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DESCRIPTION

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

ENCLOSURE

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

(40 CYS. RECEIVED)
(.20 PAGES)

**DO NOT REMOVE
ACKNOWLEDGED**

PLANT NAME: TURKEY PT. # 3 & 4

SAFETY

FOR ACTION/INFORMATION

ENVIRO

SAB 1/11/77

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

INTERNAL DISTRIBUTION

<input checked="" type="checkbox"/> (REG FILE)		SYSTEMS SAFETY		PLANT SYSTEMS		SITE SAFETY &
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<input checked="" type="checkbox"/> I & E (2)		SCHROEDER		BENAROYA		DENTON & MULLER
<input checked="" type="checkbox"/> OELD				LAINAS		
<input checked="" type="checkbox"/> GOSSICK & STAFF		ENGINEERING		IPPOLITO		ENVIRO TECH.
<input checked="" type="checkbox"/> MIPC		MACARRY		KIRKWOOD		ERNST
<input checked="" type="checkbox"/> CASE		KNIGHT				BALLARD
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<input checked="" type="checkbox"/> HARLESS		PAWLICKI		STELLO		
<input checked="" type="checkbox"/> DEYOUNG						SITE TECH.
<input checked="" type="checkbox"/> PROJECT MANAGEMENT		REACTOR SAFETY		OPERATING TECH.		GAMMILL
<input checked="" type="checkbox"/> BOYD		ROSS		EISENHUT		STEEP
<input checked="" type="checkbox"/> P. COLLINS		NOVAK (2)		SHAO		HULMAN
<input checked="" type="checkbox"/> HOUSTON		ROSZTOCZY		BAER		
<input checked="" type="checkbox"/> PETERSON		CHECK		BUTLER		SITE ANALYSIS
<input checked="" type="checkbox"/> MELTZ				GRIMES		VOLLMER
<input checked="" type="checkbox"/> HELTEMES		AT & I				BUNCH
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		RUTBERG				KREGER

EXTERNAL DISTRIBUTION

CONTROL NUMBER

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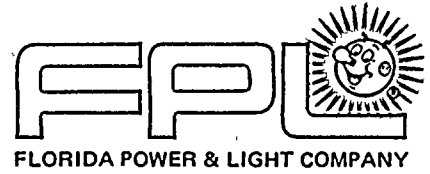
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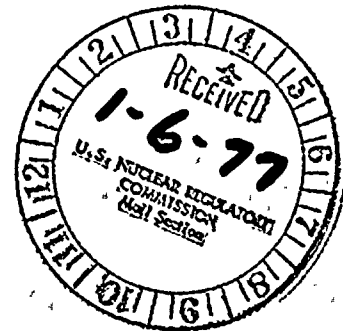


January 3, 1977
L-77-1

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.



TABLE 1

LARGE BREAK
TIME SEQUENCE OF EVENTS
STEAM GENERATOR
10% TUBE PLUGGING

	<u>DECL</u> <u>(C_D=0.4)</u> <u>(Sec)</u>
START	<u>0.0</u>
Reactor Trip Signal	<u>0.595</u>
S. I. Signal	<u>0.67</u>
Acc. Injection	<u>16.3</u>
End of Bypass	<u>27.52</u>
End of Blowdown	<u>27.66</u>
Bottom of Core Recovery	<u>46.59</u>
Acc. Empty	<u>61.02</u>
Pump Injection	<u>25.67</u>

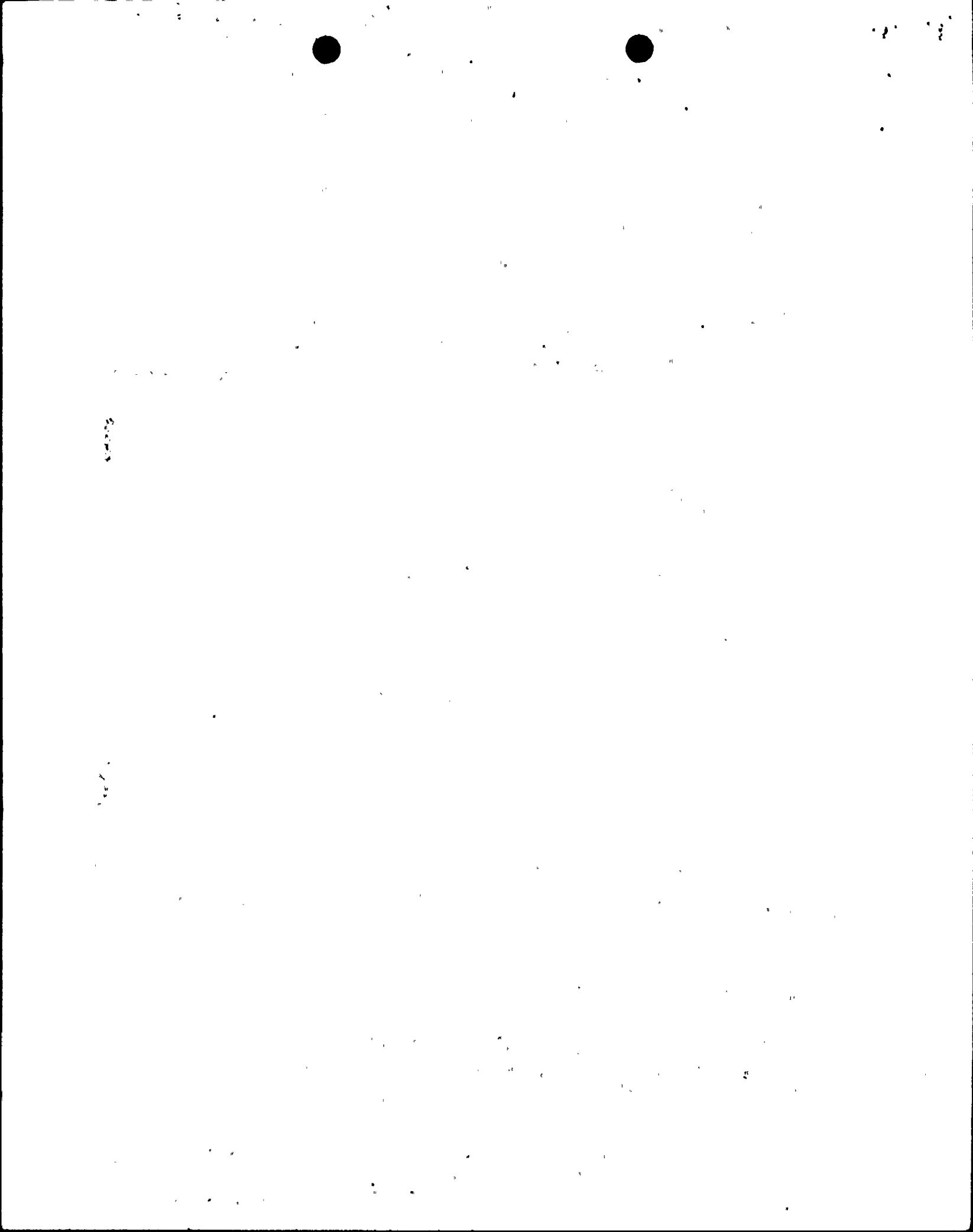


TABLE 2

LARGE BREAK
STEAM GENERATOR
10% TUBE PLUGGING

<u>Results</u>	<u>DECL</u> <u>(C_D=0.4)</u>
Peak Clad Temp. °F	<u>2190</u>
Peak Clad Location Ft.	<u>6.0</u>
Local Zr/H ₂ O R _{xn} (max)%	<u>11.922</u>
Local Zr/H ₂ O Location Ft.	<u>6.0</u>
Total Zr/H ₂ O Reaction %	<u><0.3</u>
Hot Rod Burst Time sec	<u>22.8</u>
Hot Rod Burst Location Ft.	<u>6.0</u>
 <u>Calculation</u> 	
Core Power Mwt 102% of	<u>2200</u>
Peak Linear Power kw/ft 102% of	<u>12.61</u>
Peaking Factor	<u>2.22</u>
Accumulator Water Volume (ft ³)	<u>875</u> (per accumulator)
Fuel region + cycle analyzed	<u>Cycle</u> <u>Region</u>
UNITS 3 and 4	<u>3</u> <u>3</u>

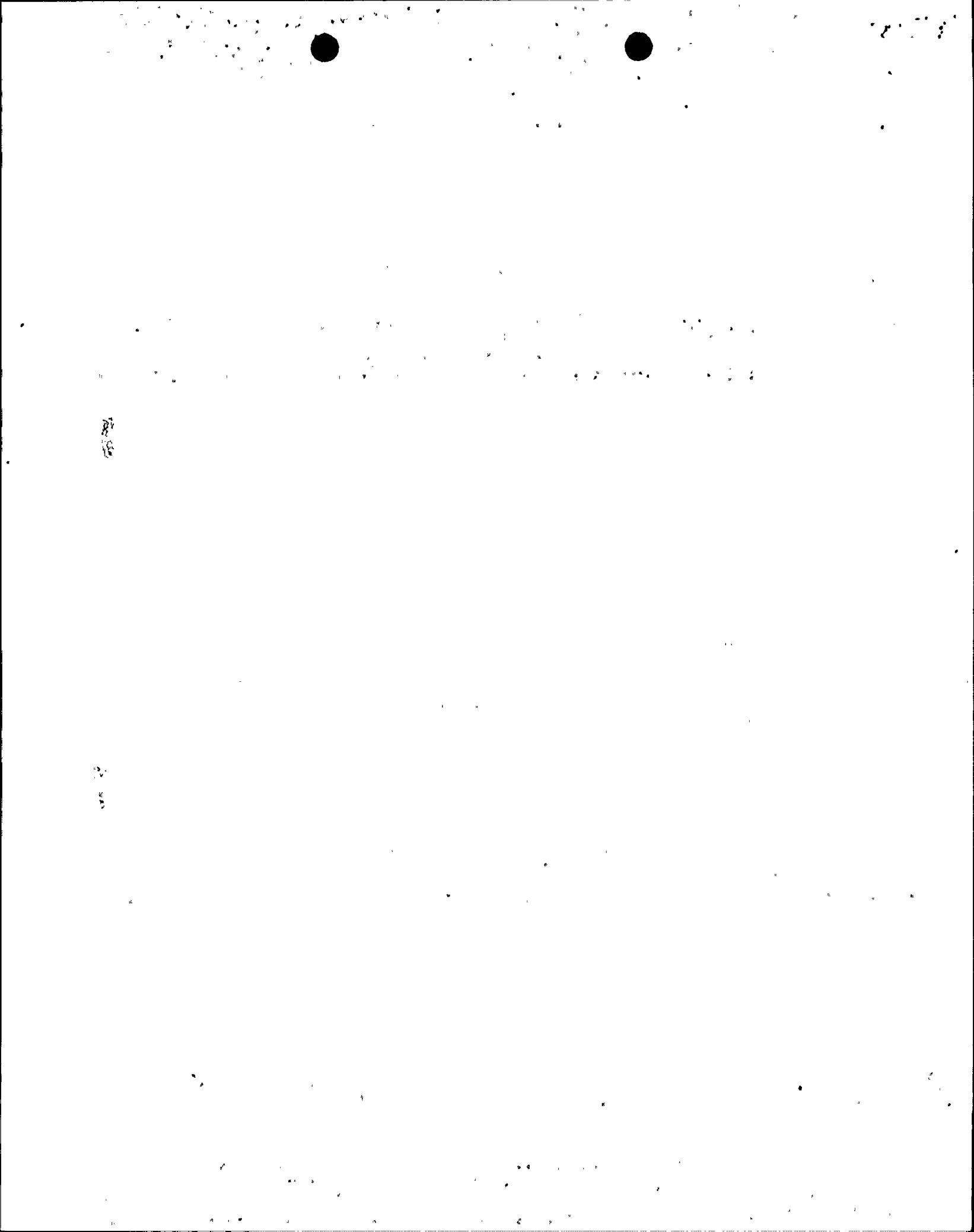


TABLE 3 /

LARGE BREAK
CONTAINMENT DATA (DRY CONTAINMENT)

NET FREE VOLUME	<u>1.55 x 10⁶</u> 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

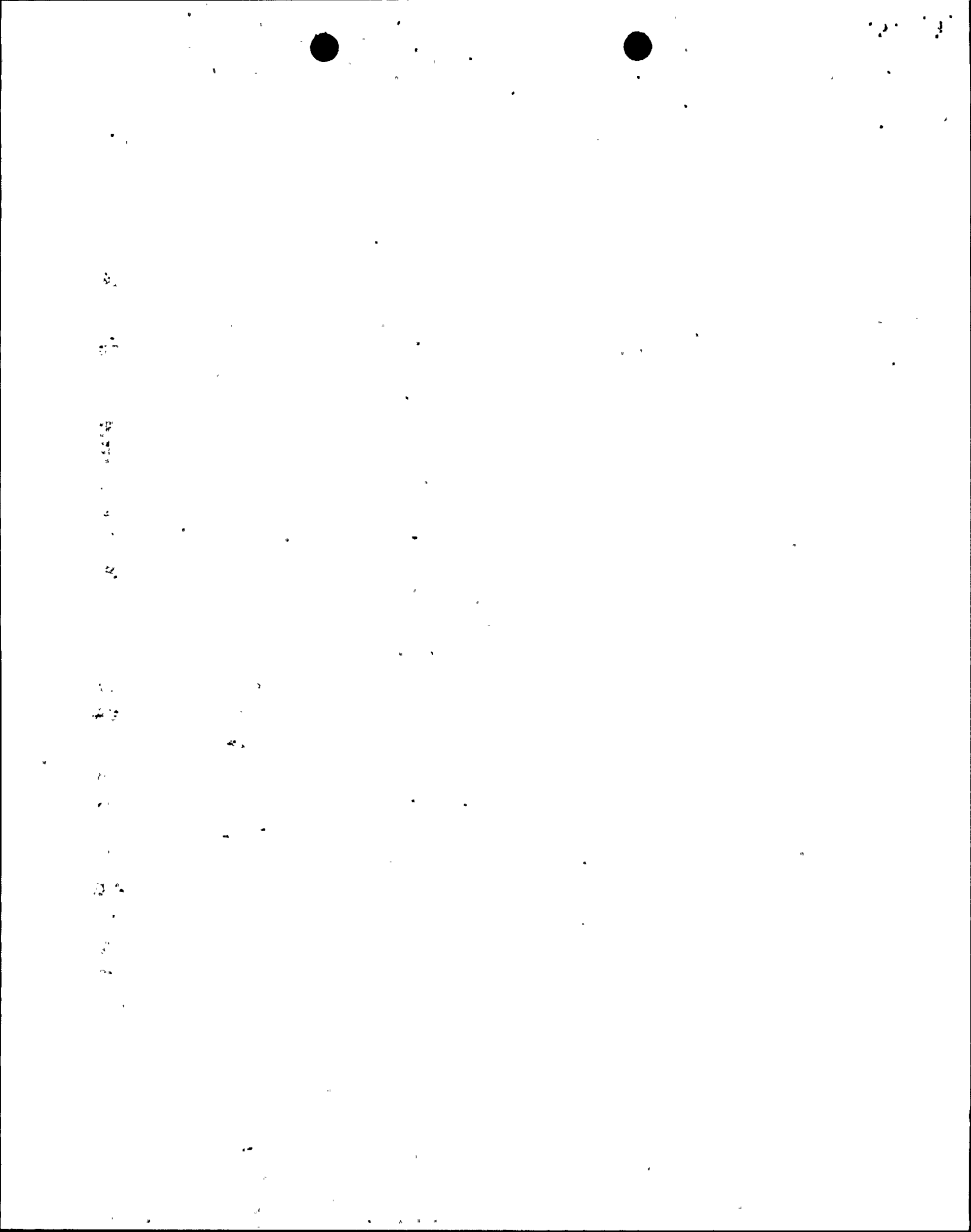


TABLE 3 (Continued)

LARGE BREAK
CONTAINMENT DATA (DRY CONTAINMENT)

STRUCTURAL HEAT SINKS

	<u>Thickness (In)</u>	<u>Area (Ft²)</u>
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

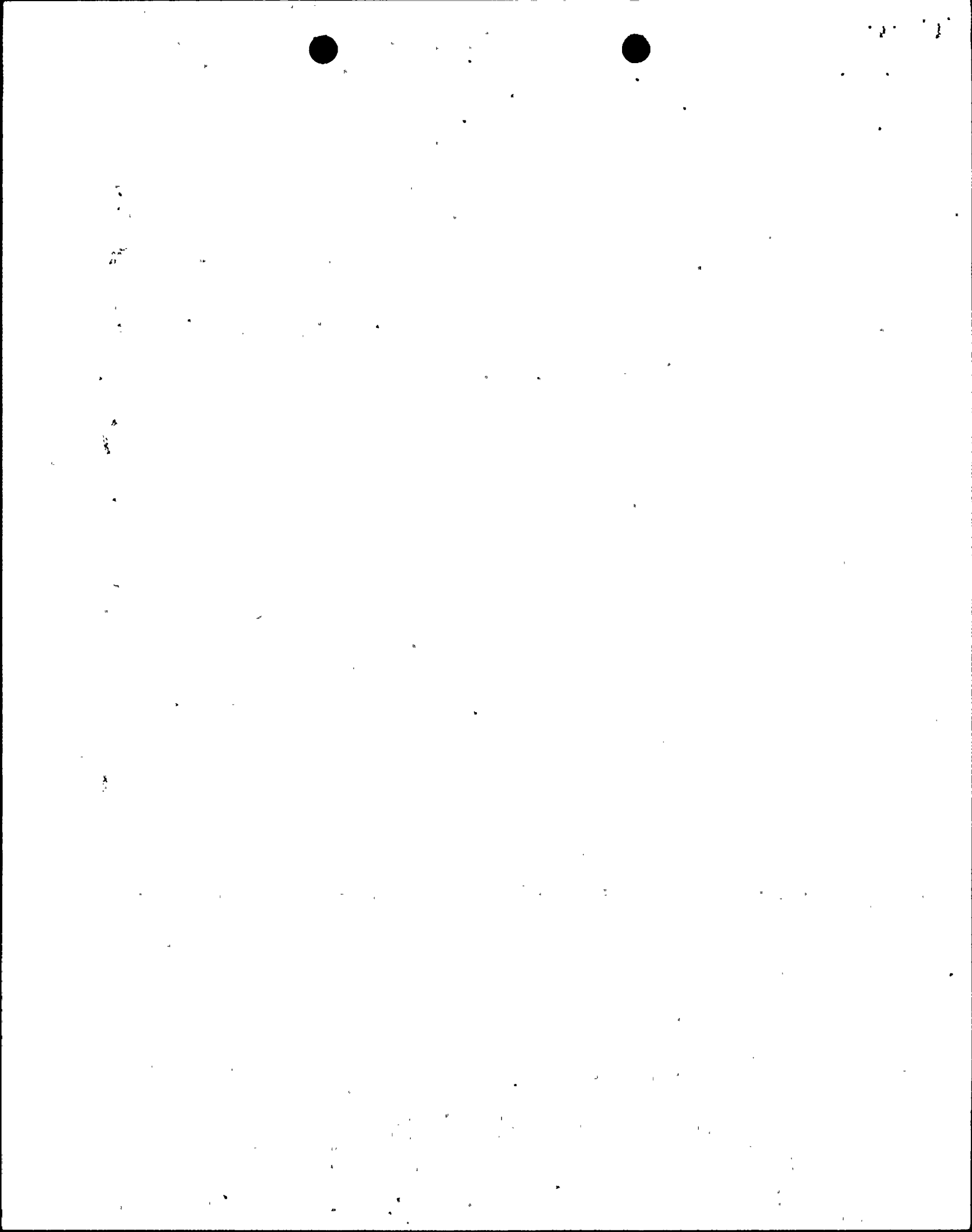


TABLE 4

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

<u>TIME</u> <u>(SEC)</u>	<u>TOTAL MASS FLOWRATE</u> <u>(LBM/SEC)</u>	<u>TOTAL ENERGY FLOWRATE</u> <u>(10^5 BTU/SEC)</u>
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

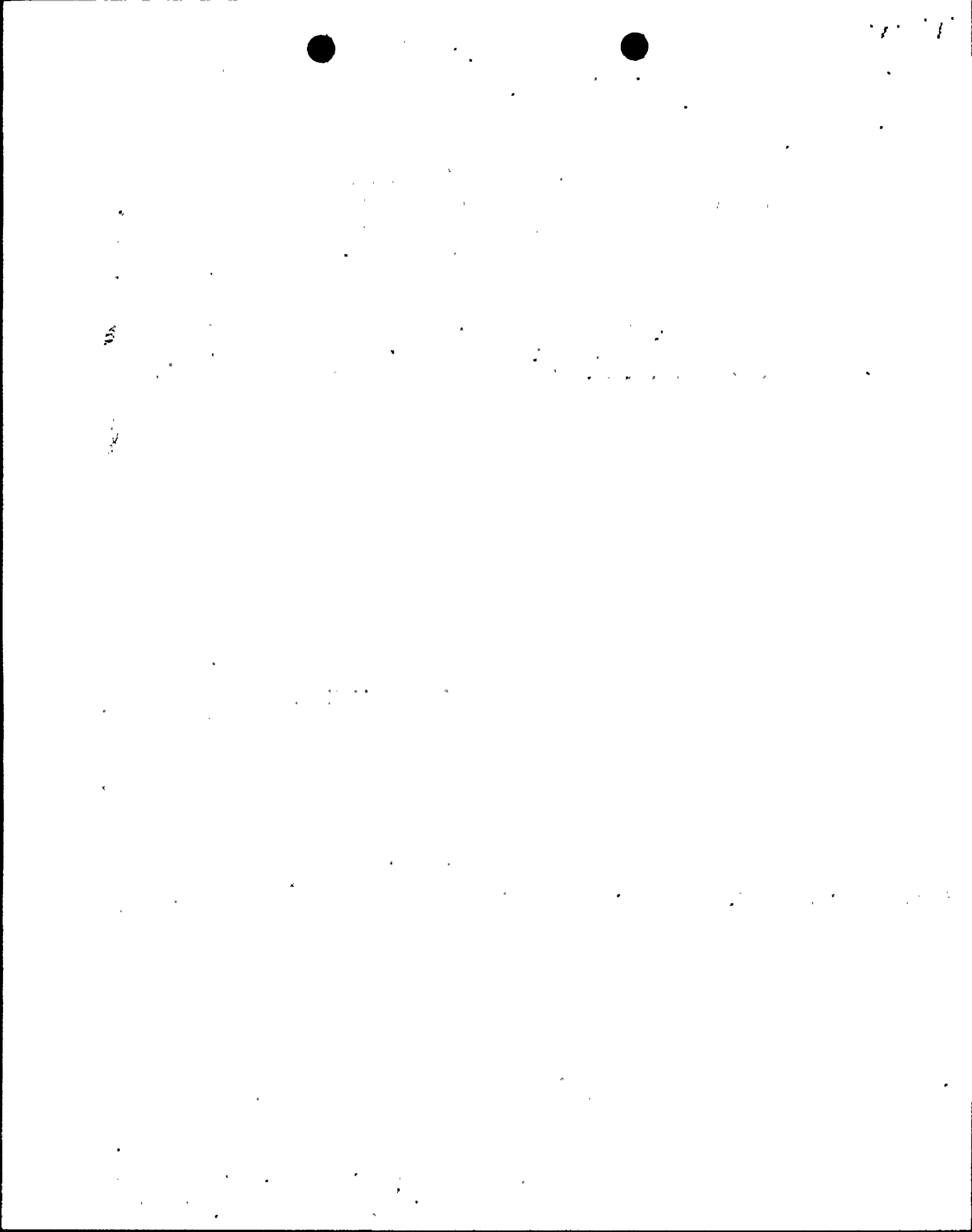
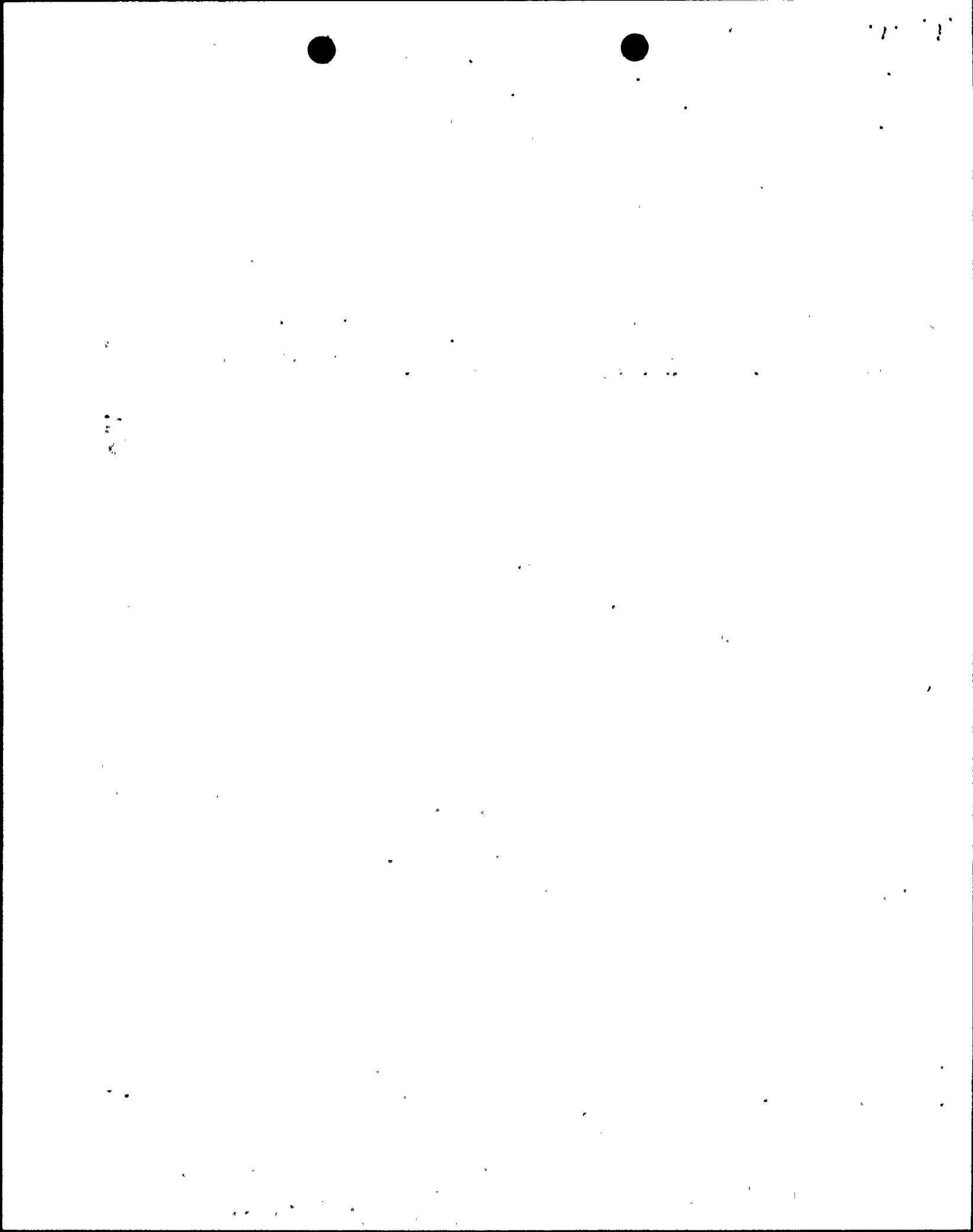


TABLE 5

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

<u>TIME (SEC)</u>	<u>MASS FLOWRATE (LBM/SEC)</u>
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



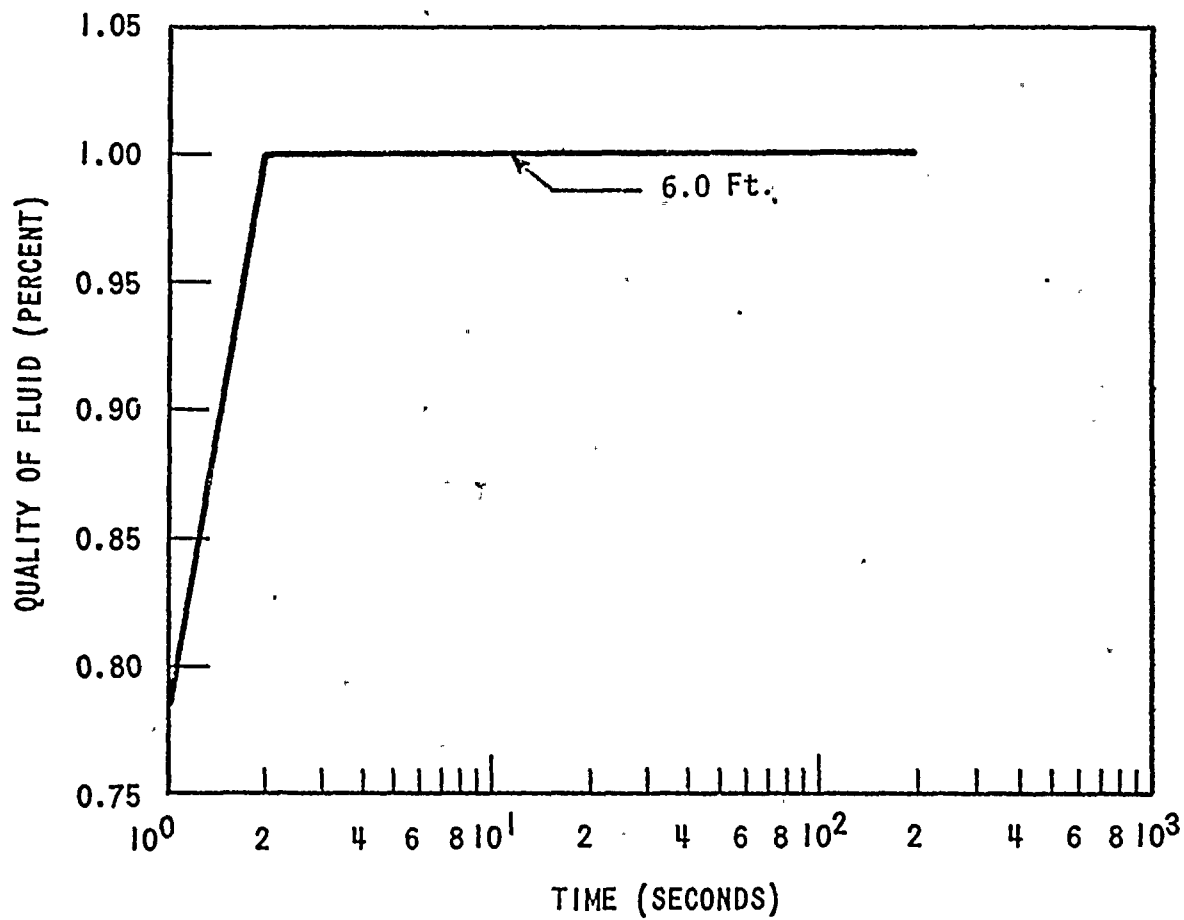
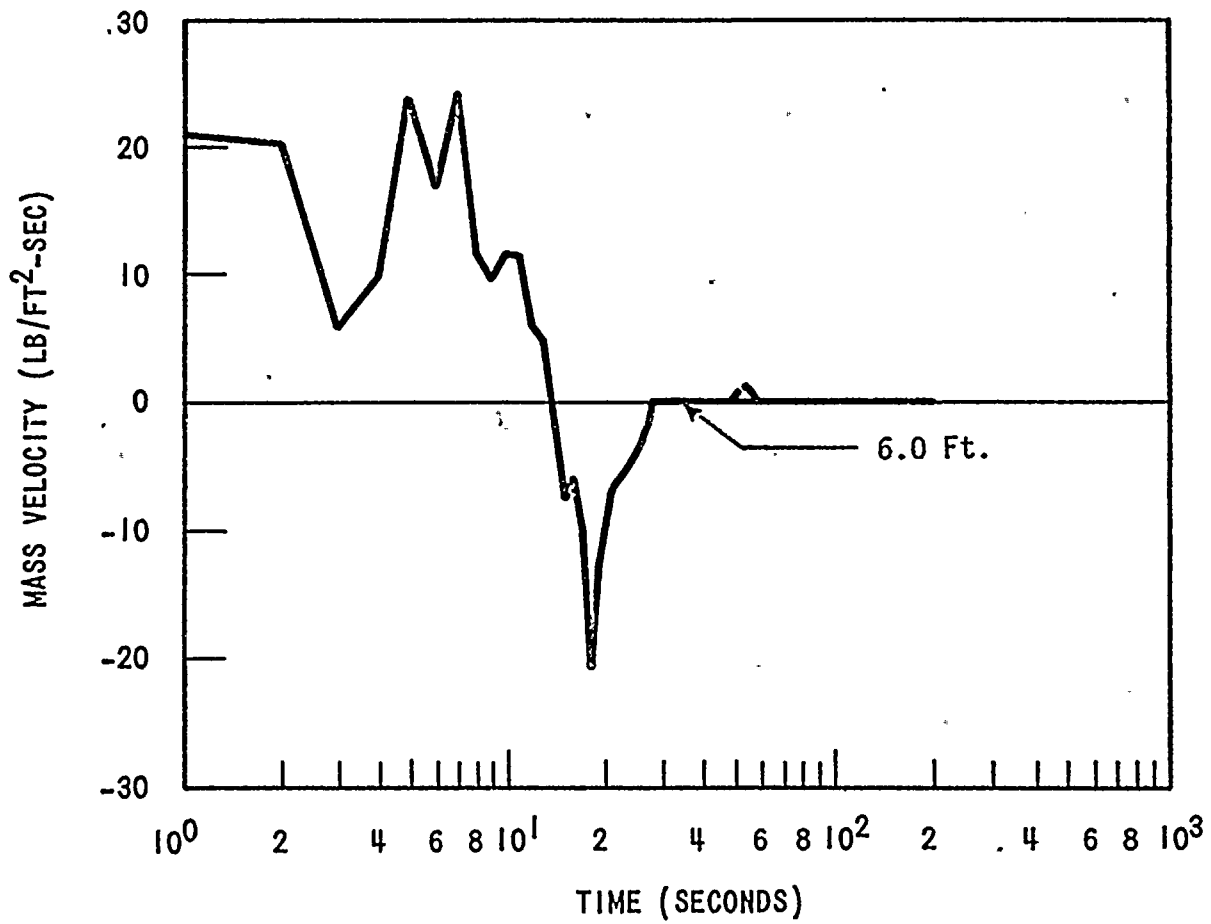
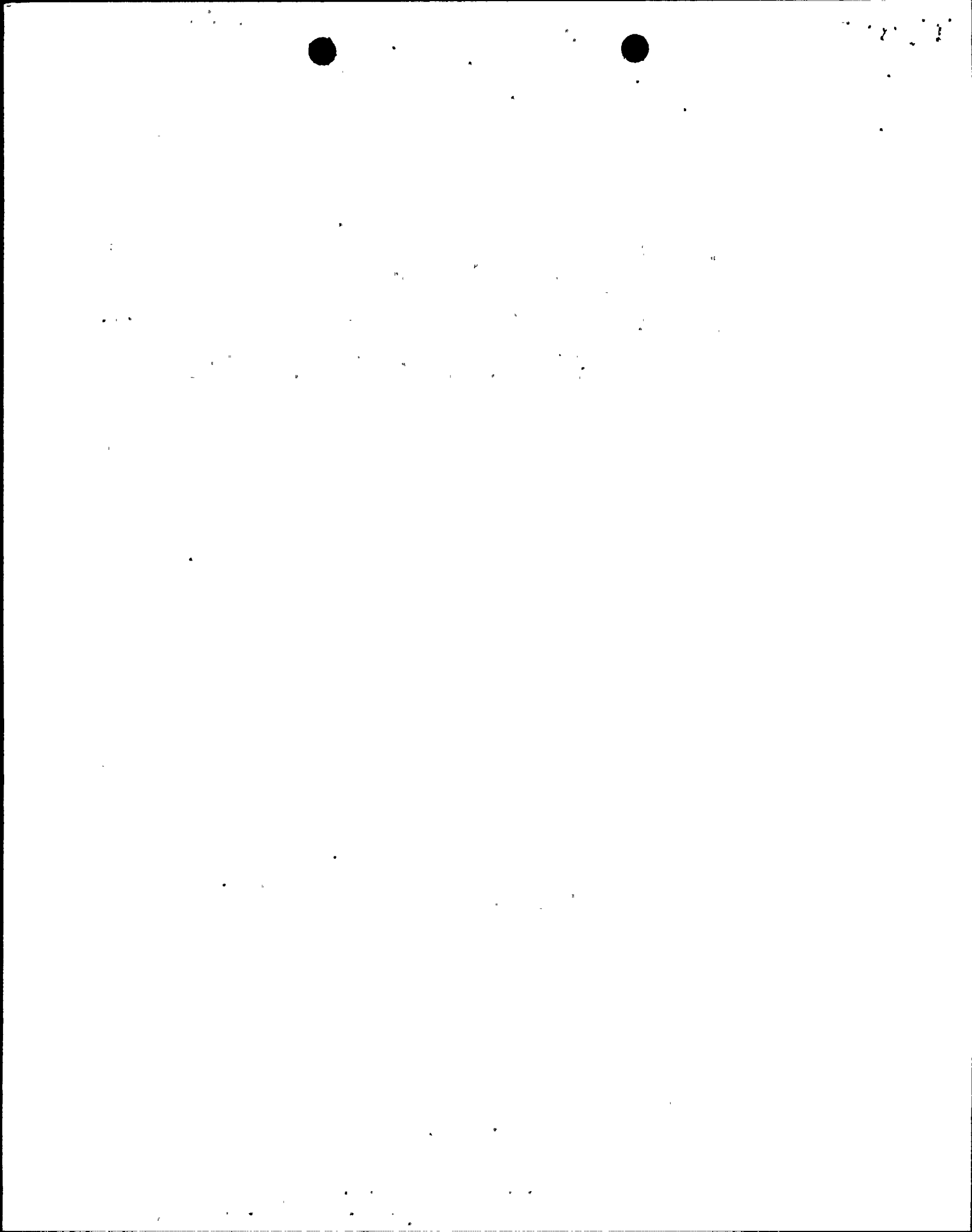
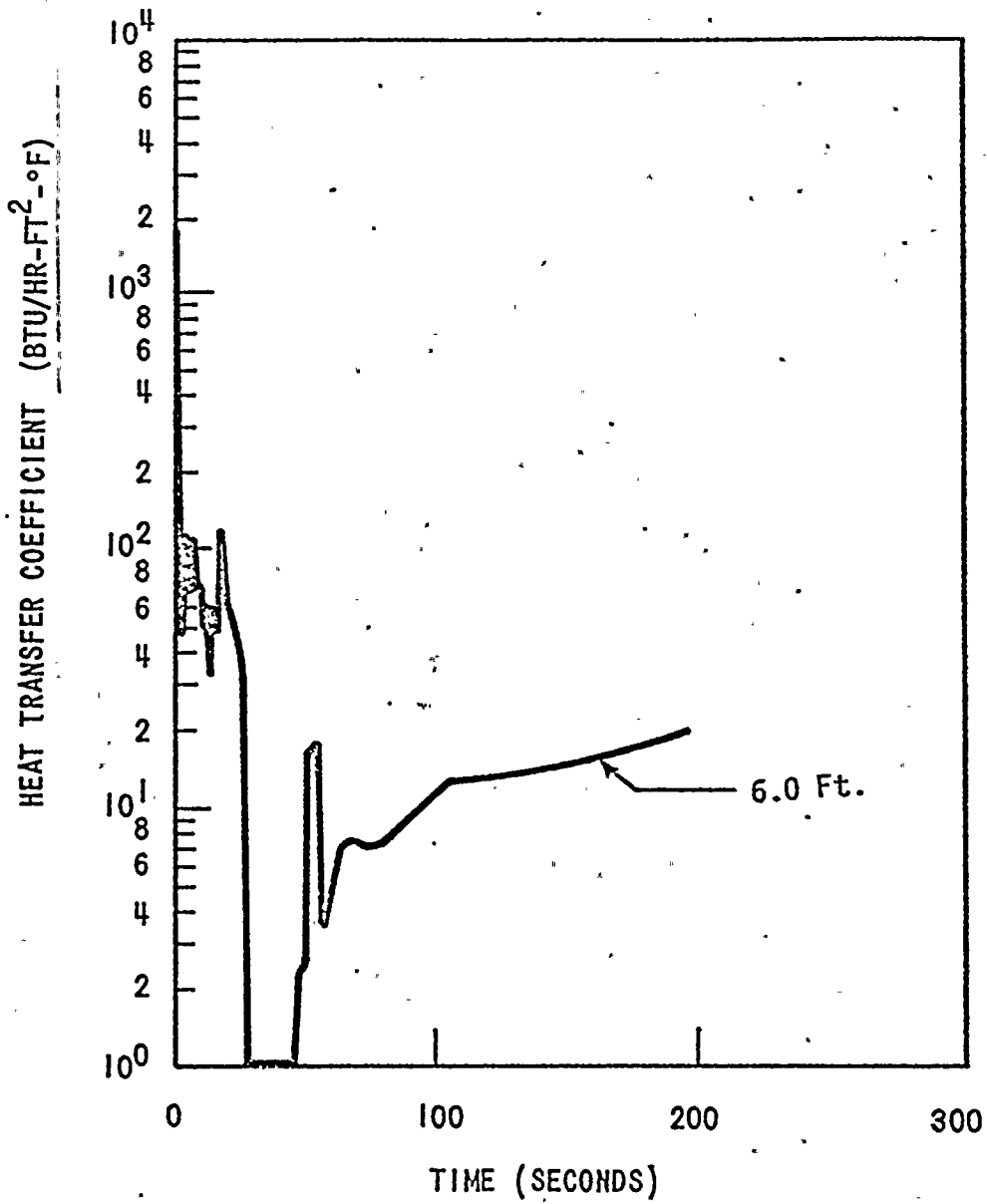
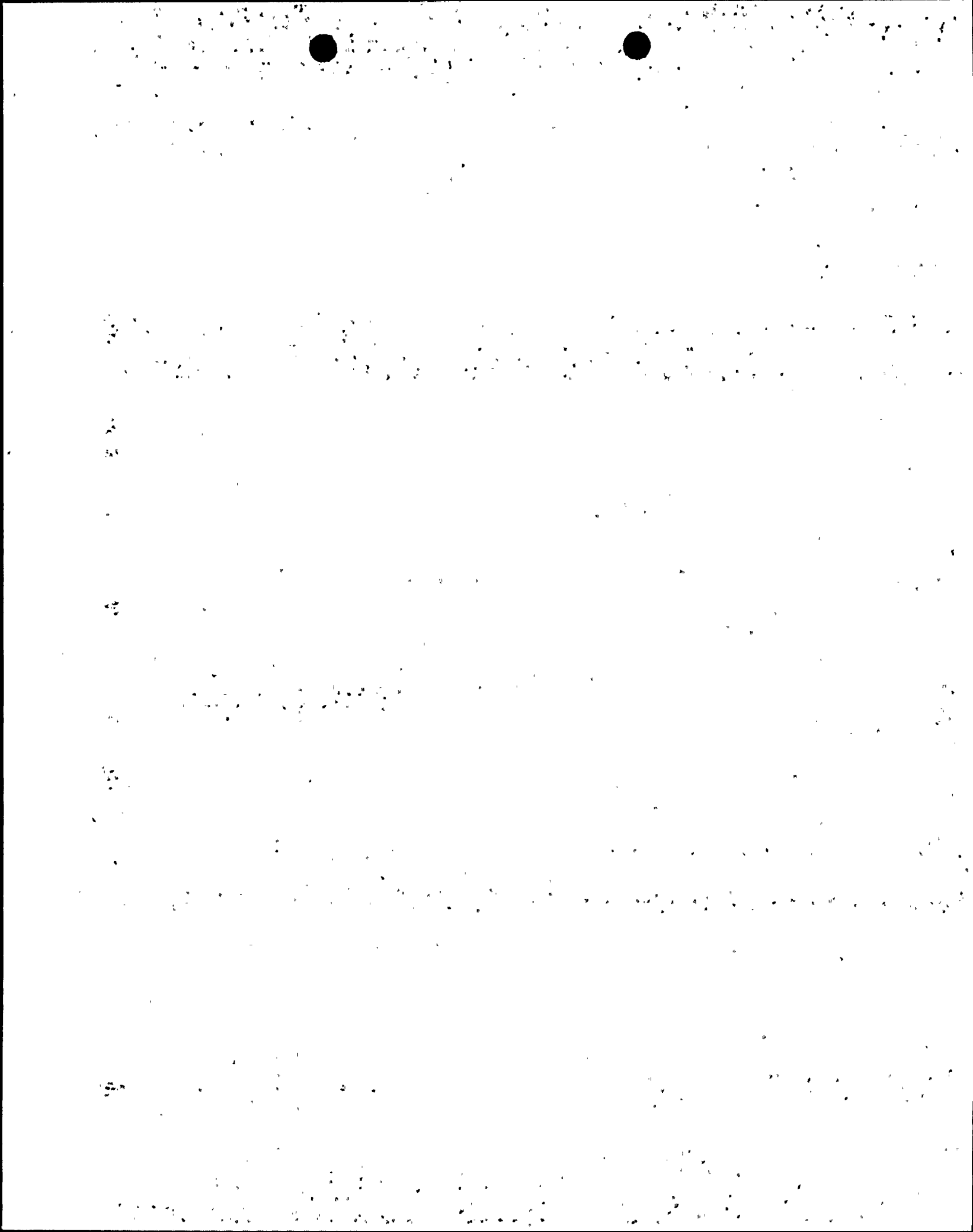


Figure 1 Fluid Quality - DECLG ($C_D = 0.4$)

Figure 2 Mass Velocity - DECLG ($C_D = 0.4$)



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



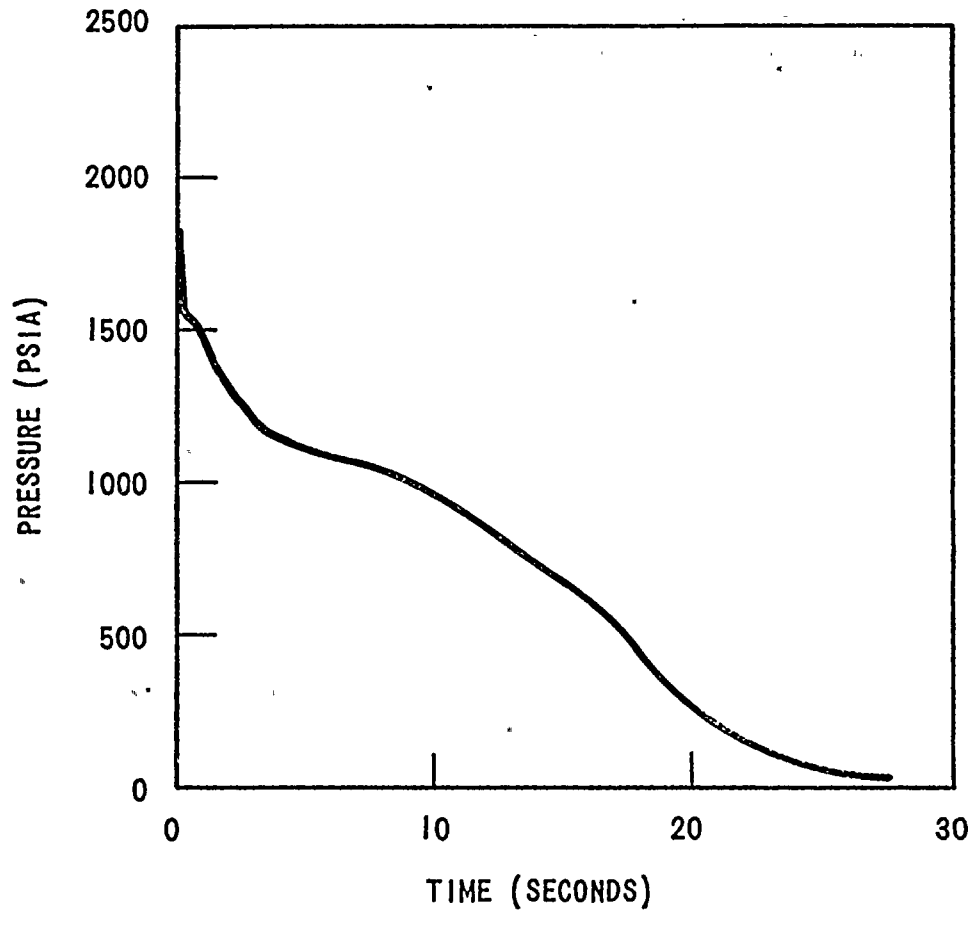
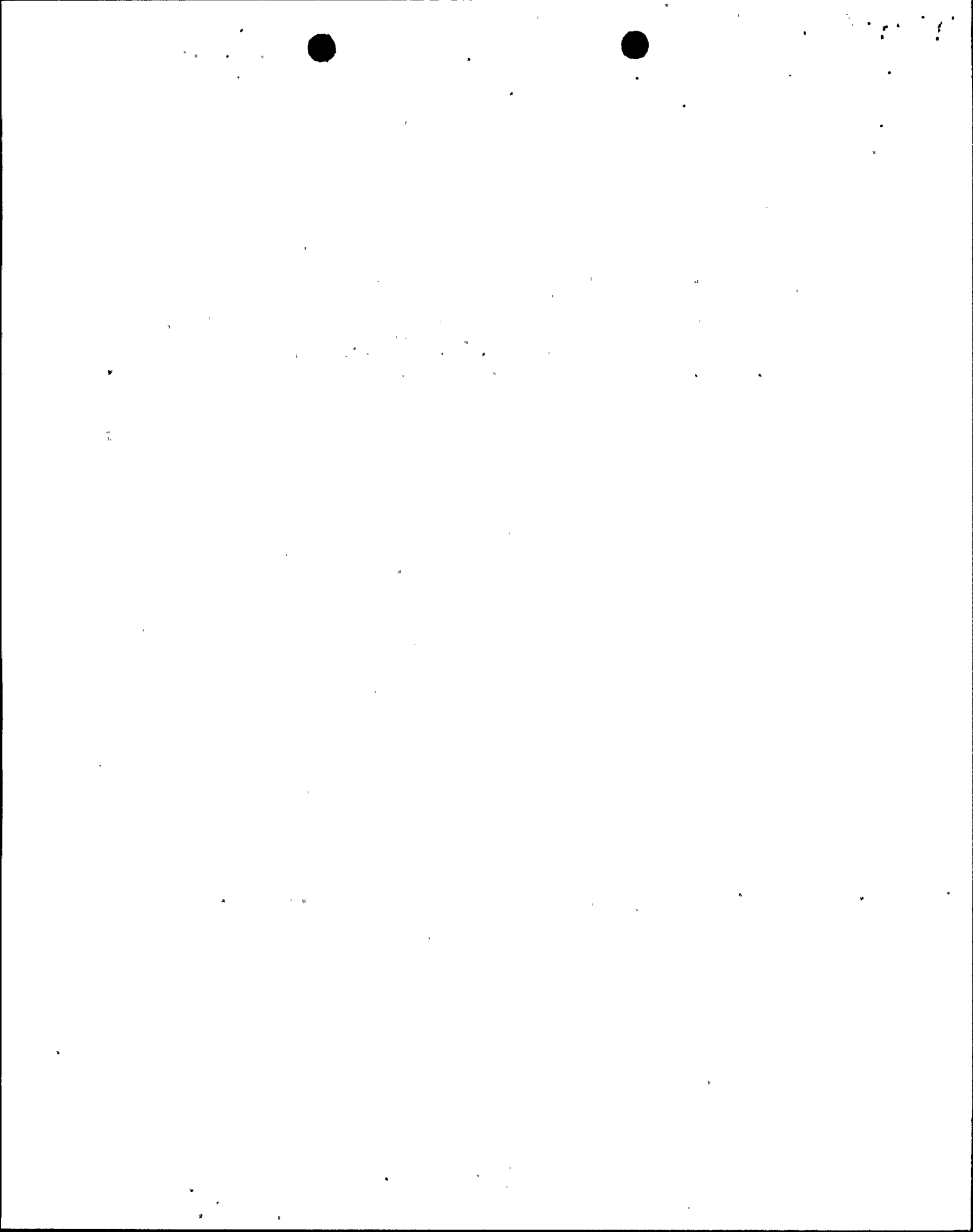


Figure 4 Core Pressure - DECLG ($C_D = 0.4$)



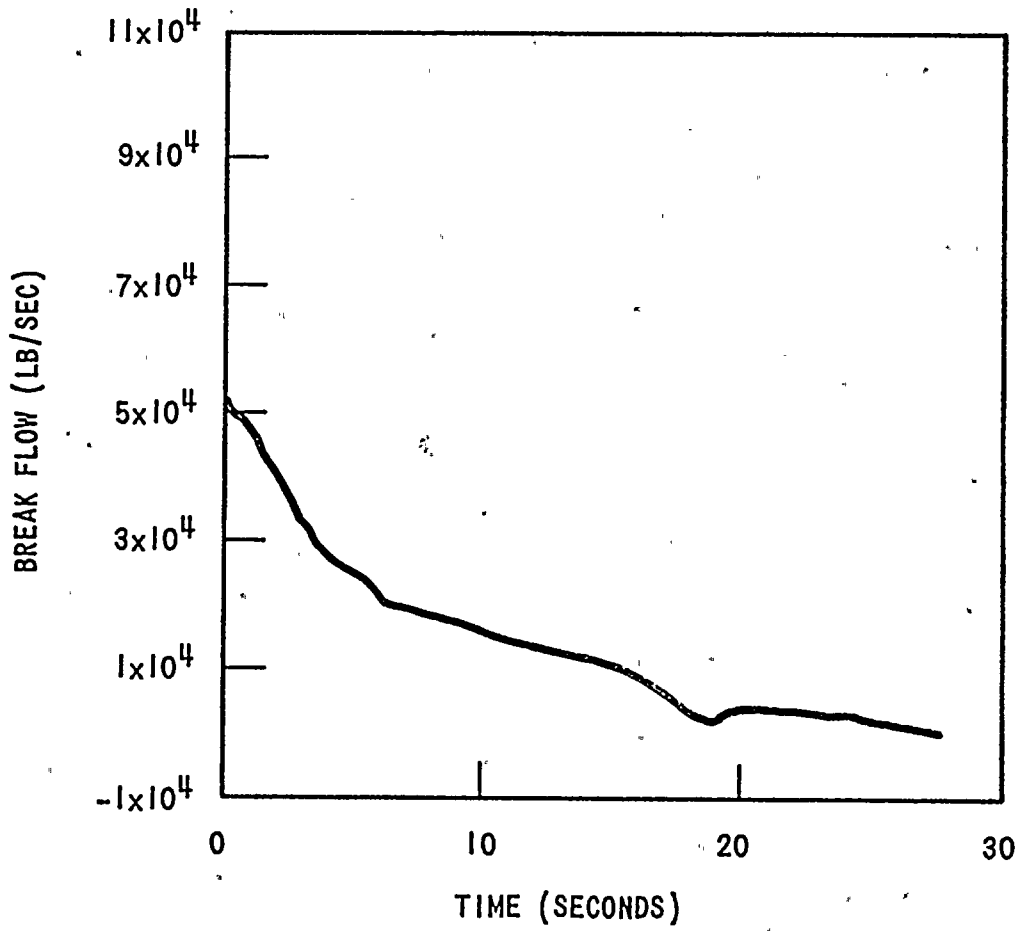
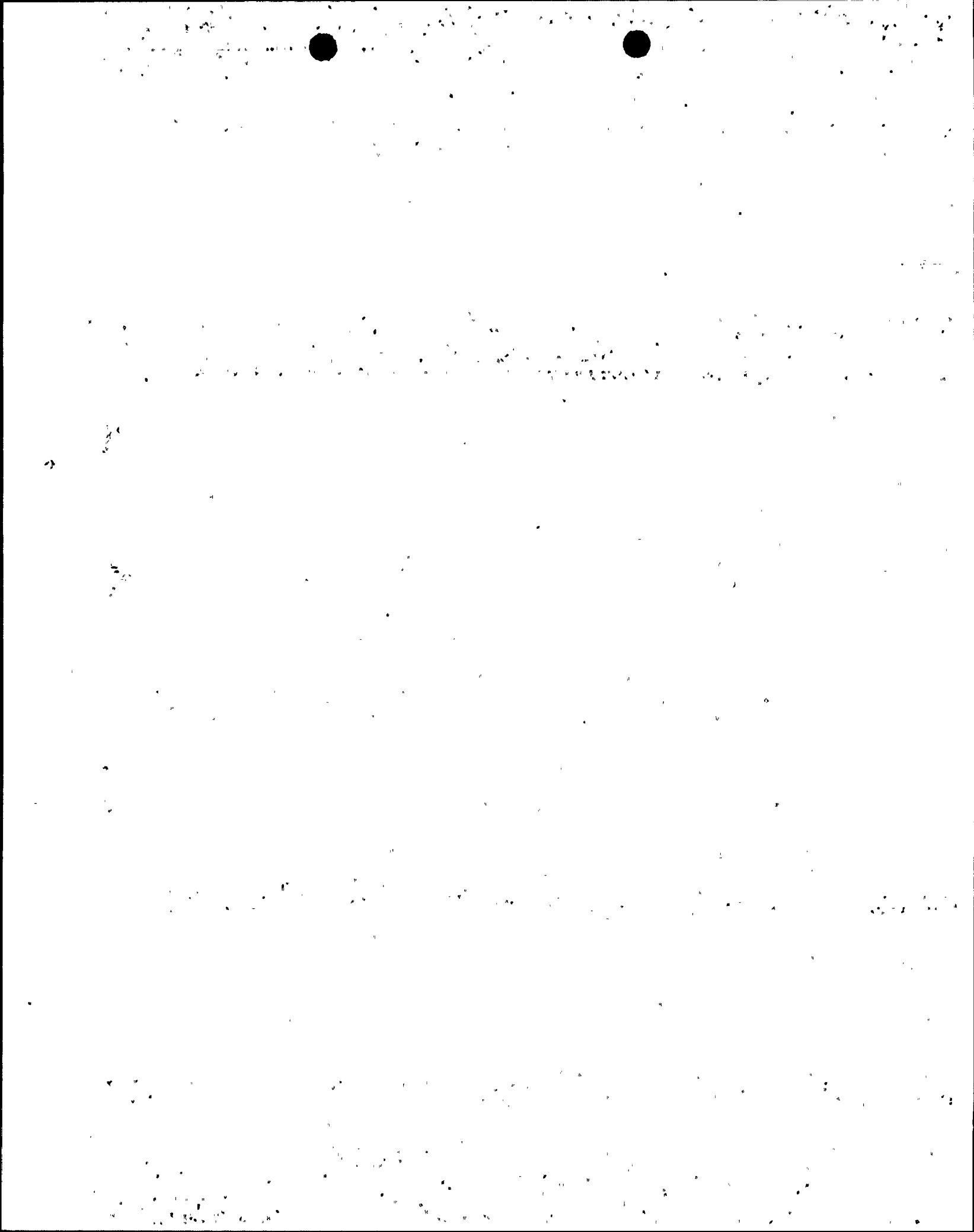


Figure 5 Break Flow Rate - DECLG ($C_D = 0.4$)



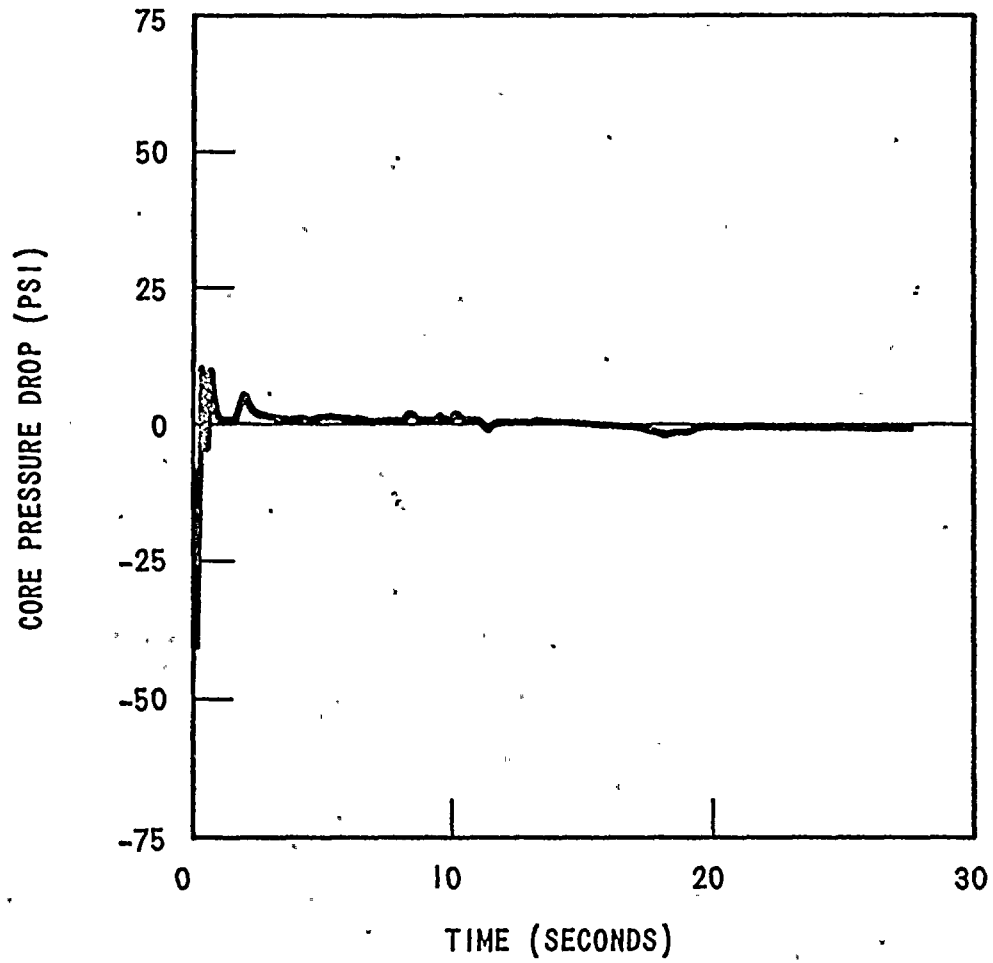
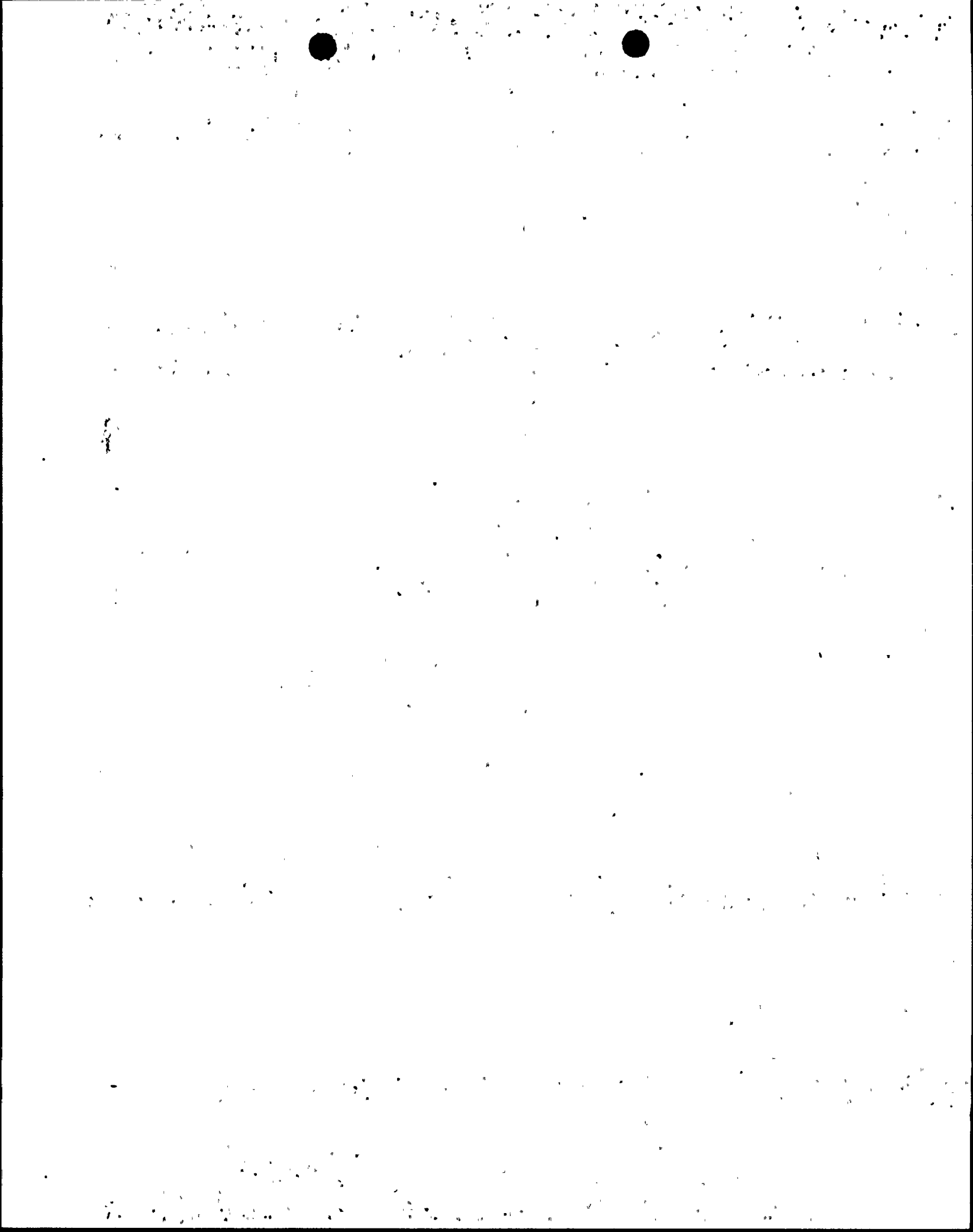


Figure 6 Core Pressure Drop - DECLG ($C_D = 0.4$)



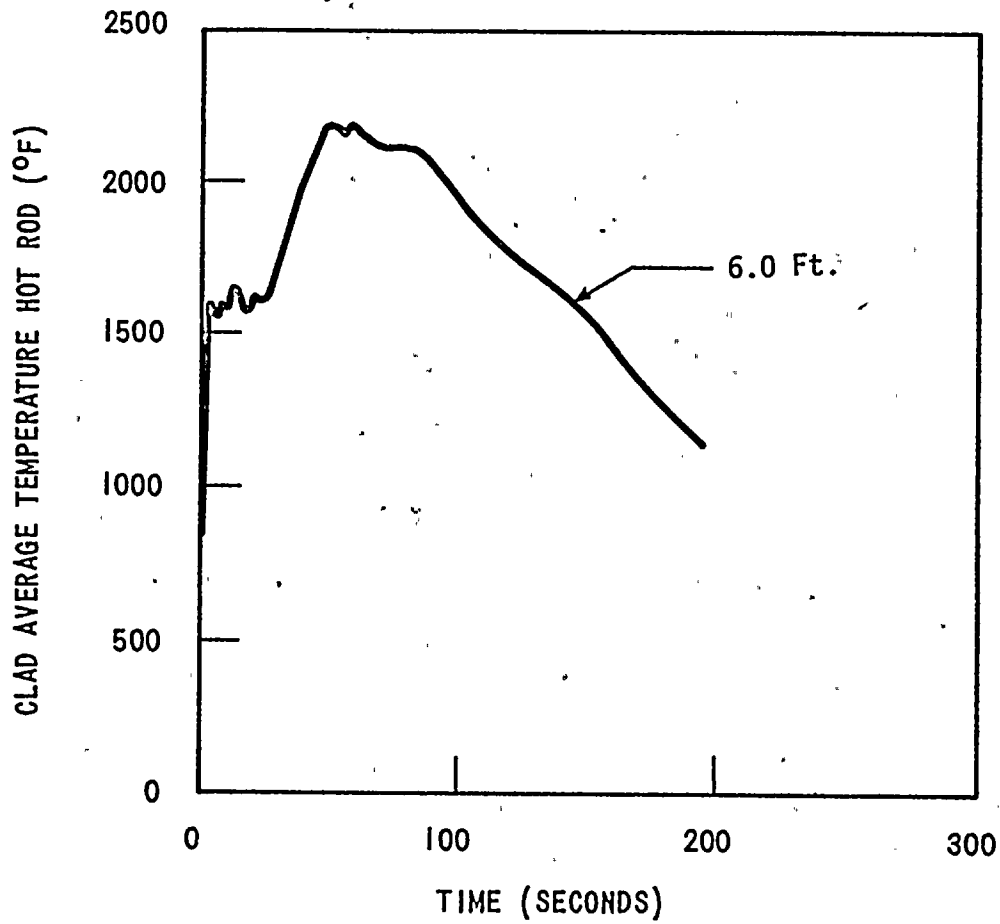
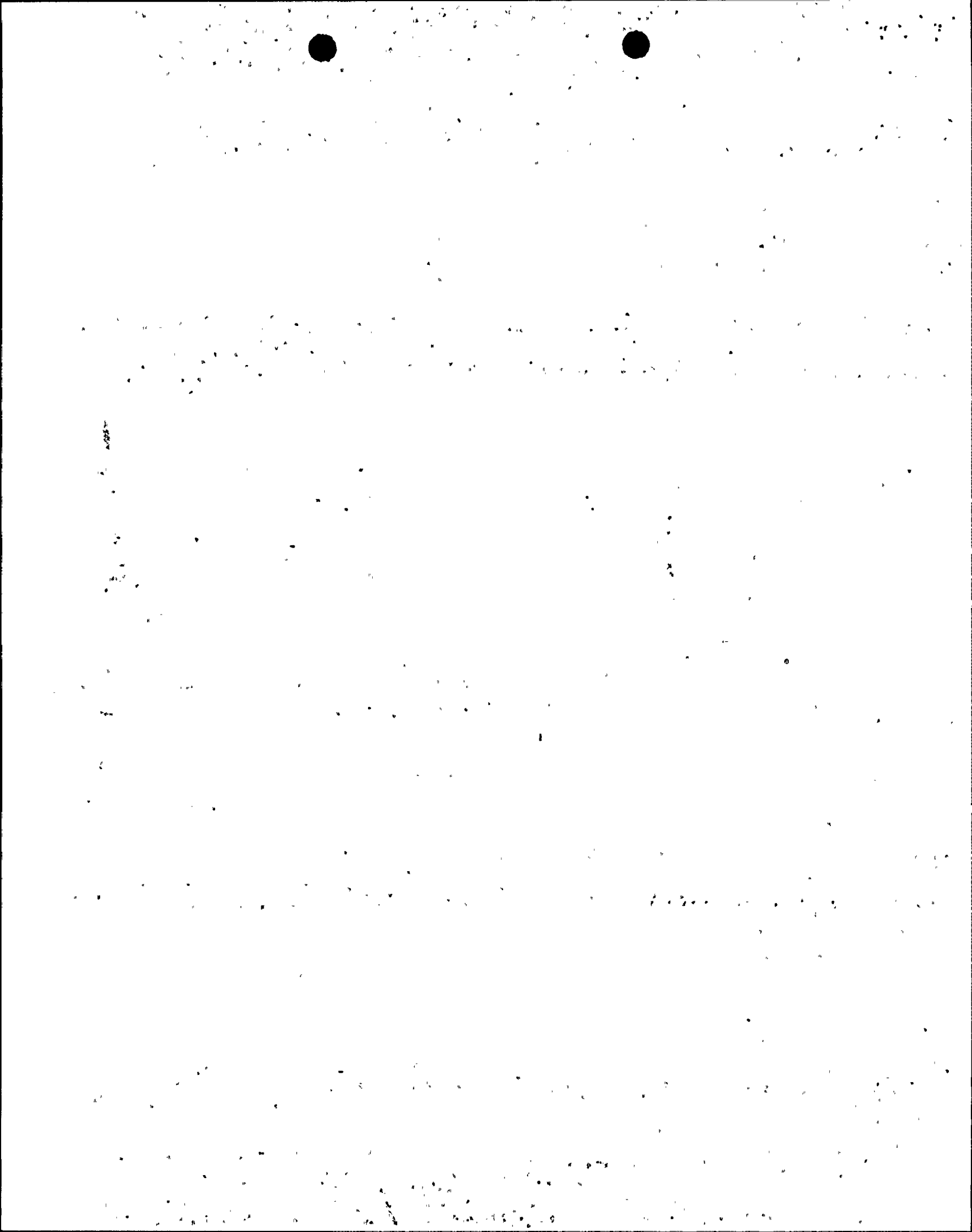


Figure 7 Peak Clad Temperature - DECLG ($C_D = 0.4$)



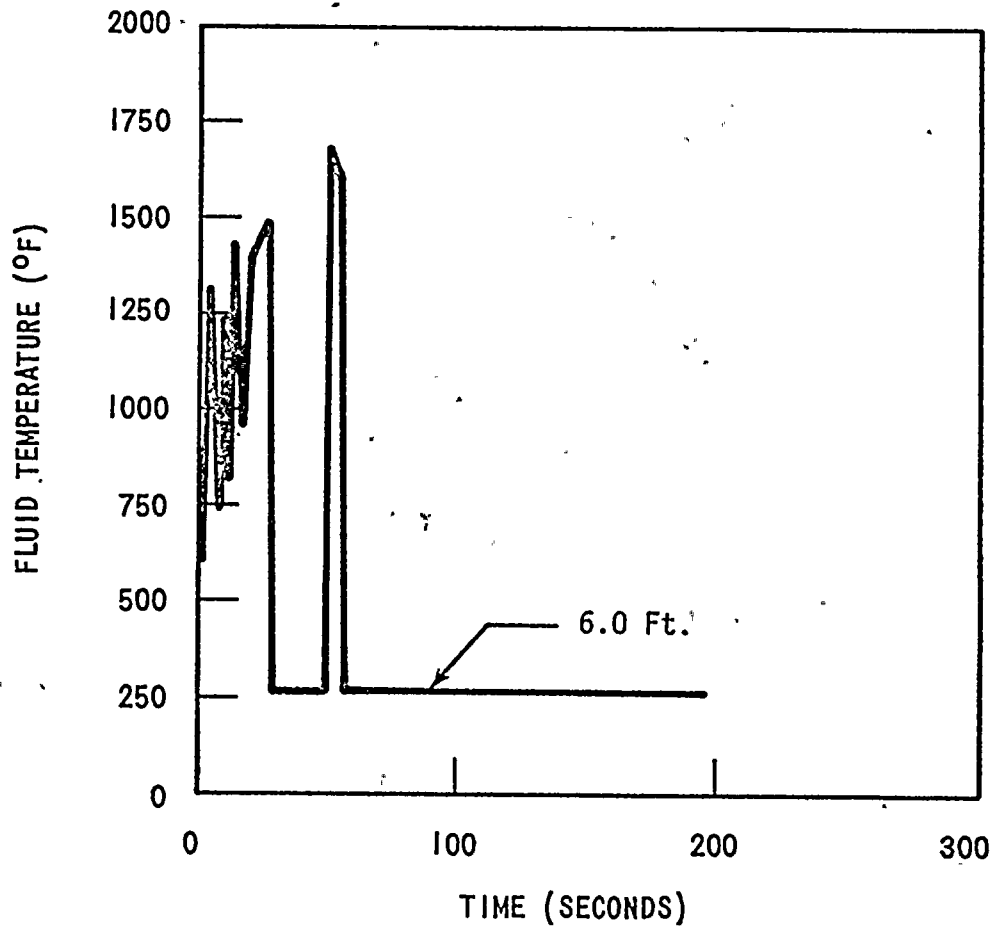
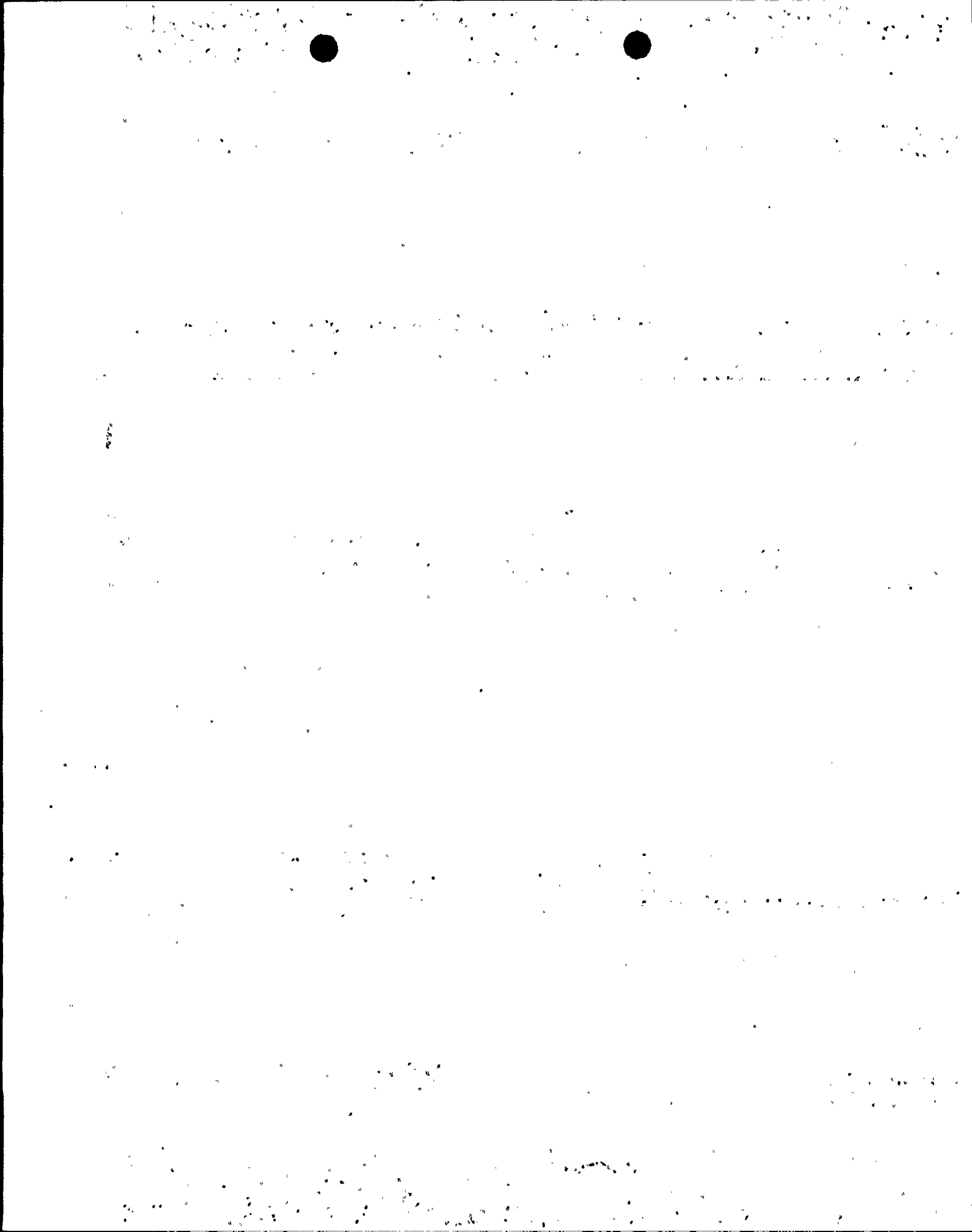


Figure 8 Fluid Temperature - DECLG ($C_D = 0.4$)



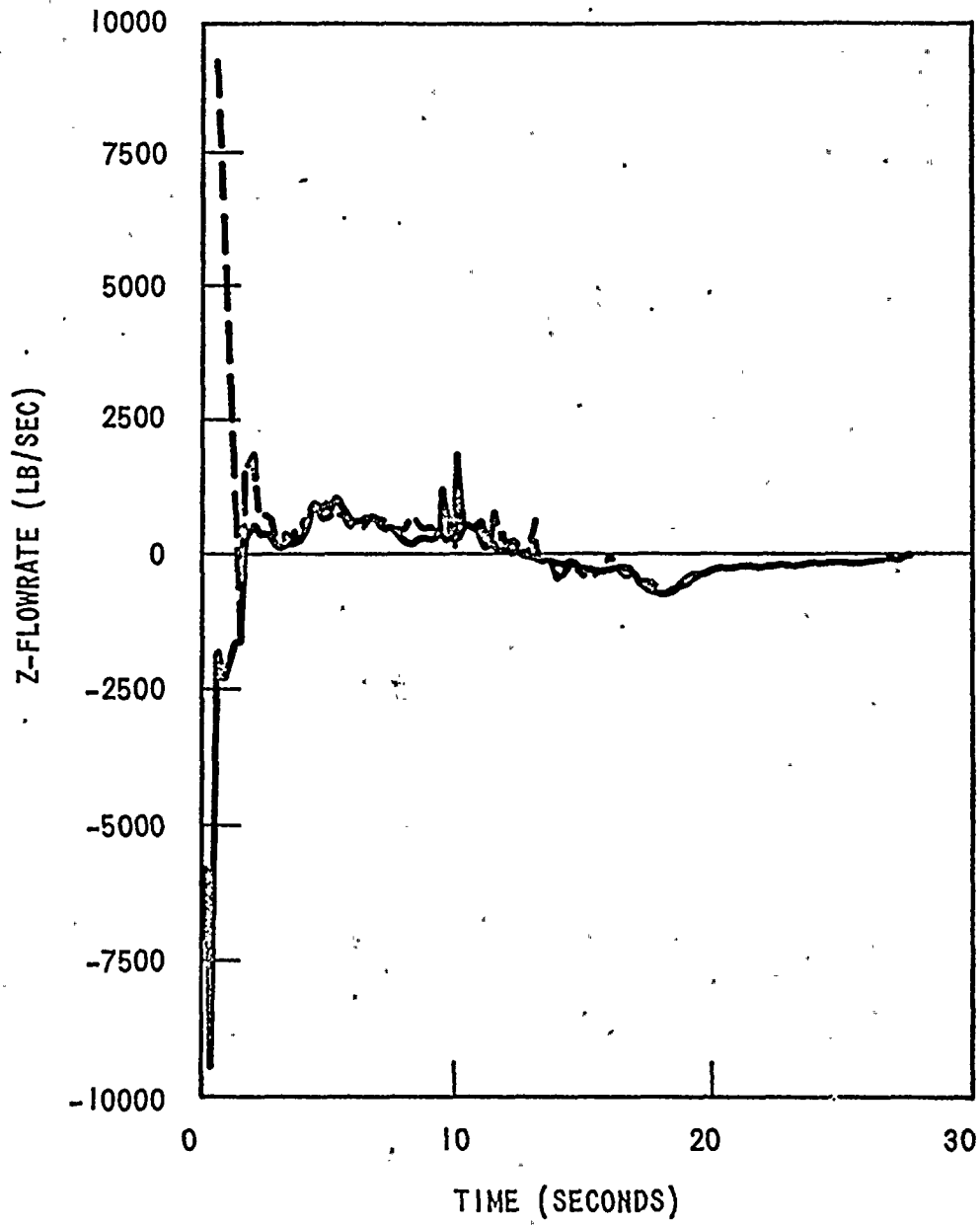
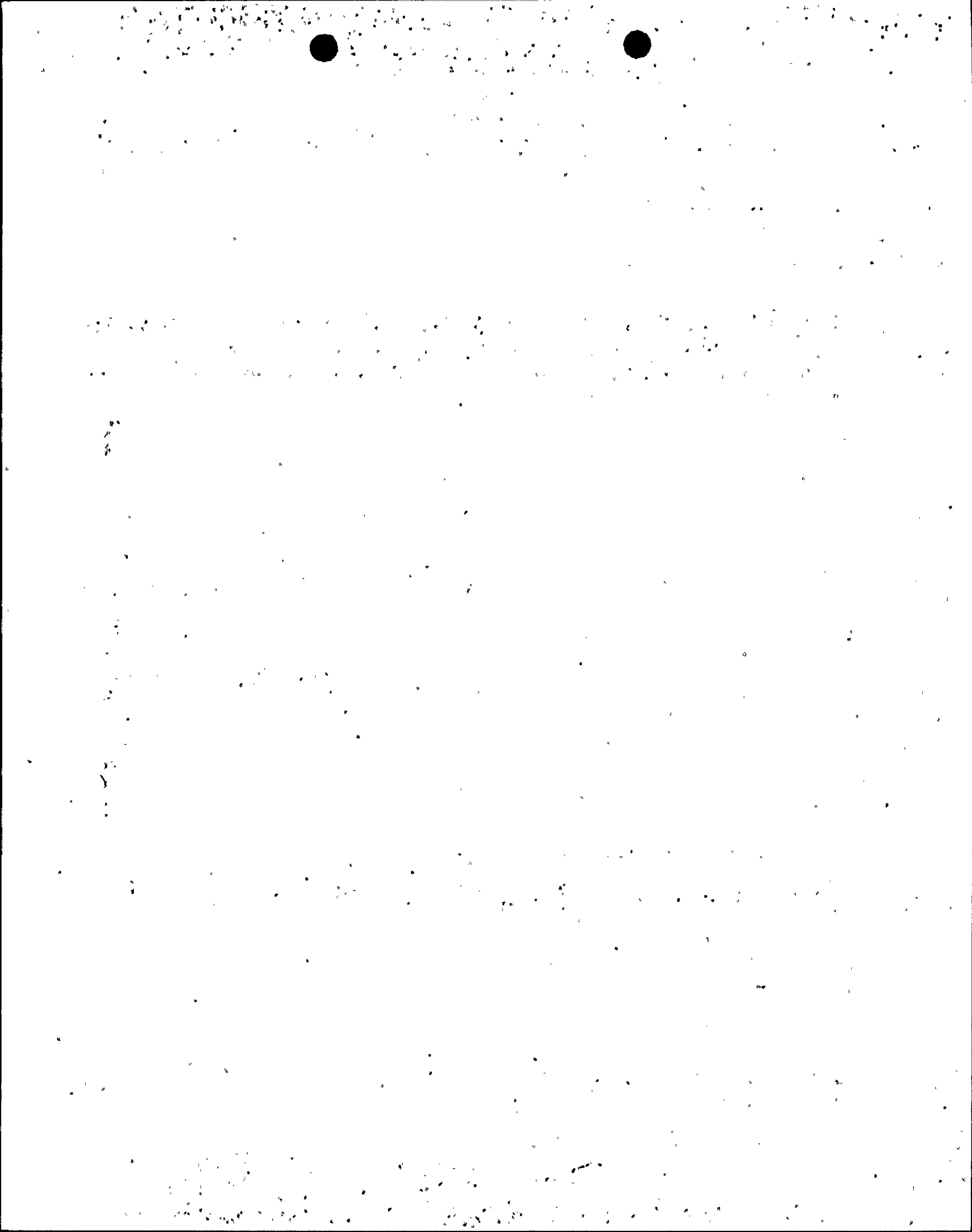


Figure 9 Core Flow - Top and Bottom - DECLG ($C_D = 0.4$)



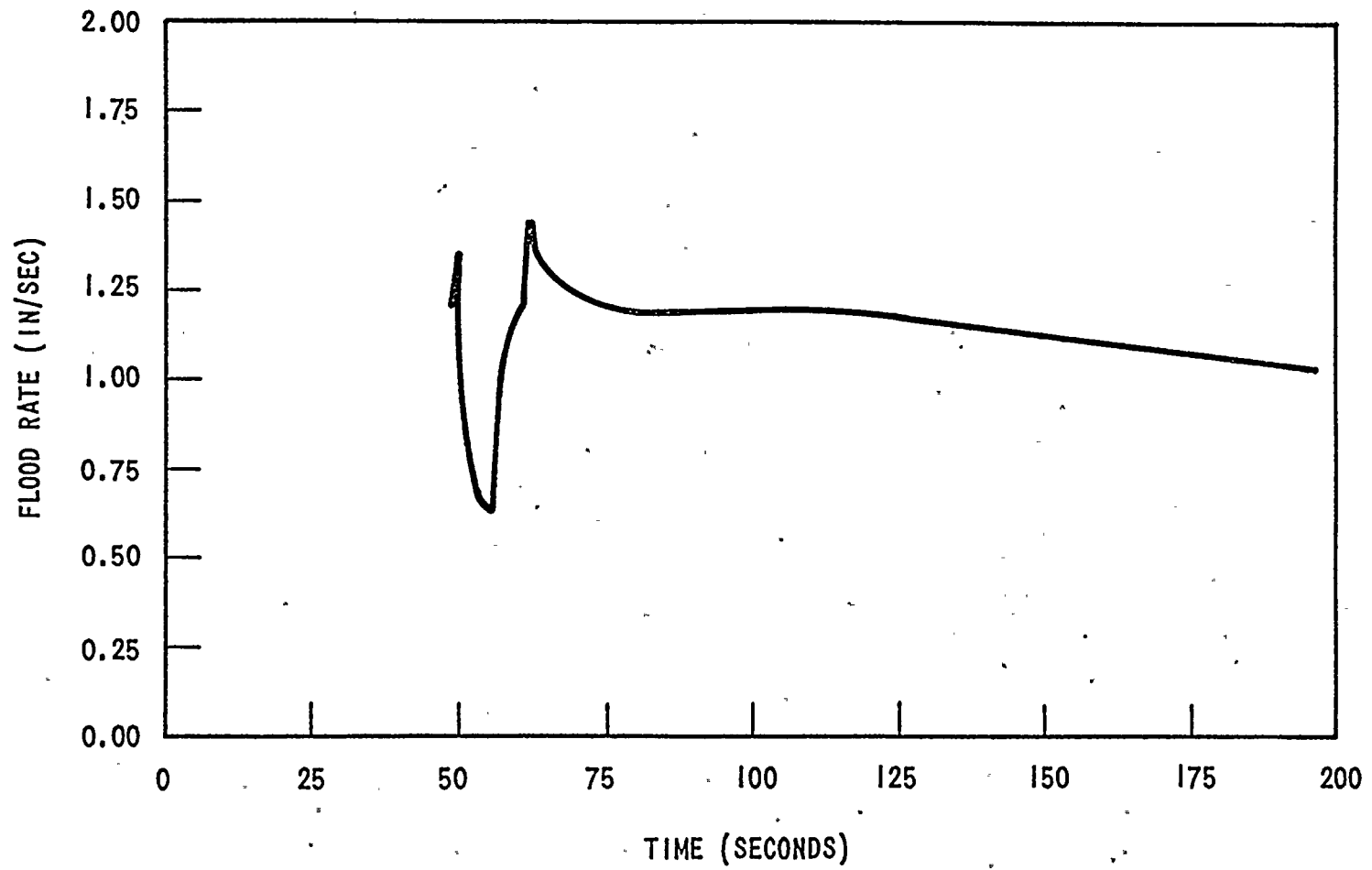
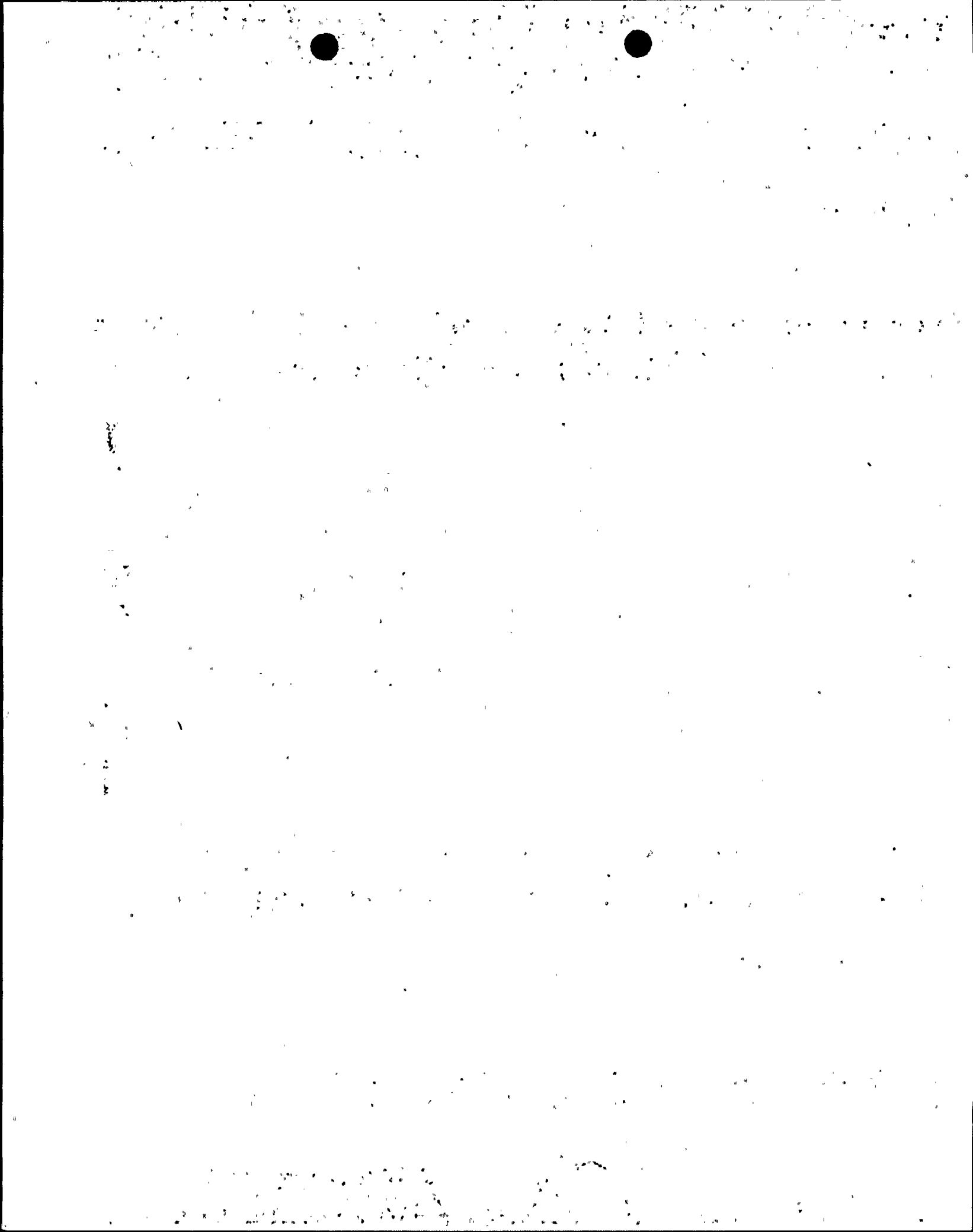


Figure 10 Reflood Transient - DECLG ($C_D = 0.4$)
Core Inlet Velocity



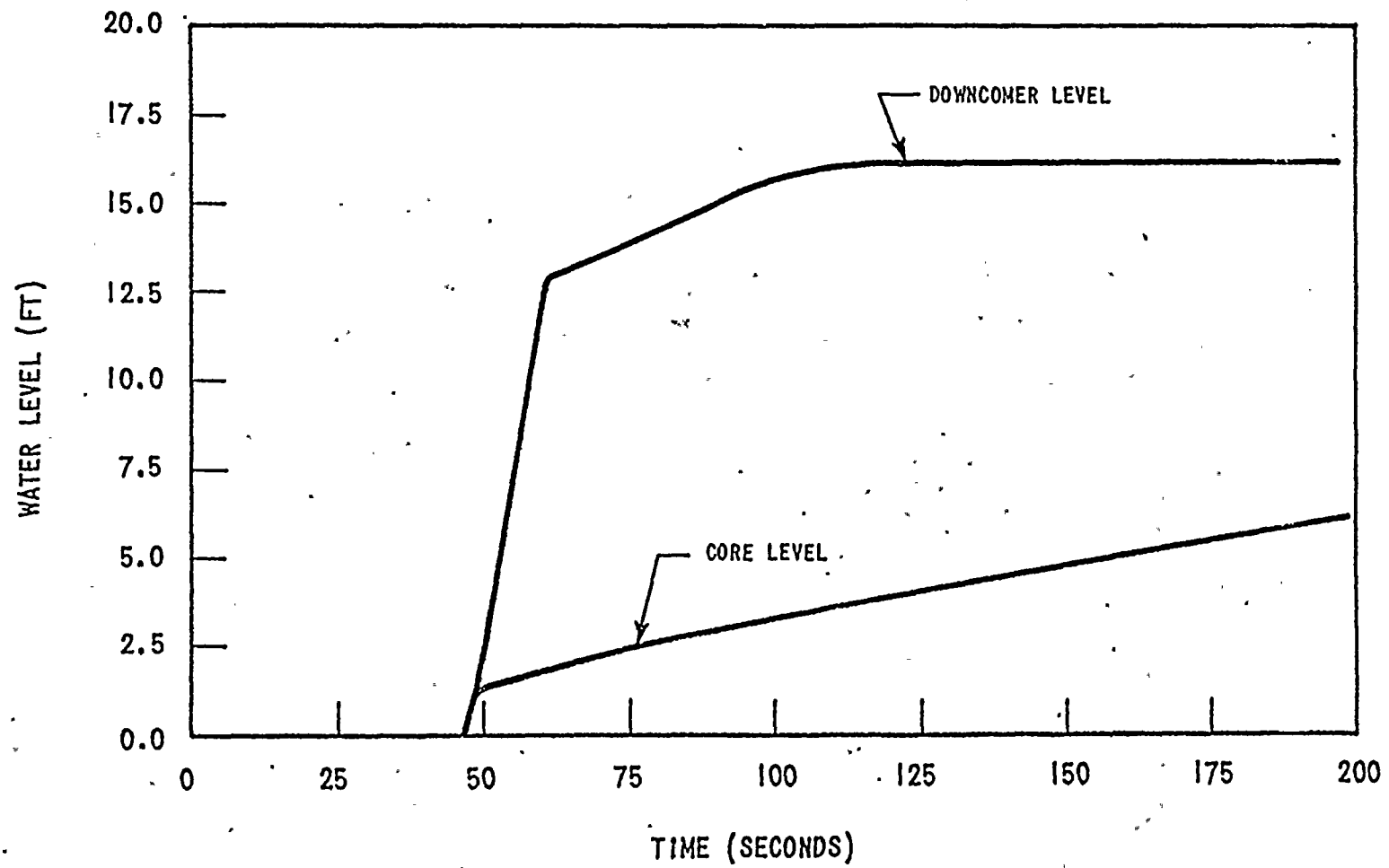
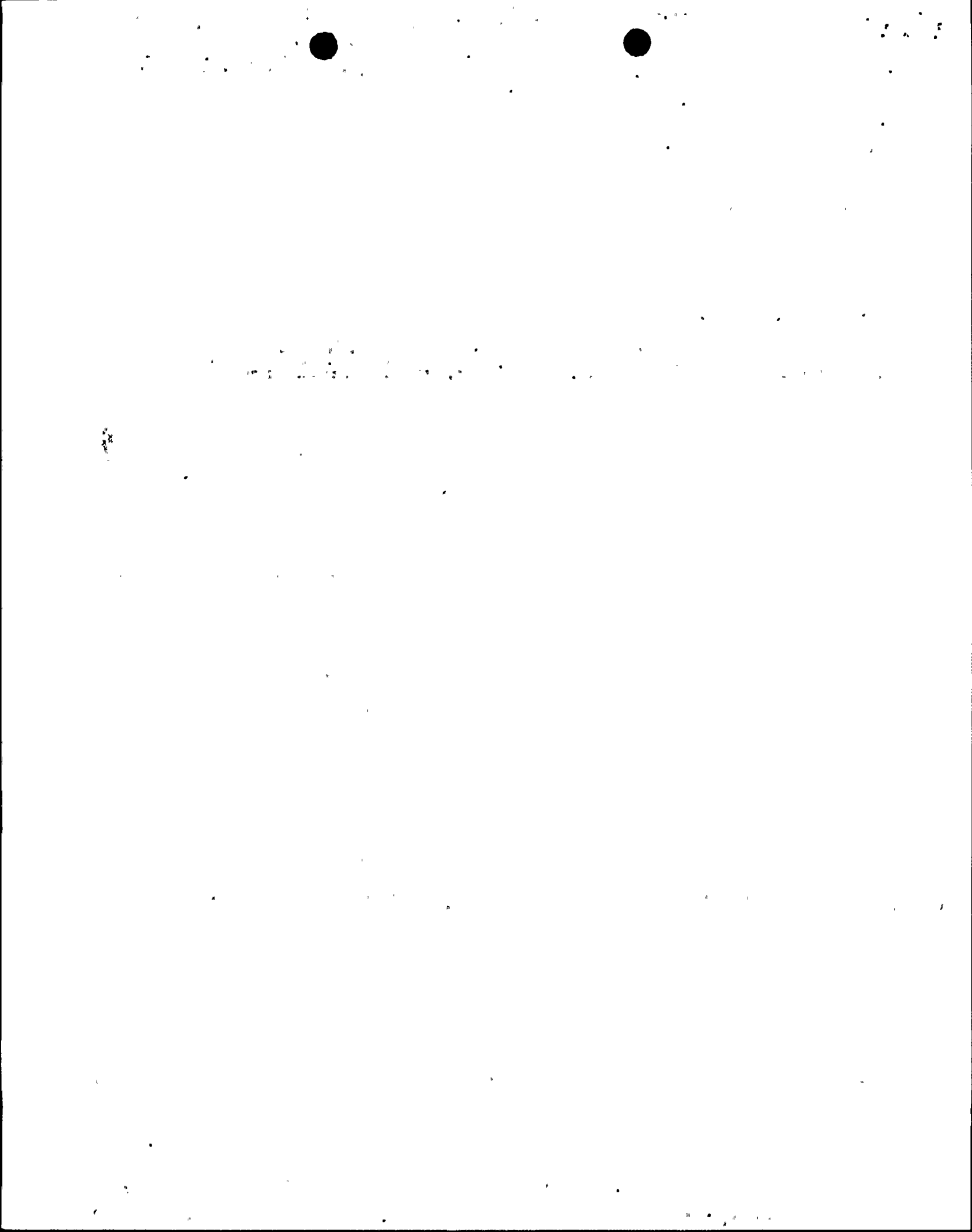


Figure 1.1 Reflood Transient - DECLG ($C_D = 0.4$)
— Downcomer and Core Water Levels



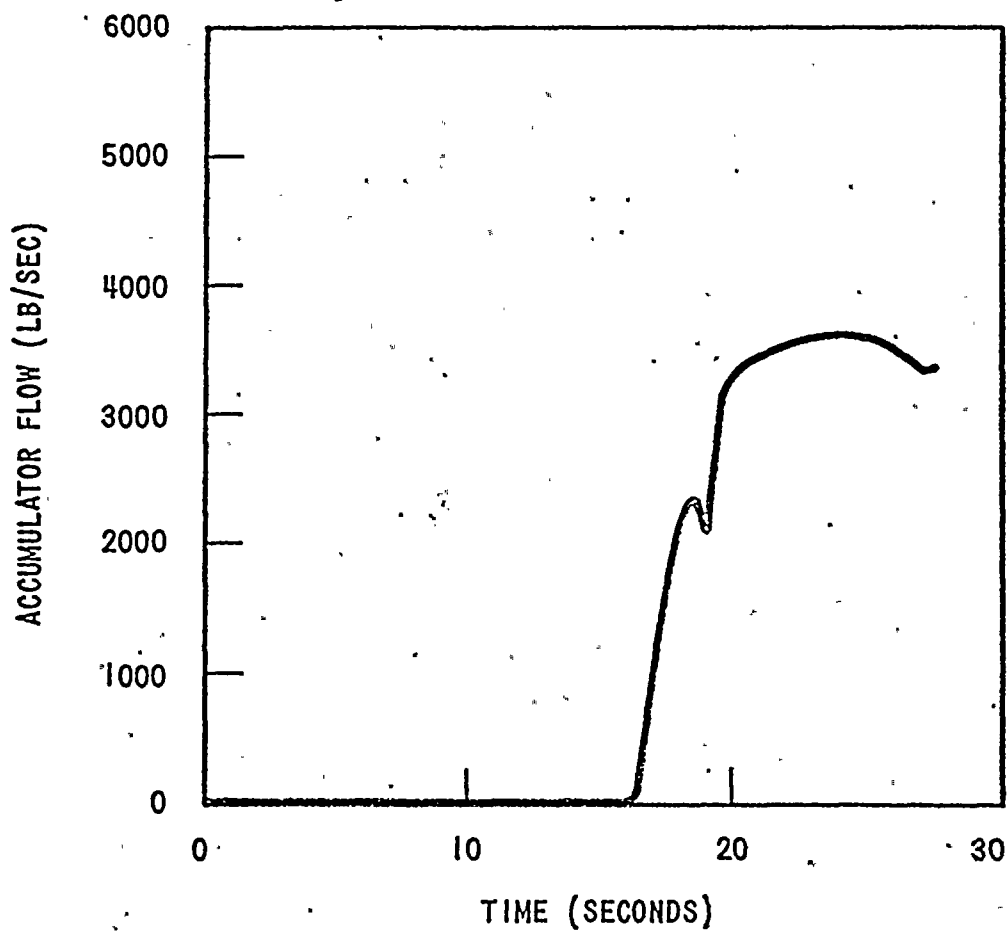
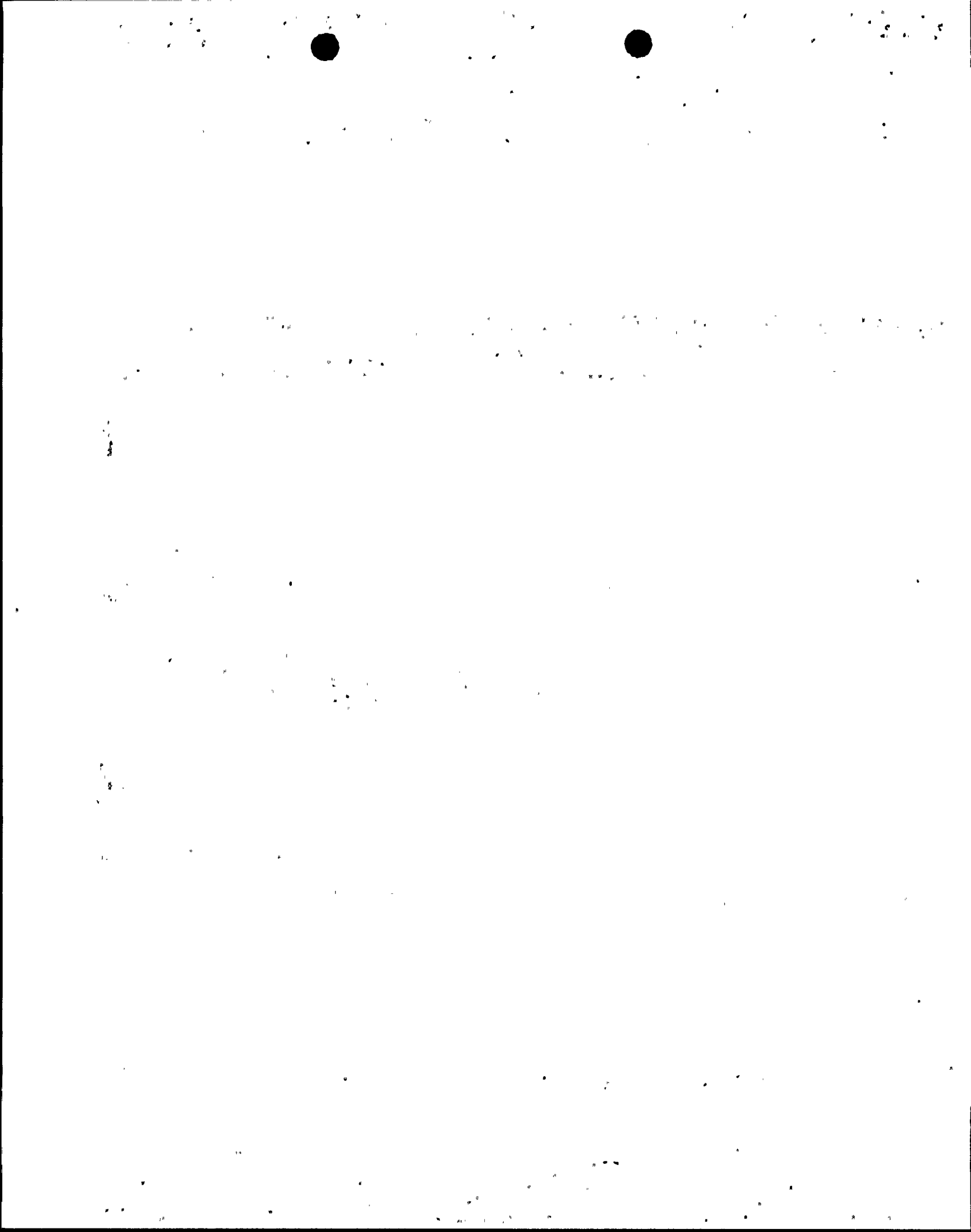


Figure 12 Accumulator Flow (Blowdown) -DECLG ($C_D = 0.4$)



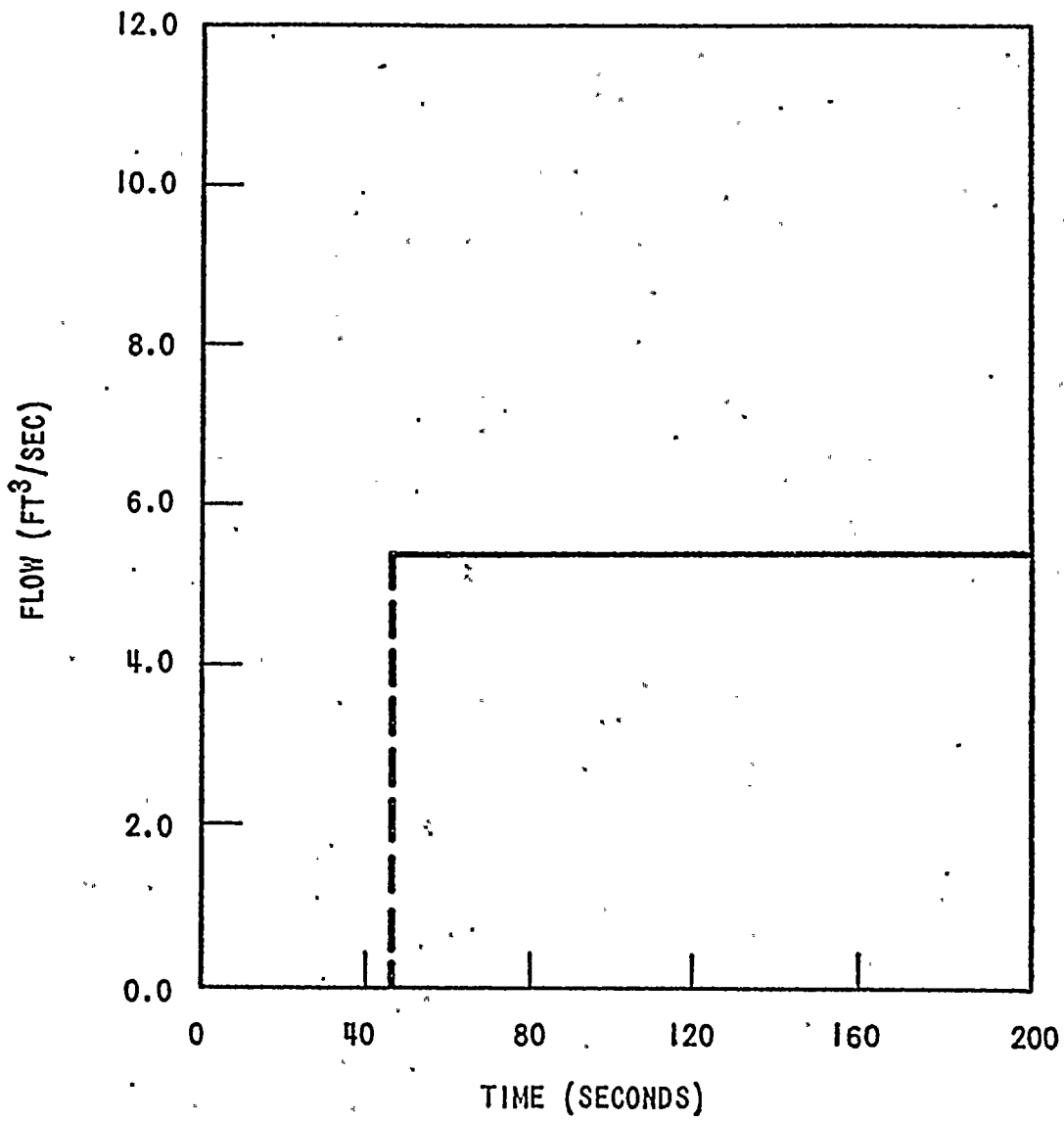
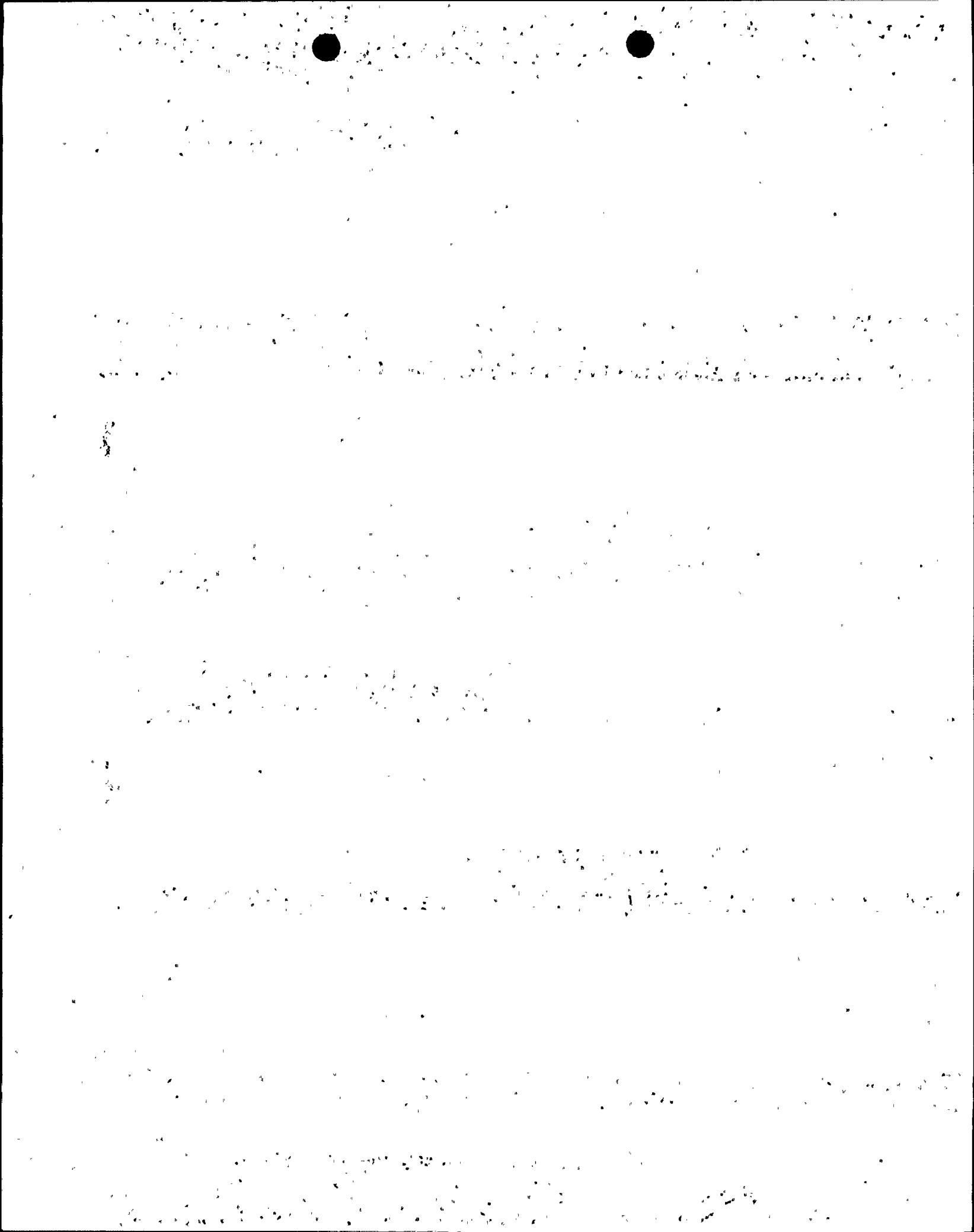


Figure 13 Pumped ECCS Flow (Reflood) - DECLG ($C_D = 0.4$)



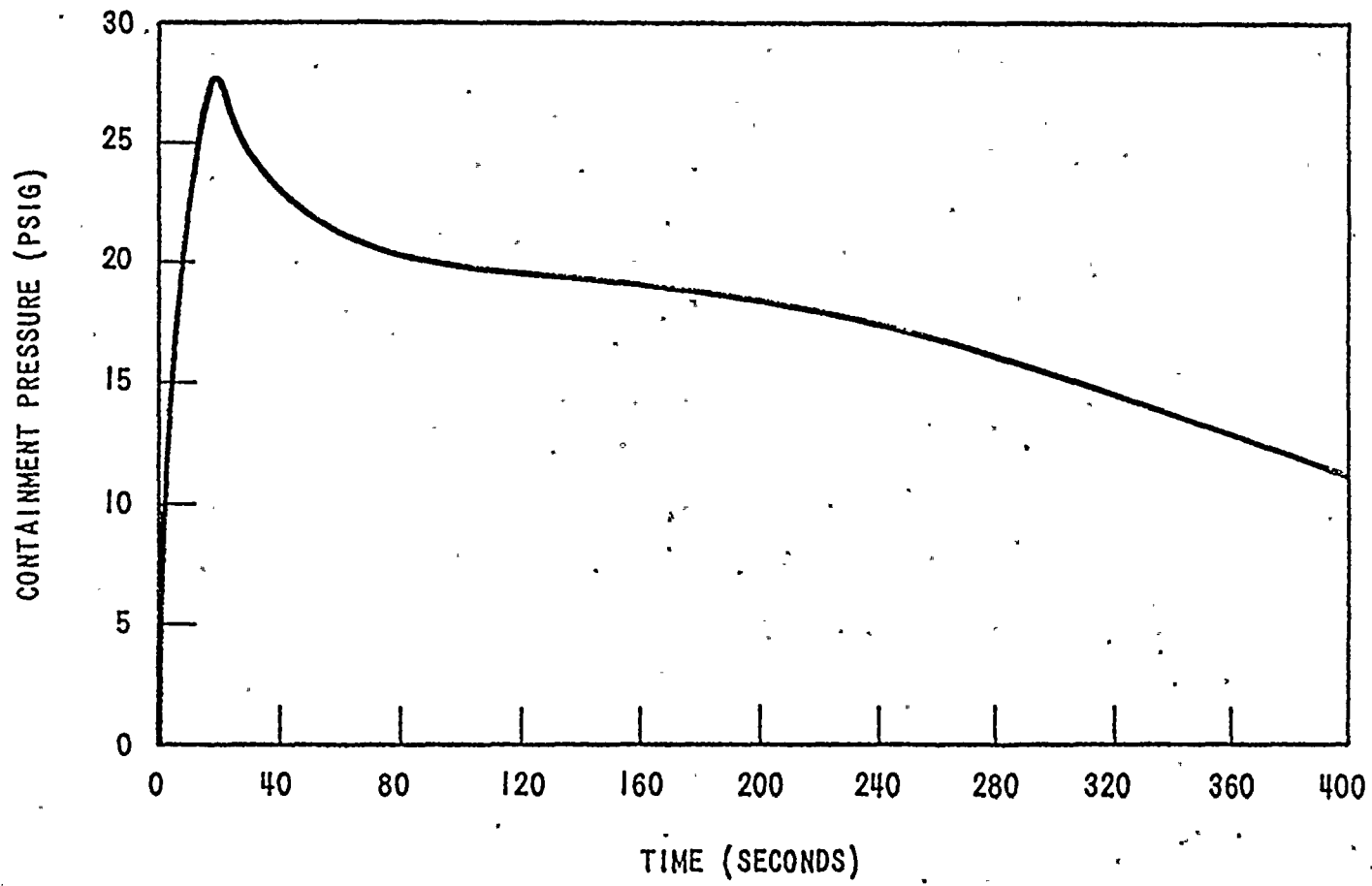
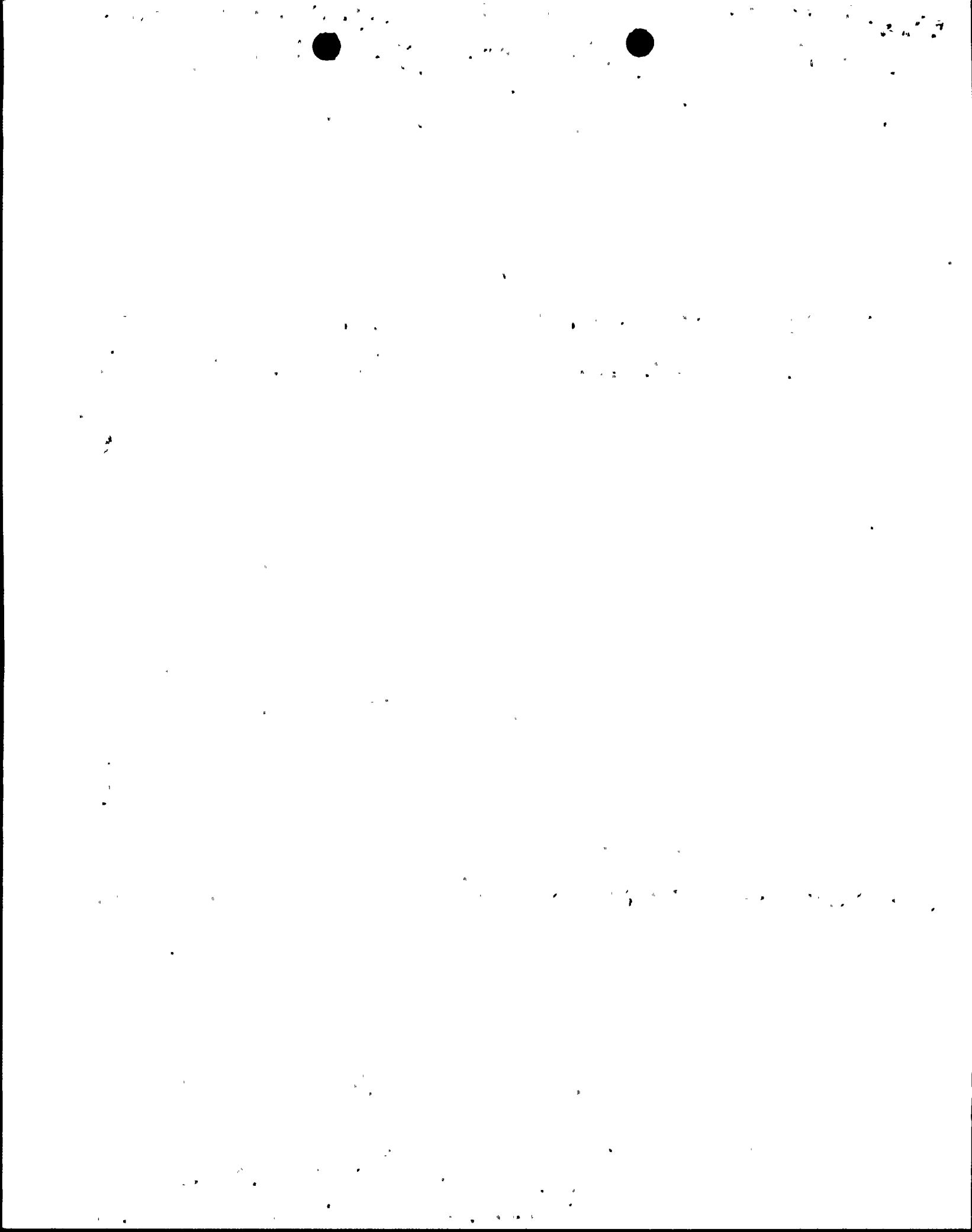


Figure 14 Containment Pressure - DECLG ($C_D = 0.4$)



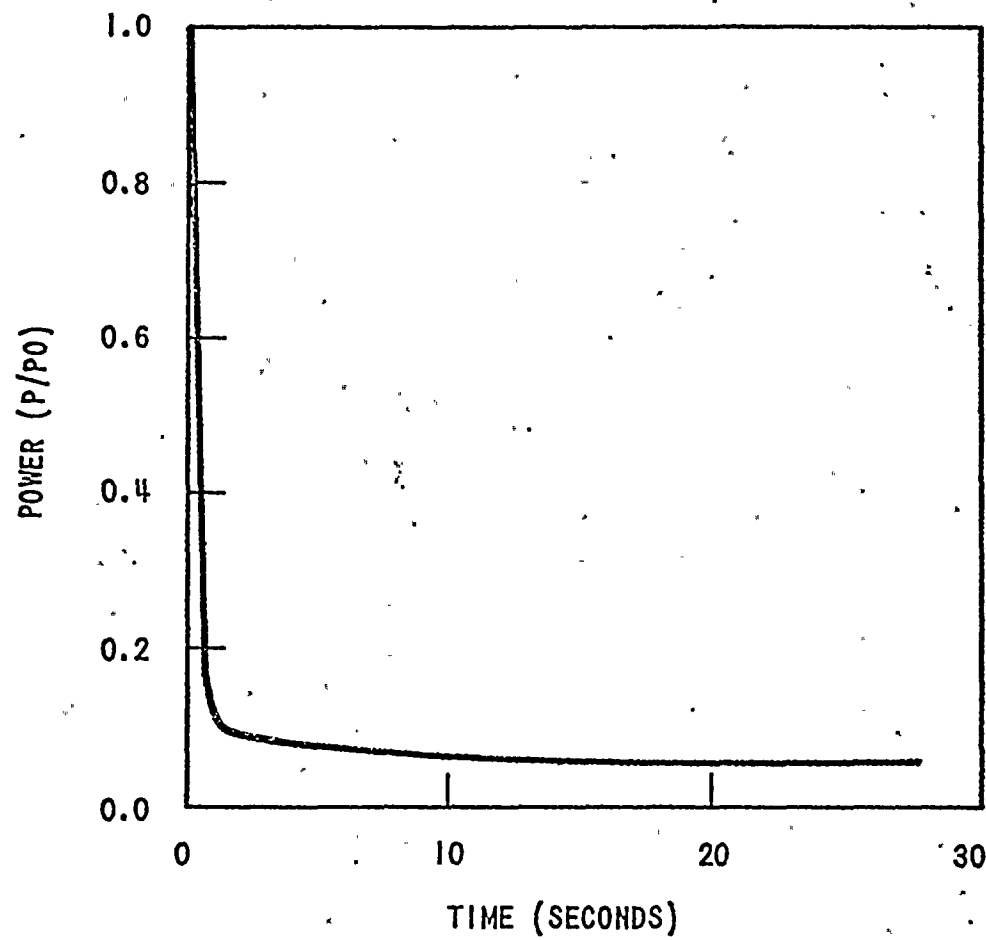
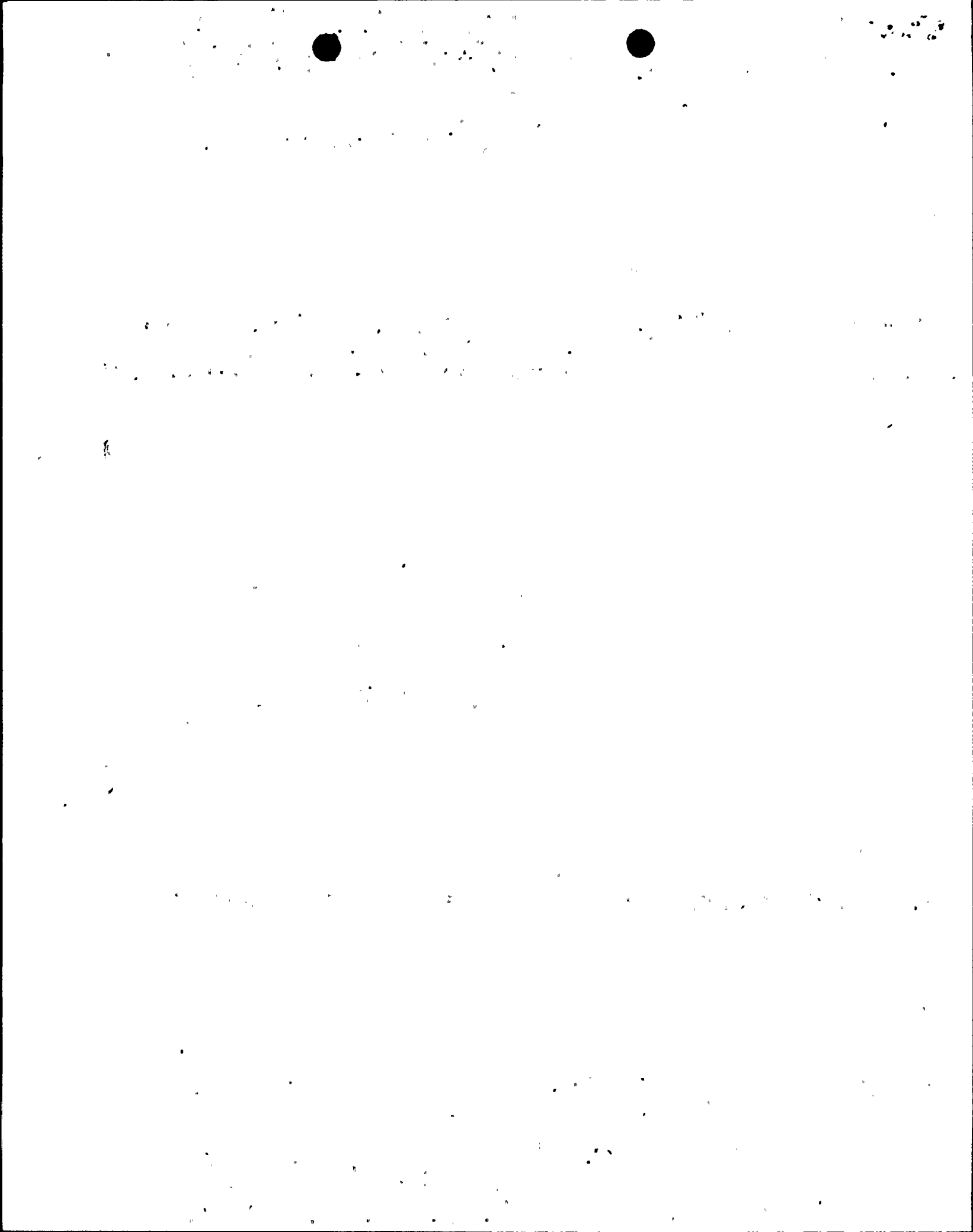


Figure 15 Core Power Transient - DECLG ($C_D = 0.4$)



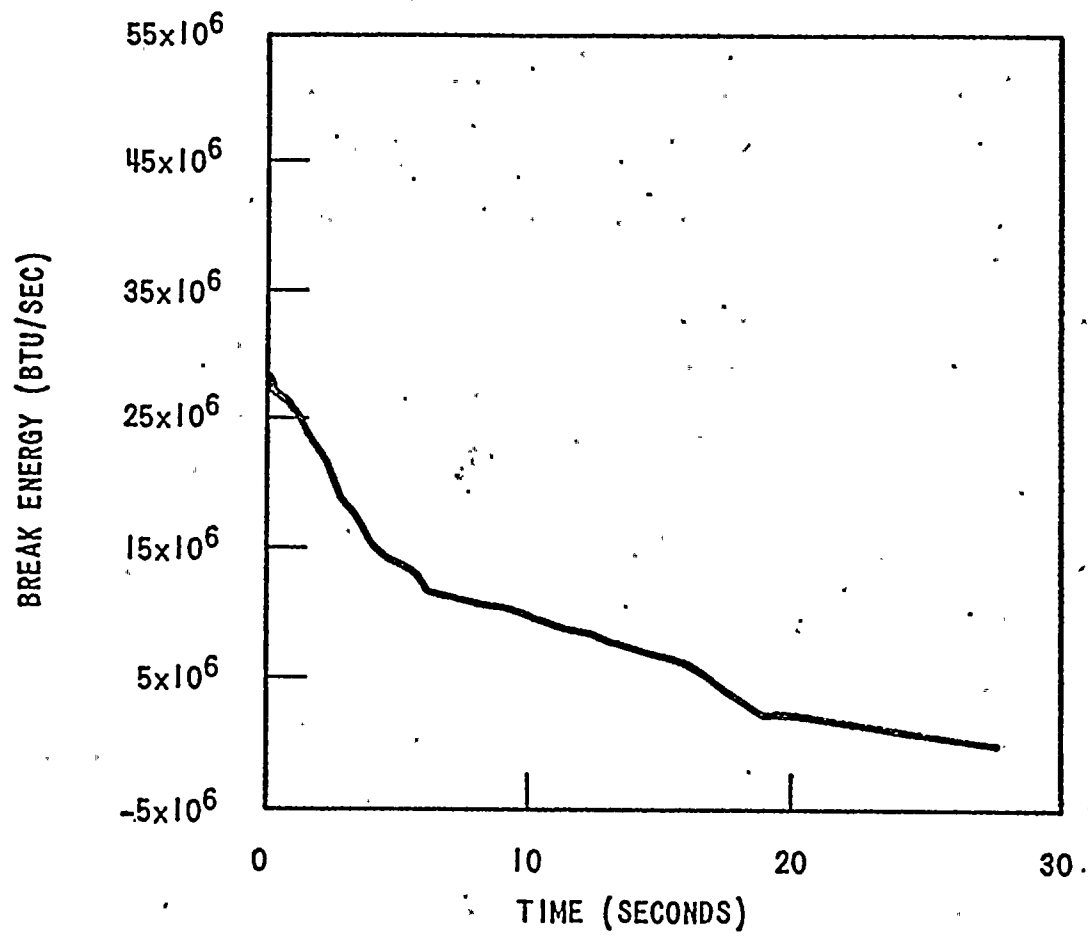
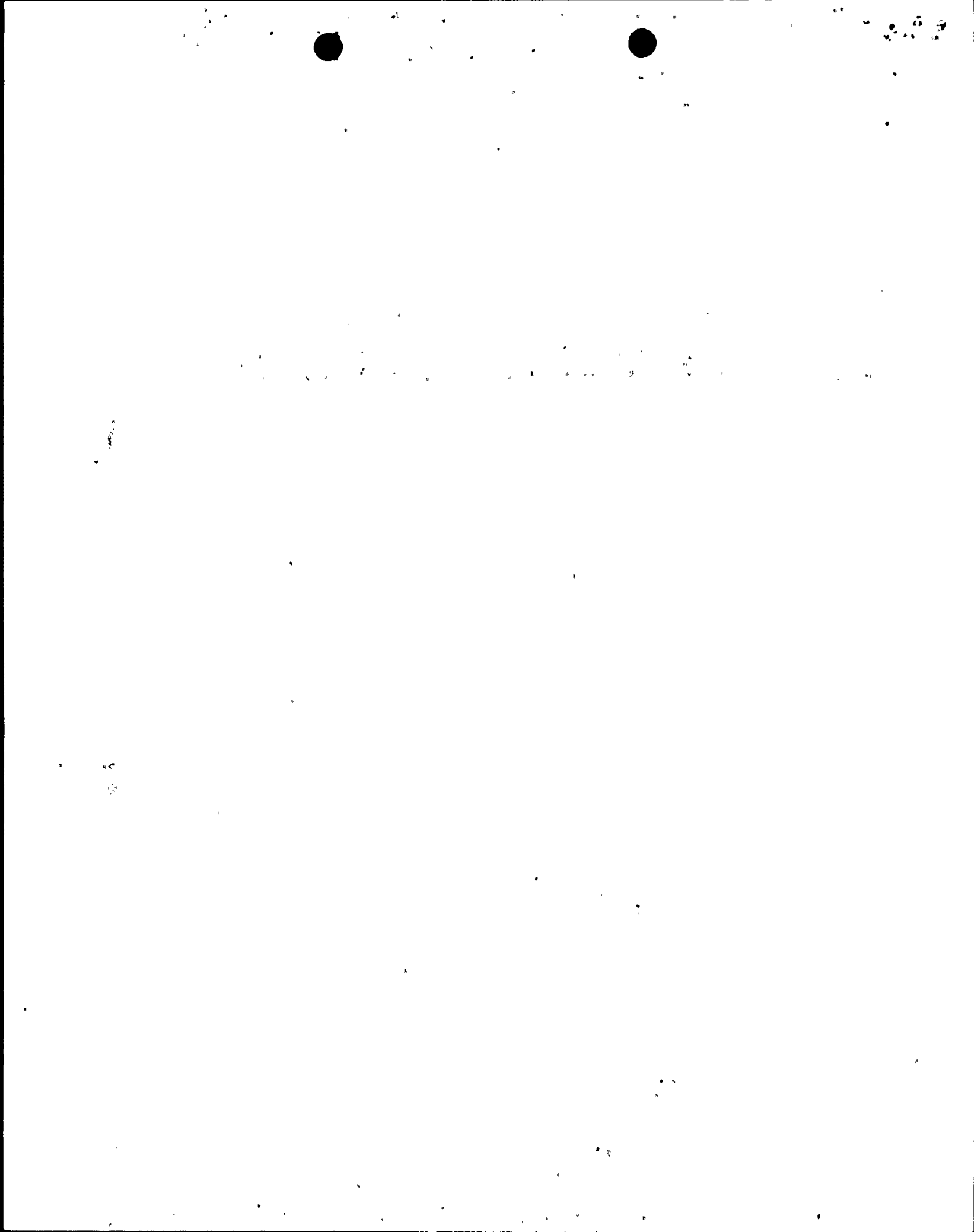


Figure 16 Break Energy Released to Containment



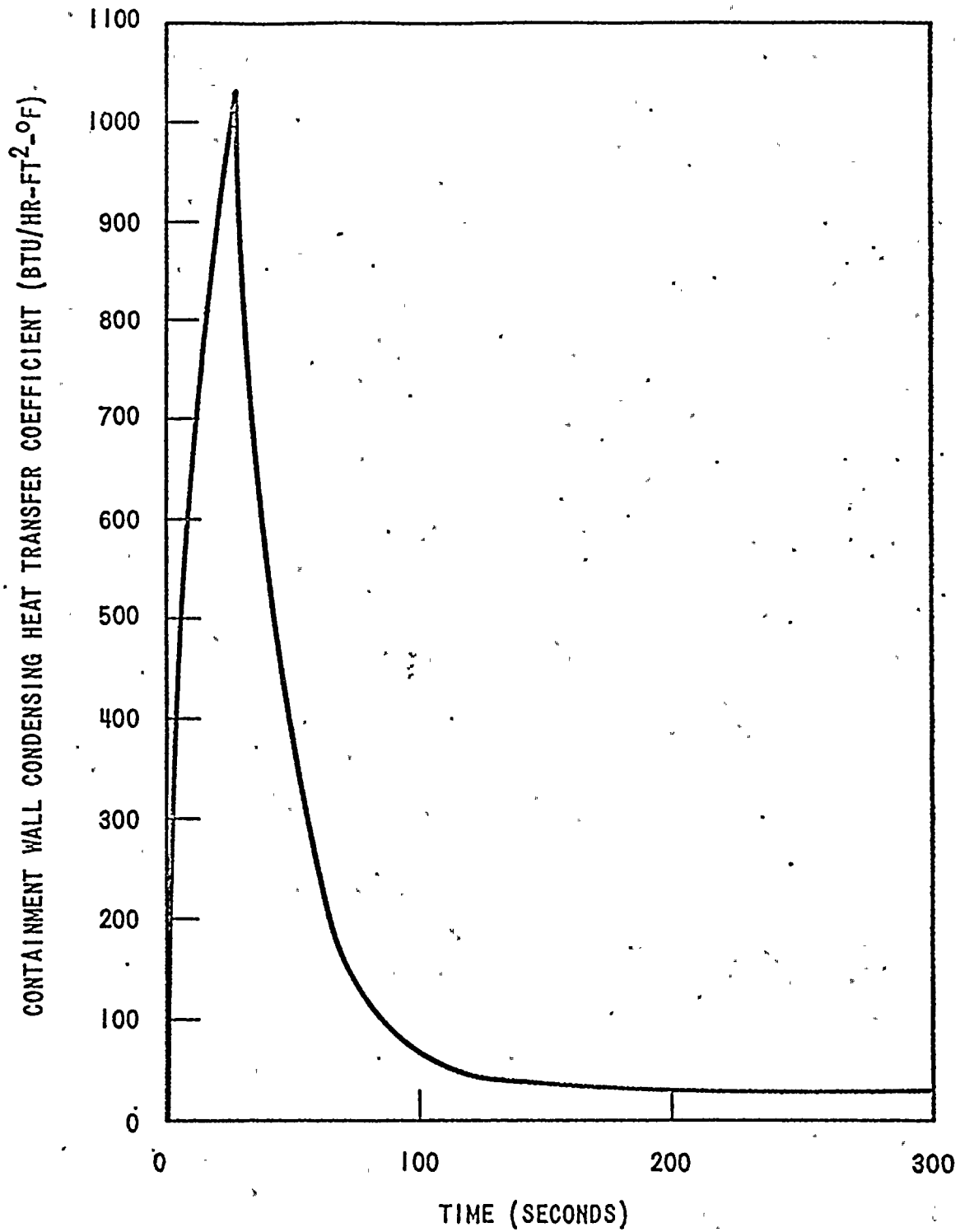


Figure 17 Containment-Wall Condensing Heat Transfer Coefficient

