.6740

July 14, 1988

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING APPEAL BOARD

In the Matter of	)	
	)	Docket Nos. 50-250 OLA-2
FLORIDA POWER AND LIGHT COMPANY	)	50-251 OLA-2
	)	
(Turkey Point Plant, Units 3 & 4)	)	(SFP Expansion)

STAFF REPLY TO APPEAL BOARD ORDER OF JUNE 27, 1988

In an order dated June 27, 1988, the Appeal Board requested the views of the parties on whether the Licensing Board, under the circumstances of this case, should have imposed license conditions embracing the Licensee's written commitments to undertake surveillance testing programs regarding the use of Boraflex in the spent fuel pools and the Licensee's agreement not to store any fuel with an enrichment of U-235 greater than 4.1 percent prior to completion of the next surveillance testing, now scheduled for December 1989. The Staff concludes that the imposition of such license conditions is not necessary.

Addressing the question whether administrative controls should be imposed by means of either a license condition or a technical specification requirement the Staff advised the Licensing Board, (See, Staff's Proposed Findings of Fact at 4-5, December 24, 1987) that the guidance of the Appeal Board in Portland General Electric Co. (Trojan Nuclear Plant), ALAB-531, 9 NRC 263, 272 (1979) should be followed. There, the Appeal Board stated:

DS07

> There is neither a statutory nor regulatory requirement that every operational detail set forth in an applicant's safety analysis report (or the equivalent) be subject to a technical specification, to be included in the license as an absolute condition of operation which is legally binding upon the licensee when and until changed with specific Commission approval. Rather, ... the contemplation of both the Act and the regulations is that technical specifications are to be reserved for those matters as to which the imposition of rigid conditions or limitations upon reactor operation is deemed necessary to obviate the possibility of an abnormal situation or event giving rise to an immediate threat to the public health and safety.

9 NRC at 273 (footnote omitted, emphasis added). 1/

The Appeal Board pointed out in Trojan that "[t]his is not to say... that no significance attaches to commitments in a licensee's safety analysis report which have been found not to possess safety implications of sufficient gravity and immediacy to warrant their translation into technical specifications. To the contrary, 10 CFR 50.59(b) specifically charges holders of operating licenses with the duty..." to maintain records of changes in the facility or in procedures described in the FSAR and to report such changes at intervals not to exceed once a year along with a summary of the safety evaluation of such changes. Id.

In the Zion case, the Appeal Board agreed with the Licensing Board that "the effects of corrosion and the objects of the testing and surveillance programs in question are not of the gravity and immediacy alluded to in Trojan that calls for translation from commitments to technical speci-

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1/ See 10 C.F.R. § 50.36; Sacramento Municipal Utility District (Rancho Seco Nuclear Generating Station), ALAB-746, 18 NRC 749, 754 n.4 (1983); Commonwealth Edison Co. (Zion Station, Units 1 and 2), ALAB-616, 12 NRC 419, 422 (1980); Virginia Electric Power Co. (North Anna Nuclear Power Station, Units 1 and 2), ALAB-578, 11 NRC 189, 217 (1980).

fications." Id. at 423. Nonetheless, the Appeal Board incorporated the licensee's commitments relating to testing and surveillance into the Appeal Board's order in the proceeding. Id. at 424. The Appeal Board, however, noted

> We do not imply that we have cause to believe that the Applicant would not abide by its commitments... We are confident that without further guidance from us, the staff will be able to record the commitments thus embodied so its inspectors can insure compliance." Id. at 424, fn.9.

Hearings were held in the captioned proceeding on the Boraflex contention (Contention 6) and one other contention on September 15 and 16, 1987. At the hearing, the Staff and Licensee presented testimony on Contention 6 by way of a series of witness panels which were in general agreement as to the lack of merit to Contention 6. The intervenors did not sponsor any direct testimony and based their case on the cross-examination of the Licensee's and Staff's panels.

On the basis of the evidence received at the hearing the Licensing Board found:

> 87. The Board finds that, based on the evidence presented by the Licensee and Staff, no safety significant degradation in the Turkey Point Boraflex panels at Turkey Point is expected to occur. The Licensee's surveillance programs include blackness testing on Boraflex specimens and panels at specified schedules which are adequate to detect physical degradations, including gaps, and will provide reasonable assurance that gap formation will be detected in sufficient time to enable Licensee to take corrective actions such that the NRC acceptance criterion of k_{eff} less than or equal to 0.95 is met. Licensee and Staff have adequately analyzed the materials integrity of Boraflex, and the material continues to be acceptable for use in safe storage of the spent fuel at the Turkey Point Nuclear Generating Plant.

27 NRC 387 at 414.

The Licensee in a series of letters to the NRC Staff committed to the surveillance testing arrangements described in the initial decision. In letters designated L-82-279, 313, 348 and 363 and attached hereto, the Licensee agreed to blackness testing of full length Boraflex panels and surveillance testing of Boraflex specimens. The letters describe the schedule for the testing and the measurements to be taken. The measurements include the uniformity of boron distribution, neutron attenuation and spatial boron distribution anomalies and gaps. These tests are now scheduled for December 1989 and are typical of the many surveillance tests that are routinely performed by Licensees in the normal operation of their plants. In addition, the regional inspection staff is aware of the commitments. As a general rule the Staff does not require special license conditions for such testing.

In letter L-87-363 the Licensee agreed not to store fuel with an enrichment greater than 4.1 percent prior to the completion of the blackness testing of the Boraflex panels and the surveillance of the Boraflex specimens. As noted earlier, this testing is now scheduled for December 1989. Because of the long lead time and high visibility associated with procuring new higher enriched fuel the Staff is confident that the Boraflex in the spent fuel pool will be adequately tested and examined prior to any enrichment increases in the fuel. In short, the matters

involved in the licensee's commitments in this case are not of the gravity and immediacy referred to in Trojan or Zion. 2/

In view of the foregoing, including the findings of the Licensing Board, the Staff does not believe that the imposition of license conditions is necessary in this matter.

Respectfully submitted,

Benjamin H. Vogler

Benjamin H. Vogler
Senior Supervisory Trial
Attorney

Dated at Rockville, Maryland
this 14th day of July, 1988

2/ In Zion, the Appeal Board referred to a then pending Advanced Notice of Rulemaking relating to requirements for technical specifications and concluded that the rulemaking proposal did not suggest treatment different from the Trojan standard. Id. at 423. The current interim Policy Statement on technical specifications, 52 FR 3788, contains further guidance in the form of three criteria for determining which matters (existing LCOs) should be included in upgraded technical specifications. In general, these criteria do not appear to be at odds with the Appeal Board's Trojan standard. More directly related to the Turkey Point proceeding, the commitments at issue would not qualify to be included in technical specifications under the three criteria of the interim Policy Statement.

P. O. BOX 14000, JUNO BEACH FL 33408-0420

FPL

JULY 10 1987
L-87-279

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

Gentlemen:

Re: Turkey Point Units 3 and 4
Docket No. 50-250 and 50-251
Request for Additional Information
Boraflex Usage at Turkey Point

Attached is Florida Power & Light Company's response to your June 9, 1987 request for additional information concerning the continued use of Boraflex at Turkey Point.

Should there be further questions, please contact us.

Very truly yours,

C. O. Woody
Group Vice President
Nuclear Energy

COW/RG/gp

Attachment

cc: Dr. J. Nelson Grace, Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant

A001 Add: NMSS/SGOB 1 1
1/1 NRR/DOEA/EAB 1 1
NRR/DREP/EPB 1 1
NRR/DREP/RPB 1 1

Ltr Encl

RG3/049/1

Request for Additional Information -
Boraflex Usage at Turkey Point

Question 1 Based on the recent experience pertaining to degradation of Boraflex in spent fuel pools at Quad Cities and Point Beach Nuclear Power Plants, provide justification to demonstrate the continued acceptability of Boraflex for application in the Turkey Point spent fuel pool.

Response Boraflex is the neutron absorbing poison used in the Turkey Point spent fuel racks. This material assures a shutdown margin of 5% with no boron in the spent fuel pool water.

As discussed in Section 4.7.2 of the Turkey Point Units 3 and 4 Spent Fuel Storage Modification, Safety Analysis Report, dated March 14, 1984, Boraflex has undergone extensive qualification testing to study the effects of gamma and neutron irradiation in various environments and to verify its structural integrity and stability as a neutron absorbing material. These tests indicated that Boraflex maintains its neutron attentuation capabilities when subjected to an environment of borated water and 1.03×10^{11} rads gamma radiation. Additionally, further tests have recently been conducted and preliminary results indicate that some shrinkage (a maximum of about 2%) can occur in Boraflex,

and that this shrinkage is complete at approximately 1×10^{10} rads gamma.

Three plants have reported the results of their first Boraflex surveillance. Of these three, the Boraflex material used at Point Beach Nuclear Power Plant has received the highest accumulated dose. This Boraflex material has been in use for a total of five years, and some of the Boraflex panels have received a 20 year-equivalent radiation dose due to the spent fuel management techniques used at Point Beach. The examination of the 2" x 2" sample coupons at Point Beach (which had a maximum exposure of 1.6×10^{10} rads gamma) showed that the coupons had experienced changes in physical characteristics such as color, size, hardness, and brittleness. However, the nuclear characteristics of the samples had not experienced any unexpected changes, and the boron absorbing properties of the samples met the acceptance criteria for maintaining the 5% Δ k/k shutdown margin. Point Beach also examined two full size (150" long x 8" wide) Boraflex panels, which had a maximum exposure of about $1 \times 10^{[illegible]}$ rads gamma. These panels had a far lesser amount of physical changes than the 2" x 2" sample coupons. Thus, the examination of the Point Beach

coupons and Boraflex panels indicates that, while some physical changes in Boraflex may occur with accelerated radiation exposure, the Boraflex will retain its neutron absorbing characteristics.

Prairie Island has also examined two large (8" x 12") Boraflex coupons. One of the coupons (which had a 6 month exposure) had an appearance similar to the as-manufactured Boraflex. The other coupon (which had a 12 month exposure) had some slight physical changes similar to that experienced by the Boraflex panels at Point Beach.

The Boraflex panels in the Quad Cities racks (which had an exposure of about 10^9 rads gamma) were examined by a neutron surveillance technique. Gaps were noted in the Boraflex panels, and review of the size and number of gaps was performed. This review indicated that the gaps were attributed to a rack design and fabrication process which did not allow the Boraflex to shrink without cracking. The Quad Cities racks were designed to hold smaller BWR fuel and did not utilize a protective wrapper for installing the Boraflex. The fabrication process required the Boraflex material to be glued and firmly clamped in place to the stainless steel

fuel rack walls. This process did not allow for the predicted shrinkage of Boraflex and as such gaps developed. Additionally, the Boraflex panels at Quad Cities were not constructed from a single sheet of Boraflex, resulting in pre-existing breaks in the Boraflex panels. Less than half of the Boraflex panels at Quad Cities had gaps. Furthermore, the gaps in the Boraflex panels at Quad Cities varied in length up to a maximum of 4" and were located at various places along the heighth of the panels. A k-effective analysis of the Quad Cities spent fuel pool demonstrated that these gaps did not cause Quad Cities to exceed its 0.95 limit on k-effective.

Turkey Point racks are designed to hold the large PWR fuel assemblies. Boraflex panels were constructed from a single sheet of Boraflex and are held in the stainless steel cell wall by enclosing it with a wrapper plate. During fabrication, a cut-to-length sheet of Boraflex was attached to the wrapper plate with adhesive applied in short lengths (up to 2 1/2" long) at a maximum of 16 places (8 per side) along the length of the Boraflex. The purpose of the adhesive was to provide temporary support during the spot welding process and not for long-term

binding. The wrapper provides an enclosure which protects the Boraflex from the flow of water, very much like that used in the original Boraflex qualification testing. Additionally, the wrapper enables the Boraflex panel to remain in place without the necessity of tightly clamping the panel in place.

In conclusion, the experience at Point Beach indicates that some physical changes may occur in Boraflex, but that the Boraflex will retain its neutron attentuation properties. Additionally, both testing of Boraflex and the experience at Quad Cities indicates that some shrinkage in Boraflex may occur, but that this shrinkage is limited to a maximum of 2 to 3% of the length of the Boraflex. The Quad Cities Boraflex panels had some gaps because the racks did not permit the Boraflex to shrink without cracking. Since there are differences in the manufacturing process of the Boraflex used at Quad Cities and Turkey Point, the experience at Quad Cities may not be applicable to Turkey Point. In any case, due to the small size and the random orientation of the gaps at Quad Citites, the gaps did not cause the k-effective of Quad Cities spent fuel pool to exceed the 0.95 limit.

Therefore, FPL considers that the Boraflex is acceptable for continued use at Turkey Point.

Question 2 Based on the recent information, provide any changes to the in-service surveillance program for Boraflex neutron absorbing material and describe the frequency of examination and acceptance criteria for continued use. Provide the procedures for testing the Boraflex material and interpretation of test data.

Response To confirm that the Boraflex at Turkey Point is acceptable for continued use, FPL will conduct two types of examinations of the Boraflex. First, as described in the Turkey Point Units 3 and 4 Spent Fuel Storage Facility Modification, Safety Analysis Report, dated March 14, 1984. Section 4.8, Testing and In-service Surveillance, FPL will conduct an in-service surveillance program. This program will evaluate both Region I and Region II Boraflex samples for the following:

I. Physical Characteristics

A. Examine the stainless steel jacket and note whether the material is smooth or exhibits any visible damage.

B. Examine the Boraflex poison sample and note whether the material is smooth

or exhibits any visible changes (color, pitting or cracking, etc.).

C. Measure specimen(s) weight and volume, and calculate its density.

D. Measure the hardness of the specimen(s).

II. Nuclear Characteristics

A. Take a neutron radiograph of the specimen(s) to determine the uniformity of boron distribution.

B. Perform attenuation measurement of the specimen(s), and determine the B_{10} loading. The minimum area density of boron should be equal to or greater than 0.02 gm/cm^2 for Region I and 0.012 gm/cm^2 for Region II.

Second, FPL will conduct a surveillance program to detect any spatial distribution anomalies in the Boraflex panels. This program, called "Blackness Testing", will involve the use of a fast neutron source and thermal neutron detectors. The thermal neutron detectors will be connected to four chart recorders which will record the presence of thermal neutrons. The number of thermal neutrons will be low if the boron carbide is present in the Boraflex material. If gaps or voids are present, the number of thermal neutrons will increase and

be recorded by the chart recorders. This arrangement of instruments would detect gaps or anomalies in the Boraflex panels. The Blackness Testing technique was utilized successfully by Quad Cities to determine the existence of gaps in their spent fuel racks. FPL will perform the baseline testing in late July or early August for several storage cells in both Region I and Region II that have received the highest cumulated exposure to date. FPL will then retest these cells on a regular interval to be determined at a later date. This interval will be based on FPL's results and EPRI and industry data.

FPL's surveillance programs will be sufficient to detect any changes in the neutron attentuation properties of the Boraflex and any changes in the physical distribution of the Boraflex. As a result, these programs will assure that the Boraflex in the Turkey Point spent fuel racks will be acceptable for continued use.

Question 3 Describe the corrective actions to be taken if degraded Boraflex specimens or absorber is found in the spent fuel pool.

Response

FPL will follow the industry efforts concerning the performance of Boraflex. EPRI, Bisco (the manufacturers of Boraflex) and several utilities are analyzing data as it becomes available and will notify the industry of the results. FPL will evaluate these results and determine whether any additional actions are warranted for the Turkey Point spent fuel racks.

A sensitivity study has been performed to determine whether the Boraflex material at Turkey Point would be acceptable if it develops gaps. As discussed above, tests and the Quad Cities surveillances indicate that 2% shrinkage could occur. If it is conservatively assumed that this shrinkage would cause gaps in the Turkey Point Boraflex, the shrinkage could result in a two or three inch gap. If it is postulated that such gaps would occur in every Boraflex panel at exactly the same location (which is an extremely conservative and unrealistic assumption based on the Quad Cities data), the attached curves show that the Turkey Point spent fuel pool would still maintain the required shutdown margin. This shutdown margin does not account for the 1950 ppm boron in solution which adds an additional 30%Δ k/k shutdown margin.

Therefore, should the Boraflex degrade, the spent fuel could still be stored at Turkey Point with the required shutdown margin.

ATTACHMENT

A study has been completed to determine the effect of gaps in BOROFLEX poison plates on spent fuel rack K_{eff}. The basis for this study was the Turkey Point Unit 3 Region 1 spent fuel storage racks.

Axial gaps in the BOROFLEX ranging from 0 to 10" were modeled explicitly using KENO. These gaps were modeled in one half of and in all of the poison plates in the rack.

The results from the KENO calculations were applied as adders to the originally calculated rack K_{eff} and uncertainties. The details of the calculation of the original K_{eff} with uncertainties are attached.

The KENO calculations and the original criticality analysis assume a maximum U-235 enrichment of 4.5 w/o. The results are presented in Figures 1 and 2.

It was also requested that the same type of data be provided with a maximum U-235 enrichment of 4.1 w/o assumed. The original criticality analysis included a study which showed the sensitivity of rack K_{eff} to fuel enrichment for the Region 1 spent fuel racks. This study was used to determine that the decrease in U-235 enrichment from 4.5 w/o to 4.1 w/o results in a 0.018 ΔK decrease in rack K_{eff}. This small change in fuel enrichment does not significantly effect the reactivity worth of the gaps in the poison plates. The data for the study using the 4.1 w/o fuel was produced by subtracting the 0.018 ΔK from the results of the 4.5 w/o fuel study. The results of this second study are presented in Figures 1 and 3.

The data presented in this report are the results of a detailed sensitivity study and are representative of the results that would come from a complete reanalysis of the Turkey Point Unit 3 Region 1 spent fuel storage racks.

The following text was taken directly from the Turkey Point criticality analysis report.

Based on the analysis describe above, the following equation is used to develop the final K_{eff} for the Turkey Point Region 1 spent fuel storage racks:

$$K_{eff} = K_{nominal} + B_{method} + B_{part} + B_{mech} + ((ks_{nominal}^2) + (ks_{method})^2 + (ks_{mech})^2)^{1/2}$$

Where:

$K_{nominal}$ = nominal case KENO K_{eff} = 0.9150

B_{method} = method bias determined from benchmark critical comparisons = 0.0 ΔK

B_{part} = bias to account for poison particle self-shielding = .0025 ΔK

B_{mech} = bias to account for material thickness and construction tolerance = 0.00740 ΔK

$ks_{nominal}$ = 95/95 uncertainty in the nominal case KENO K_{eff} = 0.00401 ΔK

ks_{method} = 95/95 uncertainty in the method bias = 0.013 ΔK

ks_{mech} = 95/95 uncertainty associated with material thickness and construction tolerances = 0.00721 ΔK

Substituting calculated values in the order listed above, the result is:

$$K_{eff} = 0.9150 + 0.0 + 0.0025 + 0.00740 + ((0.00401)^2 + (0.013)^2 + (0.00721)^2)^{1/2} = 0.9403$$

FIGURE 1

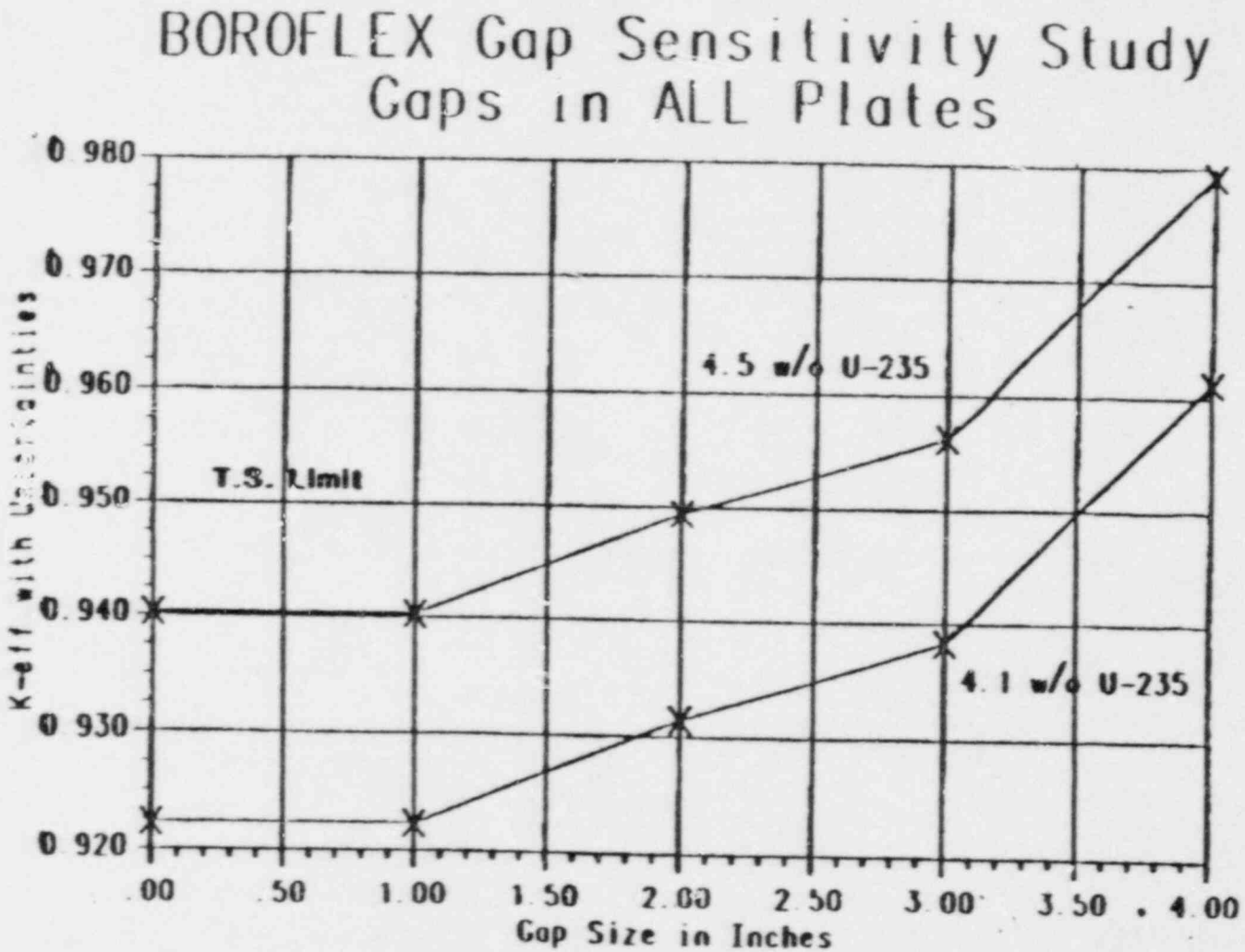

BOROFLEX Gap Sensitivity Study
Gaps in ALL Plates
0.980
0.970
0.960
0.950
0.940
0.930
0.920
K-eff with Uncertainties
T.S. Limit
4.5 w/o U-235
4.1 w/o U-235
.00
.50
1.00
1.50
2.00
2.50
3.00
3.50
4.00
Gap Size in Inches

FIGURE 2

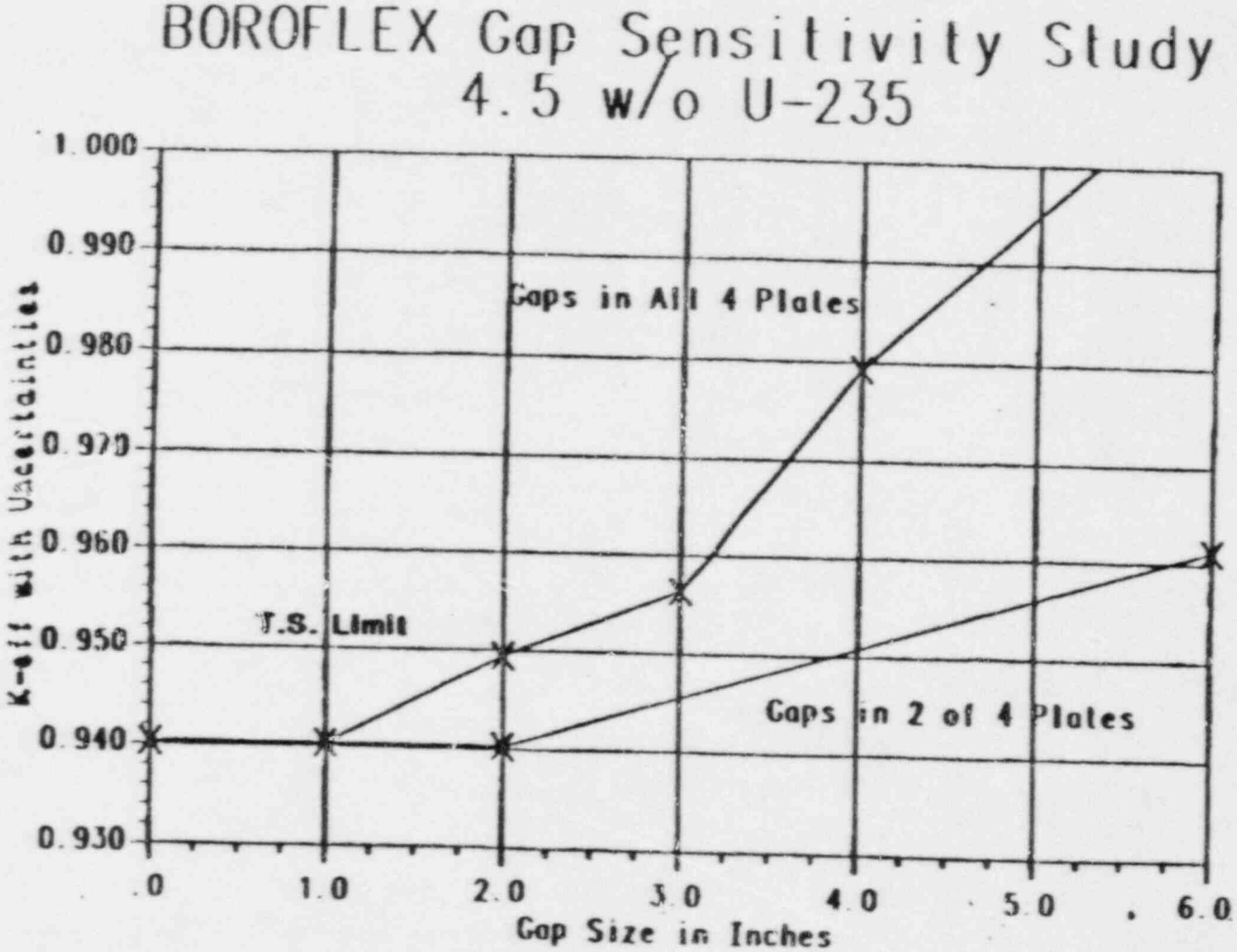
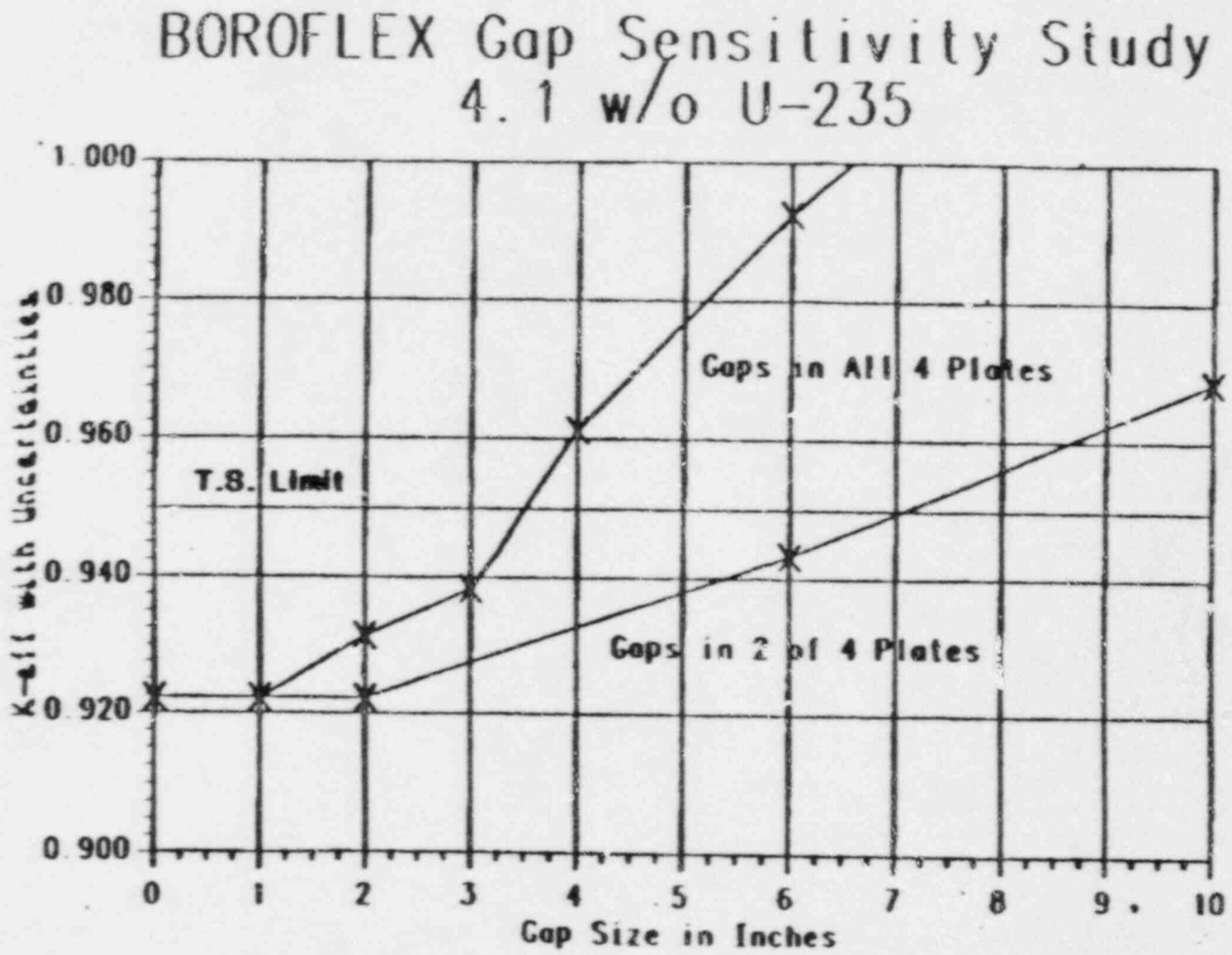

BOROFLEX Gap Sensitivity Study
4.5 w/o U-235
1.000
0.990
0.980
0.970
0.960
0.950
0.940
0.930
K-eff with Uncertainties
Gaps in All 4 Plates
T.S. Limit
Gaps in 2 of 4 Plates
.0
1.0
2.0
3.0
4.0
5.0
6.0
Gap Size in Inches

FIGURE 3


BOROFLEX Gap Sensitivity Study
4.1 w/o U-235
1.000
0.980
0.960
0.940
0.920
0.900
Keff with Uncertainties
T.S. Limit
Gaps in All 4 Plates
Gaps in 2 of 4 Plates
0
1
2
3
4
5
6
7
8
9
10
Gap Size in Inches

P. O. BOX 14000, JUNO BEACH, FL 33408

FLORIDA POWER & LIGHT COMPANY

JULY 27 1987

L-87-313

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
Request for Additional Information
Boraflex Usage in Spent Fuel Pools

Your letter dated June 9, 1987 requested information concerning the use of Boraflex poison material in the spent fuel storage racks at Turkey Point Units 3 and 4. Florida Power & Light provided a response to those questions by our letter L-87-279 dated July 10, 1987. As this response explains, FPL considers the Boraflex to be acceptable for continued use. FPL will be performing a surveillance test, known as Blackness Testing, on these racks and will provide the results of this surveillance to the staff. The purpose of this letter is to provide additional information in response to NRC Staff question regarding the existence of possible options if degradation of the Boraflex were to occur.

FPL has completed a review of possible options if degraded Boraflex poison is discovered by our surveillance program.

1) The degraded Boraflex could be evaluated to determine whether the degradation and any expected future degradation would adversely affect FPL's ability to satisfy the .95 K_{eff} limit for the Turkey Point spent fuel pools. If the pools could still satisfy this limit, no further action would be necessary.

2) Administrative controls could be imposed on the placement of new fuel assemblies around storage cell locations that have degraded Boraflex. The sensitivity analysis performed for Turkey Point Units 3 and 4 assumes only new fuel with 4.5 w/o fuel is stored in the spent fuel pool. By limiting the amount and location of the storage of new fuel assemblies and by inserting spent fuel between the new fuel, FPL could reduce the K_{eff} to less than or equal to .95.

A001
1/0

3) A poison material similar to a control rod or burnable poison could be added to any new fuel assembly to be placed in a storage cell with degraded Boraflex. This would reduce the K_{eff} to less than or equal to the .95 limit.

4) Poison plates could be added into the space between the fuel assembly and the cell wall to assure a K_{eff} of less than or equal to .95.

5) FPL has taken no credit for the 1950 ppm boron concentration in the spent fuel pool water. This boron concentration alone assures a K_{eff} of less than .90. In order to take credit for this boron, FPL could establish various administrative controls to provide a high level of confidence that the spent fuel pool water will remain borated. These controls could include isolating pure water sources and routine sampling of the boron concentration.

6) The storage cells with the degraded Boraflex could be blocked off to prevent loading of any fuel assembly into the cell.

7) The storage racks with the degraded Boraflex could be coated with boron with a sufficient density to assure a K_{eff} of less than or equal to.95.

8) The storage racks which contain degraded Boraflex could be replaced.

It should be emphasized tha FPL believes that the Boraflex at Turkey Point is acceptable for continued use and that no changes will be necessary in the manner in which FPL plans to store fuel at Turkey Point. The purpose of this letter is only to indicate that there are several possible actions which could be taken to assure the continued safe storage of fuel at Turkey Point if the Boraflex in the spent fuel racks were to experience degradation.

Should there be any further questions, please contact us.

Very truly yours,

W. M. Paduano Jr.
for C. O. Woody
Group Vice President
Nuclear Energy

COW/RG/gp

cc: Dr. J. Nelson Grace, Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant

P. O. BOX 14000, JUNO BEACH, FL 33408-0420

FPL

AUGUST 20 1987

L-87-348

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
Surveillance Results from Unit 3 Spent Fuel Pool

Your letter dated June 9, 1987 requested information concerning the use of Boraflex neutron absorbing material in Turkey Point Units 3 and 4 spent fuel racks. Our letters, L-87-279 (dated July 10, 1987) and L-87-313 (dated July 27, 1987) responded to your letter. In those letters Florida Power & Light (FPL) committed to provide the staff with the results of our baseline blackness testing program. FPL added this testing to the existing surveillance program in response to industry experience concerning Boraflex usage.

Blackness testing was performed during the first week of August 1987 on the installed spent fuel racks in Turkey Point Unit 3 Spent Fuel Pool. FPL tested eight Region I storage locations (containing a total of 32 full length Boraflex panels) and ten Region II storage locations (containing a total of 22 full length Boraflex panels). FPL selected these storage locations because they are representative of those storage locations which have received the highest accumulated dose for Region I and Region II. Calculations indicate that the accumulated gamma dose would be 7.8×10^9 rads assuming an infinite array of storage cells each containing a spent fuel assembly with an average burnup of 36,000 MWD/MTU stored for one year. No indication of gaps, voids or other spatial distribution anomalies were observed in any of the 54 panels.

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In addition to indicating the existing condition of the Boraflex panels, this testing will provide baseline data for comparison against the results of future surveillance tests. FPL expects to perform the next test within three years (in conjunction with the five year surveillance interval for the Boraflex sample coupons), or sooner, if industry experience indicates a shorter surveillance period is warranted. Calculations indicate that the accumulated gamma dose would be 1.2×10^{10} rads assuming an infinite array of storage cells each containing a spent fuel assembly with an average burnup of 36,000 MWD/MTU stored for one year.

Should there be further questions, please contact us.

Very truly yours,

C. O. Woody
Group Vice President
Nuclear Energy

COW/RG/gp

cc: Dr. J. Nelson Grace, Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant

NUCLEAR LICENSING
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Return to H. Edison

P. O. BOX 14000, JUNO BEACH, FL 33408-0420

FPL

AUGUST 27 1987

L-87-363

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
Request for Additional Information
<u>Boraflex</u>

Our letter L-87-279, dated July 10, 1987, provided the results of a sensitivity analysis performed for Turkey Point Units 3 and 4 spent fuel racks. This analysis was performed to show the affect of postulated gaps on maintaining the 0.95 K_{eff} shutdown criteria. The analysis shows that Florida Power & Light (FPL) will be able to maintain the 0.95 K_{eff} shutdown criteria for future fuel cycles, assuming that each Boraflex plate has gaps of 3.5 inches and each storage cell in the fuel racks has an assembly with an enrichment of 4.1%. There are no indications of gaps as a result of the blackness testing at Turkey Point, and the enrichment of the new fuel currently used at Turkey Point ranges from 3.4% to 3.6%. Under FPL's fuel management program and the current limits on reactor operations, FPL will only be able to increase the maximum Turkey Point fuel enrichment in small increments (approximately 0.2%) each cycle. Therefore, at the time of the next blackness testing and surveillance of the Boraflex in approximately three years, the maximum fuel enrichment at Turkey Point will be less than 4.1%. Prior to completion of that surveillance, FPL will not store fuel with an enrichment greater than 4.1%.

Should there be any questions, please contact us.

Very truly yours,

R. J. Acosta

C. O. Woody
Group Vice President
Nuclear Energy

COW/RG/gp

Attachment

cc: Dr. J. Nelson Grace, Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant

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L-87-363                          No. of copies: 43   08/31/87
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[illegible]      [illegible]       [illegible]        RICHARDS
[illegible]FORD  VAULT CUSTODIAN   [illegible]        WARD
WILLIAMS, JR.    YORK              YOUNG
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RG3/054/1

an FPL Group company

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING APPEAL BOARD

In the Matter of	)	
	)	Docket Nos. 50-250 OLA-2
FLORIDA POWER AND LIGHT COMPANY	)	50-251 OLA-2
	)	
(Turkey Point Plant, Units 3 & 4)	)	(SFP Expansion)

CERTIFICATE OF SERVICE

I hereby certify that copies of "STAFF REPLY TO APPEAL BOARD ORDER OF JUNE 27, 1988" in the above-captioned proceeding have been served on the following by deposit in the United States mail, first class, or as indiated by an asterisk through deposit in the Nuclear Regulatory Commission's internal mail system, this 14th day of July, 1988:

Dr. Robert M. Lazo, Chairman*
Administrative Judge
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dr. Emmeth A. Luebke
Administrative Judge
5500 Friendship Boulevard, Apt. 1923N
Chevy Chase, MD 20815

Dr. Richard F. Cole*
Administrative Judge
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Michael A. Bauser, Esq.
Newman & Holtzinger, P.C.
1615 L Street, NW
Washington, DC 20036

Richard J. Goddard, Esq.
Regional Counsel
USNRC, Region II
101 Marietta St., N.W., Suite 2900
Atlanta, GA 30303

Atomic Safety and Licensing Board*
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Atomic Safety and Licensing
Appeal Board*
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Docketing and Service Section*
Office of the Secretary
U.S Nuclear Regulatory Commission
Washington, DC 20555

Norman A. Coll, Esq.
Coll, Davidson, Carter, Smith
Salter & Barkett, P.A.
Co-Counsel for FPL
3200 Miami Center
100 Chopin Plaza
Miami, FL 33131

Joette Lorion
7269 SW 54th Avenue
Miami, FL 33143

Adjudicatory File*
Atomic Safety and Licensing Board
Panel Docket
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Benjamin H. Vogler

Benjamin H. Vogler
Senior Supervisory Trial
Attorney