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AUTH.NAME	AUTHOR AFFILIATION
UHRIG,R.E.	Florida Power & Light Co.
RECIP.NAME	**RECIPIENT AFFILIATION**
EISENHUT,D.G.	Division of Licensing

SUBJECT: Forwards addl clarification of proposed license amends re base load & radial burndown, in response to NRC questions. Affidavit encl. Encl withheld (ref 10CFR2.790).

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FLORIDA POWER & LIGHT COMPANY

January 28, 1982
L-82-36

WITHOLD ATTACHMENT 1 FROM PUBLIC DISCLOSURE

RECEIVED
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US NUCLEAR REGULATORY COMMISSION
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Office of Nuclear Reactor Regulation
Attention: Mr. Darrell G. Eisenhut, Director
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Eisenhut:

Re: Turkey Point Units 3 & 4
Docket Nos. 50-250 & 50-251
Proposed License Amendments
Base Load and Radial Burndown

In response to questions from the NRC staff, the following attachments are provided for the purpose of clarifying the subject license amendment submittal (FPL letter L-81-492 dated November 23, 1981).

1. Attachment 1 provides additional information supporting the statistical independence of $F_Q^{P,BU}$, and is proprietary.

2. Attachment 2 is the non-proprietary version of Attachment 1.

3. Attachment 3 replaces the proposed Technical Specification page 3.2-3a in our initial submittal.

4. Attachment 4 replaces the proposed Technical Specification page 3.2-4 in our initial submittal.

Please notify us if you have any further questions on our amendment request.

Very truly yours,

Jack E. Vessely for

Robert E. Uhrig
Vice President
Advanced Systems & Technology

REU/PLP/mbd

Attachments

cc: Mr. J.P. O'Reily, Director, Region II
Harold F. Reis, Esquire

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AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

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COUNTY OF ALLEGHENY:

Before me, the undersigned authority, personally appeared Robert A. Wiesemann, who, being by me duly sworn according to law, deposes and says that he is authorized to execute this Affidavit on behalf of Westinghouse Electric Corporation ("Westinghouse") and that the averments of fact set forth in this Affidavit are true and correct to the best of his knowledge, information, and belief:

Robert A. Wiesemann

Robert A. Wiesemann, Manager
Licensing Programs

Sworn to and subscribed before me this 12th day of May 1976.

Genevieve Kish

Notary Public

GENEVIEVE KISH, NOTARY PUBLIC
MONROEVILLE BOROUGH
ALLEGHENY COUNTY
MY COMMISSION EXPIRES JULY 22, 1976

(1) I am Manager, Licensing Programs, in the Pressurized Water Reactor Systems Division, of Westinghouse Electric Corporation and as such, I have been specifically delegated the function of reviewing the proprietary information sought to be withheld from public disclosure in connection with nuclear power plant licensing or rule-making proceedings, and am authorized to apply for its withholding on behalf of the Westinghouse Water Reactor Divisions.

(2) I am making this Affidavit in conformance with the provisions of 10 CFR Section 2.790 of the Commission's regulations and in conjunction with the Westinghouse application for withholding accompanying this Affidavit.

(3) I have personal knowledge of the criteria and procedures utilized by Westinghouse Nuclear Energy Systems in designating information as a trade secret, privileged or as confidential commercial or financial information.

(4) Pursuant to the provisions of paragraph (b)(4) of Section 2.790 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.

(i) The information sought to be withheld from public disclosure is owned and has been held in confidence by Westinghouse.

(ii). The information is of a type customarily held in confidence by Westinghouse and not customarily disclosed to the public. Westinghouse has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The application of that system and the substance of that system constitutes Westinghouse policy and provides the rational basis required.

Under that system, information is held in confidence if it falls in one or more of several types, the release of which might result in the loss of an existing or potential competitive advantage, as follows:

(a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by any of Westinghouse's competitors without license from Westinghouse constitutes a competitive economic advantage over other companies.

(b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage, e.g., by optimization or improved marketability.

(c) Its use by a competitor would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing a similar product.

(d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Westinghouse, its customers or suppliers.

(e) It reveals aspects of past, present, or future Westinghouse or customer funded development plans and programs of potential commercial value to Westinghouse.

(f) It contains patentable ideas, for which patent protection may be desirable.

(g) It is not the property of Westinghouse, but must be treated as proprietary by Westinghouse according to agreements with the owner.

There are sound policy reasons behind the Westinghouse system which include the following:

(a) The use of such information by Westinghouse gives Westinghouse a competitive advantage over its competitors. It is, therefore, withheld from disclosure to protect the Westinghouse competitive position.

(b) It is information which is marketable in many ways. The extent to which such information is available to competitors diminishes the Westinghouse ability to sell products and services involving the use of the information.

(c) Use by our competitor would put Westinghouse at a competitive disadvantage by reducing his expenditure of resources at our expense.

(d) Each component of proprietary information pertinent to a particular competitive advantage is potentially as valuable as the total competitive advantage. If competitors acquire components of proprietary information, any one component may be the key to the entire puzzle, thereby depriving Westinghouse of a competitive advantage.

(e) Unrestricted disclosure would jeopardize the position of prominence of Westinghouse in the world market, and thereby give a market advantage to the competition in those countries.

(f) The Westinghouse capacity to invest corporate assets in research and development depends upon the success in obtaining and maintaining a competitive advantage.

(iii) The information is being transmitted to the Commission in confidence and, under the provisions of 10 CFR Section 2.790, it is to be received in confidence by the Commission.

(iv) The information is not available in public sources to the best of our knowledge and belief.

(v) The proprietary information sought to be withheld in this submittal is that which is appropriately marked in Attachment II to Commonwealth Edison Company letter, Pliml to Purple dated May 4, 1976, concerning reload safety and licensing. This information is being provided in support of a reload review of Commonwealth Edison's Zion Station Unit 1, plant for cycle 2 operation. This information is required per NRC Branch Technical Position CPB 4.3-1 "Westinghouse Constant Axial Offset Control (CAOC)" since the applicant proposes cycle 2 CAOC operation for $F_Q = 2.25$.

This information enables Westinghouse to:

(a) Justify the design basis for the fuel

(b) Assist its customers to obtain licenses

(c) Meet warranties

Further, this information has substantial commercial value as follows:

(a) Westinghouse sells the use of the information to its customers for purposes of meeting NRC requirements for licensing documentation.

(b) Westinghouse uses the information to perform and justify analyses which are sold to customers.

(c) Westinghouse uses the information to sell nuclear fuel and related services to its customers.

Public disclosure of this information is likely to cause substantial harm to the competitive position of Westinghouse in selling nuclear fuel and related services.

Westinghouse retains a marketing advantage by virtue of the knowledge, experience and competence it has gained through long involvement and considerable investment in all aspects of the nuclear power generation industry. In particular Westinghouse has developed a unique understanding of the factors and parameters which are variable in the process of design of nuclear fuel and which do affect the in service performance of the fuel and its suitability for the purpose for which it was provided.

In all cases that purpose is to generate energy in a safe and efficient manner while enabling the operating nuclear generating station to meet all regulatory requirements affected by the core loading of nuclear fuel. Confidence in being able to accomplish this comes from the exercise of judgement based on experience, in the application of empirically derived models based on prior data and in the use of proven analytical models to simulate behavior of the fuel in normal operation and under hypothetical transients.

Thus, the essence of the competitive advantage in this field lies in an understanding of which analyses should be performed and in the methods and models used to perform these analyses. A substantial part of this competitive advantage will be lost if the competitors of Westinghouse are able to use the results of the analyses in the attached document to normalize or verify their own methods or models or if they are able to claim an equivalent understanding by demonstrating that they can arrive at the same or similar results. Its use by a competitor would reduce his expenditure of resources or improve his competitive position in the design and licensing of a similar product.

This information is a product of Westinghouse design technology. As such, it is broadly applicable to the sale and licensing of fuel in pressurized water reactors. The development of this information is the result of many years of Westinghouse effort and the expenditure of a considerable sum of money. While the analyses for this specific application were not unique, in order for competitors of Westinghouse to duplicate this information would require the investment of substantially the same amount of effort and expertise that Westinghouse possesses and which was acquired over a period of more than fifteen years and by the investment of millions of dollars. Over the years, this has included the development of heat transfer codes, nuclear analysis codes, transient analysis codes, core and system simulation methods and an experimental data base to support them.

Further the deponent sayeth not.

WITHOLD ATTACHMENT 1 FROM PUBLIC DISCLOSURE

ATTACHMENT 1

WESTINGHOUSE PROPRIETARY CLASS 2

STATISTICAL INDEPENDENCE OF $F_Q^{P,BU}$ FROM OTHER UNCERTAINTY COMPONENTS

As an example of the assessment that went into concluding $F_Q^{P,BU}$ to be independent from the other uncertainty components (and visa-versa), the correlation between manufacturing variability (enrichment and density) on power distribution and the power sensitivity going from 90% to 100% of rated power will be discussed.

The maximum impact of manufacturing variability on the Hot Full Power (HFP) power distribution has been shown to be 3% ($F_Q^E = 1.03$) on a 95% probability/95% confidence statistical basis. If the same manufacturing variability study were to be done at 90% power rather than at HFP, then very close to the same 3% impact would result. Conversely, since the change in power distribution from 90% to 100% power is caused by feedback mechanisms, the [2.9%]^{a,c}, change on power distribution[($F_Q^P = 1.029$]^{a,c}, would not be significantly influenced by the presence of manufacturing variability. From the above one would conclude that the impact of manufacturing variability on power distribution and the sensitivity of the power distribution due to an increase in power are independent or very close to independent.

A similar assessment of the relationship between F_Q^E and $F_Q^{P,BU}$, between F_N^U and $F_Q^{P,BU}$, and between F_Q^B and $F_Q^{P,BU}$ leads to the conclusion that the uncertainty components are independent or very close to independent from each other. There are several conservatisms included in the calculation of $F_Q^{P,BU}$. First F_Q^P and F_Q^{BU} were multiplied together (assumed dependent) where in fact they are likely to be independent to a large extent. Second, the resultant number was rounded up from [3.7%]^{a,c} to 4.0%. Finally, 4% can conservatively be given a 95% probability/95% confidence interpretation since this value represents the maximum loss in power capability over all elevations, for all burnups for two different types of fuel management (annual and 18-month cycles). In other words at most elevations, for most times in life, F_Q decreased or increased less than 4% when going from 90% to 100% power and/or going from a nominal burnup to the nominal burnup plus 1000 MWD/MTU. Any small correlation which exists between uncertainty components is adequately addressed by the above conservatisms.

ATTACHMENT 2

STATISTICAL INDEPENDENCE OF $F_Q^{P,BU}$ FROM OTHER UNCERTAINTY COMPONENTS

As an example of the assessment that went into concluding $F_Q^{P,BU}$ to be independent from the other uncertainty components (and visa-versa), the correlation between manufacturing variability (enrichment and density) on power distribution and the power sensitivity going from 90% to 100% of rated power will be discussed.

The maximum impact of manufacturing variability on the Hot Full Power (HFP) power distribution has been shown to be 3% (F_Q^E = 1.03) on a 95% probability/95% confidence statistical basis. If the same manufacturing variability study were to be done at 90% power rather than at HFP, then very close to the same 3% impact would result. Conversely, since the change in power distribution from 90% to 100% power is caused by feedback mechanisms, the [ ]^{a,c} change on power distribution[ ]^{a,c} would not be significantly influenced by the presence of manufacturing variability. From the above one would conclude that the impact of manufacturing variability on power distribution and the sensitivity of the power distribution due to an increase in power are independent or very close to independent.

A similar assessment of the relationship between F_Q^E and $F_Q^{P,BU}$, between F_N^U and $F_Q^{P,BU}$, and between F_Q^B and $F_Q^{P,BU}$ leads to the conclusion that the uncertainty components are independent or very close to independent from each other. There are several conservatisms included in the calculation of $F_Q^{P,BU}$. First F_Q^P and F_Q^{BU} were multiplied together (assumed dependent) where in fact they are likely to be independent to a large extent. Second, the resultant number was rounded up from [ ]^{a,c} to 4.0%. Finally, 4% can conservatively be given a 95% probability/95% confidence interpretation since this value represents the maximum loss in power capability over all elevations, for all burnups for two different types of fuel management (annual and 18-month cycles). In other words at most elevations, for most times in life, F_Q decreased or increased less than 4% when going from 90% to 100% power and/or going from a nominal burnup to the nominal burnup plus 1000 MWD/MTU. Any small correlation which exists between uncertainty components is adequately addressed by the above conservatisms.

operation (Section 3.2.6.a(3)) or Radial Burndown operation (Section 3.2.6.a(4)). If $[F_Q]_P$, as predicted by approved physics calculations, is less than $[F_Q]_L$ (i.e.: $P_T > 1.00$), operation in accordance with Augmented Surveillance (MIDS)(Sections 3.2.6.a(2)) Baseload Operation (Section 3.2.6.a(3)) or Radial Burndown Operation (Section 3.2.6.a(4)) is not required.

For operation at power levels between P_T and 1.00, the following shall apply when not in baseload or radial burndown operation:

1. The axial power distribution shall be measured by MIDS when the thermal power is in excess of P_T such that the limit of $[F_Q]^L/P$ times Figure 3.2-3 is not exceeded. $F_j(Z)$ is the normalized axial power distribution from thimble j at core elevation (Z).

   (1) If $F_j(Z)$ exceeds $[F_j(Z)]_S$ as defined in the bases by $\leq$ 4%, immediately reduce thermal power one percent for every percent by which $[F_j(Z)]_S$ is exceeded.

   (2) If $F_j(Z)$ exceeds $[F_j(Z)]_S$ by > 4% immediately reduce thermal power below P_T. Corrective action to reduce $F_j(Z)$ below the limit will permit return to thermal power not to exceed current P_L as defined in the bases.

2. $F_j(Z)$ shall be determined to be within limits by using MIDS to monitor the thimbles required per specification 6.a.2-3 below at the following frequencies:

   (1) At least once every 24 hours, and

   (2) Immediately following and as a minimum at 2, 4 and 8 hours following the events listed below and every 24 hours thereafter

      1) Raising the thermal power above P_T, or
      2) Movement of control-bank D more than an accumulated total of 15 steps in any one direction.

3. MIDS shall be operable when the thermal power exceeds P_T with:

   (1) At least two thimbles available for which R_j and $_j$ as defined in the bases have been determined.

   (2) At least two movable detectors available for mapping $F_j(Z)$.

   (3) The continued accuracy and representativeness of the selected thimbles shall be verified by using the most recent flux map as per Table 4.1-1 to update the R for each selected thimble.

(3) Base Load Operation

1. Base Load operation may be used at power levels between P_T and P_{BL} or P_T and 1.00 (whichever is most limiting). The maximum relative power permitted under Base Load operation,

4. Radial [illegible]ndown operation may be utilize[illegible]t powers between P_T and P_{RB}, or P_T and 1.00 (whichever is most limiting) provided that the indicated flux difference is within $\pm$ 5% of the target axial offset. I

5. If any of the requirements of Section 3.2.6.a(4)4 are not maintained, then the power shall be reduced to less than or equal to P_T or within 15 minutes augmented surveillance of hot channel factors shall be initiated if the power is above P_T.

b. (1) The measurement of total peaking factor, $[F_Q(Z)]^{Meas}_{Map}$ shall be increased by three percent to account for manufacturing tolerances and further increased by five percent to account for measurement error. These uncertainties only apply if the map is taken for purposes other than determination of P_{BL} and P_{RB}.

(2) The measurement of the enthalpy rise hot channel factor F^N_H, shall be increased by four percent to account for measurement error.

If either measured hot channel factor exceeds its limit specified under Item 6a, the reactor power shall be reduced so as not to exceed a fraction of the rated value equal to the ratio of the F_Q or F^N_H limit to measured value, whichever is less, and the high neutron flux trip setpoint shall be reduced by the same ratio. If subsequent in-core mapping cannot, within a 24 hour period, demonstrate that the hot channel factors are met, the reactor shall be brought to a hot shutdown condition with return to power authorized only for the purpose of physics testing. The reactor may be returned to higher power levels when measurements indicate that hot channel factors are within limits.

c. The reference equilibrium indicated axial flux difference as a function of power level (called the target flux difference) shall be measured at least once per effective full power quarter. If the axial flux difference has not been measured in the last effective full power month, the target flux difference must be updated monthly by linear interpolation using the most recent measured value and the value predicted for the end of the cycle life.

d. Except during physics tests or during excore calibration procedures and as modified by items 6e through 6g below, the indicated axial flux difference shall be maintained within a $\pm$ 5% band about the target flux difference (this defines the target band on axial flux difference). During Baseload Operation (Section 3.2.6.a(3)), the indicated axial flux shall be maintained within a ± 2% or ± 3% band about the target flux difference.

e. If the indicated axial flux difference at a power level greater than 90% of the rated power deviates