UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	Docket Nos. 50-250 OLA-1 50-251 OLA-1
FLORIDA POWER AND LIGHT COMPANY	
(Turkey Point Nuclear Generating Units 3 & 4)	ASLBP No. 84-496-03 LA

LICENSEE'S MOTION FOR
SUMMARY DISPOSITION OF
INTERVENORS' CONTENTION (d)

Florida Power & Light Company ("FPL" or "Licensee") moves, pursuant to 10 C.F.R. § 2.749, for summary disposition of Intervenors' Contention (d). It is Licensee's position, for the reasons set forth herein, that there is no genuine issue as to any fact material to Contention (d), and that FPL is entitled to a decision in its favor on the Contention as a matter of law. This motion is supported by the

(1) Affidavit of Edward A. Dzenis, attached hereto;

(2) Licensee's Statement of Material Facts as to which There Is No Genuine Issue To Be Heard with respect to Intervenors' Contention (d), dated August 10, 1984; and

(3) Licensee's Memorandum of Law in Support of Motions for Summary Disposition of Intervenors' Contentions (b) and (d), dated August 10, 1984.

I. BACKGROUND

Intervenors' Contention (d) was admitted by the Licensing Board Prehearing Conference Order, dated May 16, 1984. Thereafter, on May 29, 1984, Licensee propounded interrogatories to Intervenors. These were answered, in accordance with a July 3, 1984 Board Order granting an unopposed motion for extension of time, in Intervenors' Response to Interrogatories Propounded by Florida Power & Light Company, dated July 10, 1984 ("Intervenors' Response to Interrogatories"). There are no outstanding discovery requests, and Intervenors' Contention (d) is ripe for summary disposition.

II. DISCUSSION

Intervenors' Contention (d) reads as follows:

> The proposed decrease in the departure in the nucleate boiling ratio (DNBR) would significantly and adversely affect the margin of safety for the operation of the reactors. The restriction of the DNBR safety limit is intended to prevent over-heating of the fuel and possible cladding perforation, which would result in the release of fission products from the fuel. If the minimum allowable DBNR [sic] is reduced from 1.3 to 1.7 [sic; read 1.17] as proposed, this would authorize operation of the fuel much closer to the upper boundary of the nucleate boiling regime. Thus, the safety margin will be significantly reduced. Operation above the boundary of the nucleate boiling regime

> could result in excessive cladding temperatures because of the departure from the nucleate boiling (DNB) and the resultant sharp reduction in heat transfer coefficient. Thus, the proposed amendment will both significantly reduce the safety margin and significantly increase the probability of serious consequences from an accident.

Amended Petition To Intervene, pp. 5-6, Jan. 25, 1984.

10 C.F.R. Part 50, Appendix A requires, in General Design Criterion (GDC) 10, "Reactor Design," that "the reactor core and associated equipment, control, and protection system shall be designed with appropriate margin to assure that specified acceptable fuel design limits are not exceeded during any condition of normal operation, including the effect of anticipated operational occurrences. With respect to fuel performance, the Nuclear Regulatory Commission ("NRC") Staff has prescribed that these requirements can be met through the use of heat trar fer correlations based on experimental data in safety analyses and in establishing technical specifications which assure with 95% confidence that there is a 95% probability that fuel design limits, including departure from nuclear boiling ("DNB"), will not be exceeded. See attached Affidavit of Edward A. Dzenis, pp. 2-3 ("Dzenis Affidavit").

In a reactor, operation at and beyond the DNB point is avoided by providing that the heat flux at which DNB commences, called the critical heat flux ("CHF"), is always higher than that actually existing at the fuel rod surface. Specifically,

control is maintained in terms of a number called DNB ratio ("DNBR"), which is:

$$DNBR = \frac{\text{Critical Heat Flux}}{\text{Actual Heat Flux}} = \frac{CHF}{AHF}$$

Defining a limit on the minimum DNBR, corresponding to a 95% probability that CHF will not be reached with a 95% confidence level for a particular DNB correlation, provides the requisite assurance that adverse heat transfer conditions will not be reached in the reactor core. Dzenis Affidavit, pp. 4-6.

Turkey Point Units 3 and 4 previously operated with Westinghouse 15 x 15 low-parasitic ("LOPAR") fueled cores. Beginning with Turkey Point Unit 3 cycle 9 and Unit 4 cycle 10 reloads, both units were refueled with 15 x 15 optimized fuel assembly ("OFA") regions supplied by Westinghouse. Future core loadings will range from approximately a 1/3 OFA-2/3 LOPAR mixed core to eventually an all OFA core. Dzenis Affidavit, p. 2.

As indicated earlier, reactors must be designed such that there is adequate heat transfer from the fuel rods to cooling water so that fuel damage is not expected to occur during normal operation, including the effect of anticipated operational occurrences. The NRC has specified that this design basis is met by providing assurance with 95% confidence that there will be at least a 95% probability that the hottest fuel rod in the core does not experience DNB. Specific events which must meet this DNB design basis are uncontrolled rod cluster control assembly (RCCA) withdrawal from a sub-critical condition; uncontrolled RCCA withdrawal at power;

RCCA drop; chemical and volume control system malfunction; startup of an inactive reactor coolant loop; reduction in feedwater enthalpy incident; excessive load increase incident; loss of reactor coolant flow; loss of external electrical load; loss of normal feedwater; loss of offsite A.C. power; and rupture of a steam pipe (valve malfunction). Dzenis Affidavit, pp. 7-8.

Two Westinghouse correlations approved by the NRC for determining CHF have been used for Turkey Point Units 3 and 4. The L-grid DNB correlation, which is based on an earlier W-3 correlation, is approved for use in the analysis of LOPAR fuel. The WRB-1 DNB correlation is approved for use in the analysis of OFA type fuel. Dzenis Affidavit, p. 4.

The minimum DNBR acceptance limit required with the use of L-grid correlation has been statistically determined to be 1.30. This acceptance limit accounts for uncertainties involved in the prediction of DNB with the L-grid correlation. Whereas the L-grid correlation is based on single tube data, however, the WRB-1 correlation is based on data from more sophisticated rod bundle tests. The fact that the WRB-1 correlation is a better predictor of DNB for actual nuclear reactor geometries is shown by the result that the minimum DNBR acceptance limit required with the use of the WRB-1 correlation is only 1.17. The WRB-1 acceptance limit was calculated using the same statistical methods as were used in calculating the L-grid DNBR acceptance limit. The 1.17 DNBR acceptance limit

has been accepted by the NRC as meeting the DNB design basis when using the WRB-1 correlation. Dzenis Affidavit, p. 9.

It is important to recognize that the difference in minimum DNBR for the two correlations in no way implies a reduction in the safety margin of a nuclear reactor. This is because the DNB design basis, i.e., 95% probability with a 95% confidence level that the hottest rod does not experience DNB, remains unchanged. Rather, it reflects a natural progression in the understanding of this phenomenon as more data is obtained. Dzenis Affidavit, p. 9.

Analyses performed for Turkey Point in support of amendments first noticed in the Federal Register on October 7, 1983 -- providing, among other things, for increasing the hot channel factor $F_{\Delta H}$ limit -- demonstrated that the minimum calculated DNBR values for both fuel types are above the DNBR acceptance limit. This was verified for the events which must meet the DNB design basis.*/ Dzenis Affidavit, p. 10.

In addition, with respect to these amendments, it should be emphasized that -- although $F_{\Delta H}$ does have a direct impact on calculated DNBR values -- the change in $F_{\Delta H}$ does not reduce

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*/ On pages 5 and 6 of the Intervenors' Response to Interrogatories it is contended that "the 'proposed decrease in the departure in the nucleate boiling ratio' would result in failure to meet the ECCS acceptance criteria of 10 C.F.R. 50.46," including certain portions of Appendix K. DNBR limits, however, do not apply to loss-of-coolant (LOCA) analyses and ECCS performance criteria. See Dzenis Affidavit, pp. 7-8. In fact, critical heat flux and departure from nucleate boiling are fully expected during a design basis LOCA. See, e.g., 10 C.F.R. Part 50 Appendix K, I.C.5.

DNBR values to a point where they are below the acceptance limit. Previous DNB analyses (prior to the $F_{\Delta H}$ amendment) showed that the minimum DNBR values for both transient and normal operation not only met the DNB acceptance limit, but were actually greater than the acceptance limit by an amount which may be called the "DNBR Available for Design Flexibility." The NRC design basis that there is a 95% probability with 95% confidence that the hottest rod does not undergo DNB defines the safety margin. Although increasing $F_{\Delta H}$ has resulted in reduction in "DNBR Available for Design Flexibility," the full safety margin has been maintained at Turkey Point. Dzenis Affidavit, pp. 10-11.

In sum, with respect to the Turkey Point DNB analysis performed in support of the amendments first noticed on October 7, 1984, including a change in $F_{\Delta H}$:

A. Appropriate NRC-approved methodology has been used in all analyses. Computer programs and DNB correlations used in the analysis were appropriate and NRC accepted.

B. There has been no reduction in safety margin. The DNB design basis requires a 95% probability with 95% confidence that the hottest rod does not undergo DNB. This design basis has been met both for the Turkey Point LOPAR and OFA fuel by meeting their DNBR limits of 1.3 and 1.17, respectively.

C. Results of the DNB analysis show that all applicable regulatory requirements have been satisfied. Dzenis Affidavit, p. 11.

III. CONCLUSION

Based upon the foregoing, the attached Affidavit of Edward A. Dzenis, Licensee's Statement of Material Facts as to which There Is No Genuine Issue To Be Heard with respect to Intervenors' Contention (d), and Licensee's Memorandum of Law in Support of Motions for Summary Disposition of Intervenors' Contentions (b) and (d), there exists no genuine issue of material fact and this motion for summary disposition should be granted and Intervenors' Contention (d) should be decided in Licensee's favor.

Respectfully submitted,

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