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 FACIL: 50-250 Turkey Point Plant, Unit 3, Florida Power and Light Co 05000250
 AUTH. NAME: UHRIG, R. E. AUTHOR AFFILIATION: Florida Power & Light Co.
 RECIP. NAME: STELLO, V. RECIPIENT AFFILIATION: Division of Operating Reactors

SUBJECT: Submits figure of max predicted Fq for Cycle 6 based on 18-case analysis of ECCS.

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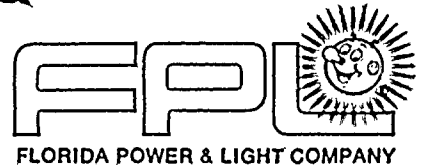
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STATE OF NEW YORK
ALBANY

IN SENATE,
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REPORT
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JAMES C. CLARK,
FOR THE YEAR ENDING
DECEMBER 31, 1905.

NEW YORK:
J. B. LIPPINCOTT COMPANY,
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P. O. Box 529100
Miami, Florida 33152



June 8, 1979
L-79-157

Office of Nuclear Reactor Regulation
Attention: Mr. Victor Stello, Director
Division of Operating Reactors
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Stello:

Re: Turkey Point Unit 3
Docket No. 50-250
ECCS Information

The attached figure of maximum predicted Fq was generated for Turkey Point Unit 3, Cycle 6 based on an 18-case analysis, and is being submitted as a result of a request from a member of your staff. The request was made in connection with the review of our request for a license amendment dated May 18, 1979 (L-79-124).

Very truly yours,

J A De Mastry
fn

Robert E. Uhrig
Vice President
Advanced Systems & Technology

REU:GDW:cf

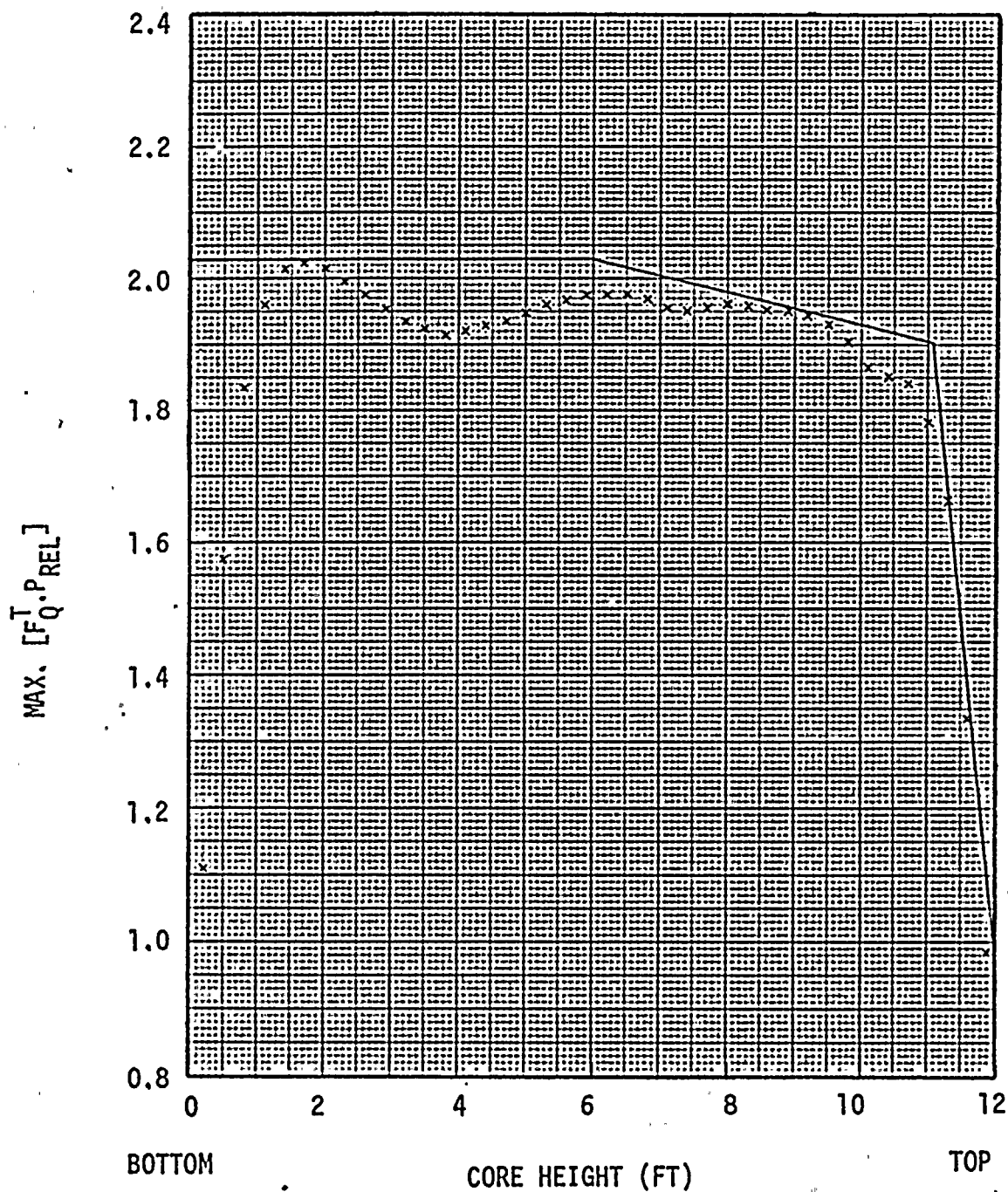
cc: Robert Lowenstein, Esquire
J. P. O'Reilly, Region II

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Pool
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7906130 207

PEOPLE...SERVING PEOPLE



TURKEY POINT UNIT 3 CYCLE 6
MAXIMUM $F_{Q.P}^T$ VS. AXIAL CORE HEIGHT
DURING NORMAL CORE OPERATION



22.5

50-250/251

NRC DISTRIBUTION FOR PART 50 DOCKET MATERIAL

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TO:

Mr. George Lear

FROM:

Florida Pwr. & Light Company
Miami, Fla.
Robert E. Uhrig

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DESCRIPTION

ACKNOWLEDGED

(1-P)

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PLANT NAME: Turkey Point Units 3 & 4
RJL 7/15/77

ENCLOSURE

Consists of requested additional EGC6 information
information.....

(3-P)

SAFETY

FOR ACTION/INFORMATION

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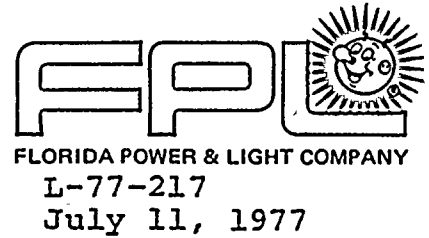
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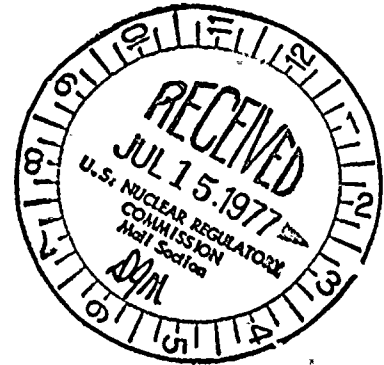
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Regulatory Docket File

Office of Nuclear Reactor Regulation
Attention: Mr. George Lear, Chief
Operating Reactors Branch #3
Division of Operating Reactors
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555



Dear Mr. Lear:

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
ECCS Information Request

On June 27, 1977, we received a telecopied request from your staff for additional ECCS information. The information you requested is attached.

Very truly yours,

Robert E. Uhrig
Vice President

REU/MAS/cpc

Attachment

cc: Mr. Norman C. Moseley, Region II
Robert Lowenstein, Esquire

771960235

1944

ATTACHMENT

Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
ECCS Information Request

Question 1

Show that the critical break size (DECLG, $C_D = 0.4$) remains unchanged in view of the fact that:

- (a) plugging of steam generator tubes used in the analysis increased from 10% to 15%, and
- (b) actual plugging of the steam generator tubes in Unit 4 is unsymmetrical and in one steam generator exceeds 15%.

Answer 1

Westinghouse has done several LOCA analyses assuming plugged steam generator tubes. In most cases, the analyses consist of doing the calculations for various levels of uniform steam generator tube plugging on the limiting break for a specific plant type. Examination of key event occurrence times such as the end of bypass, end of blowdown and bottom of core recovery shows that, in general, they vary smoothly and predictably as the level of tube plugging is changed. An example of the well-behaved nature of the tube plugging LOCA analysis results is shown in WCAP-8696, "Perturbation Technique For Calculating ECCS Cooling Performance", Figure 2. That Figure shows the increase in peak clad temperature as a function of uniform steam generator tube plugging for two loop, three loop, and four loop plants. The worst break size for these plants, which was used in this study, varied from the DECLG, $C_D = 0.4$ to the DECLG, $C_D = 1.0$. Since the sensitivity of PCT to steam generator tube plugging is between approximately 4°F and 8°F per percent plugging, it is reasonable to conclude that the DECLG break discharge coefficient does not significantly alter the effect of plugging tubes. Further rationalization of that conclusion is that a significant part of the tube plugging PCT penalty is due to the increased loop resistance to steam flow during the reflood phase of the accident is not choked, the break discharge coefficient

Answer 1 - Continued

assumed during blowdown does not effect steam flow during the reflood transient. Therefore, the PCT penalty attributed to the degradation of the core reflood rate should be the same for all large breaks.

In addition, a spectrum of three DECLG breaks has been analyzed for 0% and 5% uniform steam generator tube plugging levels for Turkey Point. In both cases, the DECLG $C_D = 0.4$ break (which is limiting) had a peak clad temperature more than 200°F higher than the peak clad temperature for the DECLG $C_D = 0.6$ break, no shift in limiting break size was observed.

Question 2

Show that the unsymmetrical steam generator plugging in Unit 4, with plugged tubes in one steam generator exceeding 15%, would not have a significant nonconservative effect on peak clad temperature.

Answer 2

Studies have been performed to determine the effect of asymmetric tube plugging on peak clad temperature. In order to bound the effects of asymmetric tube plugging, maximum asymmetry (i.e. all plugged tubes in 1) either the broken loop or 2) the intact loops) was assumed.

The studies show that assuming all plugging in the broken loop results in a slightly lower peak clad temperature than symmetric plugging. Assuming all plugging in the intact loop results in a slightly higher peak clad temperature.

For the current Unit 4 plugging distribution (9.8%, 11.3%, 17.5%), the worst case asymmetry in the intact loop is the average of the two highest individual steam generator plugging levels or 14.4%. Since this is below 15% the peak clad temperature result would not exceed the peak clad temperature for the 15% symmetric plugging case.

Furthermore, if the plugging continues in Unit 4 up to a total plant level of 15% such that the intact loop plugging is maximized to 17.6%, the effect on peak clad temperature is expected to be less than 5°F, and, therefore, insignificant.

1977 JUL 15 AM 8 52

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Mr. Victor Stello

FROM:

Florida Power & Light Co.
Miami, Florida
Robert E. Uhrig

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DESCRIPTION

Ltr. re their 2/2/77 submittal....trans the following:

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PLANT NAME:

Turkey Point Units 3 & 4

RJL

ENCLOSURE

Consists of corrected figures relating to ECCS information.....

(2-P)

SAFETY

FOR ACTION/INFORMATION

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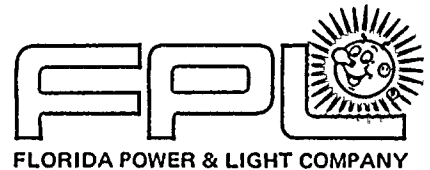
LA PDR

CONSULTANTS:

BROOKHAVEN NAT. LAB.

ULRIKSON (ORNL)

T
770.810242



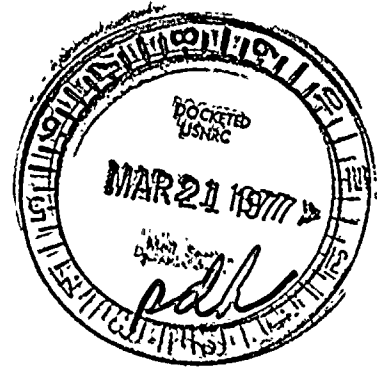
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L-77-80

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Office of Nuclear Reactor Regulation
Attention: Mr. Victor Stello, Director
Division of Operating Reactors
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Stello:

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
ECCS Information



ECCS information applicable to Turkey Point Units 3 and 4 was submitted to you on February 2, 1977 (L-77-38). Figures 1 and 2 of that submittal were in error. Revised Figures 1 and 2 are attached. The conclusions derived from the original figures remain unchanged.

Very truly yours,

E. F. Adomat

for Robert E. Uhrig
Vice President

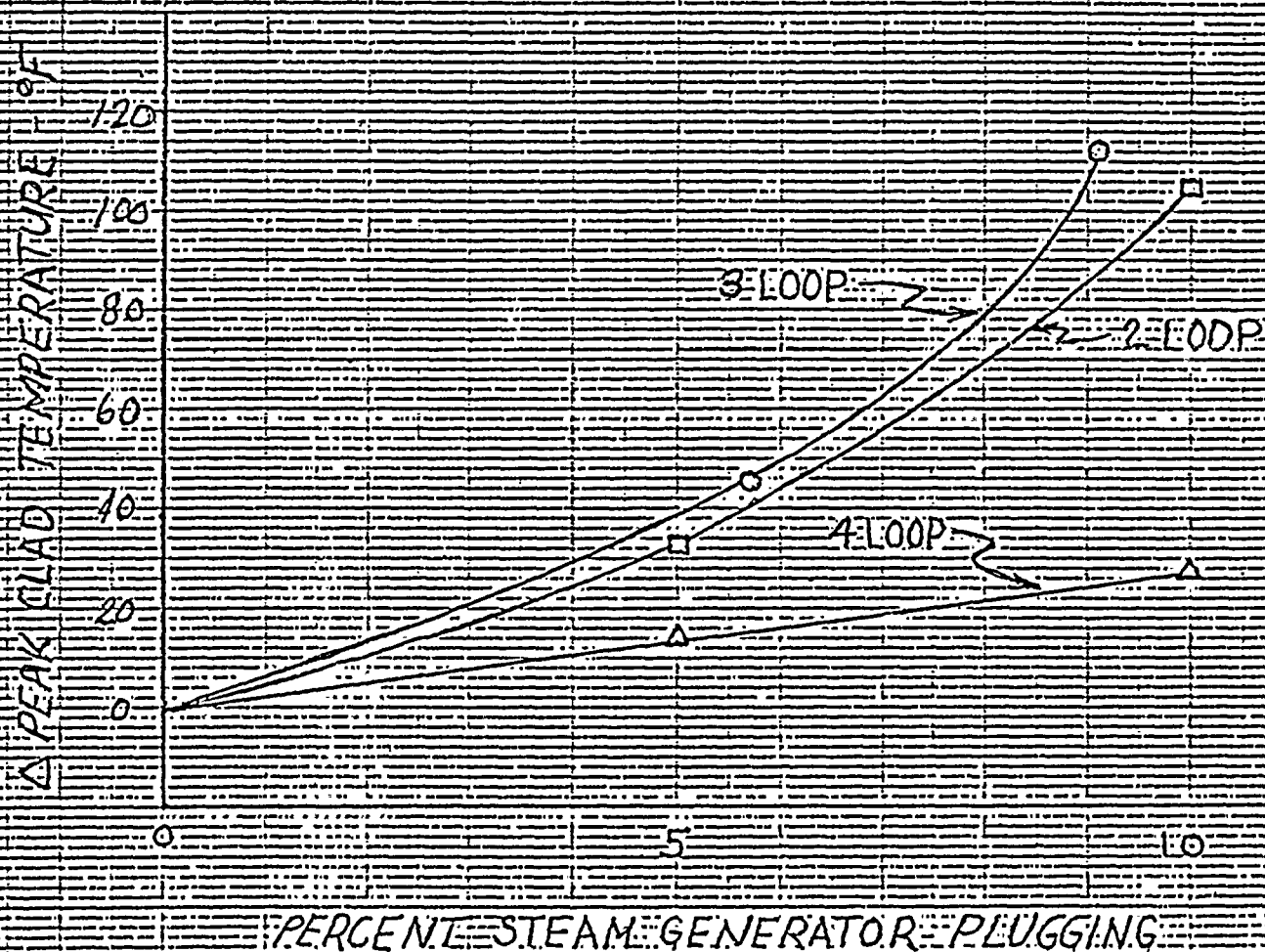
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Attachment

cc: Mr. Norman C. Moseley, Region II
Robert Lowenstein, Esquire

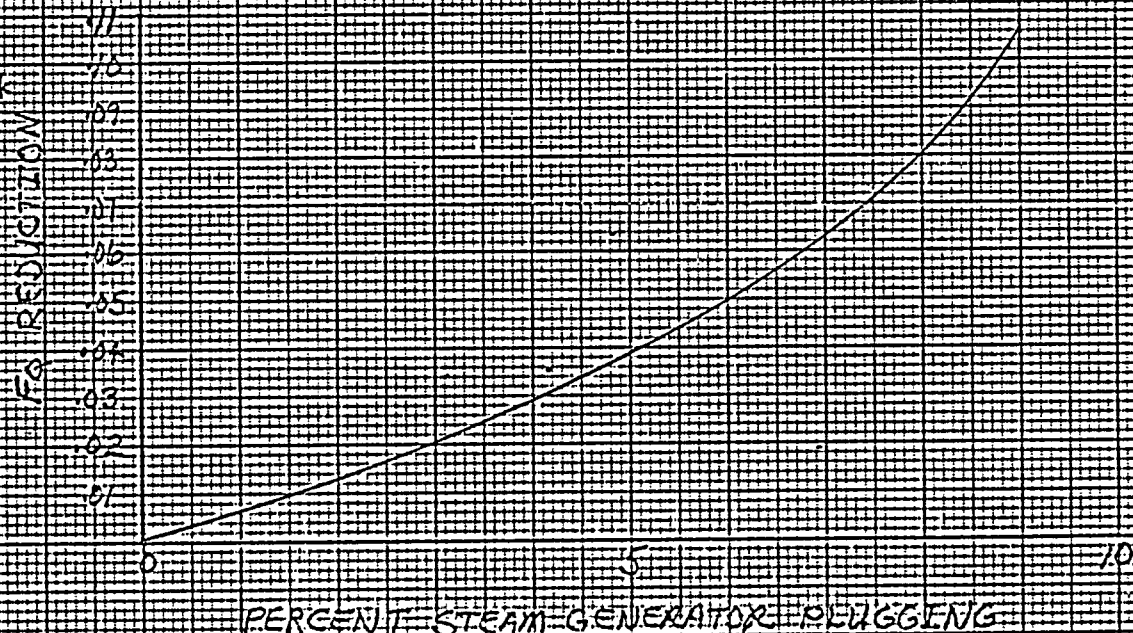
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FIGURE 1



PERCENT STEAM GENERATOR PLUGGING

FIGURE 2



X THE FQ VALUES REPRESENT AMOUNT THAT MAX ALLOWABLE FQ MUST BE REDUCED IN ORDER TO ENSURE PCT LIMITS. THESE RESULTS WERE OBTAINED USING THE 3-LOOP GENERIC CURVE CONTAINED IN FIGURE 1.

