SUBSTANTIAL SAFETY HAZARD EVALUATION TURKEY POINT UNITS 3 & • (PTPN) EMERGENCY DIESEL GENERATOR LOAD EVALUATION

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POWER PLANT ENGINEERING DEPARTMENT FLORIDA POWER & LIGHT COMPANY

JUNO BEACH, FLORIDA

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Approved: F. G. Flugger FI

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Introduction

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The evaluation hereinafter is responsive to the Nuclear Energy Departments' request (REA No. TPN-86-011) to evaluate Emergency Diesel Generator (EDG) loadings with regard to their potential reportability under 10 CFR 21. Prior to December 1985, a potential existed for placing loads on the EDGs that exceeded the PTPN Technical Specification auto-connect limit of 2750 kW; the Emergency Operating Procedure (EOP) limit of 2950 kW; and the 1/2 Hour Exceptional Rating of 3050 kW. This evaluation assesses whether or not these limits could have been exceeded, and whether a substantial safety hazard (as defined by 10 CFR 21) existed prior to December 1985.

Evaluation

A load evaluation, conducted in December 1985, indicated that the loads on the EDG for the case with one EDG in operation were as follows:

Auto-Connect	2747 kW
1-30 minutes	2875 kW
30 minutes - I hour	2794 kW

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The December 1985 evaluation was based on the then current estimate of total pump kW on the EDG. Early in 1986, inplant testing of the ICW and CCW pumps indicated that these pumps would operate at higher flows than their design values. Additional inplant testing and analysis confirmed that this results in a nigher kW per pump than was utilized in the December 1985 evaluation. The total pump kW assumed in December 1985 and the value currently expected compare as follows:

	12/85	Expected	Delta
0 - 30 minutes	2211 kW	2236 kW	+45
30 minutes - 1 hour	1931 kW	:964 kW	+33

This comparison confirms the fact that the pump loads used in the December 1985 analysis were underestimated. Had the current expected pump kW values been available and included in the December 1985 evaluation, the Technical Specification auto-connect limit of 2750 kW would have been exceeded.

The current two-EDGs running load evaluation indicates that the maximum auto-connect load based on expected pump kW is 2599 kW. This evaluation assumes the implementation of specific plant changes that delete the auto-connect feature of the Normal Containment Coolers (NCC) and certain boric acid-related loads. Prior to December 1985, these loads would have auto-connected to the EDG. Thus, they must be added to the current 2599 kW

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to December 1985. The following loads must be added:

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NCCs 128 kW L X Lank Heaters 30 kW BA Transfer Pumps 54 kW 212 kW

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As a result, the auto-connect load prior to December 1985 could have been 2811 kW for the two EDG case. Therefore, the 2750 kW auto-connected load limitation could also have been exceeded for the two (2) EDG case.

Prior to December 1985, the Instrument Air Compressors and certain turbine related loads could have auto-connected subsequent to Safety Injection Signal (SIS) reset without the operators' knowledge. These loads could have raised the EDG load as follows:

1ACs 186 kW

Turbine-Related Loads 178 kW

In November 1983, a Plant Change Modification was installed to prevent the motor-driven fire pump from auto-connecting to the EDG. Starting of the fire pump could have placed an additional 210 kW load on the EDG.

PC/Ms 84-84 and 84-85 for Control Rod Drive Mechanism cooling fan power source modifications were implemented such that they could automatically connect to the EDGs upon loss of offsite power (REA No. TPN 86-11). This potential existed on PTPN 4 from May 24, 1984 to June 22, 1985, and on PTPN 3 from February 17, 1985 to June 22, 1985. (PTPN 3 was in a refueling outage from March 30, 1985 to July 17, 1985). The CRDMs on the hot shutdown unit could potentially add 53 kW to the EDG.

The various loads cited above could have auto-connected to the EDG in either the 1-30 minute or 30 minute-1 hour load intervals. All of these loads may not add concurrently. The turbine loads engage as the turbine rolls to a stop, and the IACs and fire pumps engage on low header pressure. This notwithstanding, there is no physical reason known that would preclude their concurrent autoconnection to the EDG. Additionally, the operator would not have prior knowledge of these auto-load additions. Thus, success of any operator diagnostic and corrective actions to mitigate a potential EDG overloading condition is questionable.

Based on the above, there was a potential for loading the EDGs to the following levels prior to November 1985:

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	1-30 Minutes	30 Minutes - 1 Hour
December 1985 Estimate	2875 kW	2794 kW
Increase in Pump kW	+45	+33
LACS	+186	+186
Turbine Loads	+178	+178
Fire Pump	+210	+210
CRDM Fans	+50	+30
	3544 kW	3451 kW

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These potential EDG load levels exceed the highest FSAR value of 3050 kW by a substantial margin. There is no test data available to demonstrate that the EDG could accept these load levels.

Conclusions

Based on the above, the following can be concluded with regard to EDG loadings prior to November 1985:

- The 2750 kW Technical Specification auto-connect limit could have been exceeded.
- The FSAR 3050 kW 1/2 hour exceptional rating could have been exceeded.
- EDG loadings could have reached levels that could trip the EDG.

Since the Technical Specification limit could have been exceeded and the probability of malfunction of the EDG was increased, operation prior to November 1985 involved an unreviewed safety question.

Since the one (1) operating EDG could have been overloaded to the point where it would trip, operation prior to November 1985 involved a substantial safety hazard.

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