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SEP 18 2012

U. S. Nuclear Regulatory Commission
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SUSQUEHANNA STEAM ELECTRIC STATION
PROPOSED AMENDMENT NO. 309 TO LICENSE NPF-14 AND
PROPOSED AMENDMENT NO. 280 TO LICENSE NPF-22:
CHANGE TO TECHNICAL SPECIFICATION SURVEILLANCE
REQUIREMENT (SR) 3.8.1.19 TO INCREASE DIESEL GENERATOR E
MINIMUM STEADY STATE FREQUENCY **Docket Nos. 50-387**
PLA-6809 **and 50-388**

Pursuant to 10 CFR 50.90, PPL Susquehanna, LLC (PPL), hereby requests approval of the following proposed amendments to the Susquehanna Steam Electric Station (SSES) Unit 1 and Unit 2 Technical Specifications (TS), as described in the Enclosure. The proposed amendments would change Surveillance Requirements 3.8.1.19 in Technical Specification 3.8.1 "AC Source – Operating." Specifically, the proposed amendments will increase the minimum steady state frequency for Diesel Generator E during the Loss of Offsite Power & Emergency Core Cooling System surveillance.

The Diesel Generator E minimum steady state frequency will be established as a more restrictive value to increase the transient frequency margin, thus assuring Diesel Generator E is capable of supplying power to the required loads within the mandated limits. The proposed change will not impact the reliability of Diesel Generator E or adversely impact its ability to perform its safety function.

Justification for the change to Surveillance Requirement 3.8.1.19 is based upon the evaluation presented in the Enclosure. As demonstrated in the enclosed evaluation, the proposed amendment does not involve a significant hazard consideration.

PPL requests approval of the proposed change to the Unit 1 and Unit 2 Technical Specifications by April 12, 2013. PPL further requests that the approved amendment be issued to be effective immediately upon approval with the implementation to be completed within 60 days. This due date will allow adequate time for the new steady state frequency to be incorporated into the procedures before the next applicable Diesel Generator E surveillance is performed.

Attachments 1 and 2 contain the Technical Specification and the Technical Specification Bases markups reflecting the proposed change.

The change has been reviewed by the SSES Plant Operations Review Committee and by the Susquehanna Review Committee. In accordance with 10 CFR 50.91(b), PPL Susquehanna, LLC is providing the Commonwealth of Pennsylvania with a copy of this proposed License Amendment request.

There are no regulatory commitments associated with the proposed changes.

If you have any questions or require additional information, please contact Mr. Duane L. Filchner at 610-774-7819.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on: 9-18-12

J. M. Helsel

Enclosure:

PPL Susquehanna, LLC Evaluation of Proposed Change to the Unit 1 and Unit 2 TS SR 3.8.1.19 "AC Sources - Operating" and the corresponding TS Bases

Attachments:

Attachment 1 Proposed Unit 1 and Unit 2 Technical Specification Changes (Mark-ups)
Attachment 2 Proposed Unit 1 and Unit 2 Technical Specification Bases Changes (Mark-ups)

Copy:
NRC Region I
Mr. P. W. Finney, NRC Sr. Resident Inspector
Ms. C. J. Sanders, NRC Project Manager
Mr. L. J. Winker, DEP/BRP

Enclosure to PLA-6809

PPL Susquehanna, LLC
Evaluation of Proposed Change to the Unit 1 and Unit 2 TS SR 3.8.1.19 in TS Section 3.8.1 "AC Sources – Operating" and the Corresponding TS Bases

PPL EVALUATION

Subject: PPL Susquehanna, LLC Evaluation of Proposed Change to the Unit 1 and Unit 2 Technical Specifications (TS) Surveillance Requirements SR 3.8.1.19 in Section 3.8.1 "AC Sources - Operating" and the associated TS Bases

1. DESCRIPTION

PPL Susquehanna, LLC (PPL) proposes to increase the minimum steady state frequency for Diesel Generator E specified in Unit 1 and Unit 2 Technical Specification 3.8.1 "AC Sources - Operating" Surveillance Requirement (SR) 3.8.1.19. The new minimum steady state frequency for Diesel Generator E is applicable during a Loss of Offsite Power (LOOP) & Emergency Core Cooling System (ECCS) surveillance. At SSES, this surveillance is referred to as a Loss of Cooling Accident (LOCA) & Loss of Offsite Power (LOOP) surveillance; and will hereafter be referred to as a LOCA/LOOP surveillance in this Evaluation. The proposed change will increase the minimum steady state frequency from 58.8 Hz to 59.3 Hz for Diesel Generator E during the LOCA/LOOP surveillance only. There are no revisions to the actual steady state frequency setpoint of Diesel Generator E due to this proposed change.

The minimum steady state frequency will be established as a more restrictive value to assure compliance with plant design bases and commitments in the Final Safety Analysis Report (FSAR), thus assuring Diesel Generator E is capable of supplying power to the required loads within the mandated limits. The frequency limit change is the result a self-identified issue and has been entered into the PPL Corrective Action Program. Regulatory Guide 1.9, Revision 2, committed to in FSAR Section 8.1.6.1c, dictates the minimum steady state frequency during steady state conditions (58.8 Hz) and transient periods (57 Hz). If Diesel Generator E was set at the lowest allowable minimum steady state frequency (58.8 Hz) allowed by this requirement, then as surveillance history has shown, the frequency during transient may fall below the required value (57 Hz).

If approved, PPL plans to implement the proposed Unit 1 and Unit 2 TS amendments within 60 days.

Mark-ups of the proposed change to the Unit 1 and Unit 2 Technical Specifications (TS) and Bases are included in Attachments 1 and 2.

2. PROPOSED CHANGE

The proposed technical change to the Unit 1 and Unit 2 Technical Specification SR 3.8.1.19 revises the minimum value for the steady state frequency for Diesel Generator E.

SR 3.8.1.19 is not being revised for the steady state frequency requirements for Diesel Generators A-D. Diesel Generators A-D does not have the same FSAR commitments and do not exhibit the same frequency dip during transient periods.

SR 3.8.1.19 is being revised to verify that on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ECCS initiation signal, Emergency Diesel Generators A-E auto-start from a standby condition. Diesel Generators A-D is to achieve a steady state frequency of $\geq$ 58.8 Hz and $\leq$ 61.2 Hz. Diesel Generator E is to achieve a steady state frequency of $\geq$ 59.3 Hz and $\leq$ 61.2 Hz.

The proposed change will not impact the reliability of Diesel Generator E or adversely impact its ability to perform its safety function. Diesel Generator E is required to meet IEEE standards and Regulatory Guide standards, as committed to in the FSAR. These commitments are not being changed.

Corresponding changes are required to the TS Bases Sections B 3.8.1.

3. BACKGROUND

The purpose of the Emergency Diesel Generators, per FSAR Section 8.1.1, is to supply a highly reliable, self-contained source of power in the event of a complete loss of off-site power. The Diesel Generators are designed to provide sufficient power for the electrical loads required for a simultaneous shutdown of both reactors. This includes the loads required to mitigate the effects of a design basis LOCA on one unit with a complete loss of off-site power plus a single failure in the on-site power system, concurrent with a safe shutdown on the other unit. Diesel Generators A-D can supply their respective 4.16 kV engineered safeguards bus in both units. Diesel Generator E is a plug-in spare, which can be substituted for any one of the other four Diesel Generators: A, B, C and D; thus can power any one of the four 4.16 kV engineered safeguards buses.

Diesel Generators A-D is identical in construction and equipment, rated at 5,000 kVA. Diesel Generator E is larger, rated at 6,250 kVA. Diesel Generator E is located in a separate building approximately 250 feet away from the Diesel Generator A-D bays. Diesel Generator E supplies power to the respective Diesel Generator bus it is connected to, thus significantly increasing the conductor length from the Diesel Generator to the 4.16 kV bus.

Diesel Generator E was added to the standby power system in 1987, after the SSES Unit 1 and Unit 2 commercial operation start dates. Due to the time difference of when the Diesel Generators were designed, some of the commitments for Diesel Generator E differ from Diesel Generator A-D commitments.

Section 8.1 of the FSAR dictates the IEEE and Regulatory Guide standards for Diesel Generator performance. In FSAR Section 8.1.6.1c, Diesel Generator E commits to the Regulatory Guide 1.9 Revision 2 (Reference 7.1) frequency requirements. This requirement mandates that the frequency during transient periods cannot fall below 95% of nominal, which is 57 Hz. The requirement dictates that the steady state frequency should be within 2% of nominal, which is 58.8 Hz.

In FSAR Section 8.1.6.1b, Diesel Generators A-D is committed to Regulatory Guide 1.9 Revision 0, and takes exception to the 57 Hz minimum frequency requirement during transient periods. Diesel Generators A-D adheres to the Regulatory Guide 1.9 Revision 0 requirement that the frequency should be within 2% of nominal, which is 58.8 Hz.

The minimum steady state frequency requirement is in place to protect safety-related loads that the Diesel Generators provide power to during emergency situations and routine surveillances. An SSES calculation justifies the ±1.2 Hz (±2%) acceptance limits and that there is no impact on the operability of the connected equipment. Therefore, the ability of Diesel Generator E to serve its safety-function is not affected by the present minimum value for steady state frequency.

The maximum frequency transient occurs during the starting of the largest load, which is a Residual Heat Removal (RHR) pump motor. The LOCA/LOOP surveillance is the only isochronous mode surveillance that starts a RHR pump. The minimum acceptable steady state frequency (per Technical Specifications Section 3.8.1) is 58.8 Hz for all Diesel Generator surveillances.

During a 2010 LOCA/LOOP surveillance (SR 3.8.1.19) where Diesel Generator E was substituted for Diesel Generator D, a frequency dip of 2.0 Hz was observed when the RHR pump motor started. According to test results of previous LOCA/LOOP surveillances (see Section 4.1 below), this is the maximum frequency dip observed during a transient period. LOCA/LOOP surveillances showed that the frequency transients for Diesel Generators A-D were no more than 1.5 Hz for an RHR pump motor start. If the 1.5 Hz frequency dip is added to an assumed starting point of 58.8 Hz, the frequency remains above 57 Hz.

If the minimum Diesel Generator steady state frequency of 58.8 Hz is postulated as a starting point, then the 2010 LOCA/LOOP test shows a Diesel Generator E frequency response that could dip slightly and briefly below 57 Hz. The dip below 57 Hz would be a violation of an FSAR commitment. A Condition Report documented this potential incident, which was an outcome of a self-assessment performed in preparation for the 2010 Component Design Basis Inspection (CDBI). After the discovery of the possible violation, further analysis and research was performed to identify an appropriate course of action. This included a simulation in ETAP power system analysis software that identified that the violation is probable. This discovery is not a finding of actual Diesel Generator failure to meet criteria. It identifies a possible issue if Diesel Generator E were operating in the isochronous mode at the minimum steady state value allowed by Technical Specifications (58.8 Hz). The 58.8 Hz is approximately 2% below nominal values seen in testing and values mandated by the Diesel Generator governor tuning procedures.

The frequency dip is larger for Diesel Generator E than Diesel Generators A-D because of the increased conductor length between Diesel Generator E and the 4.16 kV buses. An SSES calculation and cable data confirms that the voltage drop between Diesel Generator E and the 4.16 kV buses is significantly higher than that for Diesel Generators A-D. The increased voltage drop corresponds with an increase in current, causing the Diesel Generator to increase power output, which causes a frequency dip. The larger frequency dip is not an operability issue of any equipment, merely characteristics of the dynamic response of the equipment in the current configuration.

Other nuclear power plants such as Crystal River Unit 3 (Reference 7.2), Virgil C. Summer Unit 1 (Reference 7.3) and Donald C. Cook Units 1 & 2 (Reference 7.4) have changed their steady state frequency Surveillance Requirements in Technical Specifications. These plants had not evaluated the effect of these frequencies on equipment powered by their Diesel Generators. SSES has verified in a calculation that the minimum and maximum steady state frequency values will not impact the operability of the loads powered by the Diesel Generators.

4. TECHNICAL ANALYSIS

4.1 Surveillance Test History

The following results were obtained for previous SSES LOCA/LOOP surveillances.

Year	Diesel Generator	Maximum Frequency Dip During Transient Observed from Traces
2011	E Substituted for A	1.5 Hz
	B	1.0 Hz
	C	1.0 Hz
	D	1.0 Hz
2010	E Substituted for D	2.0 Hz
	A	1.4 Hz
	B	1.1 Hz
	C	1.0 Hz
2009	A	1.5 Hz
	B	1.25 Hz
	C	1.1 Hz
	D	1.0 Hz
2006	E Substituted for B	1.0 Hz

The table above lists the maximum dip from nominal frequency (60 Hz) during the transient period of the RHR pump motor start. The maximum frequency dip observed was 2.0 Hz for Diesel Generator E when substituted from Diesel Generator D, during a 2010 LOCA/LOOP test. The frequency dip of concern is a brief transient value less than 1 second applicable to only the RHR pump motor start. The RHR pump motor is the first major load applied to Diesel Generator E during a LOCA/LOOP scenario. Diesel Generator E has a nominal rating of 5000 kW. The 2000 horsepower RHR motor represents approximately 1492 kW (746 watts/ horsepower * 2000) which is well within

the rating of Diesel Generator E. The other loads that would be on concurrently are those not shed from the 4.16 kV bus and represent relatively minor loading.

Test results for Diesel Generators A-E have shown that there is minimal deviation from 60 Hz during steady state periods. Steady state frequency typically varies less than ±0.1Hz from the nominal 60 Hz. The LOCA/LOOP surveillance testing shows that the governor is tightly controlling the speed of the Diesel Generators. Thus, the most recent LOCA/LOOP tests show that the steady state operation of the tested Diesel Generators does not vary significantly from 60 Hz.

4.2 Analytical Methods & Calculations

According to the SSES procedure for tuning the governor, the frequency must be set at 60 Hz ±0.1 Hz. Therefore, the minimum allowable setting for the governor frequency is 59.9 Hz. Technical Specifications currently allow for ± 2% (±1.2 Hz) margin for the steady state frequency. Reducing this to 1% margin (instead of 2%), at the lowest allowable of 59.9 Hz, this equates to a 0.6 Hz drop, which is 59.3 Hz. The maximum dip observed for Diesel Generator E during an RHR pump motor start was 2 Hz. Adding a 15% margin for conservatism (an additional 0.3 Hz), the lowest allowable steady state frequency allowing a 2.3 Hz drop is 59.3 Hz.

An SSES calculation justifies the ±1.2 Hz acceptance limits and provides evidence that there will not be negative impacts on connected loads. There is no affect on connected equipment performance by increasing the steady state frequency minimum value in a more conservative direction, from 58.8 Hz to 59.3 Hz.

In the isochronous mode, the Diesel Generator governor controls the frequency by controlling the Diesel Generator speed. Woodward Model 2301A Electronic Load Sharing and Speed Control governors were installed for Diesel Generators A-E in 2006 and 2007. According to manufacturer literature, Woodward 2301A Electronic Load Sharing and Speed Control Governors are capable of maintaining a steady state speed band within ±0.25% of rated speed. Per the SSES governor tuning procedure, the steady state speed must be set to 600 ±1 rpm, making the minimum setting allowed by procedure bounded by 599 rpm. Subtracting 0.25% from 599 rpm calculates the minimum steady state value for speed: 597.5025 rpm. This corresponds with a frequency of 59.75 Hz. This is 0.45 Hz above the proposed new minimum steady state frequency. Previous LOCA/LOOP surveillances provide evidence that the steady state frequency varies less than ±0.1 Hz during LOCA/LOOP surveillances. Therefore, a properly tuned and adjusted governor is capable of maintaining a steady state frequency above 59.3 Hz.

An evaluation was performed using ETAP Power System Analyzer software that indicates the new minimum steady state frequency will be acceptable with respect to FSAR requirements. The dynamic model for Diesel Generator E was tuned to match the

frequency response recorded in the latest LOCA/LOOP surveillance test for Diesel Generator E. The model was set to a starting steady state frequency of 59.3 Hz. During the simulated RHR pump motor start, the frequency transient did not fall below 57 Hz.

5. REGULATORY SAFETY ANALYSIS

5.1 No Significant Hazards Consideration

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

Response: No

This LAR proposes to provide more a restrictive minimum frequency requirement for Diesel Generator E during a LOCA/LOOP surveillance. The minimum steady state frequency would be changing from 2% to approximately 1% below nominal (60 Hz).

This change has no influence on the probability or consequences of any accident previously evaluated. The minimum steady state frequency change does not affect the operation of Diesel Generator E or connected equipment. The change only affects the minimum allowable value for the steady state frequency and does not change the actual setting, which is the setting that protects the Diesel Generator loads.

This change does not affect the probability or consequences of an accident previously evaluated because the proposed change does not make a change to any accident initiator, initiating condition, or assumption.

The proposed action does not involve physical changes to the Diesel Generator, nor does it change the safety function of the Diesel Generator. The proposed TS revision involves no significant changes to the operation of any systems or components in normal or accident operating conditions and no changes to existing structures, systems, or components.

The proposed action does not change any other behavior or operation of any Diesel Generator, and, therefore, has no significant impact on reactor operation. It also has no significant impact on response to any perturbation of reactor operation including transients and accidents previously analyzed in the Final Safety Analysis Report (FSAR).

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

2. Do the proposed changes create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

The proposed increase in the minimum steady state frequency only affects the minimum allowable value, and not the steady state frequency setpoint.

The proposed minimum steady state frequency does not adversely affect the operation of any safety-related components or equipment. Since the proposed action does not involve hardware changes, significant changes to the operation of any systems or components, nor change to existing structures, systems, or components, there is no possibility that a new or different kind of accident is created.

The proposed change does not involve physical changes to Diesel Generator E, nor does it change the safety function of Diesel Generator E. The proposed change does not require any physical change or alteration of any existing plant equipment. No new or different equipment is being installed, and installed equipment is not being operated in a new or different manner. There is no alteration to the parameters within which the plant is normally operated. This change does not alter the manner in which equipment operation is initiated, nor will the functional demands on credited equipment be changed. No alterations in the procedures that ensure the plant remains within analyzed limits are being proposed, and no changes are being made to the procedures relied upon to respond to an off-normal event as described in the FSAR. As such, no new failure modes are being introduced. The change does not alter assumptions made in the safety analysis and licensing basis.

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

3. Do the proposed changes involve a significant reduction in a margin of safety?

Response: No

The proposed increase in the minimum steady state frequency only affects the minimum allowable value, and not the actual steady state frequency nominal setpoint, which will remain at 60 Hz. The increase in the minimum steady state frequency is a change to increase conservatism.

The margin of safety is established through the design of the plant structures, systems, and components, the parameters within which the plant is operated, and the establishment of the setpoints for the actuation of equipment relied upon to respond to an event. The proposed change does not significantly impact the condition or performance of structures,

systems, and components relied upon for accident mitigation. The proposed change does not reduce the margin of safety that exists in the present Technical Specifications or the Final Safety Analysis Report.

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

Based on the above, PPL concludes that the proposed change 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.

5.2 Applicable Regulatory Requirements/Criteria

SSES FSAR Section 8.1 provides detailed discussion of SSES compliance with the applicable regulatory requirements and guidance.

The proposed TS amendments:

(a) Do not alter the design or function of any system

(b) Do not result in any change in the qualifications of any component; and

(c) Do not result in the reclassification of any component's status in the areas of shared, safety-related, independent, redundant, and physically or electrically separated.

10 CFR 50 Appendix A Criterion 17, "Electrical Power Systems" states that an onsite electric power system and an offsite electric power system shall be provided to permit functioning of structures, systems and components important to safety. The safety function for each system (assuming the other system is not functioning) shall be to provide sufficient capacity and capability to assure that: (1) specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded as a result of anticipated operational occurrences and (2) the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents.

10 CFR 50 Appendix A Criterion 18, "Inspection and Testing of Electric Power Systems and 10 CFR 50 Appendix B Criterion XI, "Test Control," both require established programs for assuring that the Systems Structures and Components (SSC's) are demonstrated operable on a periodic basis.

10 CFR 50.36 (c)(3) "Surveillance Requirements" specifies that surveillance requirements are requirements relating to test, calibration, or inspection to assure the

necessary quality of systems and components is maintained, that facility operations will be within safety limits, and that the limiting conditions for operation will be met.

Regulatory Guide 1.9 Revision 2, "Selection, Design, and Qualification of Diesel-Generator Units Used As Standby (Onsite) Electrical Power Systems at Nuclear Power Plants" specifies the required minimum frequency during transient, and the minimum steady state frequency requirement.

The proposed changes do not adversely impact the ability of Diesel Generator E to function as designed and do not impact conformance to the applicable 10 CFR 50 Appendix A, "General Design Criteria for Nuclear Power Plants." The revision to the minimum steady state frequency for Diesel Generator E for the LOCA/LOOP surveillance is not in conflict with the 10 CFR 50.36 requirements. The increase in the minimum steady state frequency is not in violation of the FSAR commitment to Regulatory Guide 1.9 Revision 2, because the minimum value is increasing and becoming more conservative. Therefore, the proposed changes are consistent with all applicable regulatory requirements or criteria.

The proposed changes do not violate any requirement or recommended method for assuring the operability of the Diesel Generators and maintaining the plant design and licensing basis.

The change verifies the required parameters are within the prescribed limits and independently verifies that the values assumed in the accident analysis are satisfied. This testing is performed at the stated frequencies to assure continued operability of Diesel Generator E.

Based on the analysis provided in Section 5: (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 adverse to the common defense and security or to the health and safety of the public.

6. ENVIRONMENTAL CONSIDERATION

10 CFR 51.22(c)(9) identifies certain licensing and regulatory actions, which are eligible for categorical exclusion from the requirement to perform an environmental assessment. A proposed amendment to an operating license for a facility does not require an environmental assessment if operation of the facility in accordance with the proposed amendment would not: (1) involve a significant hazards consideration; (2) result in a significant change in the types or significant increase in the amounts of any effluents that may be released offsite; or (3) result in a significant increase in individual or cumulative

occupational radiation exposure. PPL Susquehanna, LLC has evaluated the proposed change and has determined that the proposed change meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Accordingly, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment needs to be prepared in connection with issuance of the amendment. The basis for this determination, using the above criteria, follows:

Basis

As demonstrated in the "No Significant Hazards Consideration" evaluation, the proposed amendment does not involve a significant hazards consideration.

There is no significant change in the operational transients. The proposed change does not involve any physical alteration of the plant (no new or different type of equipment will be installed) or change in methods governing normal plant operation. There is no significant increase in individual or cumulative occupational radiation exposure.

7. REFERENCES

7.1 Regulatory Guide 1.9 Revision 2, "Selection, Design, and Qualification of Diesel-Generator Units Used As Standby (Onsite) Electrical Power Systems at Nuclear Power Plants."

7.2 ML092170753, Crystal River Unit 3 – "License Amendment Request #304, Revision 1 Emergency Diesel Generator Voltage and Frequency Limits Revision."

7.3 ML103190756, Virgil C. Summer, Unit 1, "License Amendment Request (LAR-10-02033), Changes to Emergency Diesel Generator Surveillance Test Requirements."

7.4 ML071910238, Donald C. Cook, "Units 1 and 2, Technical Specification Change of Diesel Generator Maximum Steady State Frequency."

Attachment 1 to PLA-6809

Technical Specification Markups
(Unit 1 and 2)

3.8 Electrical Power Systems

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.8.1.19 ----------NOTES---------- 1. All DG starts may be preceded by an engine prelube period. 2. This SR shall be performed for each DG on a rotational test basis and for each 4.16 kV ESS bus at the specified FREQUENCY. 3. This Surveillance shall not be performed in MODE 1, 2 or 3. ---------- Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ECCS initiation signal: a. De-energization of 4.16 kV ESS buses; b. Load shedding from emergency buses; and c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ 10 seconds, 2. energizes auto-connected emergency loads through individual load timers, 3. achieves steady state voltage ≥ 3793 V and ≤ 4400 V, 4. achieves steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz for DG A-D and steady state frequency ≥ 59.3 Hz and ≤ 61.2 Hz for DG E, and 5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes.	24 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.8.1.19 ----------NOTES---------- 1. All DG starts may be preceded by an engine prelube period. 2. This SR shall be performed for each DG on a rotational test basis and for each 4.16 kV ESS bus at the specified FREQUENCY. 3. This Surveillance shall not be performed in MODE 1, 2 or 3. ---------- Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ECCS initiation signal: a. De-energization of 4.16 kV ESS buses; b. Load shedding from emergency buses; and c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ 10 seconds, 2. energizes auto-connected emergency loads through individual load timers, 3. achieves steady state voltage ≥ 3793 V and ≤ 4400 V, 4. achieves steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz for DG A-D and steady state frequency ≥ 59.3 Hz and ≤ 61.2 Hz for DG E, and 5. supplies permanently connected and auto-connected emergency loads for ≥ 5 minutes.	24 months

(continued)

Attachment 2 to PLA-6809

Technical Specification Bases Markups (Unit 1 and 2)

BASES

SURVEILLANCE REQUIREMENTS (continued)

maximum operating voltage specified for 4000 V motors. It ensures that for a lightly loaded distribution system, the voltage at the terminals of 4000 V motors is no more than the maximum rated operating voltages. The specified minimum and maximum frequencies of the DG are 58.8 Hz and 61.2 Hz, respectively (not including DG E for SR 3.8.1.19). These values are equal to ± 2% of the 60 Hz nominal frequency and are derived from the recommendations found in Regulatory Guide 1.9 (Ref. 3). The lower frequency limit is necessary to support the LOCA analysis assumptions for low pressure ECCS pump flow rates (Reference 12). For SR 3.8.1.19, Diesel Generator E requires a higher minimum steady state frequency, due to the frequency transient experienced during the starting of a RHR pump. The specified minimum and maximum frequencies for DG E for SR 3.8.1.19 are 59.3 Hz and 61.2 Hz, respectively.

The Surveillance Table has been modified by a Note, to clarify the testing requirements associated with DG E. The Note is necessary to define the intent of the Surveillance Requirements associated with the integration of DG E. Specifically, the Note defines that a DG is only considered OPERABLE and required when it is aligned to the Class 1E distribution system. For example, if DG A does not meet the requirements of a specific SR, but DG E is substituted for DG A and aligned to the Class 1E distribution system, DG E is required to be OPERABLE to satisfy the LCO requirement of 4 DGs and DG A is not required to be OPERABLE because it is not aligned to the Class 1E distribution system. This is acceptable because only 4 DGs are assumed in the event analysis. Furthermore, the Note identifies when the Surveillance Requirements, as modified by SR Notes, have been met and performed, DG E can be substituted for any other DG and declared OPERABLE after performance of two SRs which verify switch alignment. This is acceptable because the testing regimen defined in the Surveillance Requirement Table ensures DG E is fully capable of performing all DG requirements.

SR 3.8.1.1

This SR ensures proper circuit continuity for the offsite AC electrical power supply to the onsite distribution network and availability of offsite AC electrical power. The breaker alignment verifies that each breaker is in its correct position to ensure that distribution buses and loads are connected to an Operable offsite power source and that appropriate independence of offsite circuits is maintained. The 7 day Frequency is adequate since breaker position is not likely to change without the operator being aware of it and because its status is displayed in the control room.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.19 (continued)

Note 2 is necessary to accommodate the testing regimen associated with DG E. See SR 3.8.1.11 for the Bases of the Note.

The reason for Note 3 is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This Surveillance tests the applicable logic associated with Unit 1. The comparable test specified in the Unit 2 Technical Specifications tests the applicable logic associated with Unit 2. Consequently, a test must be performed within the specified Frequency for each unit. As the Surveillance represents separate tests, the Note specifying the restriction for not performing the test while the unit is in MODE 1, 2 or 3 does not have applicability to Unit 2. The Note only applies to Unit 1, thus the Unit 1 Surveillances shall not be performed with Unit 1 in MODE 1, 2 or 3.

For SR 3.8.1.19, Diesel Generator E requires a higher minimum steady state frequency, due to the frequency transient experienced during the starting of a RHR pump.

SR 3.8.1.20

This Surveillance demonstrates that the DG starting independence has not been compromised. Also, this Surveillance demonstrates that each engine can achieve proper speed within the specified time when the DGs are started simultaneously. The 10 year Frequency is consistent with the recommendations of Regulatory Guide 1.9 (Ref. 3).

This SR is modified by two Notes. The reason for Note 1 is to minimize wear on the DG during testing. The Note allows all DG starts to be preceded by an engine prelube period (which for DGs A through D includes operation of the lube oil system to ensure the DG's turbo charger is sufficiently prelubricated). For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine oil continuously circulated and engine coolant being circulated as necessary to maintain temperature consistent with manufacturer recommendations.

Note 2 is necessary to identify that this test does not have to be performed with DG E substituted for any DG. The allowance is acceptable based on the design of the DG E transfer switches. The transfer of control, protection, indication,

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

4000 V motors whose minimum operating voltage is specified as 90% or 3600 V. It also allows for voltage drops to motors and other equipment down through the 120 V level where minimum operating voltage is also usually specified as 90% of name plate rating. The specified maximum steady state output voltage of 4400 V is equal to the maximum operating voltage specified for 4000 V motors. It ensures that for a lightly loaded distribution system, the voltage at the terminals of 4000 V motors is no more than the maximum rated operating voltages. The specified minimum and maximum frequencies of the DG are 58.8 Hz and 61.2 Hz, respectively (not including DG E for SR 3.8.1.19). These values are equal to ± 2% of the 60 Hz nominal frequency and are derived from the recommendations found in Regulatory Guide 1.9 (Ref. 3). The lower Frequency Limit is necessary to support the LOCA analysis assumptions for low pressure ECCS pump flow rates. (Reference 12). For SR 3.8.1.19, Diesel Generator E requires a higher minimum steady state frequency, due to the frequency transient experienced during the starting of a RHR pump. The specified minimum and maximum frequencies for DG E for SR 3.8.1.19 are 59.3 Hz and 61.2 Hz, respectively.

The Surveillance Table has been modified by a Note, to clarify the testing requirements associated with DG E. The Note is necessary to define the intent of the Surveillance Requirements associated with the integration of DG E. Specifically, the Note defines that a DG is only considered OPERABLE and required when it is aligned to the Class 1E distribution system. For example, if DG A does not meet the requirements of a specific SR, but DG E is substituted for DG A and aligned to the Class 1E distribution system, DG E is required to be OPERABLE to satisfy the LCO requirement of 4 DGs and DG A is not required to be OPERABLE because it is not aligned to the Class 1E distribution system. This is acceptable because only 4 DGs are assumed in the event analysis. Furthermore, the Note identifies when the Surveillance Requirements, as modified by SR Notes, have been met and performed, DG E can be substituted for any other DG and declared OPERABLE after performance of two SRs which verify switch alignment. This is acceptable because the testing regimen defined in the Surveillance Requirement Table ensures DG E is fully capable of performing all DG requirements.

SR 3.8.1.1

This SR ensures proper circuit continuity for the offsite AC electrical power supply to the onsite distribution network and availability of offsite AC electrical power. The breaker alignment verifies that each breaker is in its

(continued)

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SURVEILLANCE REQUIREMENTS

SR 3.8.1.19 (continued)

engine coolant being circulated as necessary to maintain temperature consistent with manufacturer recommendations.

Note 2 is necessary to accommodate the testing regimen associated with DG E. See SR 3.8.1.11 for the Bases of the Note.

The reason for Note 3 is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. This Surveillance tests the applicable logic associated with Unit 2. The comparable test specified in the Unit 1 Technical Specifications tests the applicable logic associated with Unit 1. Consequently, a test must be performed within the specified Frequency for each unit. As the Surveillance represents separate tests, the Note specifying the restriction for not performing the test while the unit is in MODE 1, 2 or 3 does not have applicability to Unit 1. The Note only applies to Unit 2, thus the Unit 2 Surveillances shall not be performed with Unit 2 in MODE 1, 2 or 3.

For SR 3.8.1.19, Diesel Generator E requires a higher minimum steady state frequency, due to the frequency transient experienced during the starting of a RHR pump.

SR 3.8.1.20

This Surveillance demonstrates that the DG starting independence has not been compromised. Also, this Surveillance demonstrates that each engine can achieve proper speed within the specified time when the DGs are started simultaneously. The 10 year Frequency is consistent with the recommendations of Regulatory Guide 1.9 (Ref. 3).

This SR is modified by two Notes. The reason for Note 1 is to minimize wear on the DG during testing. The Note allows all DG starts to be preceded by an engine prelube period (which for DGs A through D includes operation of the lube oil system to ensure the DG's turbo charger is sufficiently prelubricated.) For the purpose of this testing, the DG's must be started from standby conditions, that is, with the engine oil continuously circulated and engine coolant being circulated as necessary to maintain temperature consistent with manufacturer recommendations.

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