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SUBJECT: Forwards revised safety analysis for Emergency Power Sys Enhancement Project,concluding that proposed emergency diesel generator loading scheme & sequencer changes .acceptable.

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U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

Gentlemen:

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
Emergency Power System Enhancement Project
NRC TAC Nos. 69023 and 69024

By letter L-90-196 dated June 4, 1990, Florida Power & Light Company (FPL) submitted Supplement 2, Revision 0 to the Turkey Point Units 3 and 4 Emergency Power System (EPS) Enhancement Report entitled Safety Analysis. That supplement provided FPL's interim safety analysis for the enhanced EPS configuration.

FPL has revised the Safety Analysis Report to incorporate the results of the safety evaluation which concludes that the proposed EDG loading scheme and sequencer changes are acceptable. Attachment 1 provides Revision 1 to Supplement 2. Only the affected pages are included.

Should there be any questions regarding this information, please contact us.

Very truly yours,

T. F. Plunkett
Vice President
Turkey Point Plant Nuclear

TFP/OIH

Attachment

cc: Stewart D. Ebneter, Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant

Turkey Point Units 3 and 4
EPS Enhancement Project
NRC TAC Nos. 69203 and 69204

ATTACHMENT 1

FLORIDA POWER & LIGHT COMPANY

TURKEY POINT UNITS 3 AND 4

EMERGENCY POWER SYSTEM ENHANCEMENT REPORT

SUPPLEMENT NO. 2 SAFETY ANALYSIS REVISION 1

failure considerations), EDG loading is maintained within each EDG's continuous rating.

2. Required Engineered Safety Feature loads and desired plant investment loads are accommodated with the enhanced EPS configuration, while retaining the shared systems as originally designed.

In addition to the above, this Safety Analysis provides a discussion of the quantitative probabilistic evaluations performed for both the existing and the enhanced EPS 4.16 kV bus configurations. These evaluations (considering the AC power recovery capability of both the existing system capability and the inter-Unit crosstie provided by the enhanced design, and considering a conservative probability of operator error for either design), show that the 4.16 kV bus state failure frequency is reduced with the enhanced design. Hence overall plant safety as measured by the availability of emergency power to the plant's safety buses is improved under the enhanced EPS configuration.

Evaluations of the enhanced EPS have verified that the current design basis accident analyses as presented in the FSAR are not adversely impacted and remain valid under the enhanced EPS configuration (Reference 22).

This Safety Analysis is divided into eight sections. Following this introduction, Section 2.0 presents an overview of the enhanced EPS design and identifies any significant changes which have occurred since issuance of the June 23, 1988 EPS Enhancement Report. Section 3.0 provides analyses to show that the availability of power to required Engineered Safety Feature loads and desired plant investment loads is assured under the enhanced EPS configuration without exceeding the continuous rating of any EDG. Section 4.0 describes the enhanced sequencer design. Section 5.0 provides the results of Failure Modes and Effects Analyses (FMEAs) for postulated DBA single failures to show that under design basis conditions, the enhanced EPS will accomplish its required safety function. Section 6.0 provides the results of a quantitative probabilistic evaluation which compares the enhanced EPS to the existing EPS with respect to their ability to successfully provide power to the 4.16 kV buses. Section 7.0 then provides a summary and conclusion. References used in the Safety Analyses are listed in Section 8.0.

The times shown in 4.1 and 4.2 are total elapsed times from receipt of a LOOP signal. Note that an additional one second is required for the undervoltage relay to initiate sequencing subsequent to detection of the LOOP.

The assignment of a High Head Safety Injection Pump to each EDG in the enhanced design deletes about 305 kW from the second load block in each EDG loading, and the assignment of seven load blocks instead of four load blocks more evenly distributes the loading, and thus allows the voltage to recover more readily.

4.3 SEQUENCING LOADS ONTO BUSES FOR SI WITH OFFSITE POWER AVAILABLE

If an SI occurs with offsite power available, the enhanced EPS design utilizes the sequencers to sequence the loads onto the buses, with the same load blocks shown in Subsection 4.2 above, but without the 15-second delay for the EDGs to come up to speed and voltage. That is, the load block times shown in 4.2 occur 15 seconds earlier than for the SI with LOOP scenario. Note that any equipment operating before the receipt of the SI signal will remain operating. Since the Engineered Safety Features are loaded onto the buses earlier than for the limiting case of LOOP plus SI, the FSAR accident analyses (DBA with LOOP) remain the bounding analyses for accident consequences because of the delay to initiate the ESF equipment.

4.4 ENHANCED SEQUENCER DESIGN TO MEET SINGLE FAILURE CRITERIA

The new sequencers logic and loading blocks were designed to meet single failure criteria. The design of the load blocks for the enhanced EPS consider accident response requirements to ensure plant safety, engine loading performance and single failure. The repowering of loads from the existing MCC D (relabeled MCC 3D) and timing of the load blocks have been considered. The design includes several features which ensure that the consequences of component failures do not impact plant safety:

1. The swing load centers/motor control centers are isolated and not powered if the charging pump breaker fails to strip upon command.

2. Loading of the swing load center is delayed until after the seventh load block to accommodate any failure, during sequencing, which causes loss of the train to which the LC was initially aligned.

The loading sequence of the enhanced EPS is designed to ensure it does not adversely affect the existing FSAR accident analyses. The addition of new load blocks and the delayed loading (compared to the existing loading design) of certain ESF equipment have been considered in the design. At a minimum, all of the equipment assumed in these analyses is available and loaded on the EDGs. With the EDG load margin available with the enhanced EPS, the capability exists to power additional loads. An evaluation (Reference 22) has been completed which verified that the proposed changes to the EDG loading scheme do not adversely impact the current design basis accident analyses for Turkey Point Units 3 and 4.

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16. NUREG/CR-2728, "Interim Reliability Evaluation Program Procedures Guide" (IREP), January 1983.

17. NUREG/CR-4550, Analysis of Core Damage Frequency from Internal Events: Methodology Guidelines, Volume 1, September 1987.

18. Westinghouse "Quantitative Evaluation of Enhanced Emergency Diesel Generator Configuration for Turkey Point Nuclear Power Units 3 & 4 - Quick Look Assessment", December 1988.

19. FPL Letter to NRC, L-86-256 dated June 16, 1988, "Reportable Event 85-42 (Revision 1), Turkey Point Unit 3, Date of Event: December 14, 1985 (original date), Emergency Diesel Generator Loading".

20. Westinghouse Letter to FPL, FPL-90-611 dated May 7, 1990, "Assessment for Proposed Diesel Loading Schemes"

21. Ebasco letter No. PTP-90-139 Transmittal of 4kVAC, 480VAC, and 125V dc FMEAs to FPL dated February 15, 1990.

22. Westinghouse letter to FPL, FPL-91-509, dated January 16, 1991, "Safety Evaluation for Diesel Loading Scheme" (SECL-90-365, Rev. 1)".