NRC FORM 195 (2-76)

U.S. NUCLEAR REGULATORY COMMISSION

DOCKET NUMBER 50-250 (251)

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LTR. RE. THEIR 12/30/76 SUBMITTAL.....

ENCLOSURE
RESULTS OF THE REVISED ECCS CALCULATIONS.....
SUPPLEMENTAL INFORMATION.....

(40 CYS. RECEIVED)
(20 PAGES)

PLANT NAME: TURKEY PT. # 3 & 4

ACKNOWLEDGED

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NRC FORM 195 (2-76)

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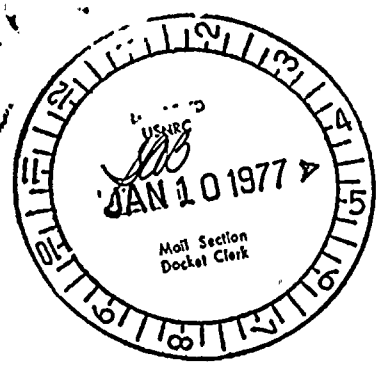

P. O. BOX 013100, MIAMI, FL 33101

FPL
FLORIDA POWER & LIGHT COMPANY

January 3, 1977
L-77-1

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 30, 1976, (L-76-438), Florida Power & Light Company forwarded the results of the revised ECCS calculations performed using a rated power level of 2200 MWt. Several of the pages in our December 30, 1976, transmittal have been revised to improve their clarity. A copy of the revised report is forwarded herewith.

Very truly yours,

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 (C_D=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

Results	DECL (C_D=0.4)
Peak Clad Temp. °F	2190
Peak Clad Location Ft.	6.0
Local Zr/H_2O Rxn(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	secs
SAFEGUARDS FAN COOLERS		
Number of Fan Coolers Operating	3	
Minimum Post Accident Initiation Time for Fan Coolers	26	secs

TABLE 3 (Continued)

LARGE BREAK

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	0.2898	---
Concrete	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	1268.7
Steel	5.5	1277.4
Steel	9.0	260.4
Stainless	0.14	---
Concrete	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 (C_D=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 (C_D=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

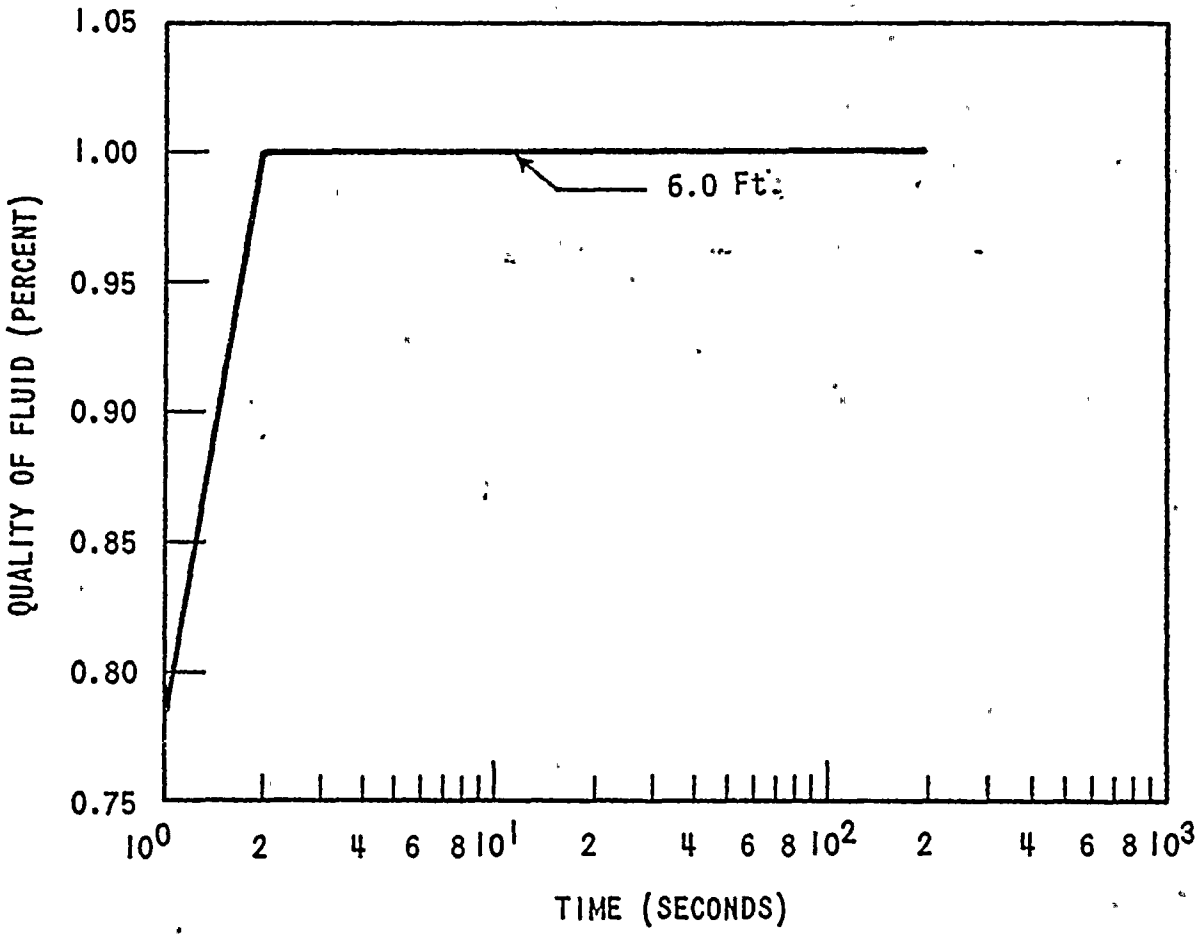


Figure 1 Fluid Quality - DECLG (C_D = 0.4)

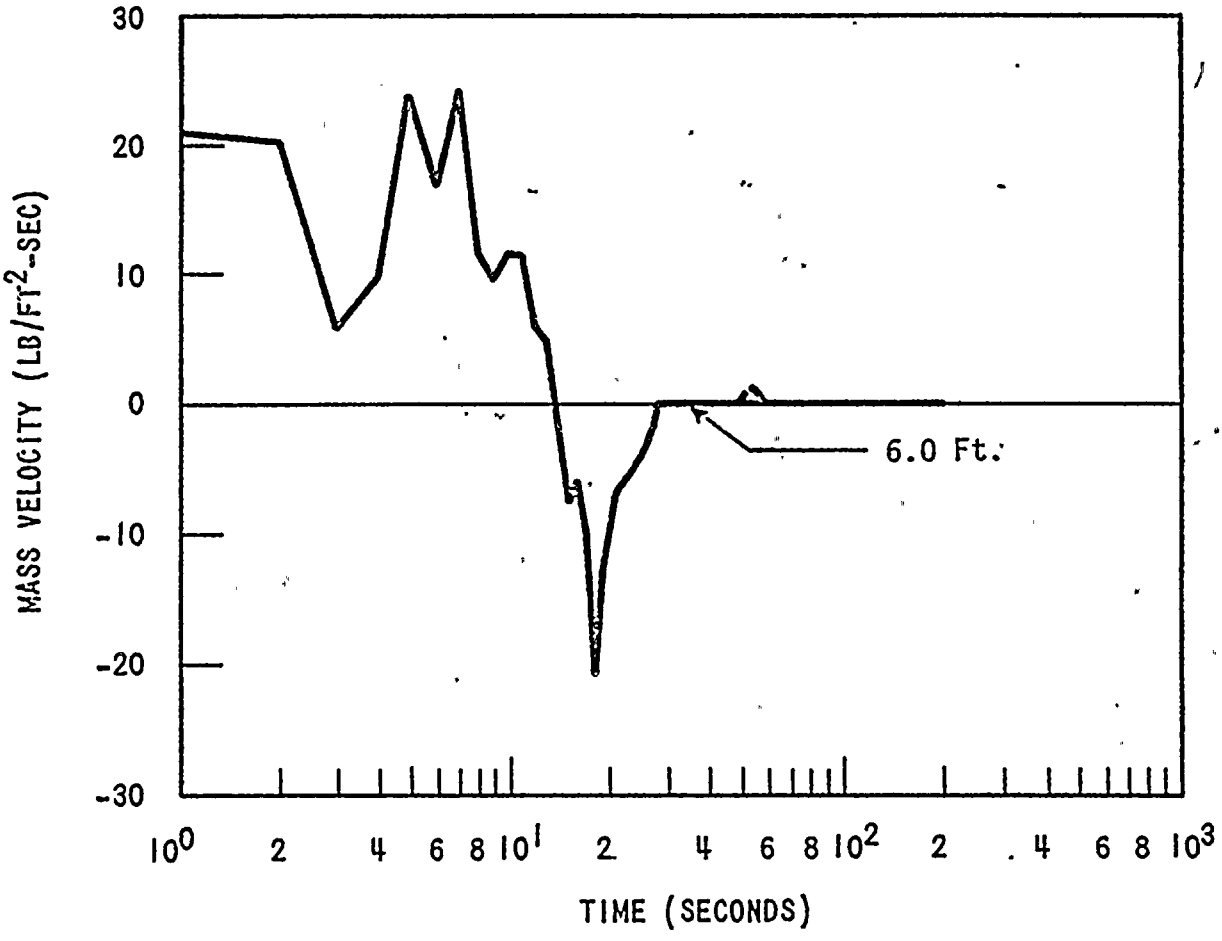


Figure 2 Mass Velocity - DECLG (C_D = 0.4)

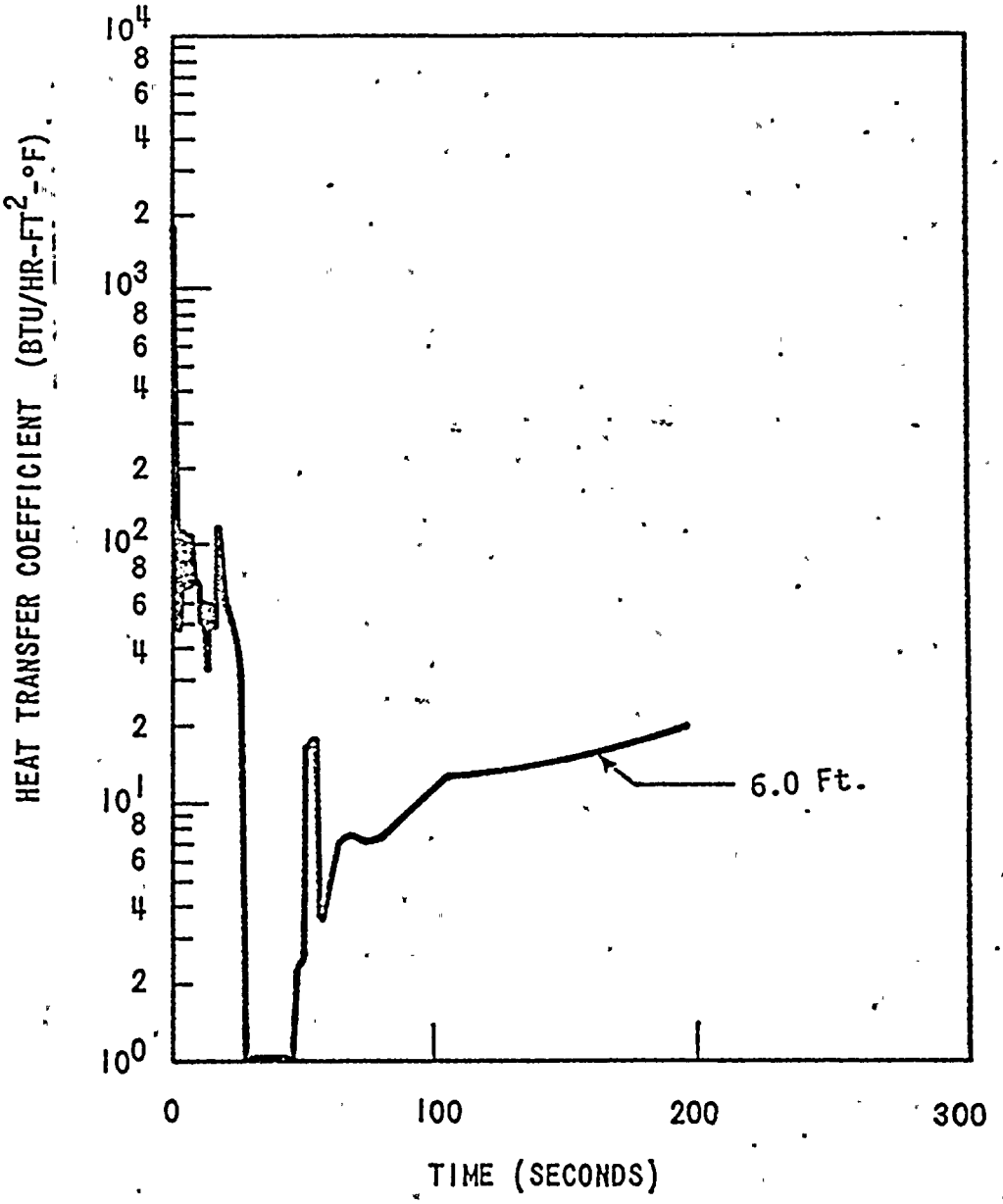


Figure 3 Heat Transfer Coefficient - DECLG (C_D = 0.4)

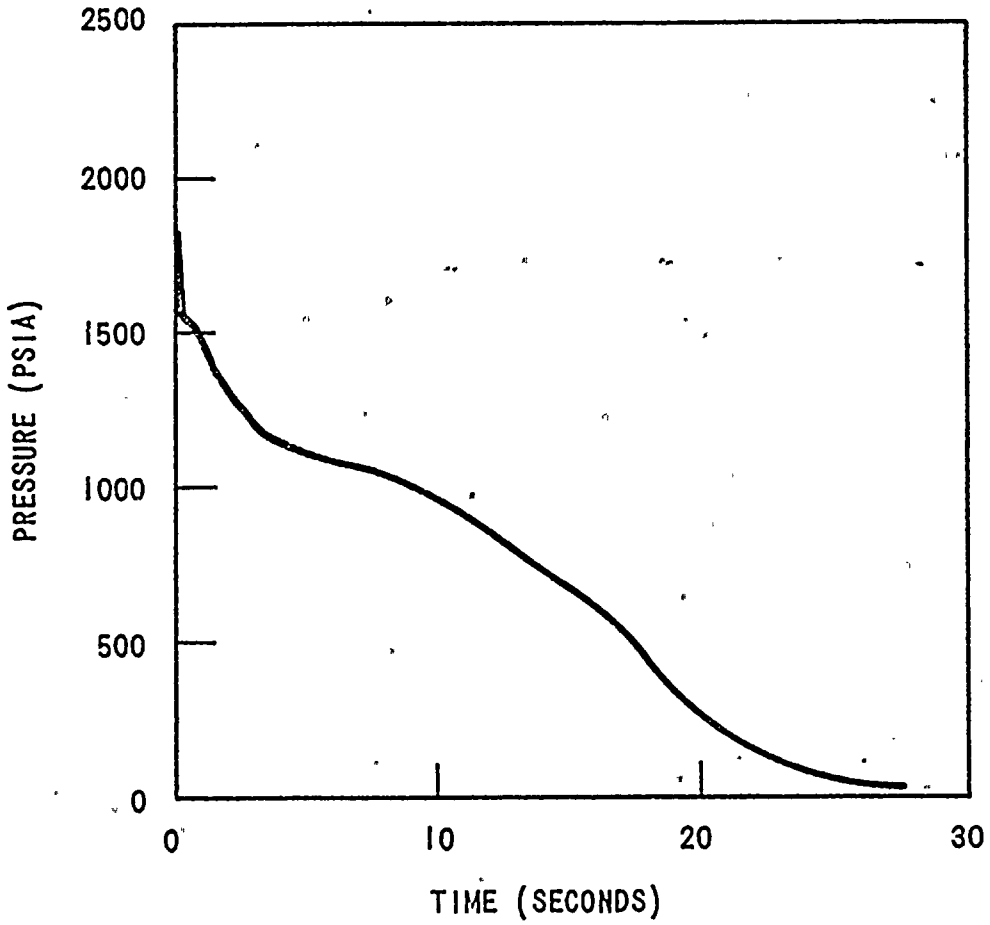


Figure 4 Core Pressure - DECLG (C_D = 0.4)

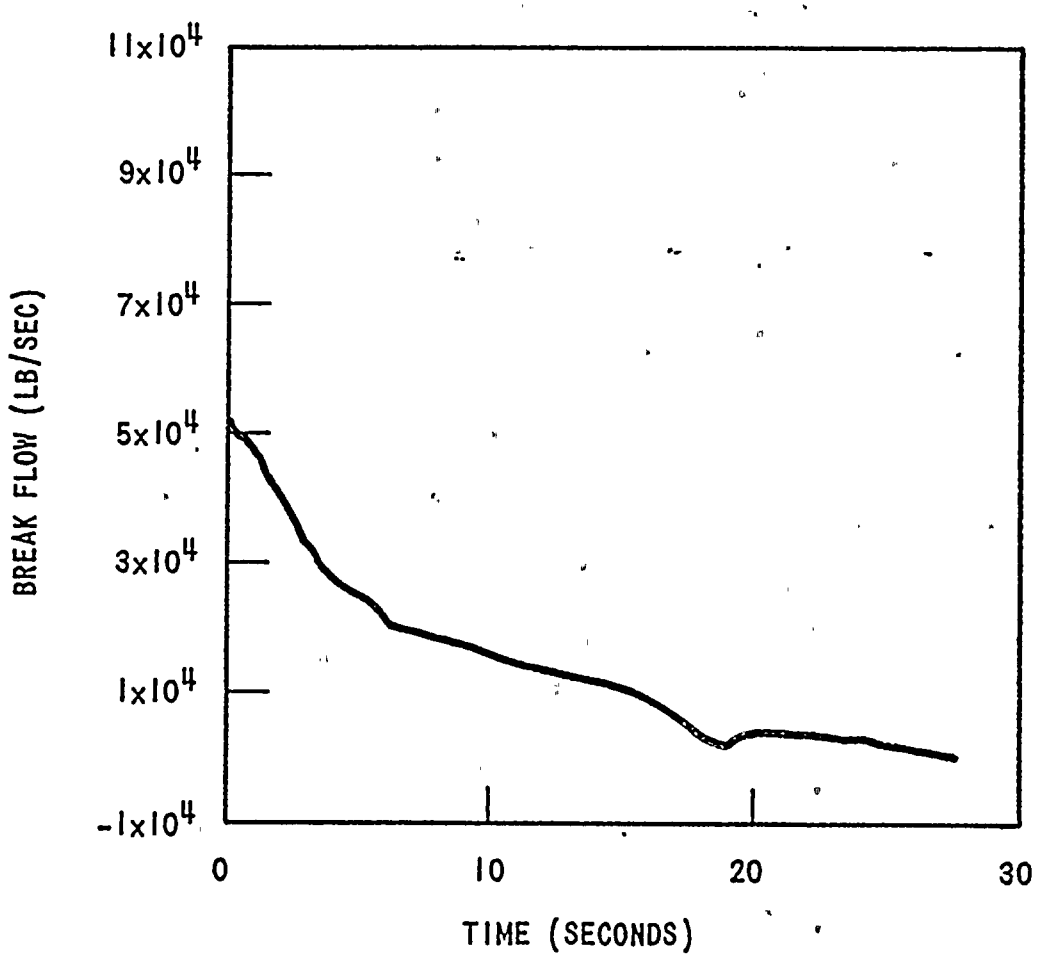


Figure 5 Break Flow Rate - DECLG (C_D = 0.4)

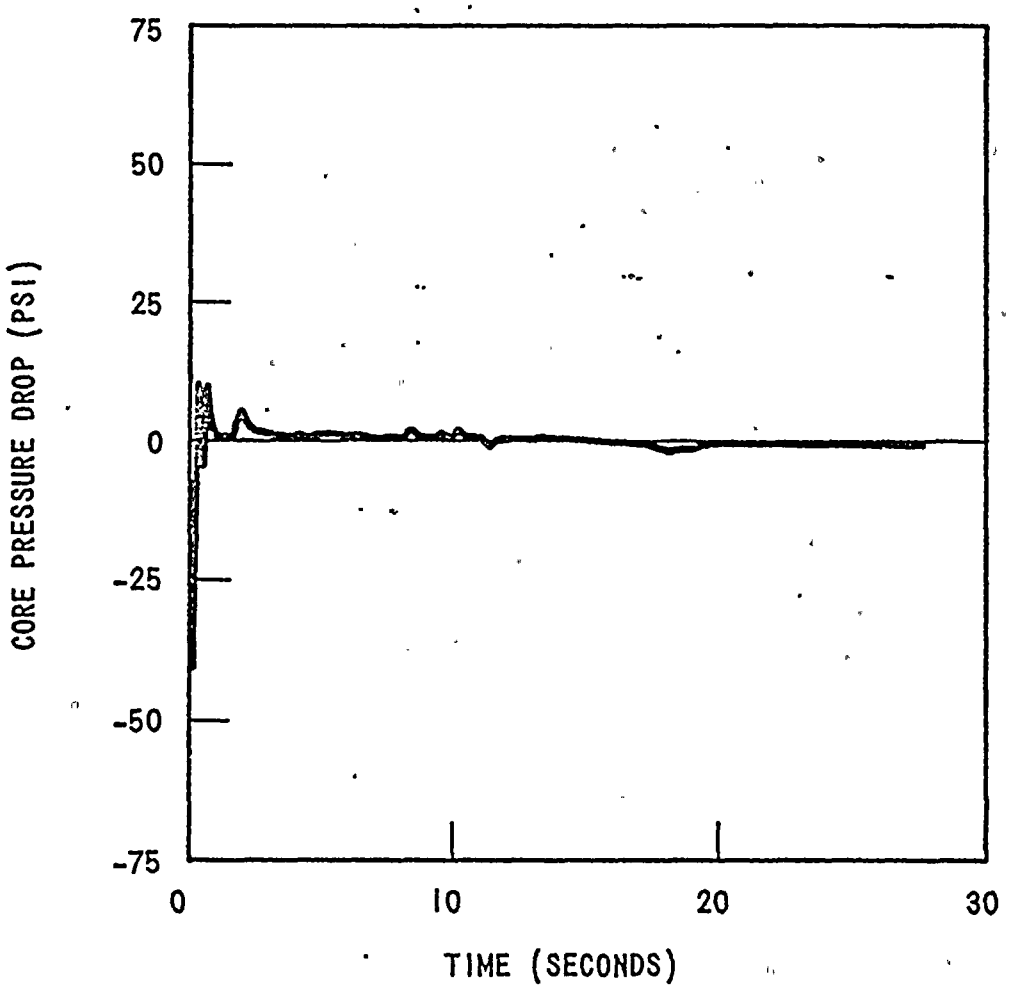


Figure 6 Core Pressure Drop - DECLG (C_D = 0.4)

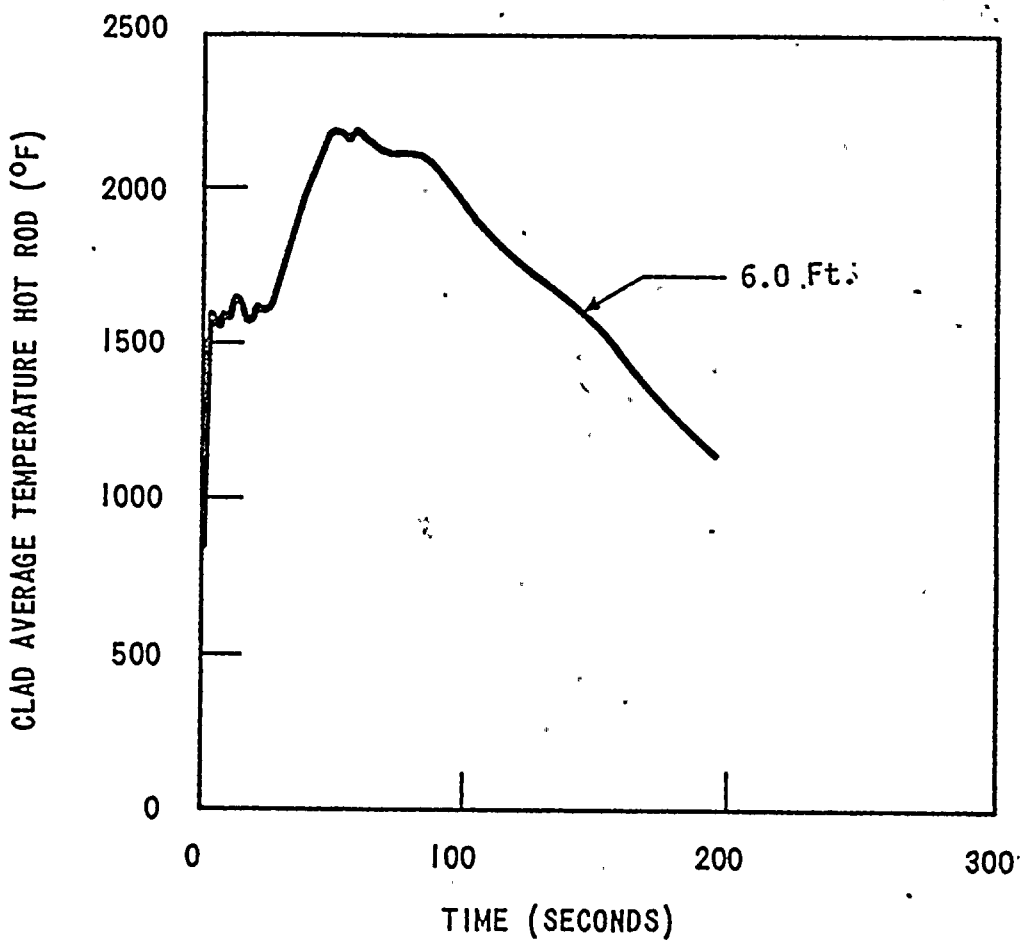


Figure 7 Peak Clad Temperature - DECLG (C_D = 0.4)

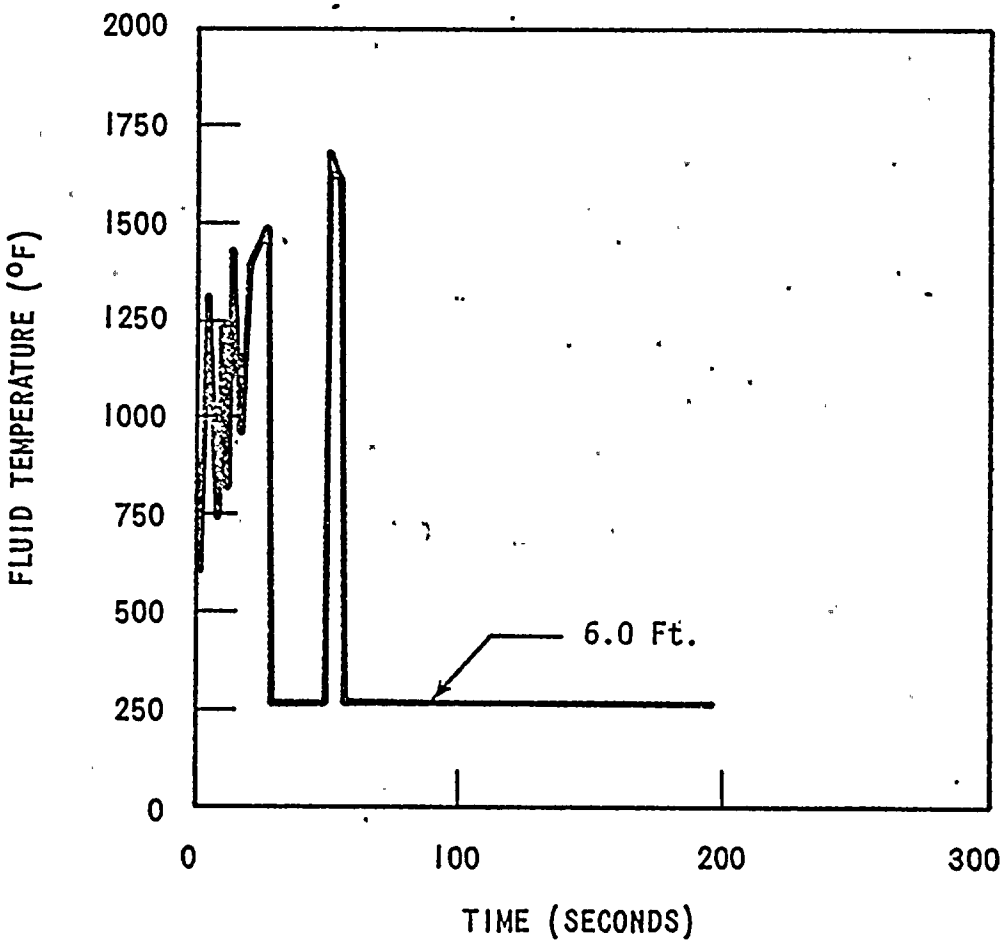


Figure 8 Fluid Temperature - DECLG (C_D = 0.4)

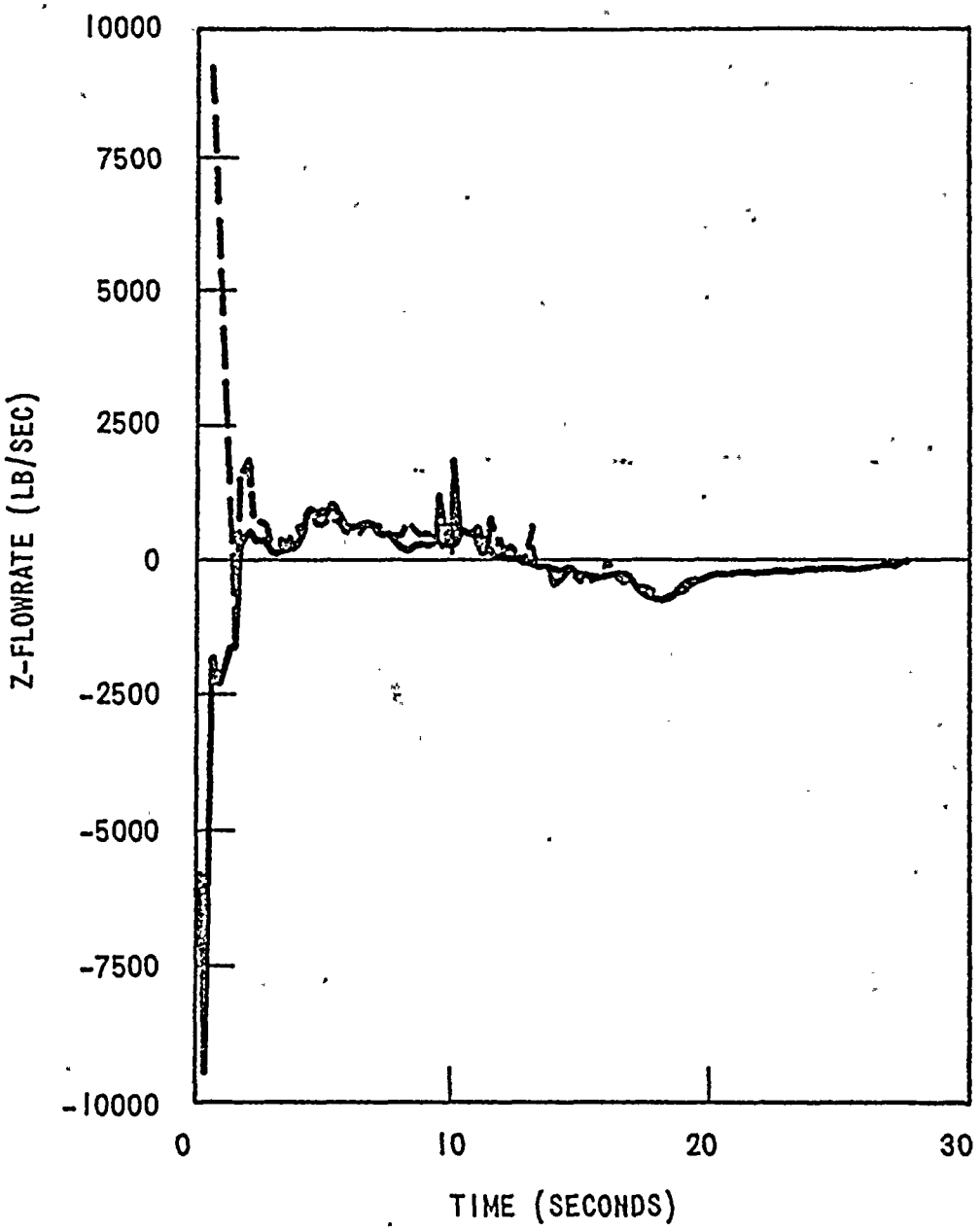


Figure 9 Core Flow - Top and Bottom - DECLG (C_D = 0.4)

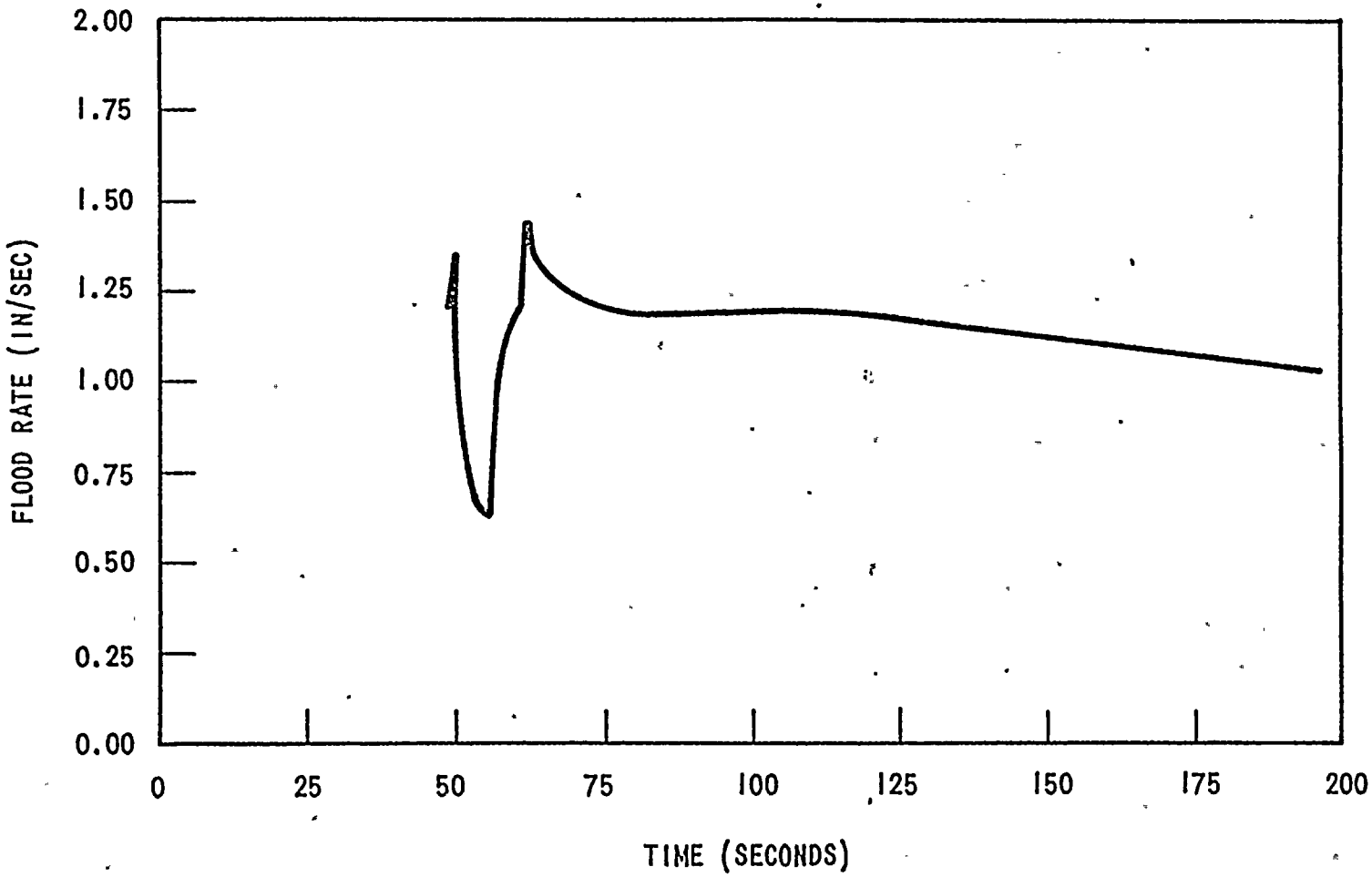


Figure 10 Reflood Transient - DECLG (C_D = 0.4)
Core Inlet Velocity

10,833-10

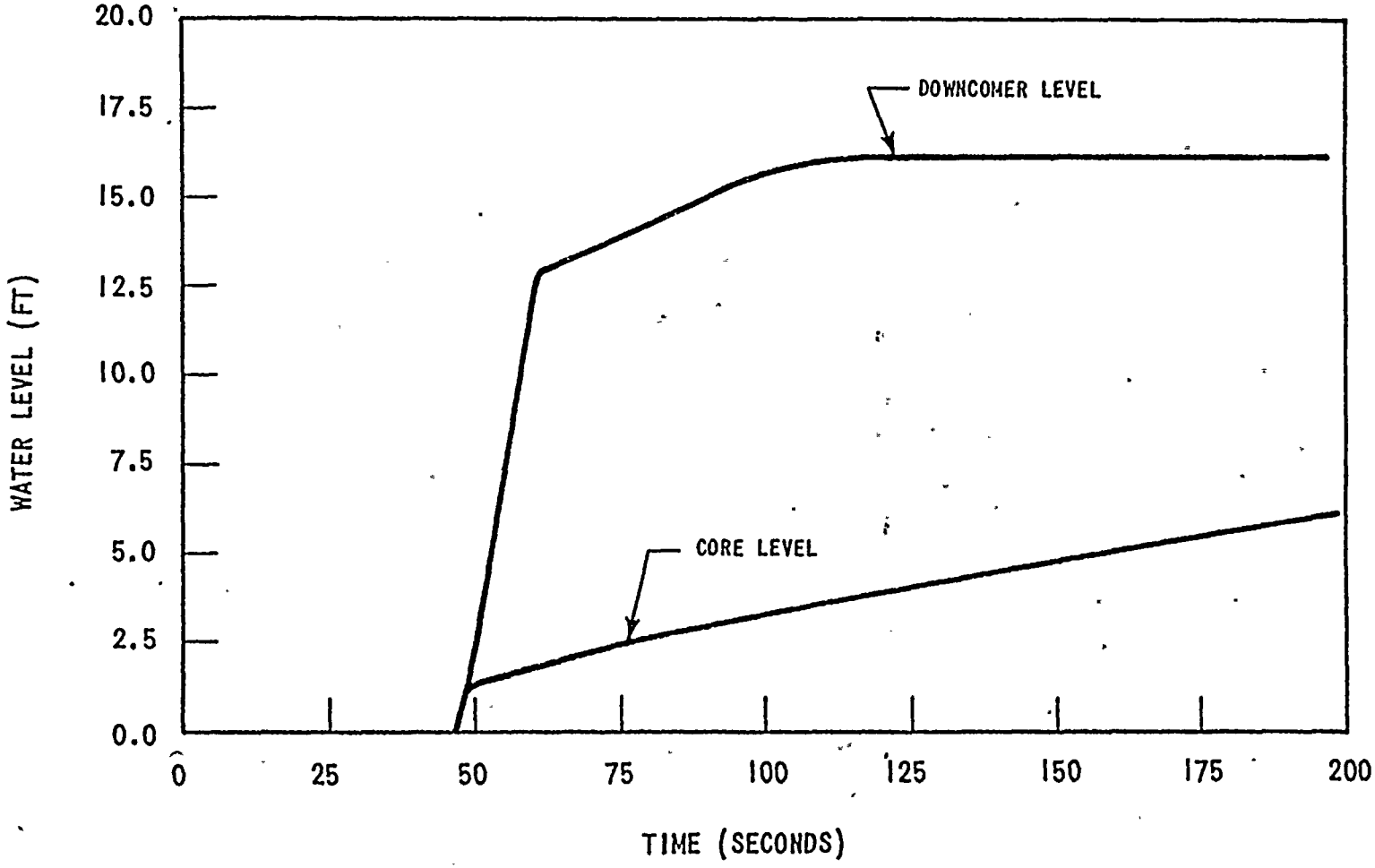


Figure 11 Reflood Transient - DECLG (C_D = 0.4)
Downcomer and Core Water Levels

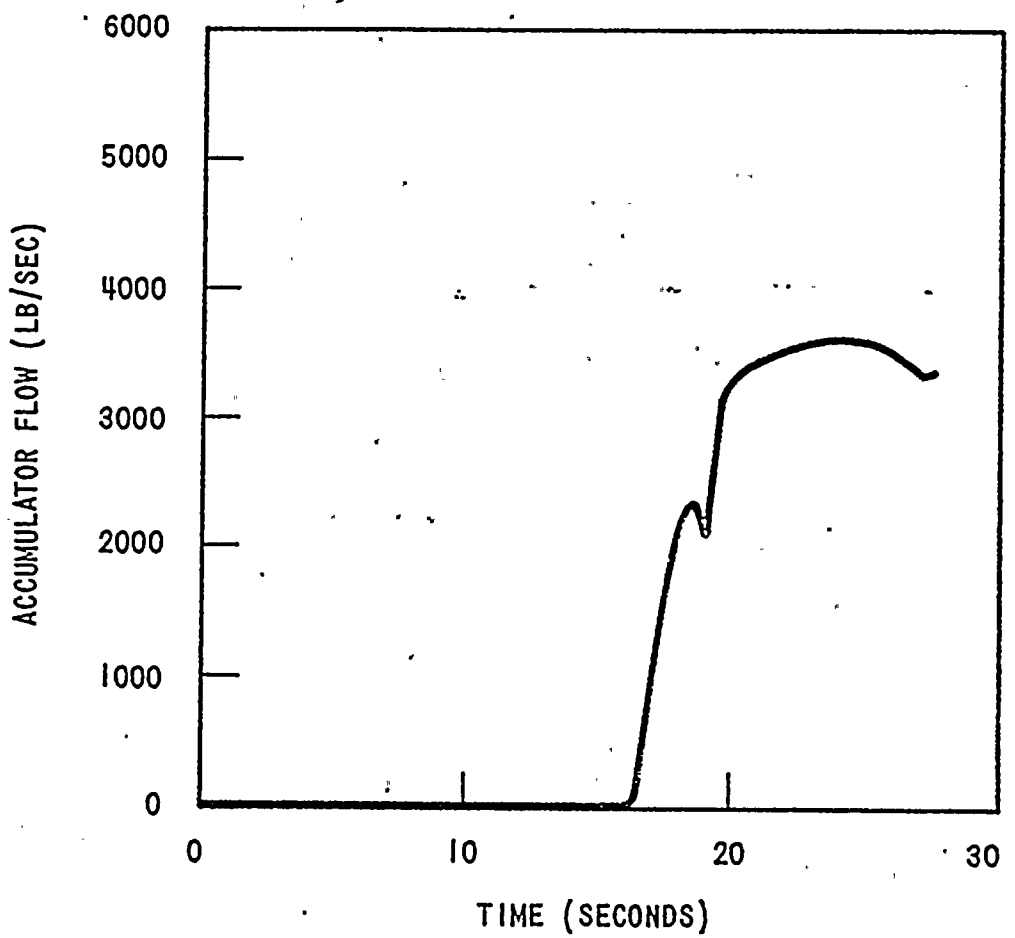


Figure 12 Accumulator Flow (Blowdown) - DECLG (C_D = 0.4)

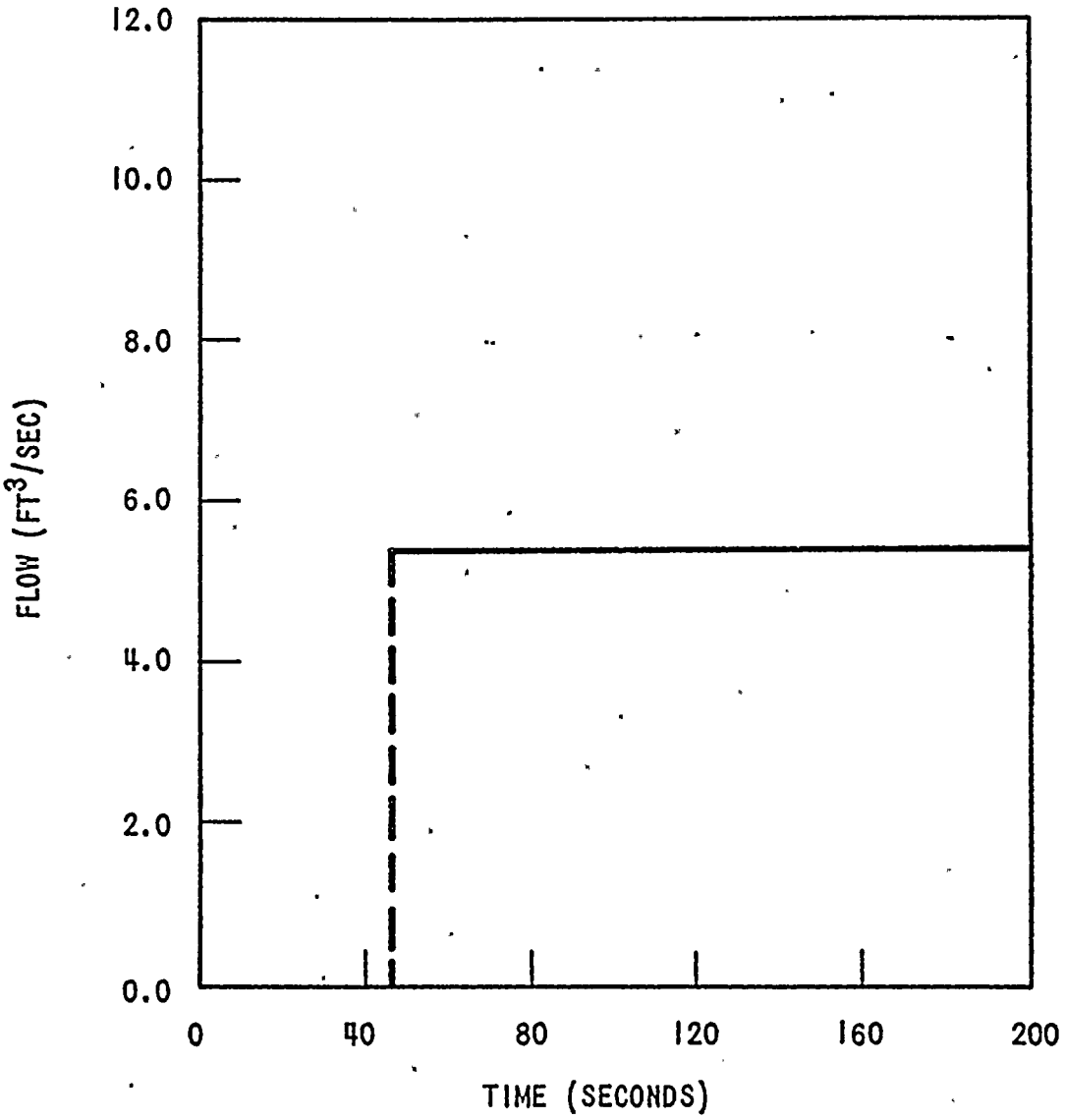


Figure 13 Pumped ECCS Flow (Reflood) - DECLG (C_D = 0.4)

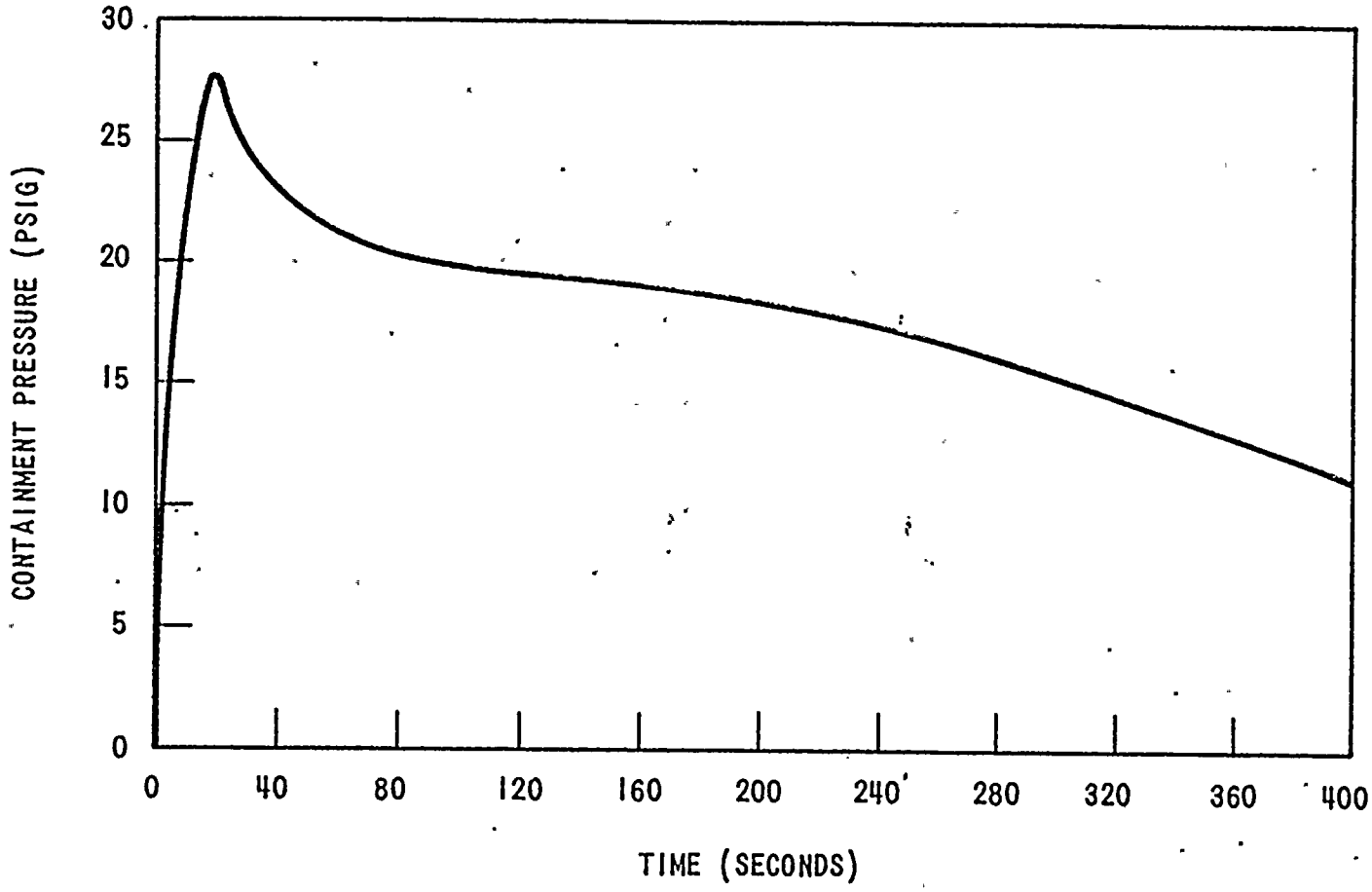


Figure 14 Containment Pressure - DECLG (C_D = 0.4)

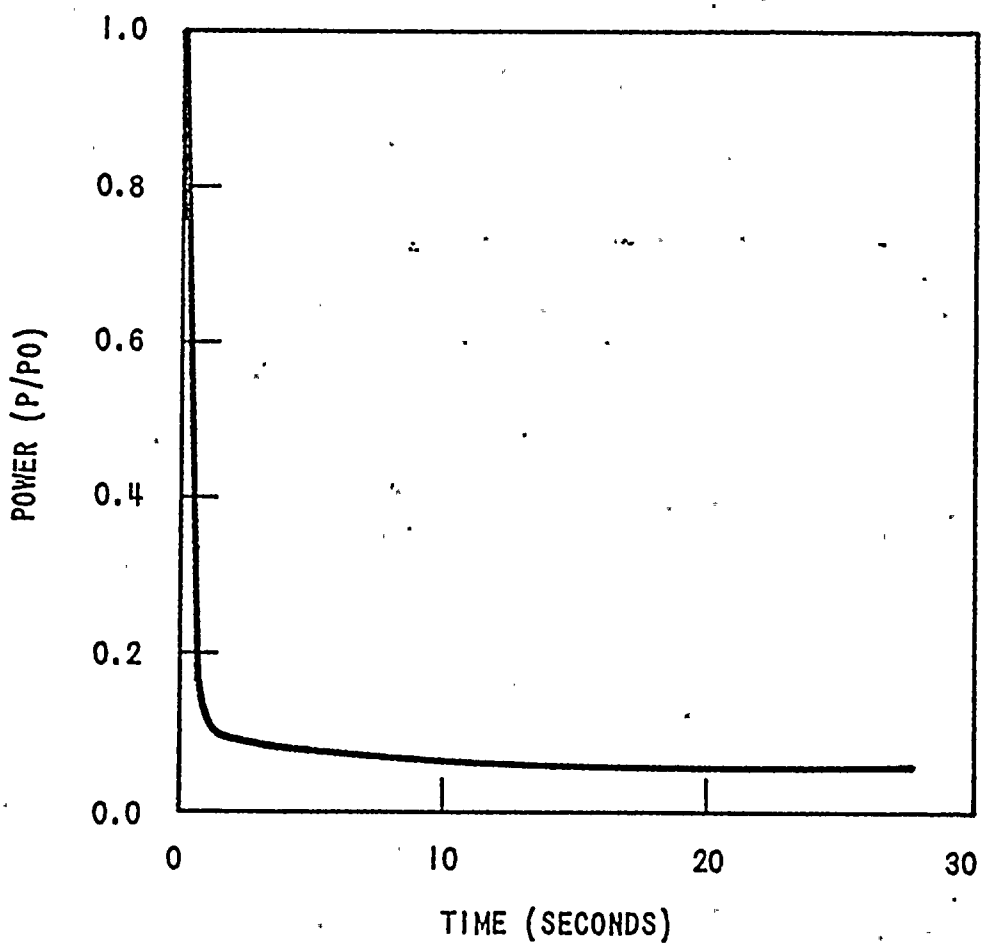


Figure 15 Core Power Transient - DECLG (C_D = 0.4)

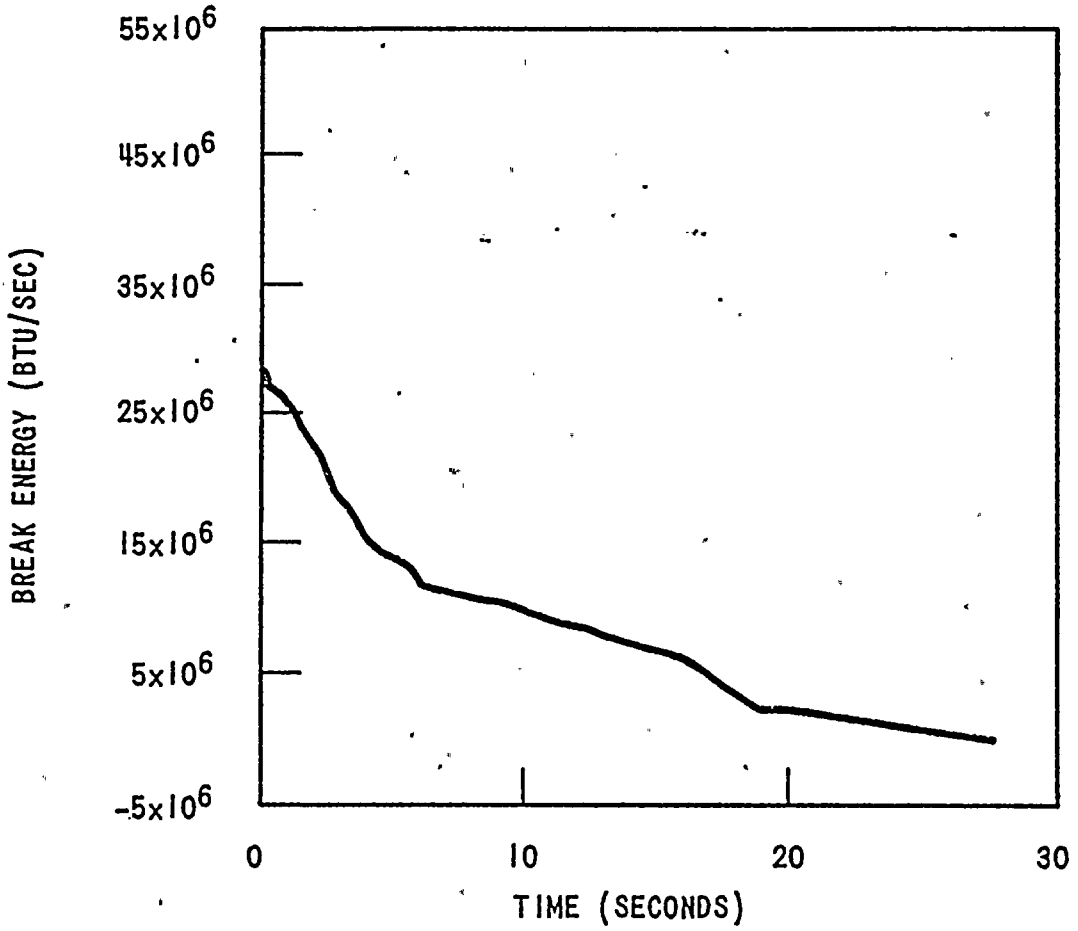


Figure 16 Break Energy Released to Containment

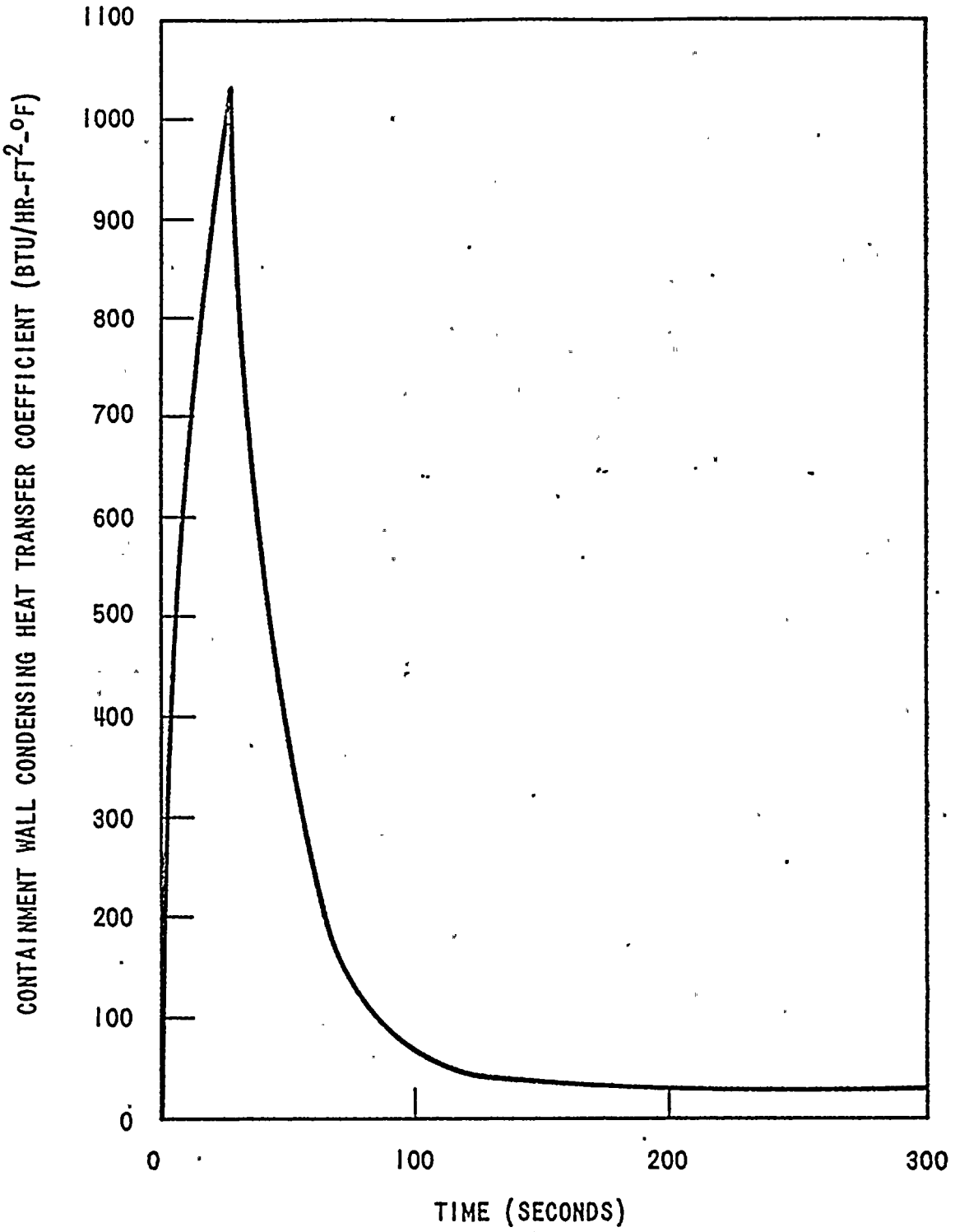
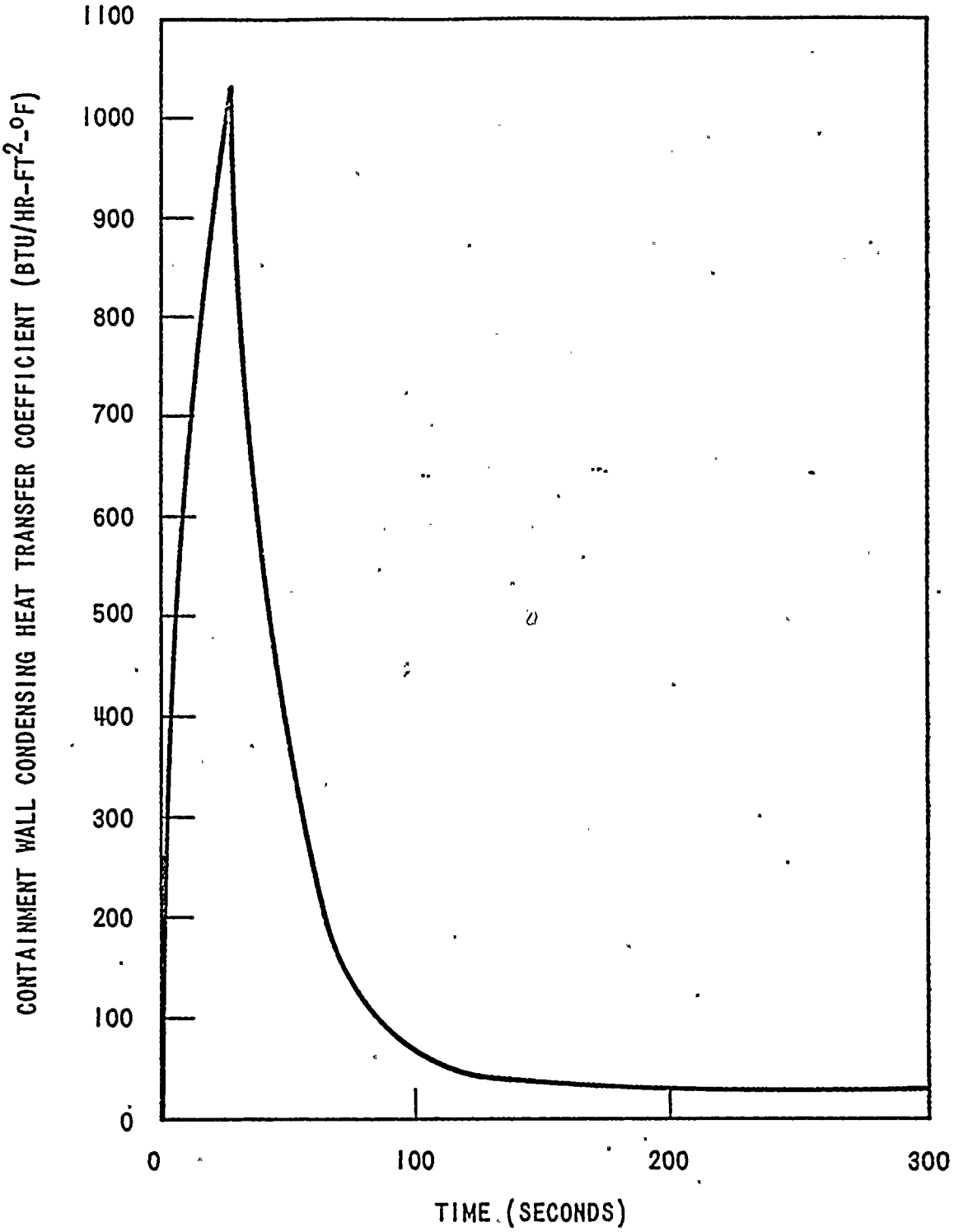


Figure 17 Containment Wall Condensing Heat Transfer Coefficient



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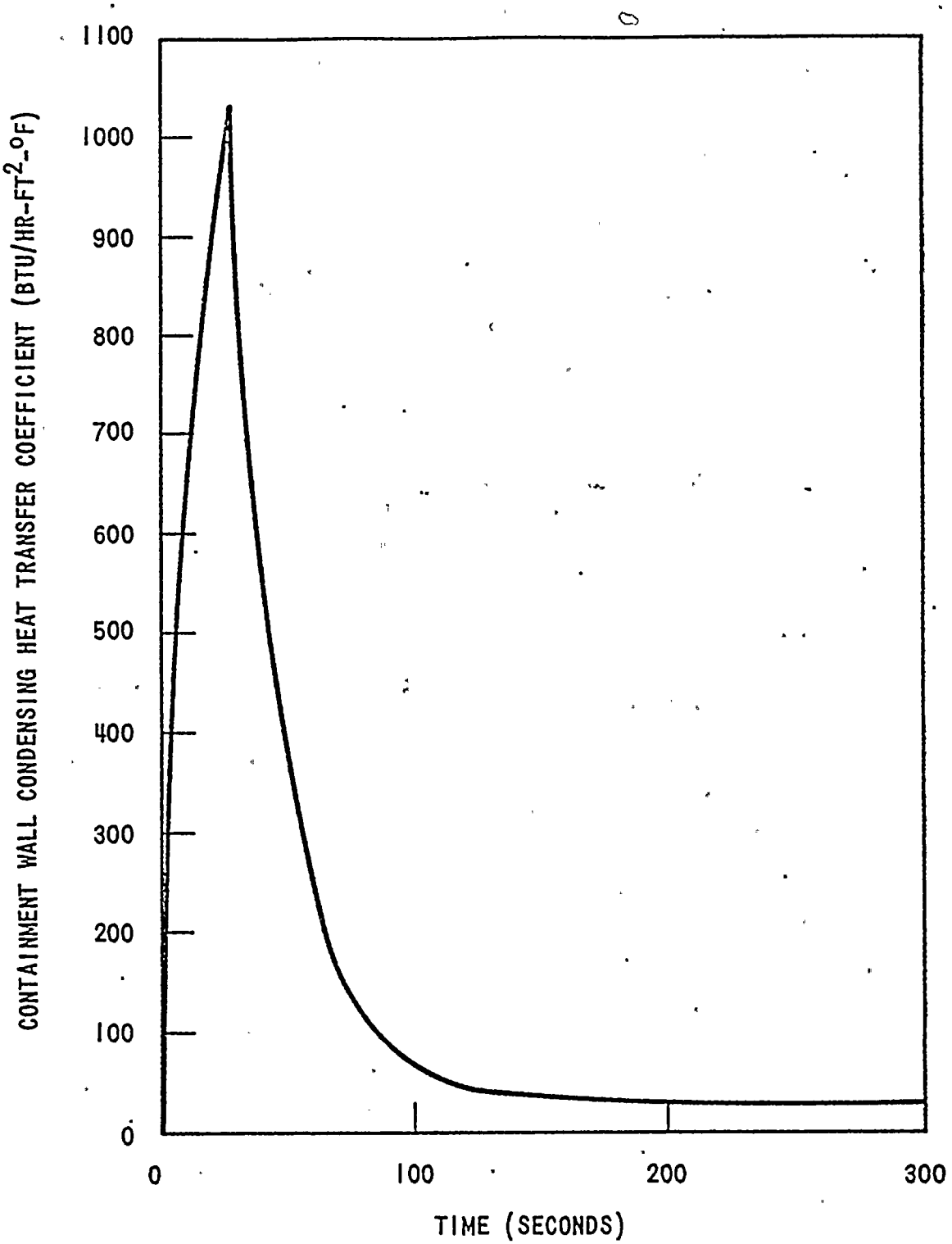

Figure 17 Containment Wall Condensing Heat Transfer Coefficient