NRC FORM 195 (2-76)

U.S. NUCLEAR REGULATORY COMMISSION

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MIAMI, FLORDIA
R.E. UHRIG

DATE OF DOCUMENT: 12/30/76

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DESCRIPTION

LTR. RE. THEIR 12/9/76 REVALUATION...TRANS THE FOLLOWING.....

ENCLOSURE

REVISED CALCULATIONS AS A SUPPLEMENT TO THE ECCS REEVALUATION, CONSISTING OF TABLES AND FIGURES.

(3 SIGNED CYS, RECEIVED)
(24 PAGES)

DO NOT REMOVE

ACKNOWLEDGED

PLANT NAME: TURKEY PT. # 3 & 4

FOR ACTION/INFORMATION — SAFETY — ENVIRO — SAB 1/6/77

	ASSIGNED AD:		ASSIGNED AD:
/	BRANCH CHIEF:	LEAR (6)	BRANCH CHIEF:
/	PROJECT MANAGER:	ELLIOTT	PROJECT MANAGER:
/	LIC. ASST.:	PARRISH	LIC. ASST.:

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/	DEYOUNG						SITE TECH.
	PROJECT MANAGEMENT		REACTOR SAFETY		OPERATING TECH.		GAMMILL
/	BOYD	/	ROSS	/	EISENHUT		STEPP
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JAN 3 1977 Mail Section Docket Clerk

December 30, 1976
L-76-438

RECEIVED JAN 3 1977 U.S. NUCLEAR REGULATORY COMMISSION

Office of Nuclear Reactor Regulation
Attn: Victor Stello, Jr., 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

On December 9, 1976, Florida Power & Light Company forwarded the ECCS Reevaluation for Turkey Point Units 3 and 4 which was performed using a rated power level of 2192 Mwt (L-76-419). The calculations have been revised using the Technical Specification rated power level of 2200 Mwt. The results of the revised calculations are forwarded herewith as a supplement to our earlier report.

Very truly yours,

E. P. Salomat

for Robert E. Uhrig
Vice President

REU/GDW/hlc
Attachment

cc: Norman C. Moseley, Region II
Robert Lowenstein, Esq.

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TABLE 1

LARGE BREAK
TIME SEQUENCE OF EVENTS
STEAM GENERATOR
10% TUBE PLUGGING
DECL
(CD=0.4)
(Sec)

START	0.0
REACTOR TRIP SIGNAL	0.595
S.I. SIGNAL	0.67
ACC. INJECTION	16.3
END OF BYPASS	27.52
END OF BLOWDOWN	27.66
BOTTOM OF CORE RECOVERY	46.59
ACC. EMPTY	61.02
PUMP INJECTION	25.67

TABLE 2

LARGE BREAK

STEAM GENERATOR
10% TUBE PLUGGING

DECL
(CD=0.4)

RESULTS	
PEAK CLAD TEMP. °F	2190
PEAK CLAD LOCATION FT.	6.0
LOCAL Zr/H_2O Reaction (max)%	11.922
LOCAL Zr/H_2O LOCATION Ft.	6.0
TOTAL Zr/H_2O Reaction %	<0.3
HOT ROD BURST TIME Sec	22.8
HOT ROD BURST LOCATION Ft.	6.0

CALCULATION	
CORE POWER Mwt 102% of	2200
PEAK LINEAR POWER kw/ft 102% of	12.61
PEAKING FACTOR	2.22
ACCUMULATOR WATER VOLUME (ft^3)	.875 (per accumulator)

FUEL REGION + CYCLE ANALYZED	CYCLE	REGION
Units 3 and 4	3	3

TABLE 3

LARGE BREAK

CONTAINMENT DATA (DRY CONTAINMENT)

NET FREE VOLUME	1.55×10^6	Ft^3
INITIAL CONDITIONS		
Pressure	14.7	psia
Temperature	90	°F
RWST Temperature	39	°F
Service Water Temperature	63	°F
Outside Temperature	39	°F
SPRAY SYSTEM		
Number of Pumps Operating	2	
Runout Flow Rate	1450	gpm
Actuation Time	26	sec
SAFEGUARDS FAN COOLERS		
Number of Fan Coolers Operating	3	
Minimum Post Accident Initiation Time for Fan Coolers	26	secs

LARGE BREAK

TABLE 3 (Continued)

CONTAINMENT DATA
(DRY CONTAINMENT)

STRUCTURAL HEAT SINKS

THICKNESS (In)		AREA (Ft^2)
STEEL	0.03	31,400
STEEL	0.063	107,158
STEEL	0.1	56,371
STEEL	0.2	57,185
STEEL	0.24	9,931
STEEL CONCRETE	0.2898 24.0 }	136,000
STEEL	0.4896	23,677
STEEL	0.6396	6,537
STEEL	0.8904	4,915
STEEL	1.256	27,802
STEEL	1.56	5,307
STEEL	2.0	668
STEEL	2.75	1,268.7
STEEL	5.5	1,277.4
STEEL	9.0	260.4
STAINLESS CONCRETE	0.14 24.0 }	14,392
STAINLESS	0.44	768
STAINLESS	2.126	3,704
STAINLESS	0.007	102,400
CONCRETE	24.0	59,132

TABLE 4

REFLOOD MASS AND ENERGY RELEASES FOR LIMITING CASE DECLG (CD=0.4) AND 10% STEAM GENERATOR TUBE PLUGGING

TIME (Sec)	TOTAL MASS FLOWRATE (LBm/Sec)	TOTAL ENERGY FLOWRATE (10^5 BTU/SEC)
46.589	0.0	0.0
48.714	0.0415	0.0005
54.286	35.50	0.4614
64.436	95.65	1.189
77.136	98.17	1.219
92.136	103.9	1.280
107.936	220.9	1.603
124.236	263.2	1.678
159.236	274.8	1.607
197.536	281.5	1.514

TABLE 5

BROKEN LOOP ACCUMULATOR FLOW TO CONTAINMENT FOR LIMITING CASE DECLG (CD=0.4) 10% STEAM GENERATOR TUBE PLUGGING

TIME (Sec)	MASS FLOWRATE (LBm/Sec)
0.0	0.0
0.02	2723.5
2.00	2276.0
4.00	1994.9
6.00	1793.1
8.00	1645.5
10.0	1526.4
15.0	1302.5
20.0	1137.8
25.0	1034.6
30.0	954.2
35.0	887.0
38.9	842.6

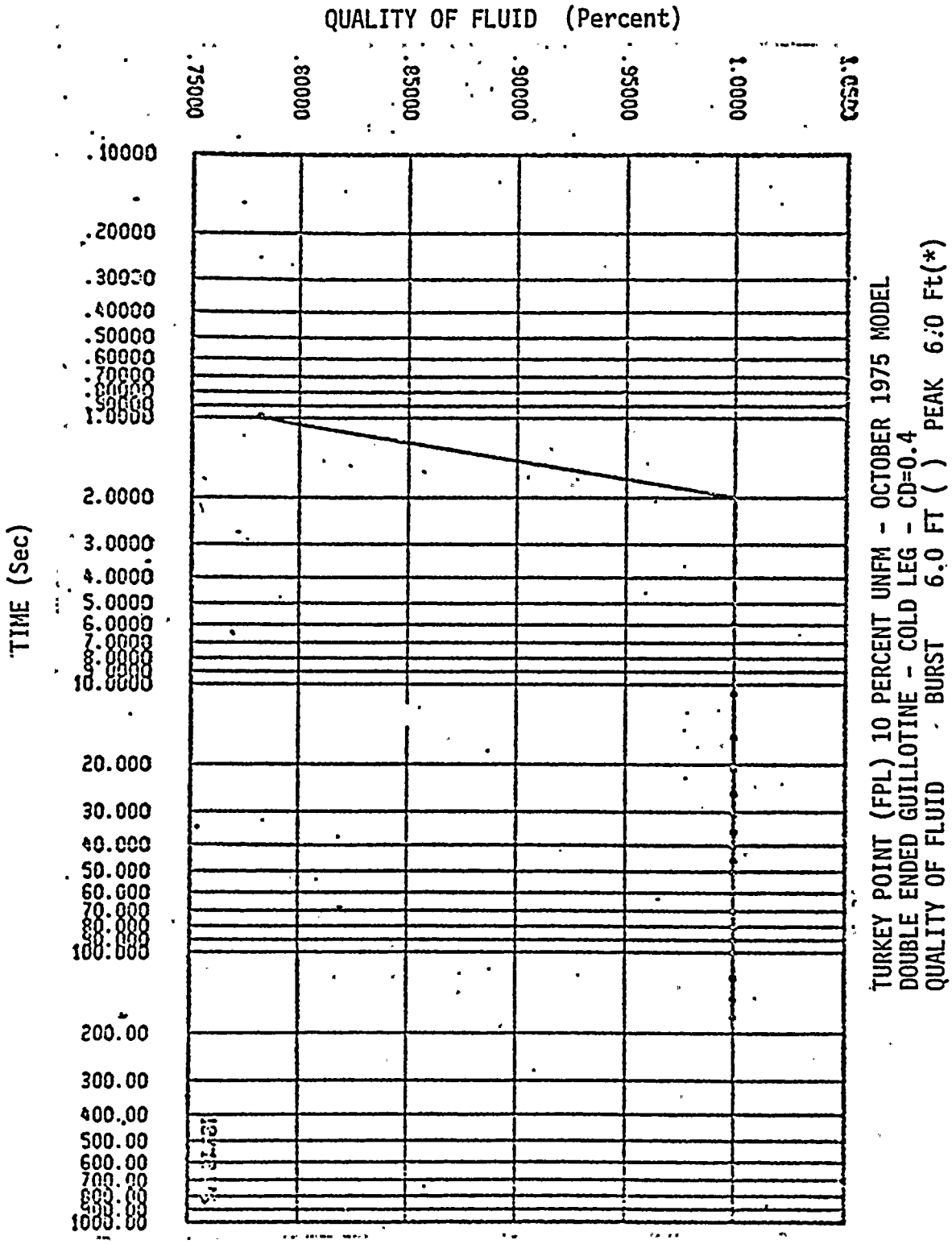

FIGURE 1. FLUID QUALITY - DECLG (CD = 0.4)

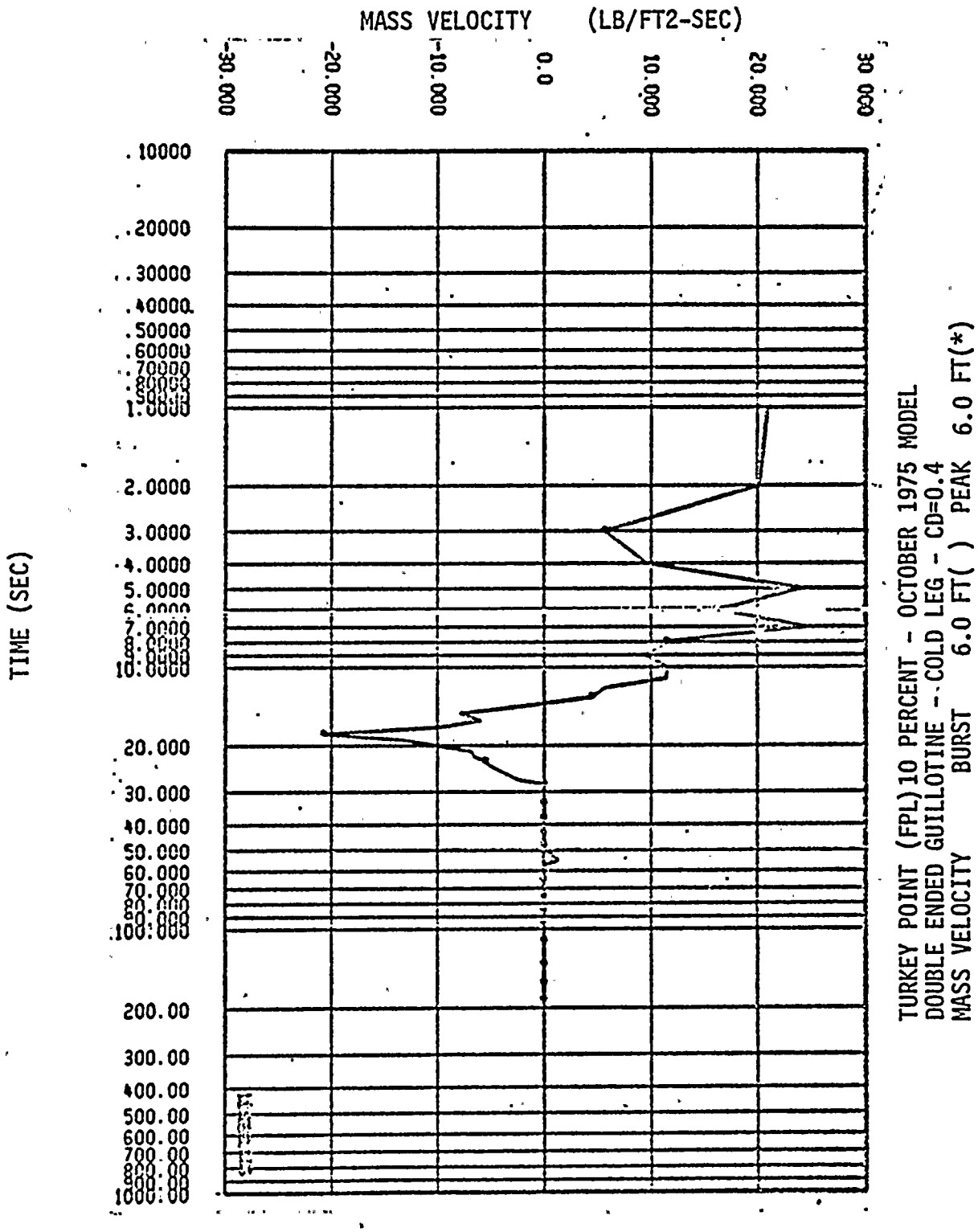

FIGURE 2. MASS VELOCITY - DECLG (CD = 0.4)

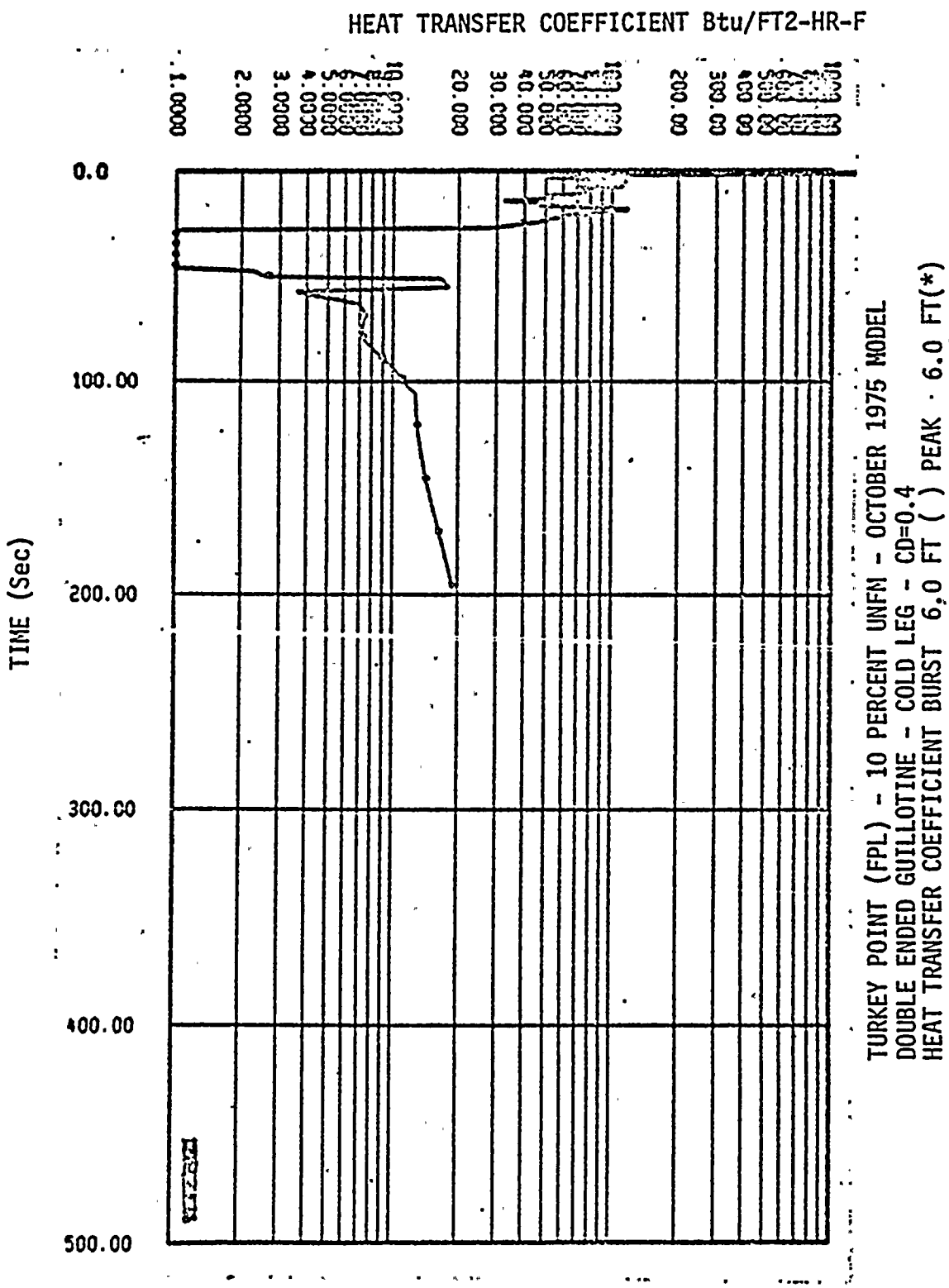

FIGURE 3. HEAT TRANSFER - COEFFICIENT - DECLG (CD = 0.4)

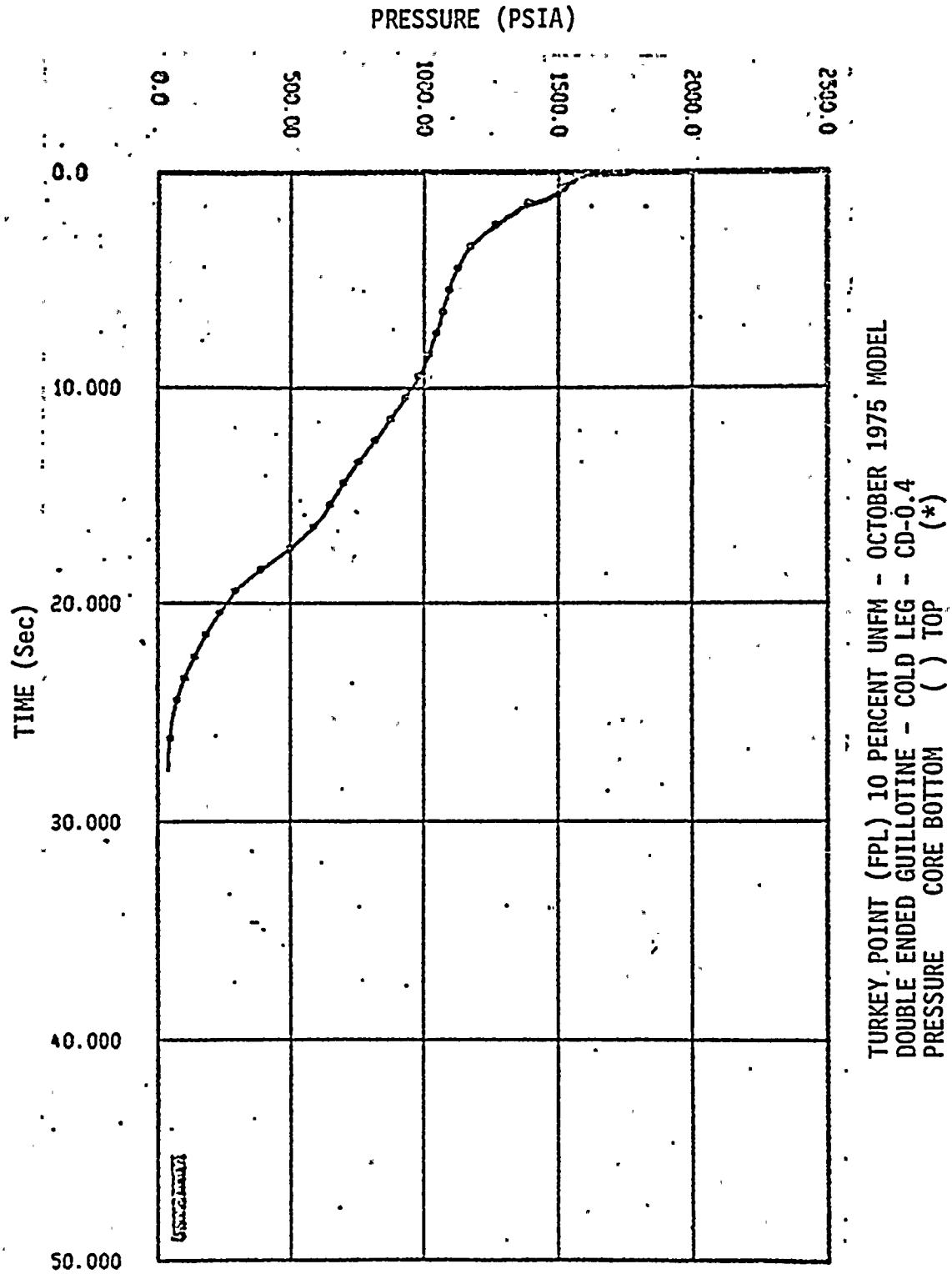

FIGURE 4. CORE PRESSURE - DECLG (CD=0.4)

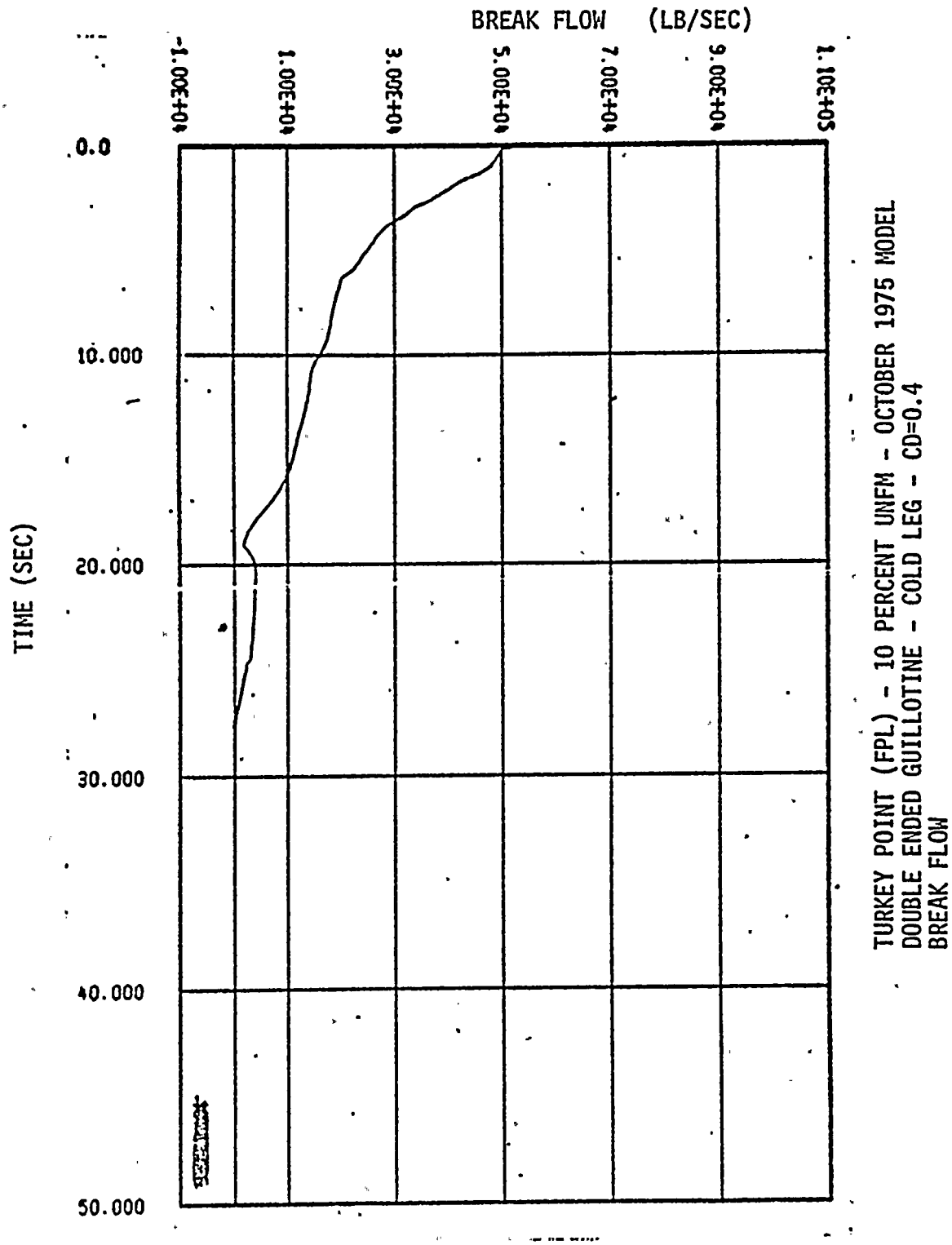

FIGURE 5. BREAK FLOW RATE - DECLG (CD=0.4)

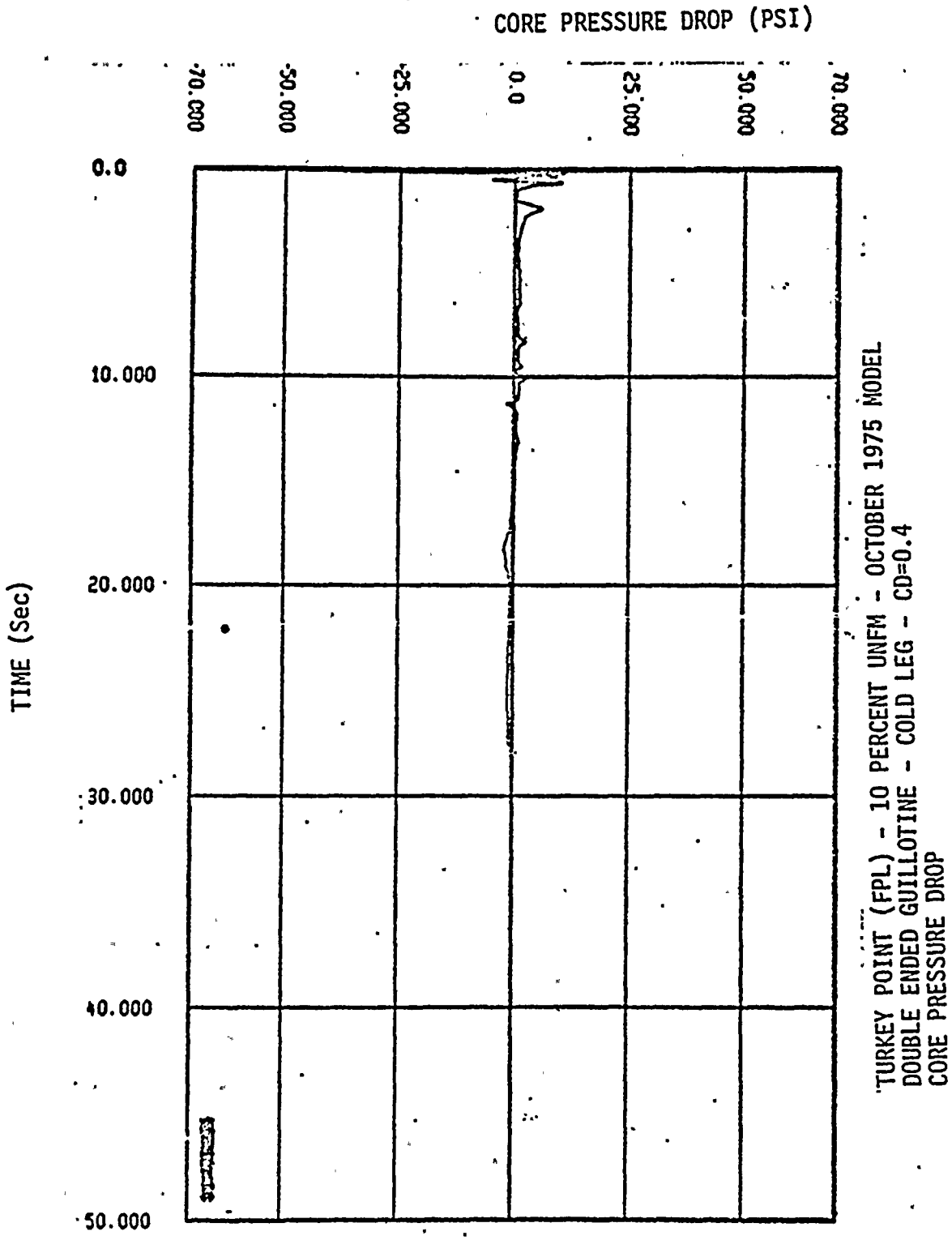

FIGURE 6. CORE PRESSURE DROP - DECLG (CD=0.4)

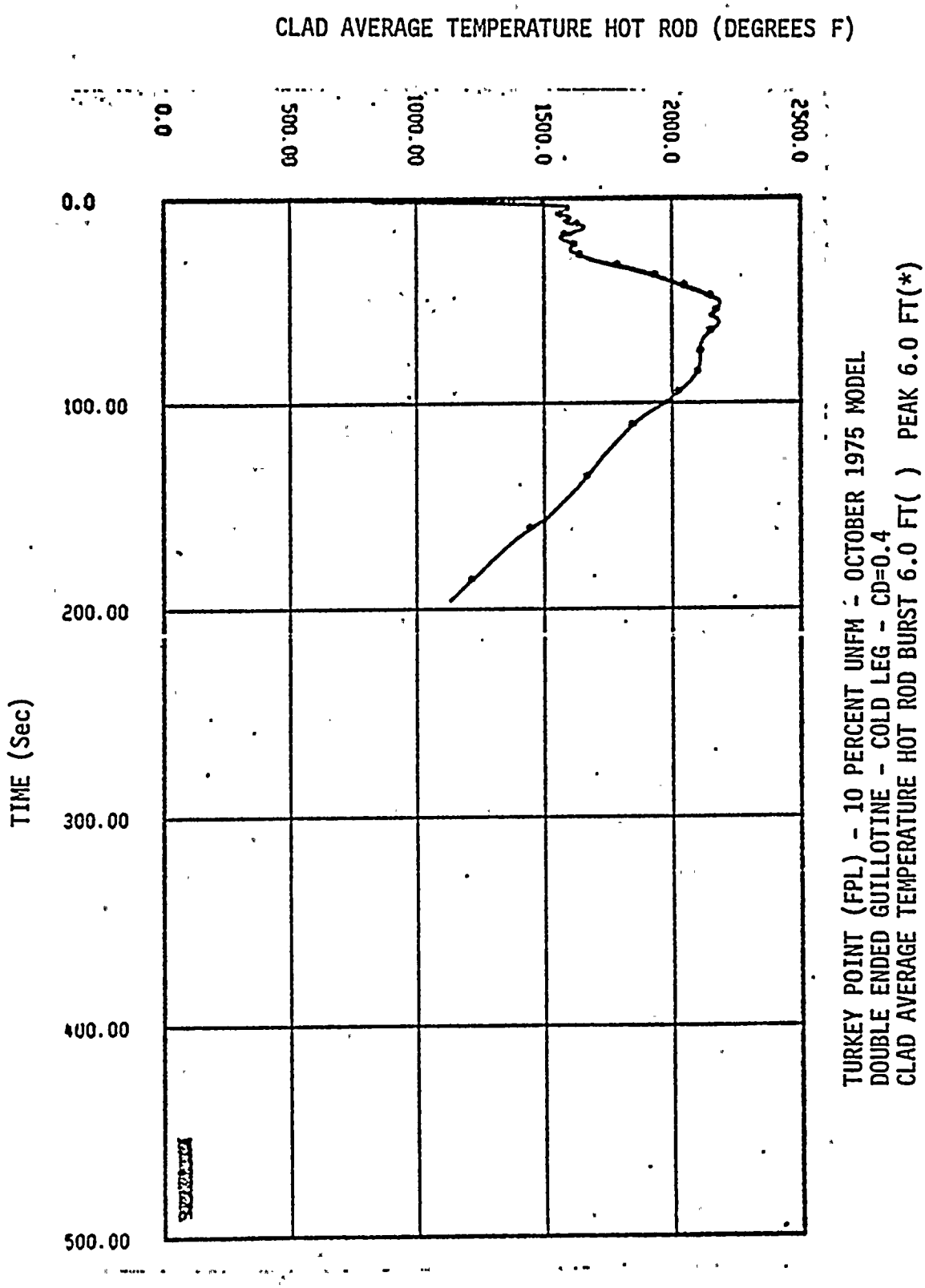

FIGURE 7. PEAK CLAD TEMPERATURE - DECLG (CD=0.4)

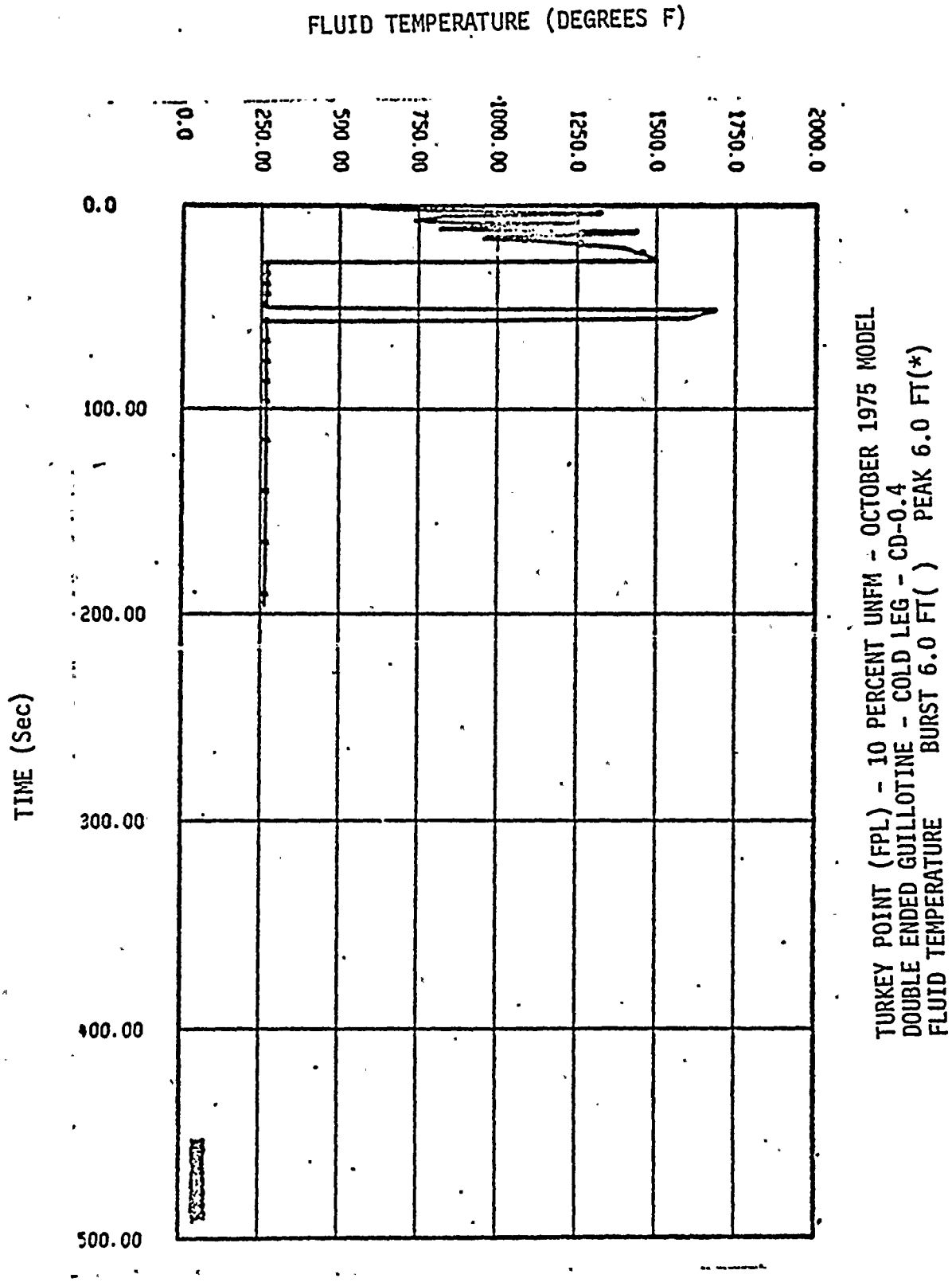

FIGURE 8. FLUID TEMPERATURE - DECLG (CD=0.4)

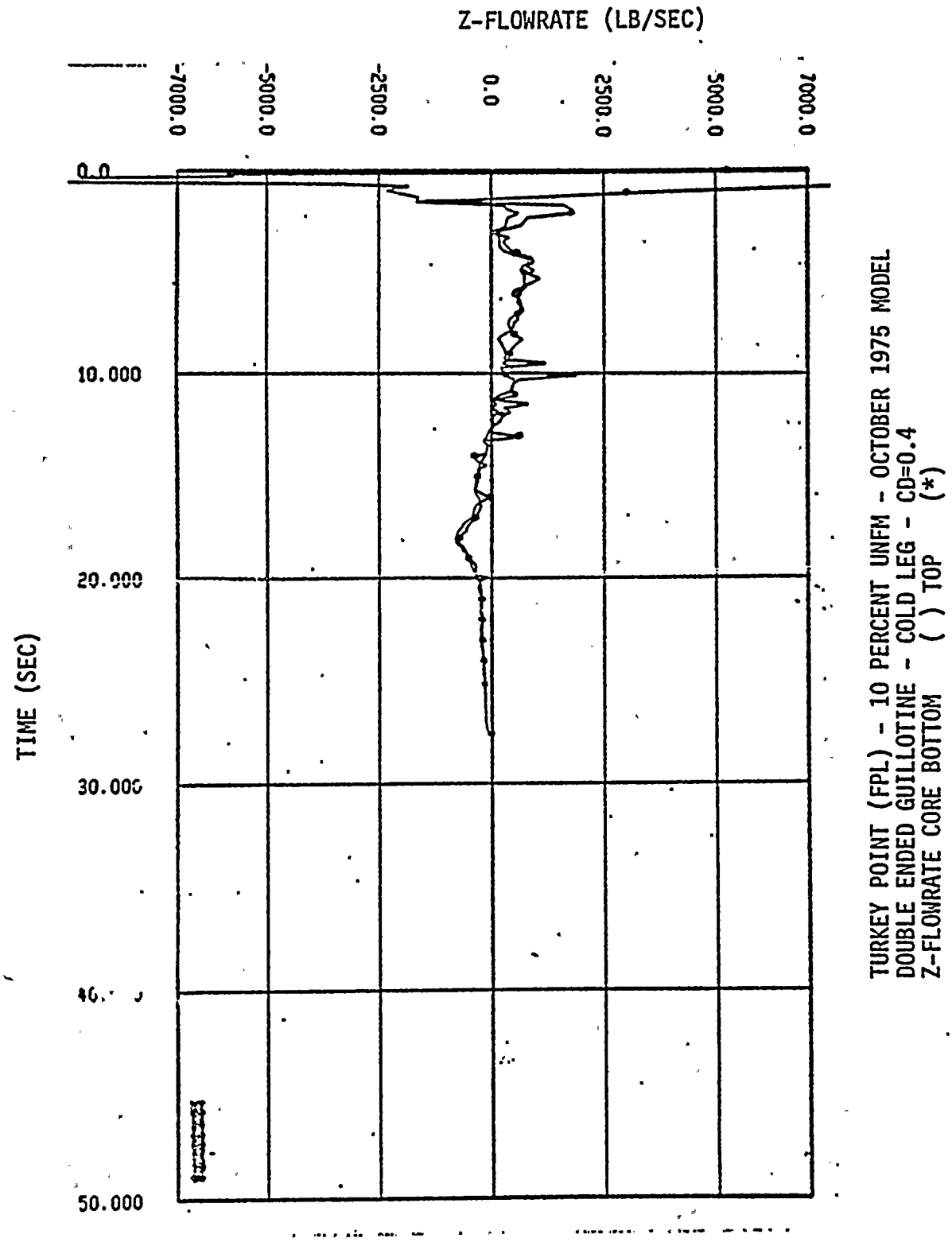

FIGURE 9. CORE FLOW - TOP AND BOTTOM - DECLG (CD-0.4)

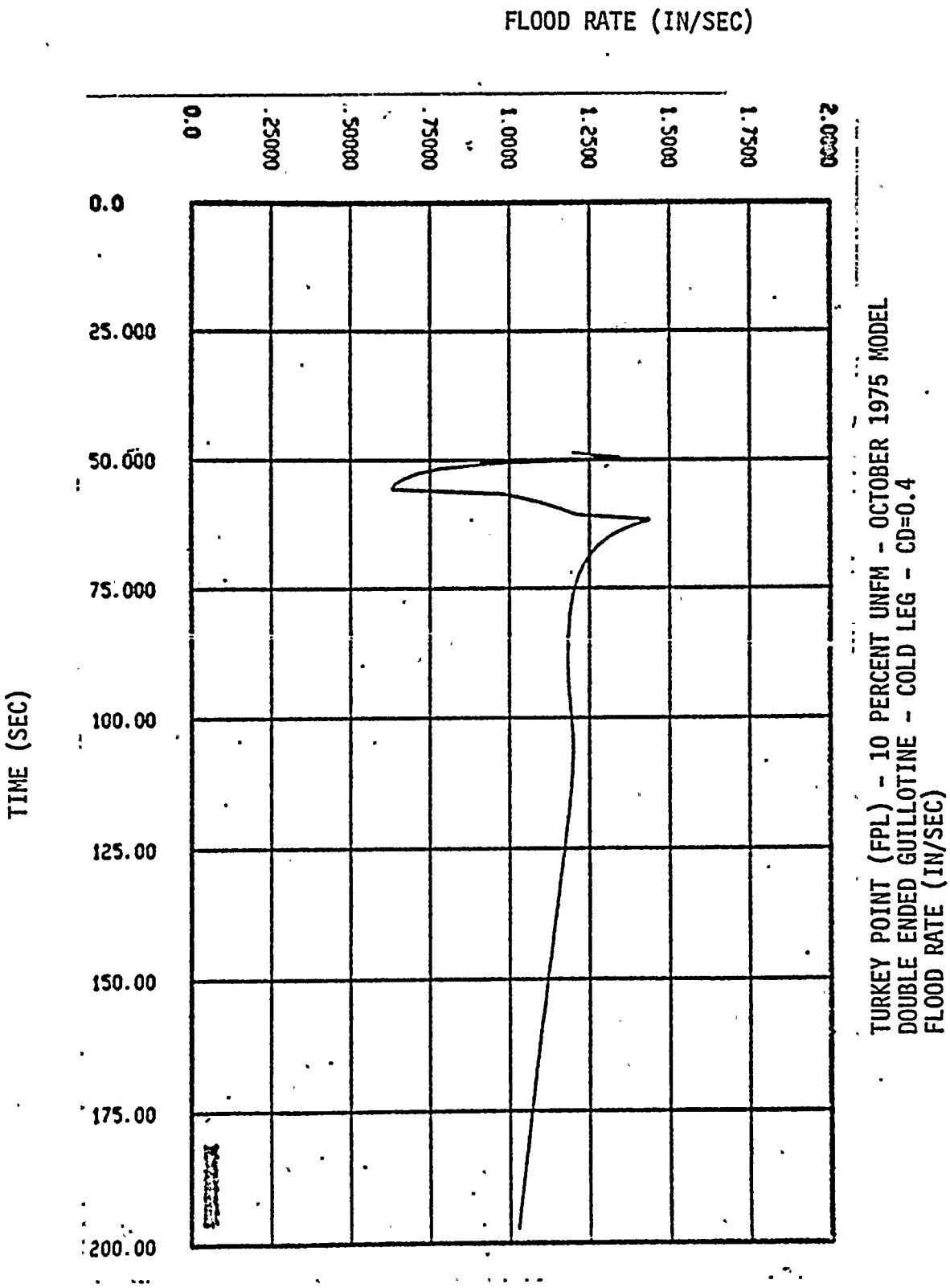

FIGURE 10. REFLOOD TRANSIENT - DECLG (CD=0.4)
CORE INLET VELOCITY

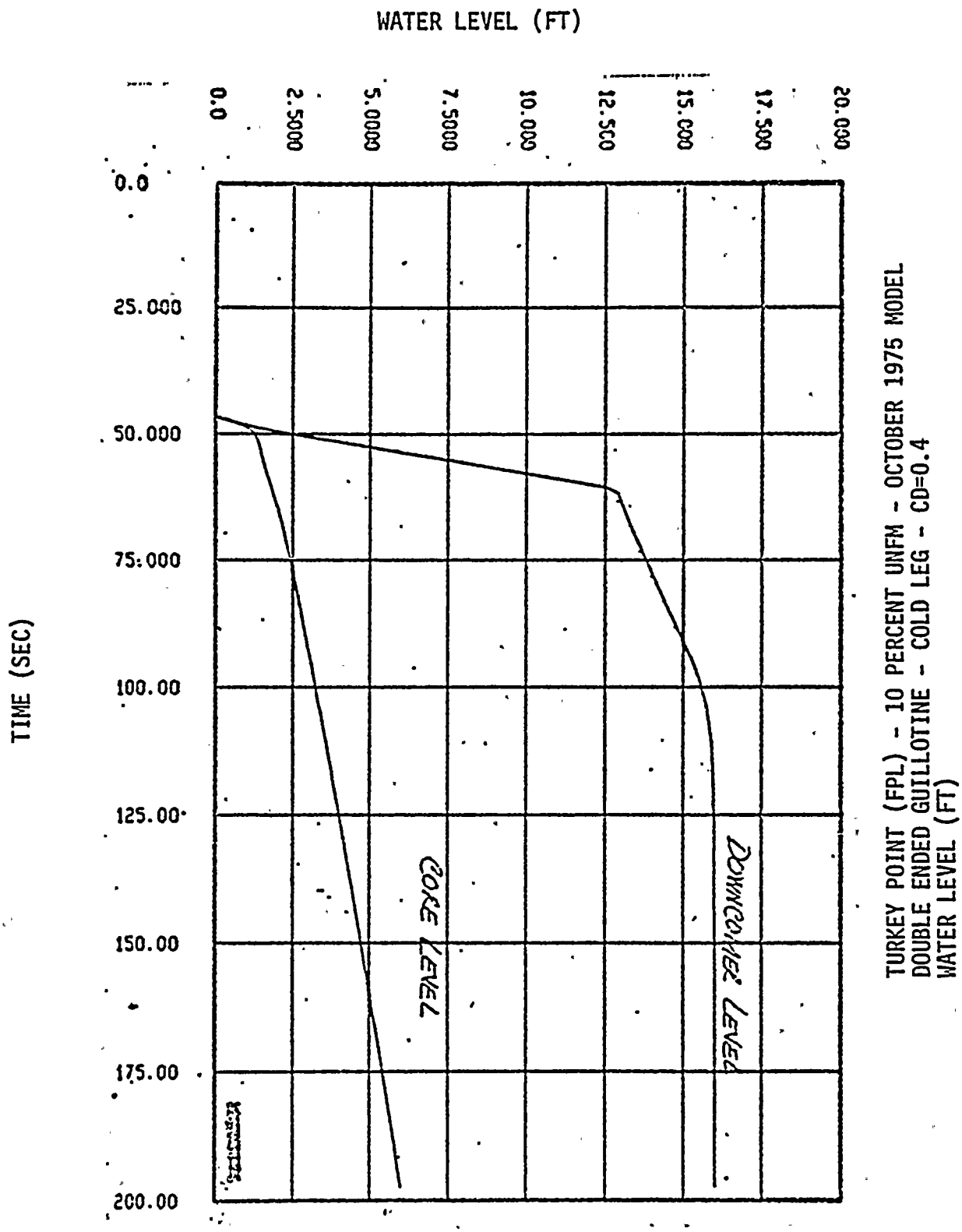

FIGURE 11. REFLOOD TRANSIENT - DECLG (CD=0.4)
DOWNCOMER AND CORE WATER LEVELS

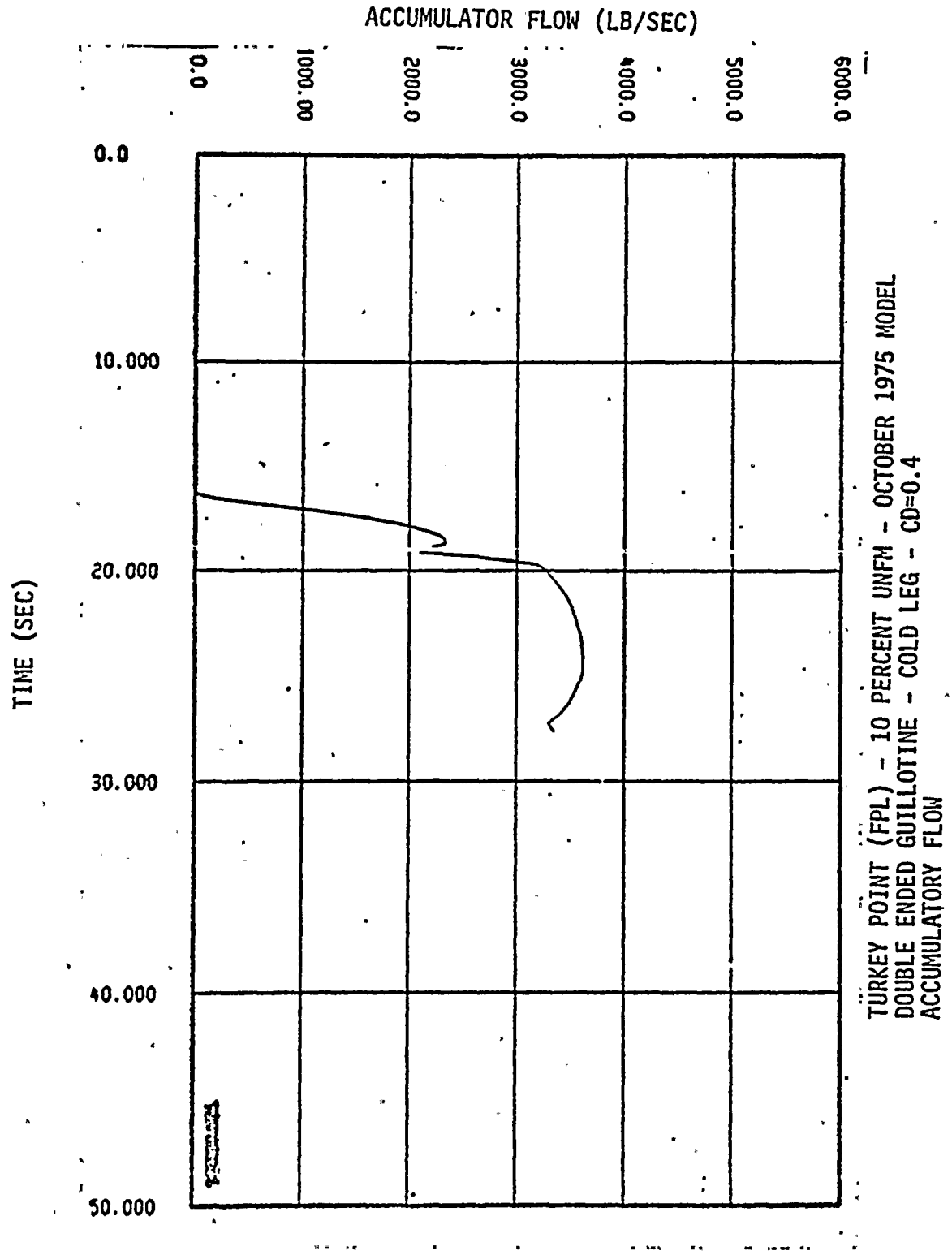

FIGURE 12. ACCUMULATOR FLOW (BLOWDOWN)- DECLG (CD=0.4)

K+E 10 X 10 TO THE CENTIMETER 18 X 25 CM. KEUFFEL & ESSER CO. MADE IN U.S.A. 46 1510

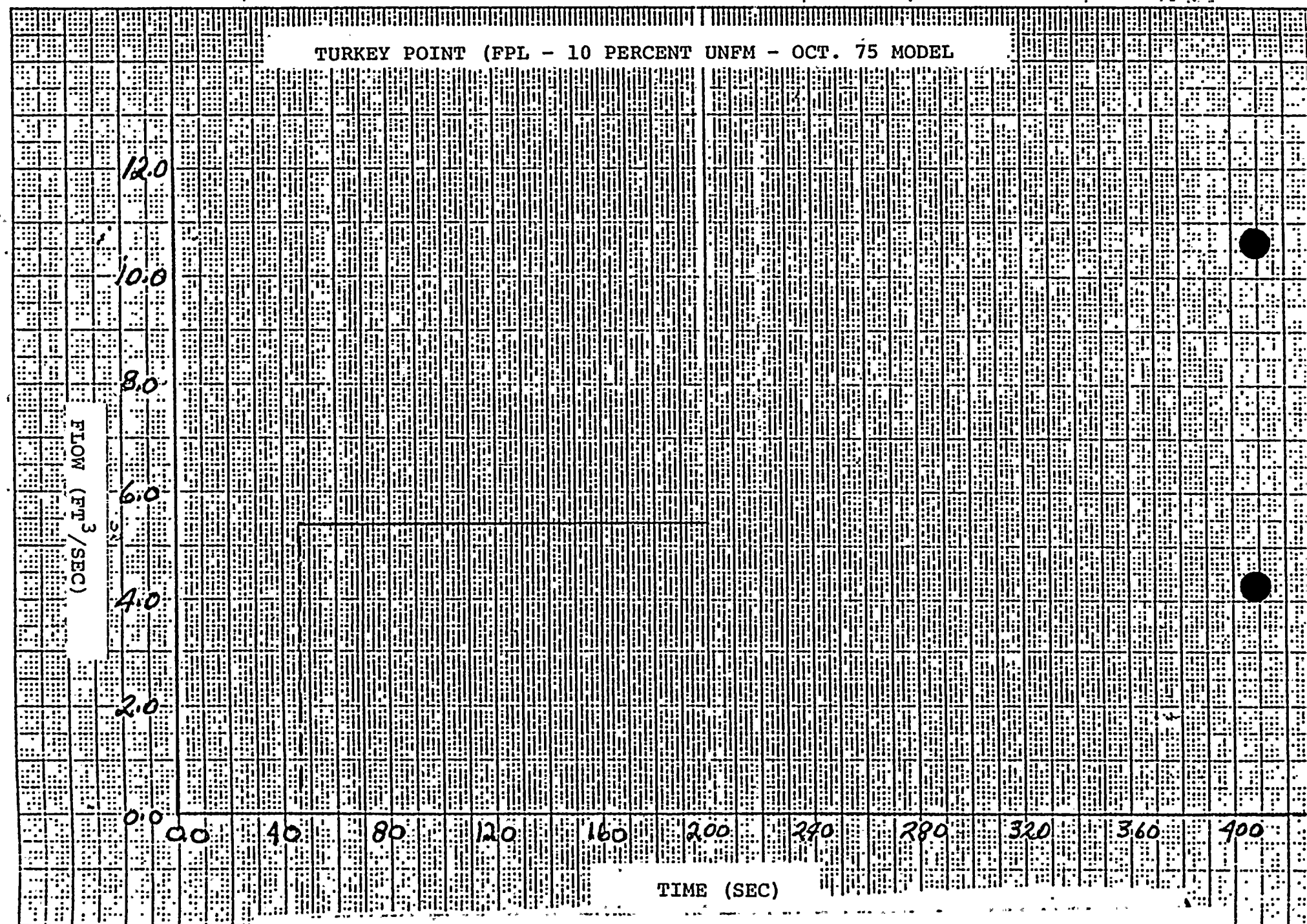

FIGURE 13. PUMPED ECCS FLOW (REFLOOD) - DECLG (CD=0.4)

K+E 10 X 10 TO THE CENTIMETER 18 X 25 CM.
KEUFFEL & ESSER CO. MADE IN U.S.A.

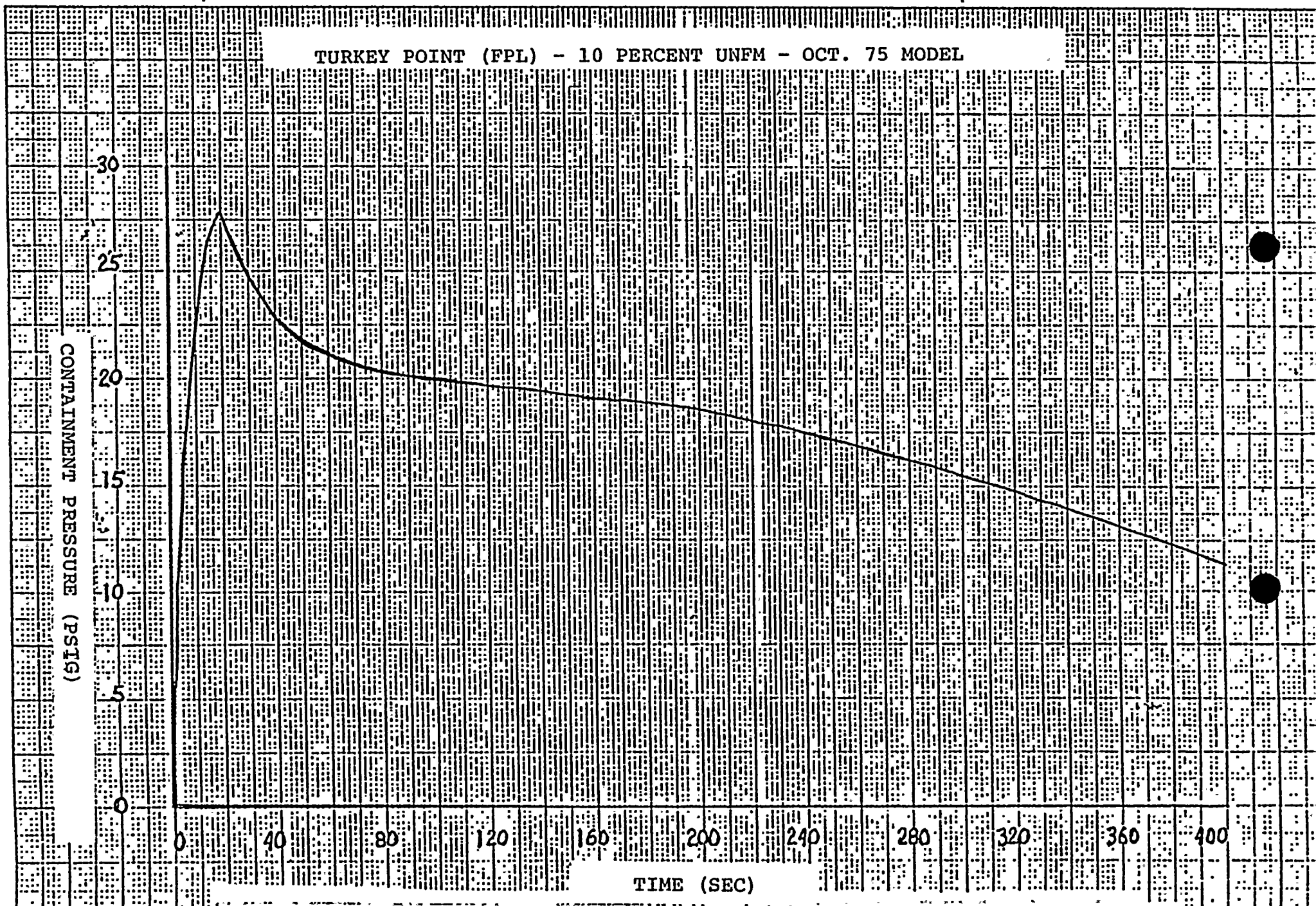

FIGURE 14. CONTAINMENT PRESSURE - DECLG (CD=0.4)

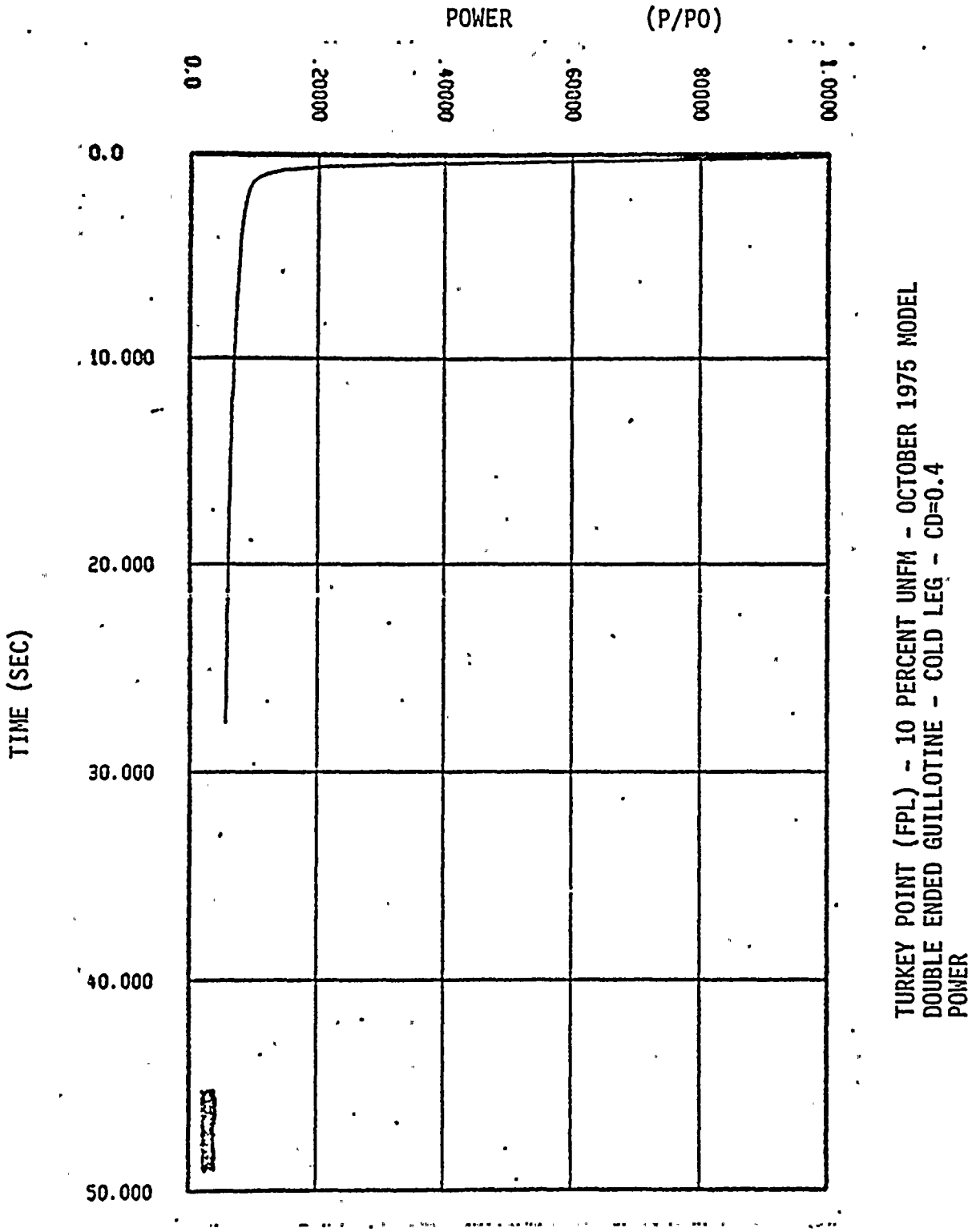

FIGURE 15. CORE POWER TRANSIENT - DECLG (CD=0.4)

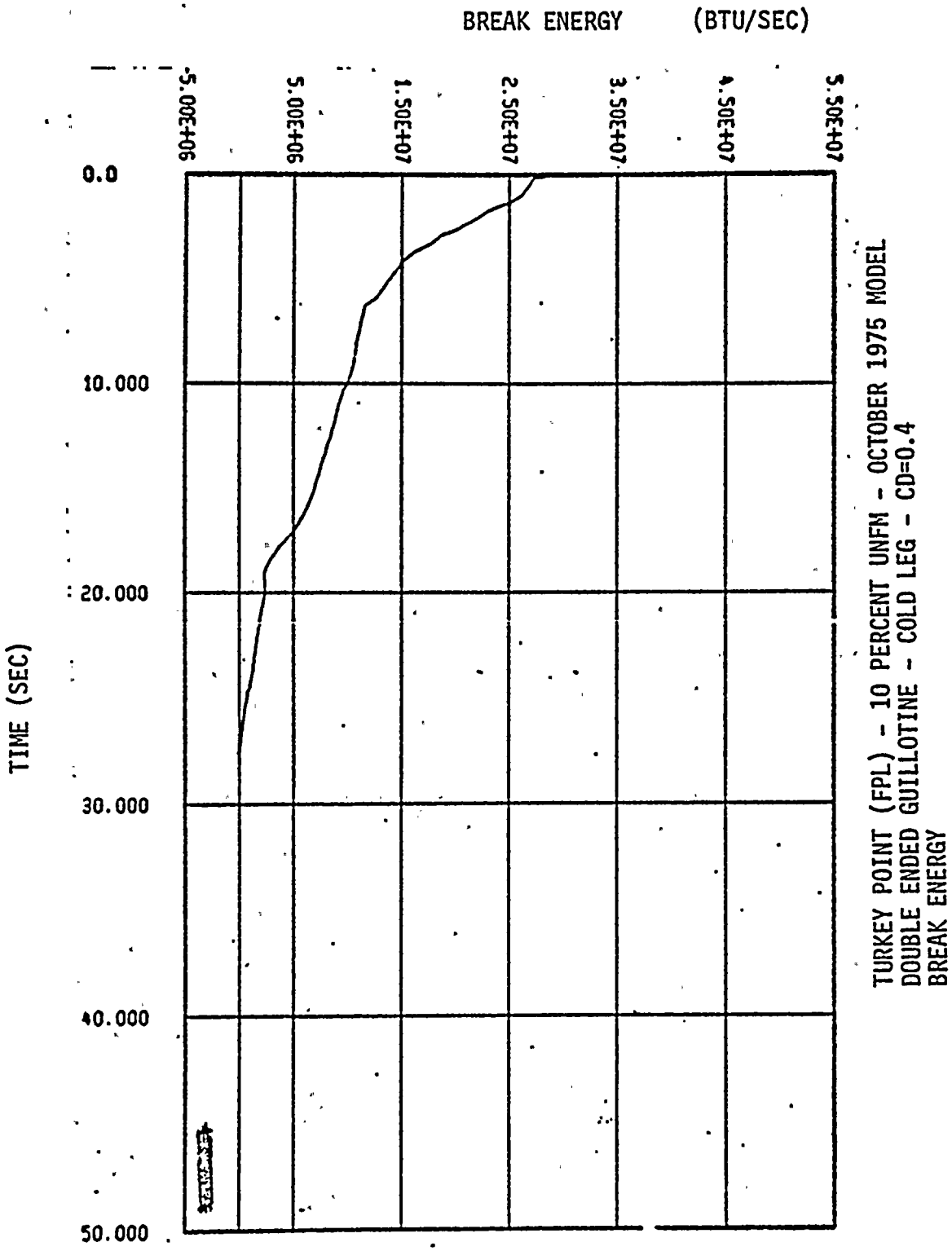

FIGURE 16. BREAK ENERGY RELEASED TO CONTAINMENT

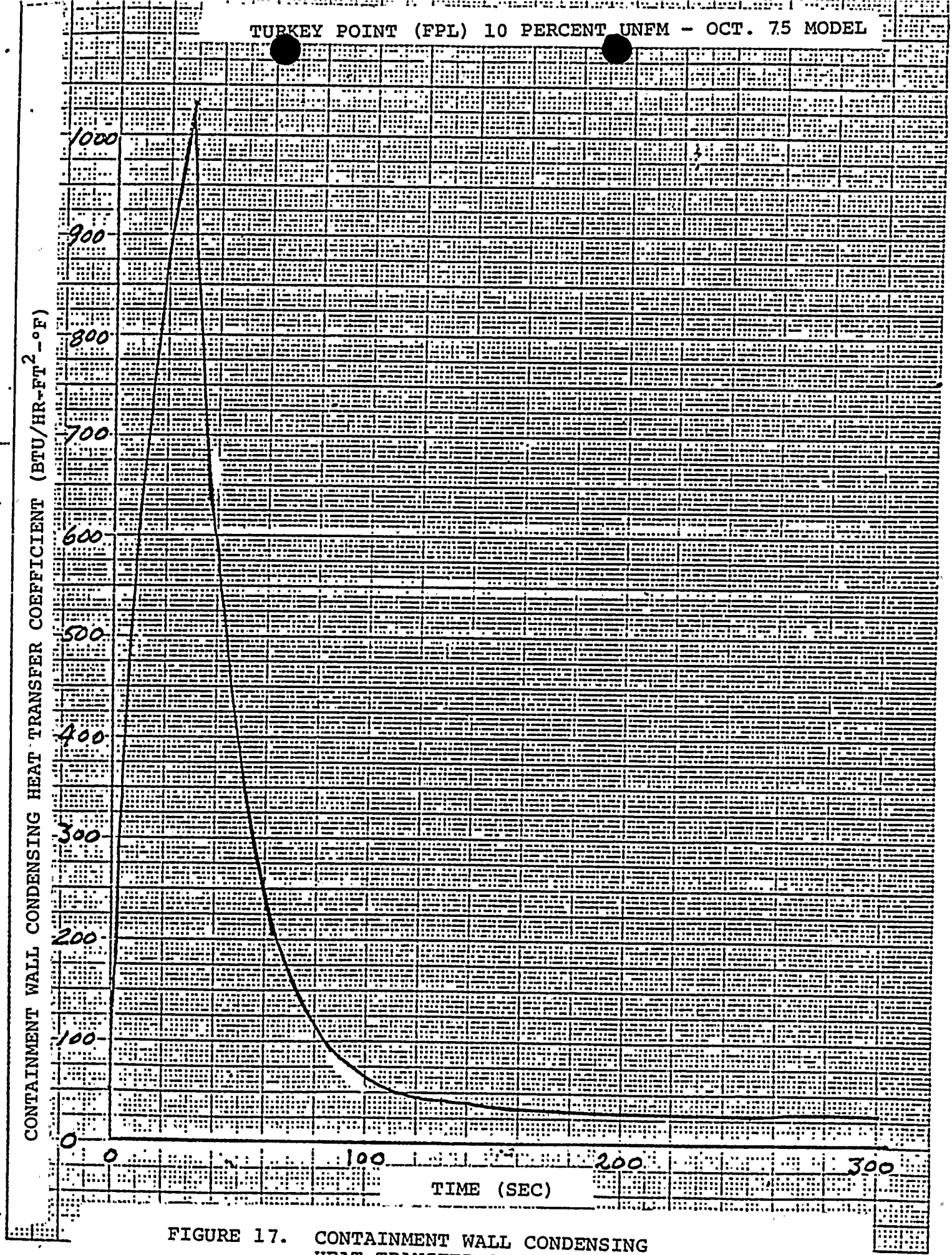

FIGURE 17. CONTAINMENT WALL CONDENSING HEAT TRANSFER COEFFICIENT