, two auxiliary feedwater pumps, containment cooling fans, and emergency turbine auxiliaries. During accident conditions accompanied by simultaneous loss of offsite power, the emergency sequencers will start automatically to load the DGs sequentially. Similarly, the shutdown sequencer for the non-accident unit will start automatically. The emergency sequencers initially block the SIAS and the containment spray actuation signal to the equipment to be sequenced and then unblock in programmed steps. The sequencing is performed so that essential loads are started within the time limits of the appropriate safety analyses.

Three of the four emergency power sources consist of 4.16 kV, three-phase, 60-cycle Fairbanks Morse DGs with a nominal continuous rating of 3000 kW. One of the four emergency power sources is a 4.16 kV, three-phase, 60-cycle tandem-engine Societe Alsacienne De Constructions Mecaniques De Mulhouse (SACM) DG which has a nominal continuous rating of 5400 kW. All DGs are physically separated and electrically isolated from each other.

Each DG must be capable of starting, accelerating to rated speed and voltage, and connecting to its respective ESF bus on detection of bus undervoltage. This will be accomplished within 10 seconds. Each DG must also be capable of accepting required loads within the assumed loading sequence intervals, and continue to operate until offsite power can be restored to the ESF buses. Proper sequencing of loads, including shedding of nonessential loads, is a required function for DG operability.

Surveillance testing of the DGs currently provides verification that the DGs can be operated at a load greater than the predicted accident loads. Operation at greater than the predicted accident load will demonstrate the ability of the DGs to perform their safety function. The predicted accident load for the 1B, 2A and 2B DGs is less than the nominal continuous rating. Therefore the current (and proposed) SRs are based on the nominal continuous rating. The 1A DG predicted accident load is significantly lower that the nominal continuous rating (5400 kW). Since the SRs are intended to demonstrate operability of the DGs by ensuring they are capable of providing a reliable source of power to mitigate the consequences of an accident, and shut down the Unit following an accident, the current (and proposed) SRs are based on the predicted accident loading.

Calvert Cliffs has determined that the existing SRs of Technical Specification 3.8.1 could be enhanced to provide additional assurance that the AC sources relied upon to ensure the availability of necessary power to the ESF systems are capable of performing their specified safety function, if needed. Specifically, changes to the existing DG SRs are proposed to bring the surveillance testing into closer conformance with existing regulatory guidance as described below.

- Existing SR 3.8.1.8 – Clarify that the SR applies to both the emergency and shutdown load sequencer and change the Frequency from 31 days to the Reference 1 recommended Frequency of 24 months (refueling interval).

Under accident and loss of offsite power conditions loads are sequentially connected to the bus by automatic load sequencers. SR 3.8.1.8 is proposed to be modified to add "each emergency and shutdown" to the description of load sequencer to clarify that there are two load sequencers and both are to be tested in accordance with this SR. In addition, the Frequency of the testing in the current SR is 31 days. This Frequency represented the licensing basis at the time of the conversion to the ITS. With the addition of the shutdown sequencer to the SR, we also request that the Frequency be changed to match

the refueling interval Frequency of Reference 1. The Frequency of 24 months is consistent with the recommendations of Regulatory Guide 1.108, Revision 1, paragraph 2.a(2) (Reference 3). Although this Regulatory Guide was withdrawn in 1993 upon issuance of Regulatory Guide 1.9, Revision 3, specific frequency guidance for the load sequencer testing was not incorporated into Regulatory Guide 1.9, Revision 3. Therefore, Reference 1 continues to reference Regulatory Guide 1.108, Revision 1 as the appropriate guidance for load sequencer testing Frequency.

- Existing SR 3.8.1.11 – Twenty four (24) hour testing is proposed as recommended in Regulatory Guide 1.9, Revision 4 (Reference 2). The 24 hour test is broken into two phases, a 2 hour operating period at a higher load and a 22 hour period at a lower load as described in the ITS (Reference 1). The test phases can be performed in either order. Note 2 would be removed from the SR.

Regulatory Guide 1.9, Revision 4, paragraph 2.2.9 requires demonstration that the DGs can start and run continuously at full load capability for an interval of not less than 24 hours. The existing SR requires that the DG start and run continuously at full load capability for not less than 60 minutes. We are requesting to increase the required run time for the DG to match the Regulatory Guide 1.9, Revision 4 SR requirement for a 24 hour run time. In addition, we are also requesting to adopt the following loading requirements for the 24 hour DG run. Specifically, for the 1B, 2A, and 2B DGs, that greater than 2 hours of the DG operation are at a load equal to 105-110% of the continuous service rating (i.e., 3000 kW for the 1B, 2A and 2B DGs) and the remaining time (approximately 22 hours) is at a load equal to 90-100 % of the continuous service rating. For the 1A DG, greater than 2 hours of the DG operation are at a load greater than 105% of the post accident loading (i.e., <4000 kW) and the remaining time (approximately 22 hours) is at a load greater than 90% of the post accident loading. These test phases can be performed in either order.

The existing SR 3.8.1.11 contains a power factor limit for the test. Regulatory Guide 1.9, Revision 4 does not contain specific power factor numbers; instead it refers to the test being conducted at the worst case power factor. A significant number of other plants (over 50%) who have a 24 hour test duration for this SR do not have specific power factor numbers in the equivalent SR. Instead, they either do not address power factor at all in the SR, or they refer to the "required" power factor. We have chosen to modify our SR by removing the specific power factor numbers from the SR and remove the accompanying Note. We will continue to verify voltage and frequency requirements are maintained as recommended in Regulatory Guide 1.9, Revision 4. This brings our proposed TS into conformance with the majority of other plants. We are requesting this change because we have voltage regulators between the offsite power source and the safety related busses. When these station voltage regulators are in the automatic mode, the voltage on the safety related busses will remain steady regardless of grid voltage swings. This supports operation of safety related equipment under degraded grid voltage conditions. To perform this surveillance test at the most limiting power factor, the voltage regulators must be placed in the manual mode of operation. This operational mode means that the safety bus voltage now tracks with the grid voltage swings. This places equipment at greater risk for being impacted by degraded grid voltage for the duration of the surveillance test. Currently, the surveillance test is one hour in duration and the exposure time with the voltage regulators in manual is minimal. With the change to a 24 hour surveillance test, the exposure time with the voltage regulators in manual is significant. The probability of a grid voltage swing is increased in a 24 hour period. It is not an optimum testing practice. Therefore, we propose to change the SR by removing the power factor numbers and the associated Note 2. The surveillance testing will be conducted at the required loads for a total of 24 hours at the worst case power factor achievable with the voltage regulators in automatic mode. The achievable power factor will depend on the grid conditions during the surveillance test but is expected to be approximately 0.9. This balances the need to protect the safety

related busses from the effects of degraded grid voltage, while testing the load capability of the diesel generator appropriately.

The SR is currently modified by two notes addressing testing transients and the appropriate power factor to be used during the SR. The Note 1 states that momentary transients outside the load and power factor limits do not invalidate the test. No changes to this note are proposed. Note 2, addressing the appropriate power factor, is proposed to be deleted as described above.

- New SR 3.8.1.17 – This SR demonstrates the operation of the DGs during a loss of the offsite power source. It is similar to ITS 3.8.1.11.

This SR demonstrates the as-designed operation of the DGs during loss of the offsite source. This test verifies all actions necessary during a loss of offsite power, including the shedding of nonessential loads and energizing of the emergency buses and respective loads from the DG. It further demonstrates the capability of the DG to automatically achieve the required voltage and frequency within the specified time. The DG auto-start time of 10 seconds is derived from requirements of the accident analysis to respond to a design basis large break LOCA. The SR should be continued for a minimum of 5 minutes in order to demonstrate that all starting transients have decayed and stability has been achieved. The requirement to verify the connection and power supply of permanent and auto-connected loads is intended to satisfactorily show the relationship of these loads to the DG loading logic.

A Note is added to minimize wear and tear on the DGs during testing. For the purpose of this testing, the DGs are started from standby conditions, that is, with the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations.

The 24 month (refueling) Frequency is consistent with the recommendations of Regulatory Guide 1.9, Revision 4 (Reference 2).

- Existing SR 3.8.2.1 – This SR provides the surveillance requirements for Operable DGs in Modes 5, 6 and during movement of irradiated fuel assemblies.

Surveillance Requirement 3.8.2.1 requires that the same SRs used to ensure Operability of the required AC sources in TS 3.8.1 are used to ensure Operability of the required AC sources in Modes 5, 6 and during movement of irradiated fuel assemblies. Several of the SRs in 3.8.1 are not required to be met because the number of required AC sources and the operating conditions for those sources are different in the Modes and conditions covered by 3.8.2. These SR are listed as excepted in SR 3.8.2.1. In addition, some of the SRs that are required to be met to ensure Operability of the required AC sources in TS 3.8.2 are not required to be performed. With limited AC sources available, a single event could compromise both the required circuit and the DG. The SRs that are required to be met, but not performed, are listed in the Note to SR 3.8.2.1. Because this SR lists Surveillance Requirements from TS 3.8.1, and changes are proposed to the SRs in TS 3.8.1, conforming changes to this SR are also required.

The change to SR 3.8.1.8 proposed above does not change its exception from SR 3.8.2.1. As currently described in the TS Bases, SR 3.8.1.8 is related to automatic starting of the DGs for an operating unit, which is not applicable for a shutdown unit. The addition of the shutdown sequencer to SR 3.8.1.8 does not change this basis. Therefore, no change to SR 3.8.2.1 is proposed related to the change of SR 3.8.1.8. The change to SR 3.8.1.11 does not change the purpose of the SR, it only proposes to change the required test time for the affected DGs. Therefore, no change to SR 3.8.2.1 is proposed related to the change of SR 3.8.1.11. A new SR is proposed to be added, SR 3.8.1.17. This SR requires a test that simulates a loss of offsite power and the subsequent automatic starting and loading of a DG. This SR is similar to

SR 3.8.1.15 since it is related to automatic starting of the DGs for an operating unit, which is not applicable for a shutdown unit. Therefore, it is added to SR 3.8.2.1 as an excepted SR, just as the other SRs which address automatic starting of the DGs.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements

The Calvert Cliffs design was reviewed for construction under the "General Design Criteria for Nuclear Power Plant Construction" issued for comment by the AEC in July 1967.

General Design Criterion 17, "Electric power systems," of Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50 states, 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 onsite system is required to have sufficient independence, redundancy, and testability to perform its safety function, assuming a single failure. The offsite power system is required to be supplied by two physically independent circuits that are designed and located so as to minimize, to the extent practical, the likelihood of their simultaneous failure under operating and postulated accident and environmental conditions. The proposed change does not affect Calvert Cliffs' compliance with the intent of GDC 17.

General Design Criterion 18, "Inspection and testing of electric power systems," states that electric power systems that are important to safety must be designed to permit appropriate periodic inspection and testing of important areas and features, to assess the continuity of the systems and the condition of their components. The systems shall be designed with a capability to test periodically (1) the operability and functional performance of the components of the systems, such as onsite power sources, relays, switches, and buses, and (2) the operability of the systems as a whole and, under conditions as close to design as practical, the full operation sequence that brings the systems into operation, including operation of applicable portions of the protection system, and the transfer of power among the nuclear power unit, the offsite power system, and the onsite power system. The proposed change does not affect Calvert Cliffs' compliance with the intent of GDC 18.

Regulatory Guide 1.9, Revision 4 (Reference 2) and Regulatory Guide 1.108, Revision 1 (Reference 3) are discussed in this application as the basis for several of the proposed changes. These discussions are provided in support of the Frequency of the proposed changes and do not constitute a commitment to these Regulatory Guides.

4.2 Significant Hazards Considerations

The proposed change would revise the Renewed Operating Licenses to amend the existing Surveillance Requirements of Technical Specifications 3.8.1, "AC Sources – Operating" and Technical Specification 3.8.2, "AC Sources - Shutdown", and add a Surveillance Requirement to Technical Specification 3.8.1, "AC Sources – Operating." The existing Surveillance Requirements of Technical Specification 3.8.1 could be enhanced to provide additional assurance that the AC Sources relied upon to ensure the availability of necessary power to the Engineered Safety Features systems are capable of performing their specified safety function if needed. To that end, Calvert Cliffs proposes modifying two existing diesel generator Technical Specification 3.8.1 Surveillance Requirements and adding one additional diesel generator Surveillance Requirement. A conforming change is made to a related Technical Specification 3.8.2 Surveillance Requirement to address the new and revised Technical Specification 3.8.1 Surveillance Requirements. The proposed changes and addition to the diesel generator Technical Specification Surveillance Requirements would substantially match the equivalent Technical Specification Surveillance

Requirements in NUREG-1432, Revision 4, Standard Technical Specifications, Combustion Engineering Plants.

Calvert Cliffs has evaluated whether or not a significant hazards consideration is involved with the proposed changes by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of Amendment" as discussed below:

1. *Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?*

   Response: No.

   This amendment request proposes to add or modify certain Technical Specification Surveillance Requirements for the diesel generators. This proposed amendment will provide additional assurance that the AC Sources relied upon to ensure the availability of necessary power to the Engineered Safety Features systems are capable of performing their specified safety function if needed. The diesel generators and their associated emergency loads are accident mitigating features, not accident initiators. This proposed amendment does not change the design function of the diesel generators or any of their required loads, and does not change the way the systems and plant are operated or maintained. This proposed amendment does not impact any plant systems that are accident initiators and does not adversely impact any accident mitigating systems.

   The proposed amendment does not affect the operability requirements for the diesel generators, as verification of such operability will continue to be performed as required. Continued verification of operability supports the capability of the diesel generators to perform their required design functions of providing emergency power to the Engineered Safety Features systems, consistent with the plant safety analyses as described in the Updated Final Safety Analysis Report (UFSAR).

   Adding or modifying Technical Specification Surveillance Requirements for the diesel generators will not significantly increase the probability of an accident previously evaluated because the diesel generators and their emergency loads are accident mitigation features, not accident initiators. Adding or modifying Technical Specification Surveillance Requirements for the diesel generators will not change any of the dose analyses associated with the UFSAR Chapter 14 accidents because accident mitigation functions and requirements remain unchanged.

   Therefore, the proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. *Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?*

   Response: No.

   This amendment request proposes to add or modify certain Technical Specification Surveillance Requirements for the diesel generators. This proposed amendment does not change the design function of the diesel generators or any required loads, and does not change the way the systems and plant are operated or maintained. This proposed amendment does not impact any plant systems that are accident initiators and does not adversely impact any accident mitigating systems. Performance of these surveillances tests will provide additional assurance that the AC Sources relied upon to ensure the availability of necessary power to the Engineered Safety Features systems are capable of performing their specified safety function if needed.

Therefore, the proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. *Does the proposed amendment involve a significant reduction in the margin of safety?*

Response: No.

This amendment request proposes to add or modify certain Technical Specification Surveillance Requirements for the diesel generators. This proposed amendment will provide additional assurance that the AC Sources relied upon to ensure the availability of necessary power to the Engineered Safety Features systems are capable of performing their specified safety function if needed. Margin of safety is related to the ability of the fission product barriers (fuel cladding, reactor coolant system, and primary containment) to perform their design functions during and following postulated accidents. This proposed amendment does not involve or affect fuel cladding, the reactor coolant system, or the primary containment. Performance of these surveillances tests will provide continued assurance that the AC Sources relied upon to ensure the availability of necessary power to the Engineered Safety Features systems are capable of performing their specified safety function if needed.

Therefore, the proposed amendment does not involve a significant reduction in the margin of safety.

Based on the above, Calvert Cliffs concludes that the proposed amendment does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and , accordingly, a finding of "no significant hazards consideration" is justified.

4.3 Conclusion

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

5.0 ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or a significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

6.0 REFERENCES

1. NUREG-1432, Standard Technical Specifications, Combustion Engineering Plants, Revision 4.0, March 2012
2. Regulatory Guide 1.9, Application and Testing of Safety-Related Diesel Generators in Nuclear Power Plants, Revision 4, March 2007

3. Regulatory Guide 1.108, Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants, Revision 1, August 1977

ATTACHMENT (2)

MARKED UP TECHNICAL SPECIFICATION PAGES

Calvert Cliffs Nuclear Power Plant, LLC
October 16, 2012

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.8	Verify interval between each sequenced load block is within ± 10% of design interval for ~~the~~ each emergency and shutdown load sequencer.	~~31 days~~ 24 months
SR 3.8.1.9	----------NOTE---------- All DG starts may be preceded by an engine prelube period. ---------- 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.	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
SR 3.8.1.11 ----------NOTE---------- ~~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.~~ ---------- ~~Verify each DG, operating at a power factor of ≤ 0.84 for DG 1A and ≤ 0.83 for DGs 1B, 2A, and 2B, operates for ≥ 60 minutes while loaded to ≥ 4000 kW for DG 1A and ≥ 3000 kW for DGs 1B, 2A, and 2B.~~ Insert 1	24 months
SR 3.8.1.12 Verify each DG rejects a load ≥ 500 hp without tripping.	24 months

Insert 1

Verify each DG operates for $\geq$ 24 hours:

a. For $\geq$ 2 hours of the test loaded to $\geq$ 4200 kW for DG 1A, and $\geq$ 3150 kW and $\leq$ 3300 kW for DGs 1B, 2A, and 2B, and
b. For the remaining hours of the test loaded to $\geq$ 3600 kW for DG 1A, and $\geq$ 2700 kW and $\leq$ 3000 kW for DGs 1B, 2A and 2B.

These test phases may be performed in either order.

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
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.	In accordance with applicable Surveillance Requirements

Insert new SR 3.8.1.17

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.8.1.17 ---------- NOTES ---------- All DG starts may be preceded by an engine prelube period. ---------- Verify on an actual or simulated loss of offsite power signal: 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.	24 months

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
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, and SR 3.8.1.14. ----------	
	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, and SR 3.8.1.17, are applicable.	In accordance with applicable SRs
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.	In accordance with applicable SRs

ATTACHMENT (3)

MARKED UP TECHNICAL SPECIFICATION BASES PAGES

In addition, it eliminates the potential for water entrainment in the fuel oil during DG operation. Water may come from any of several sources, including condensation, ground water, rain water, contaminated fuel oil, and from breakdown of the fuel oil by bacteria. Frequent checking for and removal of accumulated water minimizes fouling and provides data regarding the watertight integrity of the fuel oil system. The SR Frequencies are consistent with Reference 8. This SR is for preventive maintenance. The presence of water does not necessarily represent failure of this SR provided the accumulated water is removed during the performance of this surveillance test.

SR 3.8.1.7

This SR demonstrates that one fuel oil transfer pump operates and transfers fuel oil from its associated storage tank to its associated day tank. This is required to support continuous operation of standby power sources. This SR provides assurance that the fuel oil transfer pump is OPERABLE, the fuel oil piping system is intact, the fuel delivery piping is not obstructed, and the controls and control systems for automatic fuel transfer systems are OPERABLE.

The Frequency for this SR is 31 days. The 31-day Frequency corresponds to the design of the fuel transfer system. The design of fuel transfer systems is such that pumps will operate automatically or must be started manually in order to maintain an adequate volume of fuel oil in the day tanks during or following DG testing. In such a case, a 31-day Frequency is appropriate.

SR 3.8.1.8

Under accident and loss of offsite power conditions loads are sequentially connected to the bus by the automatic load sequencer (this SR verifies steps 1 through 5). The sequencing logic controls the permissive and closing signals to breakers to prevent overloading of the DGs due to high motor starting currents. The 10% load sequence time interval tolerance ensures that sufficient time exists for the DG to restore frequency and voltage prior to applying the next load, and that safety analysis assumptions

for the emergency load sequencer and verifies steps 1 through 3 for the shutdown load sequencer

regarding ESF equipment time delays are not violated. The UFSAR provides a summary of the automatic loading of ESF buses.

24 months

The Frequency of ~~31 days~~ is consistent with ~~DG monthly testing and is sufficient to ensure the load sequencer operation as required.~~

Reference 12; takes into consideration unit conditions required to perform the Surveillance; and is intended to be consistent with fuel cycle lengths.

SR 3.8.1.9

See SR 3.8.1.3.

SR 3.8.1.10

Transfer of each 4.16 kV ESF bus power supply from the normal offsite circuit to the alternate offsite circuit demonstrates the OPERABILITY of the alternate circuit distribution network to power the shutdown loads. The 24 month Frequency of the Surveillance is based on engineering judgment, taking into consideration the unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the 24 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.8.1.11

Insert 2

~~This SR provides verification that the DG can be operated at a load greater than predicted accident loads for at least 60 minutes once per 24 months. Operation at the greater than calculated accident loads will clearly demonstrate the ability of the DGs to perform their safety function. In order to ensure that the DG is tested under load conditions that are as close to design conditions as possible, testing must be performed using a DG load greater than or equal to calculated accident load and using a power factor ≤ 0.85. This power factor is chosen to be representative of the actual design basis inductive loading that the DG could experience. In addition, the post accident load for No. 1A DG is significantly lower than the continuous rating of No. 1A DG. To ensure No. 1A DG performance is not degraded, routine monitoring of engine parameters should be performed~~

~~during the performance of this SR for No. 1A DG (Reference 9).~~

This SR is modified by a Note which states that momentary transients due to changing bus loads do not invalidate this test. Similarly, momentary power factor transients above the limit will not invalidate the test. ~~The 24 month Frequency is adequate to ensure DG OPERABILITY and it is consistent with the refueling interval.~~

SR 3.8.1.12

Each DG is provided with an engine overspeed trip to prevent damage to the engine. Recovery from the transient caused by the loss of a large load could cause diesel engine overspeed, which, if excessive, might result in a trip of the engine. This SR demonstrates the DG load response characteristics. This SR is accomplished by tripping the DG output breaker with the DG carrying greater than or equal to its associated single largest post-accident load while paralleled to offsite power.

Consistent with References 10, 3, and 4, the load rejection test is acceptable if the increase in diesel speed does not exceed 75% of the difference between synchronous speed and the overspeed trip setpoint, or 15% above synchronous speed, whichever is lower.

The 24 month Frequency is consistent with the Reference 2, Chapter 8.

SR 3.8.1.13

This SR demonstrates that DG non-critical protective functions are bypassed on a required actuation signal. This SR is accomplished by verifying the bypass contact changes to the correct state which prevents actuation of the non-critical function. The non-critical protective functions are consistent with References 3 and 4, and Institute of Electrical and Electronic Engineers (IEEE)-387 and are listed in Reference 2, Chapter 8. Verifying the non-critical trips are bypassed will ensure DG operation during a required actuation. The non-critical trips are bypassed during DBAs and provide an alarm on an abnormal engine

Insert 2

Reference 12 requires demonstration that the DGs can start and run continuously at full load capability for an interval of not less than 24 hours, $\geq$ 2 hours of which is at a load equivalent to 105-110% of the continuous service rating and the remainder of the time at a load equivalent to 90-100% of the continuous service rating. For the Nos. 1B, 2A, and 2B DGs the SR reflects these loading ranges. For the No. 1A DG, since the post accident loading is significantly less than the continuous service rating, the post accident loading (<4000 kW) is used instead of the continuous service rating. Actual testing is performed at a load higher than the post accident loading. These test phases may be performed in either order.

The DG starts for this Surveillance can be performed either from standby or hot conditions. The provisions for prelubricating and warmup, discussed in SR 3.8.1.3 and for gradual loading, discussed in SR 3.8.1.4 are applicable to this SR.

The load band is provided to avoid routine overloading of the DG. Routine overloading may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY.

In addition, the post-accident load for No. 1A DG is significantly lower than the continuous rating of No. 1A DG. To ensure No. 1A DG performance is not degraded, routine monitoring of engine parameters should be performed during the performance of this SR for No. 1A DG (Reference 9).

The 24 month frequency is consistent with the recommendations of Reference 12, takes into consideration unit conditions required to perform the Surveillance; and is intended to be consistent with expected fuel cycle lengths.

BASES

SR 3.8.1.16

This SR lists the SRs that are applicable to the LCO 3.8.1.c (SRs 3.8.1.1, 3.8.1.2, 3.8.1.3, 3.8.1.5, 3.8.1.6, and 3.8.1.7). Performance of any SR for the LCO 3.8.1.c will satisfy both Unit 1 and Unit 2 requirements for those SRs. Surveillance Requirements 3.8.1.4, 3.8.1.8, 3.8.1.9, 3.8.1.10, 3.8.1.11, 3.8.1.12, 3.8.1.13, 3.8.1.14, ~~and~~ 3.8.1.15, and 3.8.1.17 are not required to be performed for the LCO 3.8.1.c. Surveillance Requirement 3.8.1.10 is not required because this SR verifies manual transfer of AC power sources from the normal offsite circuit to the alternate offsite circuit, but only one qualified offsite circuit is necessary for ~~the~~ LCO 3.8.1.c. Surveillance Requirements 3.8.1.4, 3.8.1.11, and 3.1.8.12 are not required because they are tests that deal with loads. Surveillance Requirement 3.8.1.8 verifies the interval between sequenced loads. Surveillance Requirement 3.8.1.14 verifies the proper sequencing with offsite power. Surveillance Requirement 3.8.1.9 and 3.8.1.17 verifies that the DG starts within 10 seconds. These SRs are not required because they do not support the function of the LCO 3.8.1.c to provide power to the CREVS and CRETS. Surveillance Requirements 3.8.1.13 and 3.8.1.15 are not required to be performed because these SRs verify the emergency loads are actuated on an ESFAS signal for the Unit in which the test is being performed. The LCO 3.8.1.c DG will not start on an ESFAS signal for this Unit.

REFERENCES

1. 10 CFR Part 50, Appendix A, "General Design Criteria for Nuclear Power Plants"
2. UFSAR
3. Regulatory Guide 1.9, Revision 3, "Selection, Design, Qualification, and Testing of Emergency Diesel Generator Units Used as Class 1E Onsite Electric Power Systems at Nuclear Power Plants," July 1993
4. Safety Guide 9, Revision 0, March 1971
5. NRC Safety Evaluation for Amendment Nos. 19 and 5 for Calvert Cliffs Nuclear Power Plant Unit Nos. 1 and 2, dated January 14, 1977
6. Regulatory Guide 1.93, Revision 0, "Availability of Electric Power Sources," December 1974

Insert new Technical Specification Bases SR 3.8.1.17

SR 3.8.1.17

As required by Regulatory Guide 1.9 (Reference 12), this Surveillance demonstrates the as designed operation of the standby power sources during loss of the offsite source. This test verifies all actions encountered from the loss of offsite power, including shedding of the nonessential loads and energization of the emergency buses and respective loads from the DG. It further demonstrates the capability of the DG to automatically achieve the required voltage and frequency within the specified time.

The DG auto-start time of 10 seconds is derived from requirements of the accident analysis to respond to a design basis large break LOCA. The Surveillance should be continued for a minimum of 5 minutes in order to demonstrate that all starting transients have decayed and stability has been achieved.

The requirement to verify the connection and power supply of permanent and auto-connected loads is intended to satisfactorily show the relationship of these loads to the DG loading logic. In certain circumstances, many of these loads cannot actually be connected or loaded without undue hardship or potential for undesired operation. For instance, Emergency Core Cooling Systems (ECCS) injection valves are not desired to be stroked open, high pressure injection systems are not capable of being operated at full flow, or shutdown cooling (SDC) systems performing a decay heat removal function are not desired to be realigned to the ECCS mode of operation. In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the DG system to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

The Frequency of 24 months is consistent with the recommendations of Regulatory Guide 1.9 (Reference 12), takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

This SR is modified by a Note. The reason for the Note is to minimize wear and tear on the DGs during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations.

7. Generic Letter 84-15, Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability, July 2, 1984

8. Regulatory Guide 1.137, Revision 1, "Fuel-Oil Systems for Standby Diesel Generators," October 1979

9. Letter from Mr. D. G. McDonald, Jr. (NRC) to Mr. C. H. Cruse (BGE), dated April 2, 1996, Issuance of Amendments for Calvert Cliffs Nuclear Power Plant, Unit 1 (TAC No. M94030) and Unit 2 (TAC No. M94031)

10. IEEE Standard 308-1991, "IEEE Standard Criteria for Class 1E Power Systems for Nuclear Power Generating Stations"

11. NO-1-117, Integrated Risk Management

12. Regulatory Guide 1.9, Revision 4, "Application and Testing of Safety-Related Diesel Generators in Nuclear Power Plants," March 2007

BASES

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required AC electrical power sources should be completed as quickly as possible in order to minimize the time during which the unit safety systems may be without sufficient power.

Pursuant to LCO 3.0.6, the Electrical Distribution System's ACTIONS are not entered even if all AC sources to it are inoperable, resulting in de-energization. Therefore, the Required Actions of Condition A are modified by a Note to indicate that when Condition A is entered with no AC power to any required ESF bus, the ACTIONS for LCO 3.8.10 must be immediately entered. This Note allows Condition A to provide requirements for the loss of the offsite circuit, whether or not a train is de-energized. Limiting Condition for Operation 3.8.10 provides the appropriate restrictions for the situation involving a de-energized train.

SURVEILLANCE REQUIREMENTS

SR 3.8.2.1 and SR 3.8.2.2

Surveillance Requirements 3.8.2.1 and 3.8.2.2 require the performance of SRs from LCO 3.8.1 that are necessary for ensuring the OPERABILITY of the AC sources in other than MODEs 1, 2, 3, and 4. Surveillance Requirement 3.8.1.10 is not required to be met, since only one offsite circuit is required to be OPERABLE. Surveillance Requirements 3.8.1.4, 3.8.1.8, 3.8.1.13, ~~and~~ 3.8.1.15, and 3.8.1.17 are related to automatic starting of the DGs for an operating unit, which is not applicable for a shutdown unit. Surveillance Requirement 3.8.1.16 is related to LCO 3.8.2.c and 3.8.2.d AC sources, and is addressed by SR 3.8.2.2.

Surveillance Requirement 3.8.2.1 is modified by a Note. The Note lists SRs not required to be performed in order to preclude de-energizing a required 4.16 kV ESF bus or disconnecting a required offsite circuit during performance of SRs. With limited AC Sources available, a single event could compromise both the required circuit and the DG. It is the intent that these SRs must still be capable of being met, but actual performance is not required during periods when the DG and offsite circuit are required to be OPERABLE.