NRC FORM 195 (2-76)

U.S. NUCLEAR REGULATORY COMMISSION

DOCKET NUMBER 50-250/251

FILE NUMBER

NRC DISTRIBUTION FOR PART 50 DOCKET MATERIAL

TO: Mr V Stello	FROM: Florida Pwr & Light Co Miami, Fla R E Uhrig	DATE OF DOCUMENT 2-2-77 DATE RECEIVED 2-4-77
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DESCRIPTION

Ltr re their 12-9-76 & 12-30-76 submittals .....trans the following:

1p

PLANT NAME: Turkey Pt 3 & 4

ENCLOSURE

ECCS Reevaluation ~~Supplemental~~ Information... submitted per NRC request.....

(40 cys encl rec'd)

11p

DO NOT REMOVE

ACKNOWLEDGED

FOR ACTION/INFORMATION ENVIRO 2-4-77 ehf

SAFETY		ENVIRO	
ASSIGNED AD:		ASSIGNED AD:	
BRANCH CHIEF:	Lear (5)	BRANCH CHIEF:	
PROJECT MANAGER:	Elliot	PROJECT MANAGER:	
LIC. ASST.:	Parrish	LIC. ASST.:	

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MIPC	MACARRY	KIRKWOOD	ERNST
CASE Ltr	KNIGHT		BALLARD
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HARLESS	PAWLICKI	STELLO	
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ACRS 16 CYS ~~HOLDING~~ SENT	As CAT B 2/4/77	

NRC FORM 195 (2-76)

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[illegible]

([illegible])

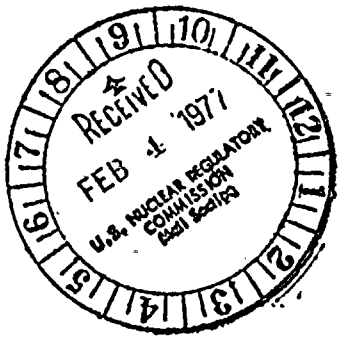
P. O. BOX 013100, MIAMI, FL 33101

FLORIDA POWER & LIGHT COMPANY

Regulatory Docket File

February 2, 1977
L-77-38

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 Reevaluation
Supplemental Information

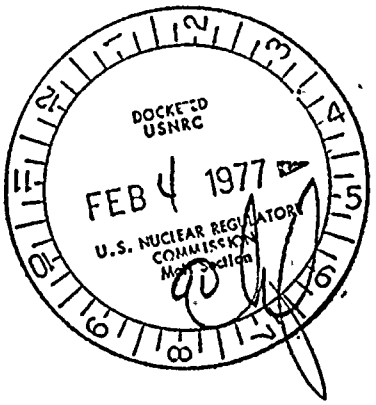
ECCS information applicable to Turkey Point Units 3 and 4 has been submitted by Florida Power & Light Company in letters dated December 9, 1976 (L-76-419) and December 30, 1976 (L-76-438 and L-76-439).

Attached herewith is additional information requested by your staff.

Very truly yours,

Robert E. Uhrig

Robert E. Uhrig
Vice President



REU/MAS/cpc

Attachment

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

1139

ATTACHMENT

Re: Turkey Point Units 3 and 4
Additional ECCS Information

QUESTION: Justify that the peak clad temperatures corresponding to different percentages of plugged steam generator tubes can be obtained by a linear interpolation, and submit a basis for the dependence of F_q on steam generator plugging.

ANSWER: Sensitivity studies were performed by Westinghouse in the early part of 1976 to determine, on a generic basis, the effect of plugged steam generator tubes on peak clad temperature (PCT) calculated during a LOCA. Three sets of runs were made, 1 each for a 2 loop plant, a 3 loop plant, and a 4 loop plant. The results were summarized and presented at an ACRS ECCS Subcommittee meeting. Plots of the results are shown in Figure 1. Figure 1 shows that the curves of ΔPCT versus percent tube plugging are concave upward, which means that linearly interpolating between any two plugging levels results in a higher, or conservative, value of ΔPCT.

Also, an answer given below to another question justifies the relationship between F_q and PCT (.01 F_q per 10°F). Therefore, since "F_q vs. PCT" is known, and "PCT vs. percent plugged tubes" is known, then the generic relationship between F_q and percent plugged tubes can be determined (Figure 2).

QUESTION: Submit the Westinghouse ECCS analyses which show that the decrease in accumulator water volume from 875 cubic feet to 825 cubic feet corresponds to 36°F rise in PCT.

ANSWER: Presented here is a discussion of the effect on the LOCA of a 50 cubic foot change in accumulator water volume.

To demonstrate the sensitivity of PCT to changes in accumulator water volume, specific analyses were made with accumulator water volumes of 825 and 875 cubic feet without changing other Turkey Point parameters. This resulted in a total change of PCT of 36°F because of the increase in downcomer water height and core inlet velocity.

The effectiveness of accumulators can be studied by inspecting Figures 1a and 1b, which are the downcomer water level and core water level plots, and Figures 2a and 2B, which are the core reflood water inlet velocity plots. The optimum accumulator water volume, based on previous studies, is generally a value that results in the downcomer being "almost" full when the accumulators empty.

From Figure 1a, when the accumulators empty, the downcomer height is about 9.5 feet for an initial water volume of 825 cubic feet per tank. Figure 1b indicates that increasing the initial water volume to 875 cubic feet per tank results in the downcomer being filled to 13.3 feet when the accumulators empty. This difference in accumulator performance during the accident results in a decrease in PCT from 2194°F for the core using 825 cubic feet initial accumulator water volume per tank to 2158°F for the case using 875 cubic feet.

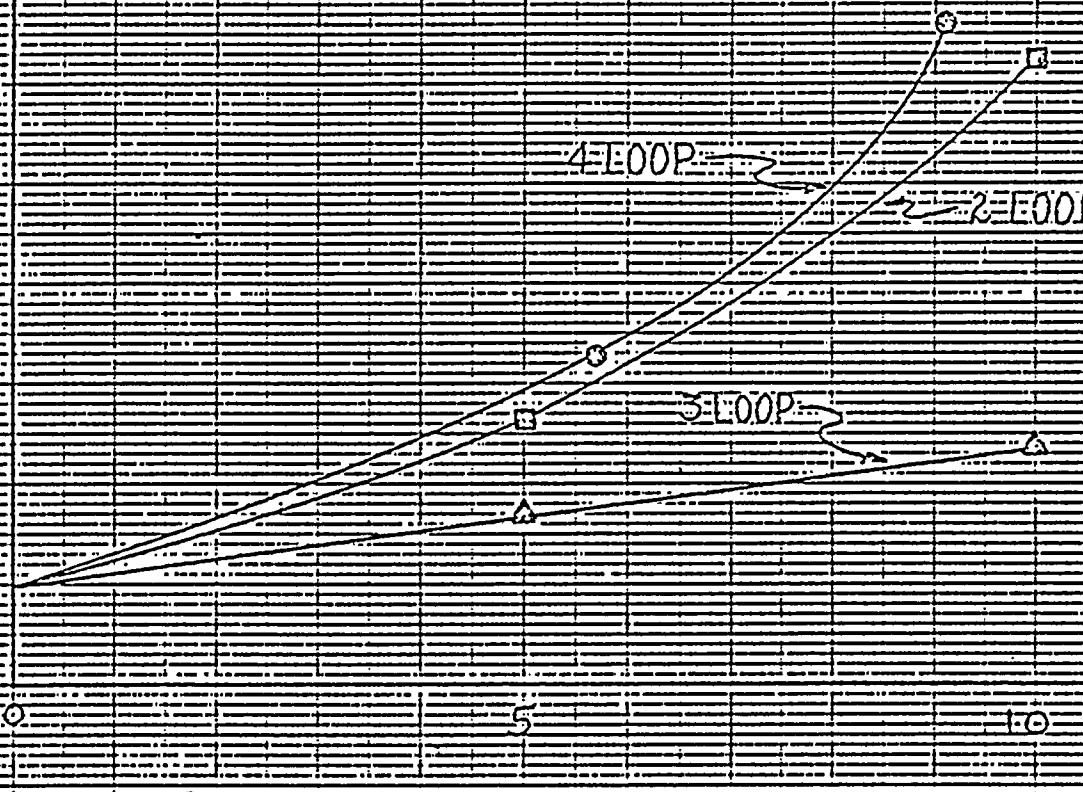
The above delta change in peak clad temperature was obtained by explicitly modeling an increase in accumulator water volume for the Turkey Point units and can only be applied in the specified range. This response does not represent a generic sensitivity study.

QUESTION: Justify, by submitting the appropriate references to applicable sensitivity studies, the relationship between F_q and PCT (.01 F_q→10°F PCT).

ANSWER: The sensitivity in the ECCS analysis to changes in the total peaking factor has been determined from previous analysis performed by Westinghouse.

As presented in Reference 12 of the previous ECCS analysis (FPL letter L-76-419 of December 9, 1976) with core power equal to 2192 Mwt, it has been established that a conservative estimate of 10°F/0.01 F_q is appropriate for use on a generic basis as an interim measure.

FIGURE 1



ΔPEAK CLAD TEMPERATURE °F

120
100
80
60
40
20
0

0
5
10

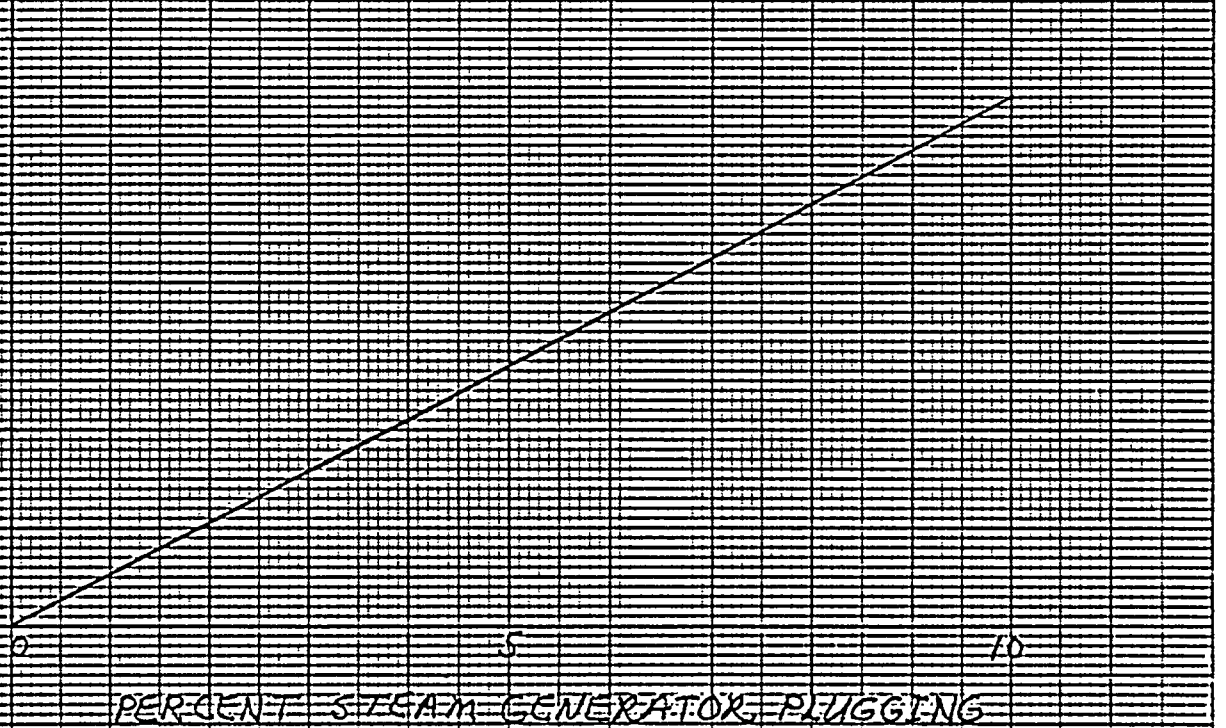
PERCENT STEAM GENERATOR PLUGGING

46 1320
K&E 10 X 10 TO ½ INCH 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 1320

K&E 10 X 10 TO ½ INCH 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

FIGURE 2



* THE F_Q VALUES REPRESENT AMOUNT THAT MAX. ALLOWABLE F_Q MUST BE REDUCED IN ORDER TO ENSURE PCT LIMITS

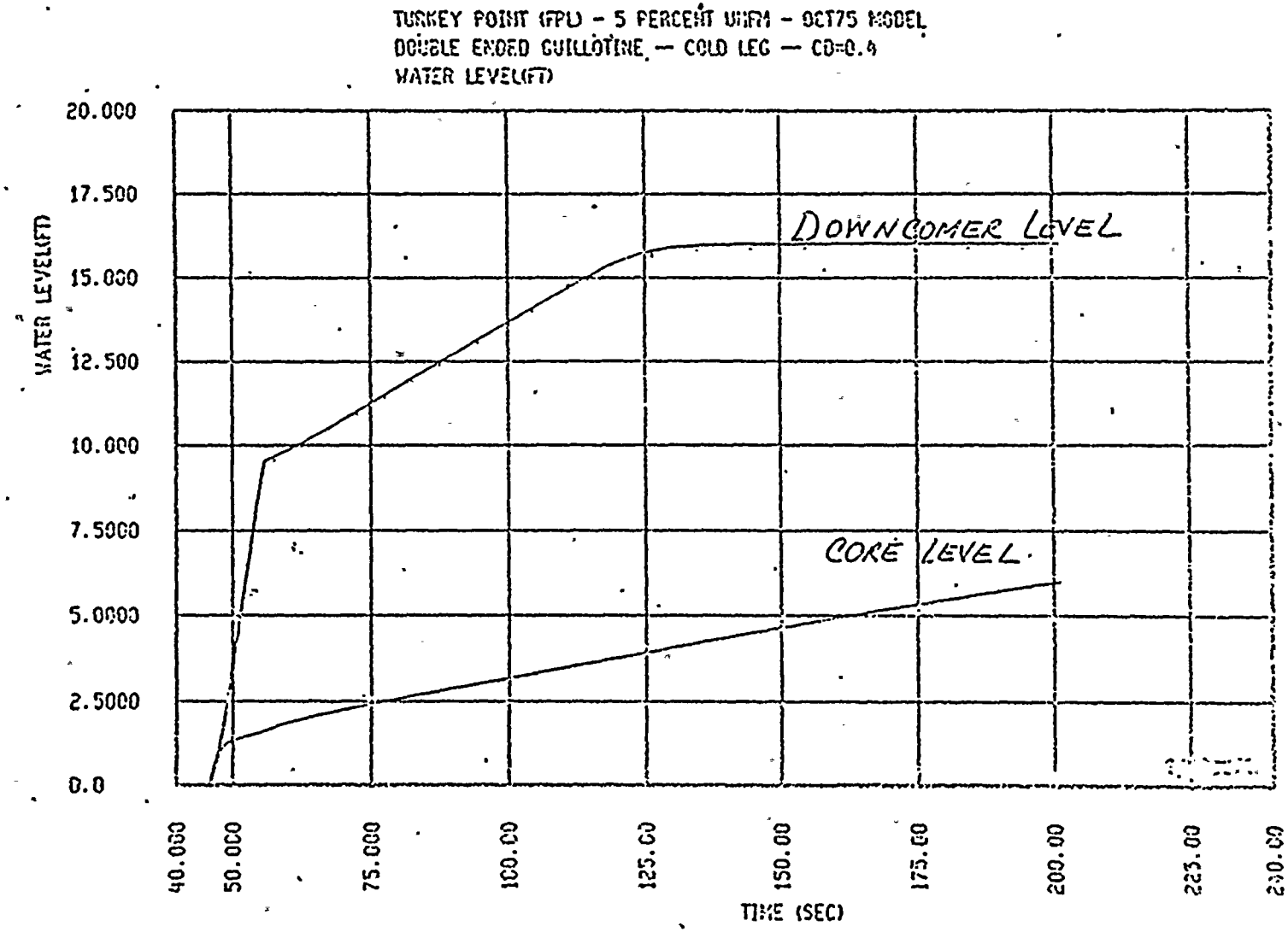


FIGURE 12 ACCUMULATOR WATER VOLUME, 825 FT³

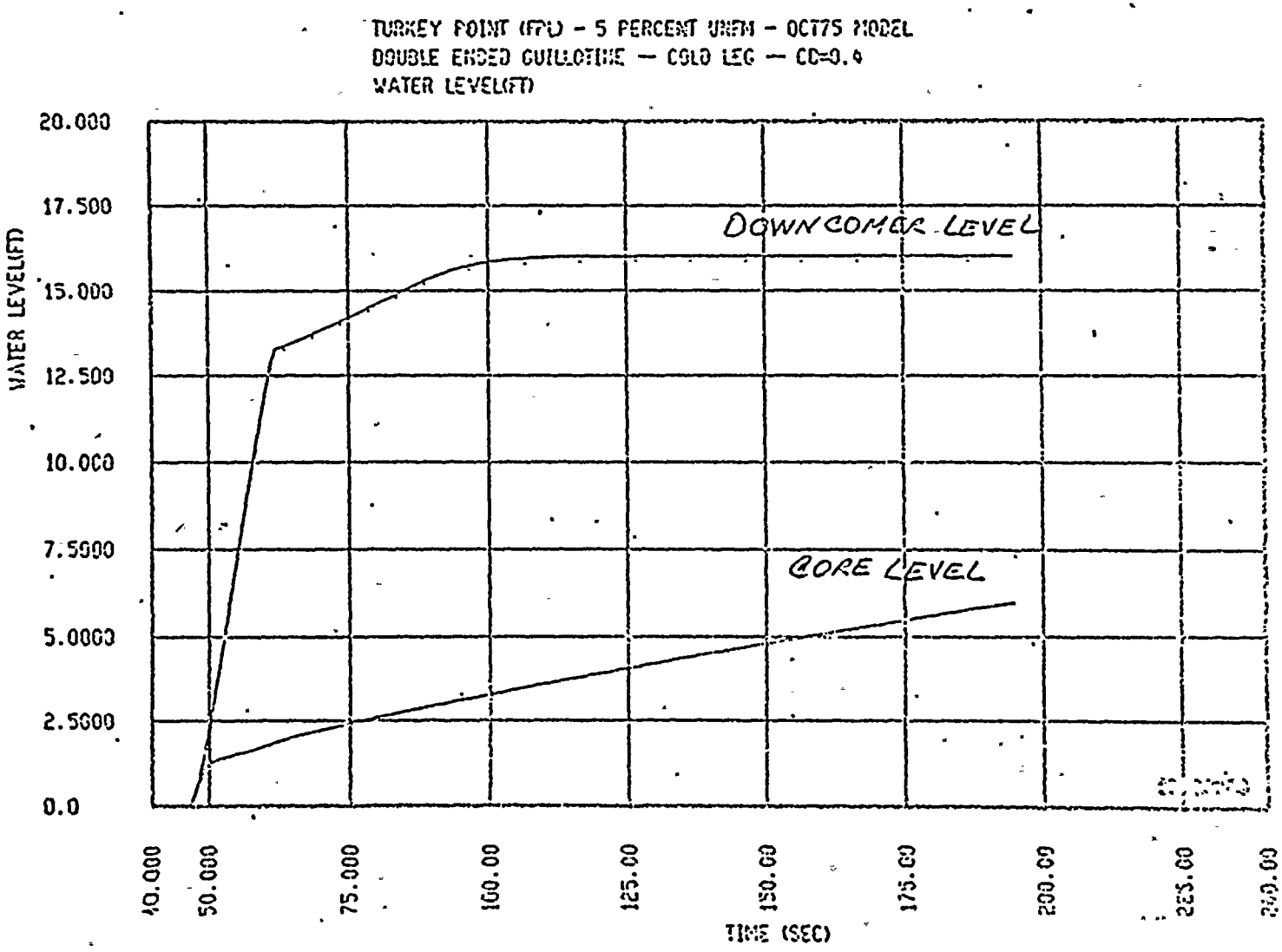


FIGURE 16 ACCUMULATOR WATER VOLUME, 875 FT^3

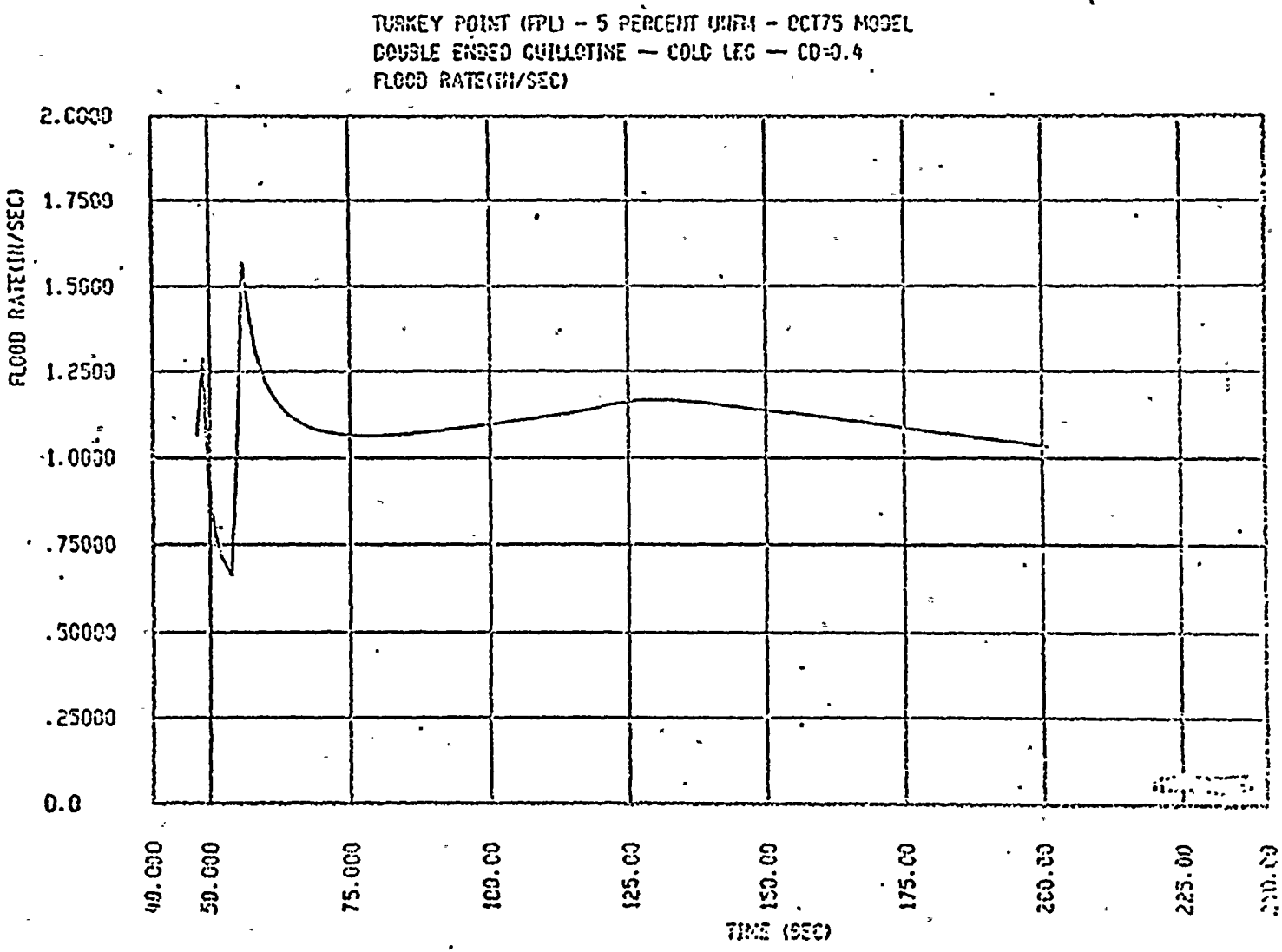


FIGURE 2a ACCUMULATOR WATER VOLUME, 825 FT^3

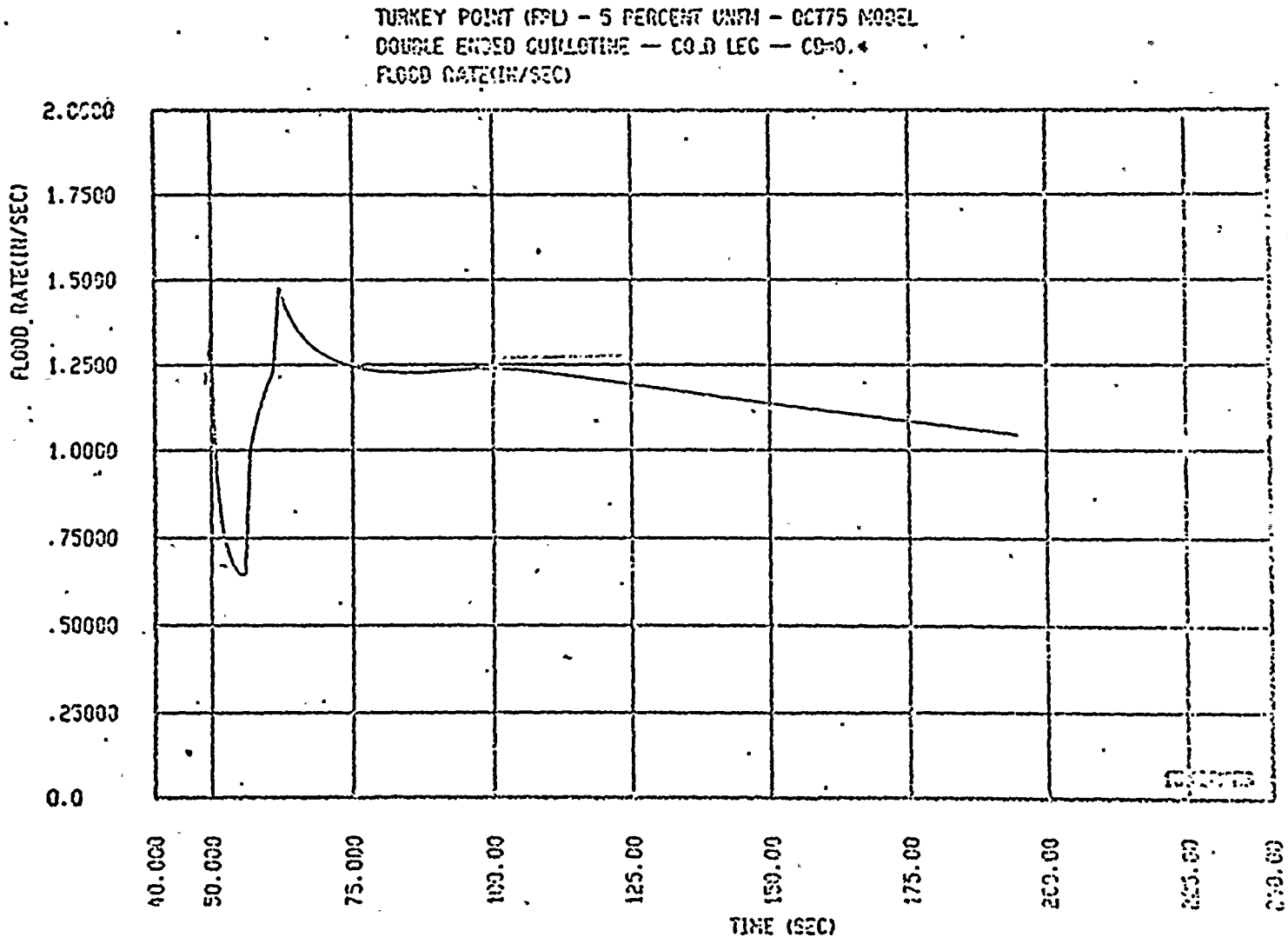


FIGURE 26 ACCUMULATOR WATER VOLUME, 875 FT³