UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

LICENSEE'S STATEMENT OF
MATERIAL FACTS AS TO
WHICH THERE IS NO
GENUINE ISSUE TO BE
HEARD WITH RESPECT TO
INTERVENORS' CONTENTION (d)

Pursuant to requirements of 10 C.F.R. § 2.749(a), Florida Power & Light Company (Licensee) offers the following statement of material facts as to which there is no genuine issue to be heard in support of "Licensee's Motion For Summary Disposition Of Intervenors' Contention (d)."

(1) Intervenors' Contention (d) states:

> The proposed decrease in 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.

(2) 10 CFR Part 50, Appendix A requires, in General Design Criterion (GDC) 10, "Reactor Design," that "the reactor core and associated coolant, control, and protection systems 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 effects 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 transfer 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 nucleate boiling (DNB), will not be exceeded. Affidavit of Edward A. Dzenis, pp. 2-3, August 8, 1984 (included as Attachment to "Licensee's Motion for Summary Disposition of Intervenors' Contention

(d)," August 10, 1984) [hereinafter cited as Dzenis Affidavit].

(3) The reactor is kept from operating near the DNB point by ensuring that the heat flux in the reactor is always below the heat flux at which DNB commences, called the critical heat flux (CHF). For this purpose a number, called DNB ratio (DNBR), is defined as:

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

In this ratio, CHF is the critical heat flux computed as a function of position along the hottest coolant channel from the appropriate DNB correlation, and AHF is the actual surface heat flux at the same position along the channel. Defining a limit on the minimum DNBR, corresponding to a 95% probability that CHF will not be reached with a 95% confidence level for any particular DNB correlation, provides the requisite assurance that adverse heat transfer conditions will not be reached anywhere in the reactor. Dzenis Affidavit, pp. 4-6.

(4) Numerous correlations have been developed in the nuclear power industry to predict the occurrence of CHF for various operating conditions and core geometries. These correlations are developed by using the results of tests performed at reactor operating conditions to determine relationships between CHF and various engineering parameters such as coolant temperature, pressure and flow velocity. Dzenis Affidavit, p. 6.

(5) Turkey Point Units 3 and 4 previously operated with Westinghouse 15x15 low-parasitic (LOPAR) fueled cores. Starting with the Turkey Point Unit 3 Cycle 9 and Unit 4 Cycle 10 reloads, both units were refueled with 15x15 optimized fuel assembly (OFA) regions supplied by the Westinghouse Electric Corporation. Future core loadings will range from approximately a 1/3 OFA-2/3 LOPAR mixed core to eventually an all OFA fueled core. Dzenis Affidavit, p. 2.

(6) 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 older 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. 6.

(7) Reactors must be designed in such a way that there is adequate transfer of heat from the fuel rods to the cooling water so that fuel damage is not expected to occur during normal operation, including the effects of anticipated operational occurrences. The NRC has specified that this design basis is met by providing assurance that with 95% confidence 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 subcritical condition; uncontrolled RCCA withdrawal at power; RCCA drop; chemical and volume control system mal-

function; 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.

(8) The DNB design basis is met by specifying a minimum DNBR acceptance limit. The reactor is then designed in such a way that the minimum value of DNBR at any point in the core during normal operation, including anticipated operational occurrences, will be greater than this acceptance limit. Dzenis Affidavit, p. 8.

(9) 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. Dzenis Affidavit, p. 9.

(10) Whereas the L-grid correlation is based on single tube data, the WRB-1 correlation is based strictly on 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.

(11) The change in minimum DNBR for the different 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 demonstrates a natural progression in the understanding of this phenomenon as more data is obtained. Dzenis Affidavit, p. 9.

(12) 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.

(13) Although $F_{\Delta H}$ does have a direct impact on calculated DNBR values, the change in $F_{\Delta H}$ does not reduce 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 a reduction in "DNBR Available for Design Flexibility," the full safety margin has been maintained at Turkey Point. Dzenis Affidavit, pp. 10-11.

(14) 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 approved.

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 respective DNBR limits of 1.30 and 1.17.

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

Respectfully submitted,

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Dated: August 10, 1984