

NRR-DRMAPEm Resource

From: Wentzel, Michael
Sent: Tuesday, May 21, 2019 9:29 AM
To: Frehafer, Ken
Cc: Mike.Snyder@fpl.com; Mack, Jarrett
Subject: Draft Request for Additional Information - St. Lucie Plant, Unit Nos. 1 and 2 Emergency Diesel Generator Surveillance Requirement Amendment Request (EPID L-2018-LLA-0574)

Ken,

By letter dated December 20, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18354A901), Florida Power & Light Company (FPL), requested amendments to Renewed Facility Operating License Nos. DPR-67 and NPF-16 for St. Lucie Plant, Unit Nos. 1 and 2 (St. Lucie 1 and 2), respectively. The proposed amendments would revise Technical Specification (TS) 3/4.8.1, "AC Sources-Operating." Specifically, the proposed changes would remove operating Mode restrictions for performance of TS Surveillance Requirements (SRs) pertaining to selected emergency diesel generators (EDGs).

The NRC's Electric Engineering Operating Reactors Branch (EEOB) staff reviewed the application and identified areas where it needs additional information to support its review. The draft request for additional information (RAI) is provided below.

Please let me know by May 28, 2019, if a clarification call is needed and if the draft RAI contains any proprietary information. If a clarification call is not needed, please let me know if FPL can respond to the RAI by June 27, 2019.

REQUEST FOR ADDITIONAL INFORMATION

LICENSE AMENDMENT REQUEST REGARDING

EMERGENCY DIESEL GENERATOR SURVEILLANCE REQUIREMENTS

ST. LUCIE PLANT, UNIT NOS. 1 AND 2

EPID L-2018-LLA-0574

FLORIDA POWER & LIGHT COMPANY

DOCKET NOS. 50-335 AND 50-389

EEOB-RAI-1

Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix A of Part 50, General Design Criterion (GDC) 17, "Electric Power Systems," states, in part, that an onsite electric power system and an offsite electric power system 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. The onsite electric power supplies shall have sufficient independence, redundancy, and testability to perform their safety functions assuming a single failure.

The St. Lucie 1 TS Bases 3/4.8 state, in part:

The ACTION requirements specified for the levels of degradation of the power sources provide restriction upon continued facility operation commensurate with the level of degradation. The OPERABILITY of the power sources are consistent with the initial condition assumptions of the accident analyses and are based upon maintaining at least one of each of the onsite A.C. and D.C. power sources and associated distribution systems OPERABLE during accident conditions coincident with an assumed loss of offsite power and single failure of the other onsite A.C. source. When one diesel generator is inoperable, there is an additional requirement to check that all required systems, subsystems, trains, components and devices (i.e., redundant features) that depend on the remaining OPERABLE diesel generator as a source of emergency power, are also OPERABLE, and that the steam-driven auxiliary feedwater pump is OPERABLE. These redundant required features are those that are assumed to function to mitigate an accident, coincident with a loss of offsite power, in the safety analysis, such as the emergency core cooling system and auxiliary feedwater system. Upon discovery of a concurrent inoperability of required redundant features the feature supported by the inoperable EDG is declared inoperable. Thus plant operators will be directed to supported feature TS action requirements for appropriate remedial actions for the inoperable required features.

The St. Lucie 2 TS Bases 3/4.8 contains a similar statement.

The proposed changes in Subsections 2.3.3, 2.3.4, and 2.3.5 of the license amendment request (LAR) add three NOTES to the several SRs. These NOTES states, in part,

[portions of] the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced.

Section 3.3 of the LAR states

the proposed change modifies the St. Lucie TS Bases to specify that (1) the assessment must consider the potential outcomes and transients associated with a failed surveillance, a successful surveillance, and a perturbation of the offsite or onsite system when tied together or when operated independently for the surveillance; as well as the operator procedures available to cope with these outcomes, (2) the assessment must be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the surveillance is performed in the normally restricted MODES, and (3) risk insights or deterministic methods may be used for the assessment.

It is not clear what criteria the assessment uses to determine whether the safety of the plant is maintained or enhanced. Please provide a discussion of what assessment will be used and what criteria the assessment would use to determine the safety of the plant is maintained or enhanced.

EEOB-RAI-2

Section 3.1 of the LAR states, in part:

In MODES 1 and 2, receipt of a LOOP [loss of offsite power] signal with an EDG operating in parallel with offsite power results in the diesel output breaker not immediately tripping and separating the EDG from off-site power. The closed EDG output breaker blocks the under-voltage protective relays that initiate load shed on the associated emergency bus. As the only source of power for loads connected to the emergency (safety) and normal (non-safety) 4.16 kV busses, the EDG under test will likely trip on over-current protection. Tripping on overcurrent protection generates a lockout signal which causes the EDG to shut down and trip open the output breaker. Once the output breaker opens, the load-shed 4.16 kV [kilovolt] under-voltage protective relays automatically unblock, detect the loss of voltage, separate the emergency bus from the normal supply bus, and isolate the emergency bus by stripping its loads. During this time, the EDG is prevented from starting and the output breaker is prevented from closing and supplying power to the emergency bus. However within minutes, operators stationed in the vicinity of the EDG would manually reset the lockout relay allowing the EDG to restart, and after

reaching nominal frequency and voltage, automatically closing the output breaker. The required safe shutdown loads would then be sequenced onto the emergency bus as designed.

It is not clear a) how long it takes for the EDG under test to manually restart and the load sequencer to complete the safe shutdown loads, and b) whether the duration of those actions can support the time required to mitigate the design basis accidents as assumed in the accident analysis. The NRC staff also notes that because the main generator/unit auxiliary transformer (UAT) is the normal power source for both safety buses, redundant trains are affected by connecting the EDG of one train to the UAT source. Under this operating mode, an undervoltage condition would not be detected on both Engineered Safety Feature buses if the generator trips or a LOOP occurs until the EDG is tripped on overcurrent (creates undervoltage condition).

Please provide a discussion of the following:

1. The design features (automatic functions) provided for the EDG during 24-hour endurance testing to ensure that the station would remain within its licensing basis in response to the most challenging design basis event during the at-power testing.
2. The time delays for the EDG to be connected to the safety buses with the EDG in isochronous mode to perform its safety functions for the following scenarios.
 - a) Turbine/generator trip followed by a LOOP
 - b) LOOP and turbine/generator trip (identify actions required to reset the trips and energize the safety buses and associated time delays)
 - c) LOOP and loss-of-coolant accident (LOCA)
 - d) LOOP and delayed LOCA

EEOB-RAI-3

The proposed change removes the simulated signal requirement from SR 4.8.1.1.2.e.3/5/8/9 (Unit 1) and SR 4.8.1.1.2.e.4/6/9/10 (Unit 2) to accommodate the proposed NOTE crediting unplanned events that satisfy the SR. The above SRs currently require simulating a LOOP or a LOOP in conjunction with an Engineered Safety Feature actuation signal. However, it is not clear how the subject SRs will be performed without an unplanned event and simulated signal during their surveillance frequencies. It appears that the subjected SRs will not be performed if there is no actual event during their surveillance frequencies. Please provide a discussion of how the proposed change would ensure that the above SRs are met.

EEOB-RAI-4

Section 3.4.2 of the LAR states, in part, that

The SR verifies the capability of the EDG fuel oil transfer pumps to transfer fuel oil from either diesel oil fuel storage tank (DOST) to the engine-mounted tanks of each EDG via normally isolated, cross-tie piping connecting the fuel oil transfer trains. The proposed change relocates the SR to licensee control. The SRs derive from RG 1.108, which established the recommendation for stations which rely on switching from one fuel oil system to another in order to satisfy the on-site 7-day (plus margin) fuel oil supply recommended ANSI N195-1976. Each fuel oil transfer pump is sized to supply fuel oil to both EDG sets simultaneously. Seismically qualified, safety-grade cross-tie piping lies between the suction and discharge headers to provide the capability of either pump to supply one EDG from both DOSTs. For St. Lucie Unit 2, TS 3/4.8.1.1 assures each DOST stores sufficient fuel to supply each EDG for 7-days. Hence the testing is unnecessary since reliance on the cross-tie piping is not needed to provide each EDG 7-days of fuel oil. For Unit 1, TS 3/4.8.1.1 assures each DOST stores sufficient fuel to supply either EDG for 7-days. Hence, both DOSTs and the cross-tie piping are relied upon to supply either EDG 7-days of fuel oil [emphasis added]. However, RG 1.108 has since been superseded by RG 1.9 which does not contain a fuel oil cross-connection testing requirement. Moreover, the cross-connection capability is a passive feature and cannot be changed without physical change to the station

in accordance with FPL's design control process. Hence, the EDG fuel oil transfer cross-connection testing is unnecessary to demonstrate EDG operability and can be relocated to plant procedural control whereby future changes will be subject to the regulatory controls of 10 CFR 50.59.

The NRC staff notes that:

- The subjected SRs require verification of the capability of the EDG fuel oil transfer pumps to transfer fuel oil from either diesel oil fuel storage tank (DOST) to the engine-mounted tanks of each EDG via cross-tie piping connecting the fuel oil transfer trains. The LAR only addresses the verification of the cross-connection capability and does not address the verification of the EDG fuel oil transfer pumps capability.
- Based on the LAR, Unit 2 the cross-tie piping is not needed to provide each EDG 7-days of fuel oil. Therefore, the proposed change appears to be reasonable. However, both DOSTs and the cross-tie piping of Unit 1 are relied upon to supply either EDG 7-days of fuel oil. Therefore, verifying the capability of the EDG fuel oil transfer pumps and the cross-tie piping is needed to support the verification of the Unit 1 EDGs' operability.

Please provide a discussion demonstrating how the capability of the Unit 1 EDG fuel oil transfer pumps and the cross-tie piping is verified to support the operability verification of the Unit 1 EDGs.

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