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格納容器圧力抑制系信頼性実証試験
データレポート・6(TEST 3101)

1980年2月

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格納容器圧力抑制系信頼性実証試験
データレポート・6（TEST 3101）

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（1979年12月27日受 理）

格納容器圧力抑制系信頼性実証試験は、LOCA時にBWR用Mark Ⅱ格納容器圧力抑制系に発生すると予想される熱水力現象に関する試験を行い，格納容器信頼性の実証に資するデータを得ることを目的としている。試験装置の体積縮小率は1／18であり，ウエットウェル部は実炉のウエットウェルの実物大20°セクタ模型である。

本報告は，昭和54年5月25日に実施したTEST 3101のデータ報告である。本試験は，放出口径74 mmの水放出試験であり，約20％のプリパージを行うことにより，チャギング現象に関して保守的な条件を設定した。なお，本試験におけるベント管内最大蒸気重量速度は約20 kg／m²－sと評価される。

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Full-Scale Mark II CRT Program
Data Report No. 6 (TEST 3101)

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The Full-Scale Mark II CRT (Containment Response Test) Program* was initiated to provide a data base for the licensing evaluation of the pressure suppression pool hydrodynamic loads associated with a hypothetical LOCA in a BWR Mark II containment. The test facility, completed in March 1979, is 1/18 in volume with a wetwell which is a full-scale replica of one 20°-sector of a reference Mark II.

This report documents experimental data from TEST 3101, which is a medium size (74 mm) water break test performed with partial prepurge of approximately 23 %. The maximum steam mass flux in the vent was rated to be about 20 kg/m^2-s. The test data is presented for the vessel depressurization and for the pressure, temperature as well as structural responses in the test containment.

Keywords : BWR, LOCA, Pressure Suppression, Mark II Containment, Hydrodynamic Loads, Full-Scale Test, Data.

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*Work performed under auspices of the Atomic Energy Bureau, the Science and Technology Agency of Japan.

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1. まえがき

格納容器圧力抑制系信頼性実証試験は，我が国の最新型沸騰水型炉に使用されているMark Ⅱ格納容器における冷却材喪失事故時の熱水力現象を模擬した試験を行い，格納容器の信頼性実証に資するデータを得ることを目的としている。

本試験計画は，電源開発促進対策特別事業の一環として，科学技術庁より原研に委託されたものであり，昭和52年度を初年度として5年間にわたり実施される予定である。原研内では，安全工学部安全工学第1研究室が試験計画の立案および試験結果の解析を担当し，同安全試験技術室が試験装置の運転，管理を担当している。試験装置は昭和54年3月原研東海研究所敷地内に完成し，以後1カ月に約1回の割合で試験を実施している。

本報告書は，昭和54年5月25日に実施したTEST 3101のデータレポートである。

本試験は，放出ノズル口径74 mmの水放出試験であり，放出に先立ってドライウェル内の空気をウェットウエル気相部に掃気する，いわゆるプリパージを行った以外，試験条件は前回の試験TEST 2101と同様である。

2. 試 験 装 置

試験装置の概略を Fig. 2.1 に示す。試験装置主要部は試験格納容器，圧力容器，放出配管等により構成される。試験格納容器ウェットウエル部は，1100 MWe 級 Mark Ⅱ格納容器のウェットウエルの中心角 20° の 1セクタを模擬したものであり，各部の高さ，内部のベント管等の寸法は実炉とほぼ同一である。ドライウエル，1次系の容積は，実炉の相当部分の約 1／18 である。これらの諸元を Table 2.1 に示す。

本試験装置における計測の項目を Table 2.2 に，計測チャンネルリストを Table 2.5 ～ 2.7 に，計測点位置を Fig. 2.2 ～ 2.9 に示す。データは 2 系統の収録系により収録する。比較的変化の遅い信号（温度，水位計出力等）は小型計算機によってオンライン収録する。一方比較的変化の速い信号（圧力の大半，歪，加速度等）は PCM（ Pulse Code Modulation ）方式により収録し，試験後小型計算機を介してデータを再編集する。収録されたデータの処理はすべて原研計算センターの大型計算機により行う。データ収録装置の主要諸元を Table 2.3 に示す。

本試験における計測器の動作状態を Table 2.8 ～ 2.10 に，圧力，差圧変換器に関する較正試験結果を Table 2.11 に，計測レンジの設定値を Table 2.12 に示す。なお，本試験ではドライウエル内の温度とベント管出口の加速度が計測レンジを超えたため，それぞれ直流増巾器，チャージアンプにおいて信号が飽和した。

本試験で生じた計測系の故障カ所は以下の通りである。

ウェットウエル気相部の露出型熱電対 WWTS－408 と水界面計 WWLF－207，ならびに歪計 VPSF－103 がそれぞれ断線した。また，ベント管出口の加速度計 VPAF－102 の絶縁が劣化し，ノイズレベルが高くなった。

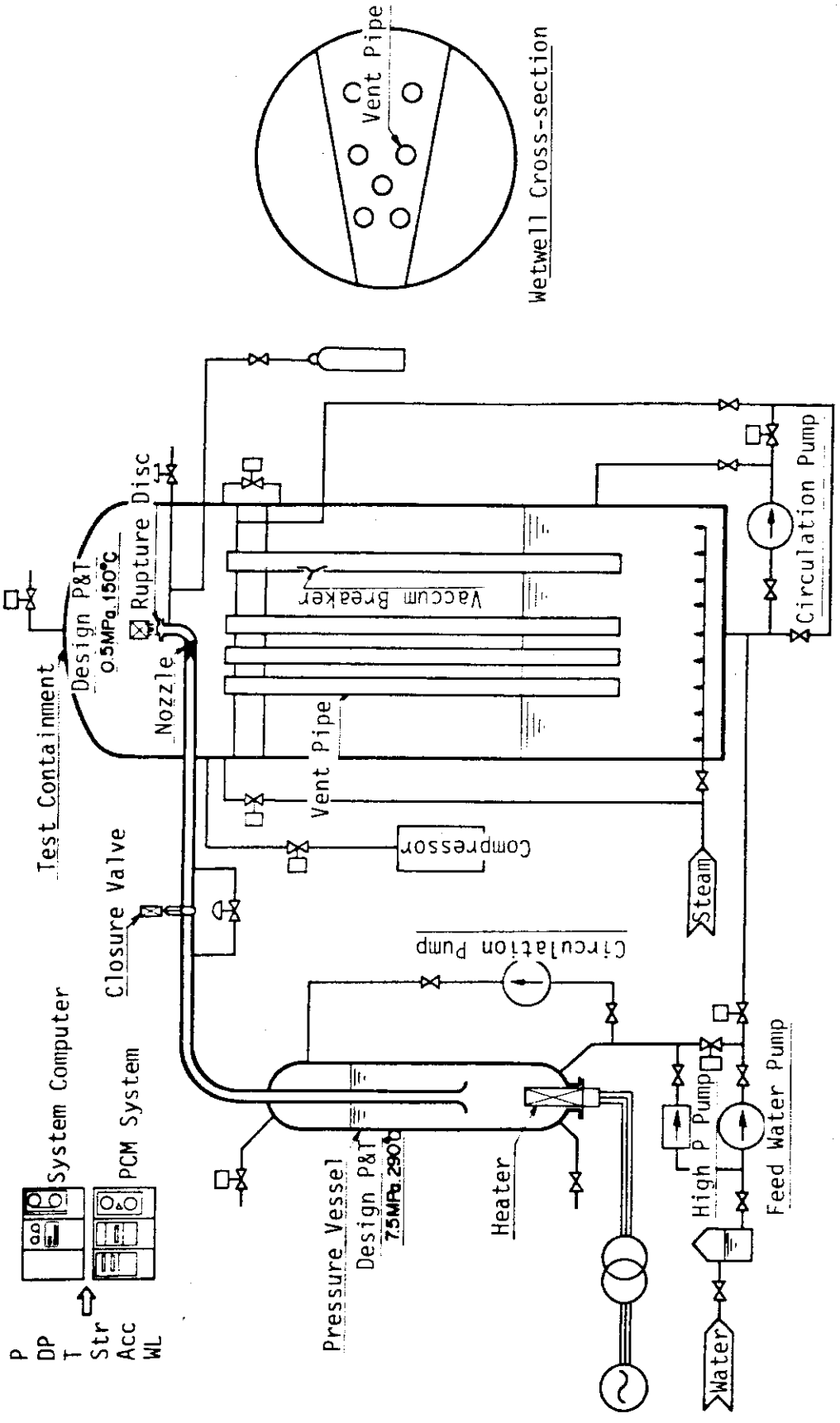

Fig. 2.1 Schematic Flow Diagram of Test Facility

Table 2.1 Comparison of Major Design Parameters

Parameter		Reference Mark II	CRT Facility
Drywell			
Free Volume, Including Air Volumes in Vent Pipes	(m^3)	5700	329
Vent Pipe			
Number	(-)	108	7
Length	(m)	14.2	13.6
Clearance, to Pool Bottom	(m)	3.66	3.66
Number of Vacuum Breakers	(-)	11	1
Wetwell			
Free Volume	(m^3)	4100	255
Water Volume	(m^3)	3200	188
Height, to Diaphragm Floor	(m)	17.3	17.0
Pressure Vessel			
Inside Diameter	(m)	6.4	2.2
Height	(m)	22.0	10.4

Table 2.2 Summary of Data Channels

Location	Item	Data Acqusition		
		Computer	PCM Track-1	PCM Track-2
Pressure Vessel	Pressure	2		
	Diff. Press.	6		
	Temperature	6		
	Water Level	6		
Blowdown Pipe	Pressure	2		
	Diff. Press.	1		
	Temperature	3		
	Timing Sig.	2	2	2
Drywell	Pressure	1	1	
	Temperature	8		
	Water Level	4		
Vent Pipe	Pressure		9	
	Temperature	6		
	Water Level	19		
	Strain		4	
	Acceleration			4
	Timing Sig.	1		
Wetwell	Pressure	1	20	
	Diff. Press.	2		
	Temperature	32		
	Water Level	80		15
	Acceleration			12

Table 2.3 Summary of Data Acquisition Systems

		Computer	PCM System
Max. Number of Channels		192	39 x 2 tracks
Input Range	(V)	±10.00	±10.00
Resolution	(mV/digit)	4.883	19.53
Sampling Rate	(data/ch./s)	50.00	455.56
Skew	(ms/ch.)	0.028	0.0488

Table 2.4 Identification of Data Channels

Channel Code = A B C D - E F G

A B Location

= P V Pressure Vessel
= B P Blowdown Pipe
= D W Drywell
= V P Vent Pipe
= W W Wetwell

C Measurement Item

= P Pressure
= D Differential Pressure
= T Temperature
= L Water Level Signal
= S Strain
= A Acceleration
= M Actuation Signal

D Data Acquisition System

= S Computer Recorded , 50 data/s
= F PCM Recorded , 455.6 data/s

E Group Number

F G Sequential Number

Table 2.5 List of Data Channels (Computer Recorded Channels)

Channel No.	Channel Code	Measurement Location
1	BPMS-001	RUPTURE DISC BREAK SIGNAL
2	BPMS-002	MAIN DISCHARGE VALVE CLOSE SIGNAL
3	VPMS-001	OPENING OF VACUUM BREAKER (5-STEPS)
4		
5	PVPS-001	VESSEL STEAM DOME
6	PVPS-002	VESSEL STEAM DOME
7	BPPS-001	BLOWDOWN PIPE (3.4M FROM OUTL.)
8	BPPS-002	BLOWDOWN PIPE (0.9M FROM OUTL.)
9	DWPS-001	DRYWELL
10	WWPS-001	WETWELL AIRSPACE (15.0M ABOVE BOTT.)
11		
12	PVDS-001	DP OVER VESSEL (EL = 0.0M - +9.2M)
13	PVDS-002	DP OVER VESSEL (EL = 0.0M - +2.6M)
14	PVDS-003	DP OVER VESSEL (EL = +2.2M - +4.2M)
15	PVDS-004	DP OVER VESSEL (EL = +3.8M - +5.8M)
16	PVDS-005	DP OVER VESSEL (EL = +5.4M - +7.4M)
17	PVDS-006	DP OVER VESSEL (EL = +7.0M - +9.2M)
18	BPDS-001	DYNAMIC PRESS. IN BLOWDOWN PIPE
19	WWDS-001	DP OVER POOL (EL = 4.5M -15.5M)
20	WWDS-002	DP ACROSS DIAPHRAGM FLOOR
21		
22	PVTS-001	VESSEL (EL = 0.6M)
23	PVTS-002	VESSEL (EL = 2.2M)
24	PVTS-003	VESSEL (EL = 3.8M)
25	PVTS-004	VESSEL (EL = 5.4M)
26	PVTS-005	VESSEL (EL = 7.0M)
27	PVTS-006	VESSEL (EL = 8.6M)
28	BPTS-001	BLOWDOWN PIPE (6.5M FROM OUTL.)
29	BPTS-002	BLOWDOWN PIPE (4.1M FROM OUTL.)
30	BPTS-003	BLOWDOWN PIPE (0.9M FROM OUTL.)
31	DWTS-101	DRYWELL (0.5M ABOVE DF)
32	DWTS-102	DRYWELL (2.5M ABOVE DF)
33	DWTS-103	DRYWELL (4.5M ABOVE DF)
34	DWTS-201	DRYWELL (0.5M ABOVE DF)
35	DWTS-202	DRYWELL (2.5M ABOVE DF)
36	DWTS-203	DRYWELL (4.5M ABOVE DF)
37	DWTS-301	DRYWELL (0.5M ABOVE DF)
38	DWTS-302	DRYWELL (3.5M ABOVE DF)
39	VPTS-101	VP1 (0.5M ABOVE OUTL.)
40	VPTS-102	VP1 (11.5M ABOVE OUTL.)
41	VPTS-201	VP2 (0.5M ABOVE OUTL.)
42	VPTS-202	VP2 (11.5M ABOVE OUTL.)
43	VPTS-301	VP3 (0.5M ABOVE OUTL.)
44	VPTS-302	VP3 (11.5M ABOVE OUTL.)
45	WWTS-101	WETWELL (T1, 1.0M ABOVE BOTT.)
46	WWTS-102	WETWELL (T1, 3.0M ABOVE BOTT.)
47	WWTS-103	WETWELL (T1, 5.0M ABOVE BOTT.)
48	WWTS-104	WETWELL (T1, 7.0M ABOVE BOTT.)
49	WWTS-105	WETWELL (T1, 9.0M ABOVE BOTT.)
50	WWTS-106	WETWELL (T1, 11.0M ABOVE BOTT.)
51	WWTS-107	WETWELL (T1, 13.0M ABOVE BOTT.)
52	WWTS-108	WETWELL (T1, 15.0M ABOVE BOTT.)

Table 2.5 (continued)

Channel No.	Channel Code	Measurement Location
53	WWTS-201	WETWELL (T2, 1.0M ABOVE BOTT.)
54	WWTS-202	WETWELL (T2, 3.0M ABOVE BOTT.)
55	WWTS-203	WETWELL (T2, 5.0M ABOVE BOTT.)
56	WWTS-204	WETWELL (T2, 7.0M ABOVE BOTT.)
57	WWTS-205	WETWELL (T2, 9.0M ABOVE BOTT.)
58	WWTS-206	WETWELL (T2, 11.0M ABOVE BOTT.)
59	WWTS-207	WETWELL (T2, 13.0M ABOVE BOTT.)
60	WWTS-208	WETWELL (T2, 15.0M ABOVE BOTT.)
61	WWTS-301	WETWELL (T3, 1.0M ABOVE BOTT.)
62	WWTS-302	WETWELL (T3, 3.0M ABOVE BOTT.)
63	WWTS-303	WETWELL (T3, 5.0M ABOVE BOTT.)
64	WWTS-304	WETWELL (T3, 7.0M ABOVE BOTT.)
65	WWTS-305	WETWELL (T3, 9.0M ABOVE BOTT.)
66	WWTS-306	WETWELL (T3, 11.0M ABOVE BOTT.)
67	WWTS-307	WETWELL (T3, 13.0M ABOVE BOTT.)
68	WWTS-308	WETWELL (T3, 15.0M ABOVE BOTT.)
69	WWTS-401	WETWELL (T4, 1.0M ABOVE BOTT.)
70	WWTS-402	WETWELL (T4, 3.0M ABOVE BOTT.)
71	WWTS-403	WETWELL (T4, 5.0M ABOVE BOTT.)
72	WWTS-404	WETWELL (T4, 7.0M ABOVE BOTT.)
73	WWTS-405	WETWELL (T4, 9.0M ABOVE BOTT.)
74	WWTS-406	WETWELL (T4, 11.0M ABOVE BOTT.)
75	WWTS-407	WETWELL (T4, 13.0M ABOVE BOTT.)
76	WWTS-408	WETWELL (T4, 15.0M ABOVE BOTT.)
77		
78	PVLS-001	VESSEL (EL = 0.6M)
79	PVLS-002	VESSEL (EL = 2.2M)
80	PVLS-003	VESSEL (EL = 3.8M)
81	PVLS-004	VESSEL (EL = 5.4M)
82	PVLS-005	VESSEL (EL = 7.0M)
83	PVLS-006	VESSEL (EL = 8.6M)
84	DWLS-001	DRYWELL (0.048M ABOVE DF)
85	DWLS-002	DRYWELL (0.096M ABOVE DF)
86	DWLS-003	DRYWELL (0.144M ABOVE DF)
87	DWLS-004	DRYWELL (0.192M ABOVE DF)
88	VPLS-101	VP1 (0.042M ABOVE OUTL.)
89	VPLS-103	VP1 (2.042M ABOVE OUTL.)
90	VPLS-105	VP1 (4.042M ABOVE OUTL.)
91	VPLS-201	VP2 (0.042M ABOVE OUTL.)
92	VPLS-203	VP2 (2.042M ABOVE OUTL.)
93	VPLS-205	VP2 (4.042M ABOVE OUTL.)
94	VPLS-301	VP3 (0.042M ABOVE OUTL.)
95	VPLS-302	VP3 (1.042M ABOVE OUTL.)
96	VPLS-303	VP3 (2.042M ABOVE OUTL.)
97	VPLS-304	VP3 (3.042M ABOVE OUTL.)
98	VPLS-305	VP3 (4.042M ABOVE OUTL.)
99	VPLS-401	VP4 (0.042M ABOVE OUTL.)
100	VPLS-403	VP4 (2.042M ABOVE OUTL.)
101	VPLS-405	VP4 (4.042M ABOVE OUTL.)
102	VPLS-501	VP5 (0.042M ABOVE OUTL.)
103	VPLS-502	VP5 (1.042M ABOVE OUTL.)
104	VPLS-503	VP5 (2.042M ABOVE OUTL.)
105	VPLS-504	VP5 (3.042M ABOVE OUTL.)
106	VPLS-505	VP5 (4.042M ABOVE OUTL.)

Table 2.5 (continued)

Channel No.	Channel Code	Measurement Location
107	WWLS-104	WETWELL (L1, 5.75M ABOVE BOTT.)
108	WWLS-105	WETWELL (L1, 6.50M ABOVE BOTT.)
109	WWLS-106	WETWELL (L1, 7.25M ABOVE BOTT.)
110	WWLS-107	WETWELL (L1, 8.00M ABOVE BOTT.)
111	WWLS-108	WETWELL (L1, 8.75M ABOVE BOTT.)
112	WWLS-109	WETWELL (L1, 9.50M ABOVE BOTT.)
113	WWLS-110	WETWELL (L1, 10.25M ABOVE BOTT.)
114	WWLS-111	WETWELL (L1, 11.00M ABOVE BOTT.)
115	WWLS-112	WETWELL (L1, 11.75M ABOVE BOTT.)
116	WWLS-113	WETWELL (L1, 12.50M ABOVE BOTT.)
117	WWLS-114	WETWELL (L1, 13.25M ABOVE BOTT.)
118	WWLS-115	WETWELL (L1, 14.00M ABOVE BOTT.)
119	WWLS-116	WETWELL (L1, 14.75M ABOVE BOTT.)
120	WWLS-201	WETWELL (L2, 3.50M ABOVE BOTT.)
121	WWLS-202	WETWELL (L2, 4.25M ABOVE BOTT.)
122	WWLS-203	WETWELL (L2, 5.00M ABOVE BOTT.)
123	WWLS-204	WETWELL (L2, 5.75M ABOVE BOTT.)
124	WWLS-205	WETWELL (L2, 6.50M ABOVE BOTT.)
125	WWLS-206	WETWELL (L2, 7.25M ABOVE BOTT.)
126	WWLS-207	WETWELL (L2, 8.00M ABOVE BOTT.)
127	WWLS-208	WETWELL (L2, 8.75M ABOVE BOTT.)
128	WWLS-209	WETWELL (L2, 9.50M ABOVE BOTT.)
129	WWLS-210	WETWELL (L2, 10.25M ABOVE BOTT.)
130	WWLS-211	WETWELL (L2, 11.00M ABOVE BOTT.)
131	WWLS-212	WETWELL (L2, 11.75M ABOVE BOTT.)
132	WWLS-213	WETWELL (L2, 12.50M ABOVE BOTT.)
133	WWLS-214	WETWELL (L2, 13.25M ABOVE BOTT.)
134	WWLS-215	WETWELL (L2, 14.00M ABOVE BOTT.)
135	WWLS-216	WETWELL (L2, 14.75M ABOVE BOTT.)
136	WWLS-303	WETWELL (L3, 5.00M ABOVE BOTT.)
137	WWLS-305	WETWELL (L3, 6.50M ABOVE BOTT.)
138	WWLS-307	WETWELL (L3, 8.00M ABOVE BOTT.)
139	WWLS-309	WETWELL (L3, 9.50M ABOVE BOTT.)
140	WWLS-311	WETWELL (L3, 11.00M ABOVE BOTT.)
141	WWLS-313	WETWELL (L3, 12.50M ABOVE BOTT.)
142	WWLS-315	WETWELL (L3, 14.00M ABOVE BOTT.)
143	WWLS-401	WETWELL (L4, 3.50M ABOVE BOTT.)
144	WWLS-402	WETWELL (L4, 4.25M ABOVE BOTT.)
145	WWLS-403	WETWELL (L4, 5.00M ABOVE BOTT.)
146	WWLS-404	WETWELL (L4, 5.75M ABOVE BOTT.)
147	WWLS-405	WETWELL (L4, 6.50M ABOVE BOTT.)
148	WWLS-406	WETWELL (L4, 7.25M ABOVE BOTT.)
149	WWLS-407	WETWELL (L4, 8.00M ABOVE BOTT.)
150	WWLS-408	WETWELL (L4, 8.75M ABOVE BOTT.)
151	WWLS-409	WETWELL (L4, 9.50M ABOVE BOTT.)
152	WWLS-410	WETWELL (L4, 10.25M ABOVE BOTT.)
153	WWLS-411	WETWELL (L4, 11.00M ABOVE BOTT.)
154	WWLS-412	WETWELL (L4, 11.75M ABOVE BOTT.)
155	WWLS-413	WETWELL (L4, 12.50M ABOVE BOTT.)
156	WWLS-414	WETWELL (L4, 13.25M ABOVE BOTT.)
157	WWLS-415	WETWELL (L4, 14.00M ABOVE BOTT.)
158	WWLS-416	WETWELL (L4, 14.75M ABOVE BOTT.)
159	WWLS-503	WETWELL (L5, 5.00M ABOVE BOTT.)
160	WWLS-505	WETWELL (L5, 6.50M ABOVE BOTT.)

Table 2.5 (continued)

Channel No.	Channel Code	Measurement Location
161	WWLS-507	WETWELL (L5, 8.00M ABOVE BOTT.)
162	WWLS-509	WETWELL (L5, 9.50M ABOVE BOTT.)
163	WWLS-511	WETWELL (L5, 11.00M ABOVE BOTT.)
164	WWLS-513	WETWELL (L5, 12.50M ABOVE BOTT.)
165	WWLS-515	WETWELL (L5, 14.00M ABOVE BOTT.)
166	WWLS-604	WETWELL (L6, 5.75M ABOVE BOTT.)
167	WWLS-606	WETWELL (L6, 7.25M ABOVE BOTT.)
168	WWLS-608	WETWELL (L6, 8.75M ABOVE BOTT.)
169	WWLS-610	WETWELL (L6, 10.25M ABOVE BOTT.)
170	WWLS-612	WETWELL (L6, 11.75M ABOVE BOTT.)
171	WWLS-614	WETWELL (L6, 13.25M ABOVE BOTT.)
172	WWLS-616	WETWELL (L6, 14.75M ABOVE BOTT.)
173	WWLS-704	WETWELL (L7, 5.75M ABOVE BOTT.)
174	WWLS-706	WETWELL (L7, 7.25M ABOVE BOTT.)
175	WWLS-708	WETWELL (L7, 8.75M ABOVE BOTT.)
176	WWLS-710	WETWELL (L7, 10.25M ABOVE BOTT.)
177	WWLS-712	WETWELL (L7, 11.75M ABOVE BOTT.)
178	WWLS-714	WETWELL (L7, 13.25M ABOVE BOTT.)
179	WWLS-716	WETWELL (L7, 14.75M ABOVE BOTT.)
180	WWLS-804	WETWELL (L8, 5.75M ABOVE BOTT.)
181	WWLS-806	WETWELL (L8, 7.25M ABOVE BOTT.)
182	WWLS-808	WETWELL (L8, 8.75M ABOVE BOTT.)
183	WWLS-810	WETWELL (L8, 10.25M ABOVE BOTT.)
184	WWLS-812	WETWELL (L8, 11.75M ABOVE BOTT.)
185	WWLS-814	WETWELL (L8, 13.25M ABOVE BOTT.)
186	WWLS-816	WETWELL (L8, 14.75M ABOVE BOTT.)
187		
188		
189		
190		
191		
192		

Table 2.6 List of Data Channels (PCM Track-1 Channels)

Channel No.	Channel Code	Measurement Location
1	BPMF-001	RUPTURE DISC BREAK SIGNAL
2	BPMF-002	MAIN DISCHARGE VALVE CLOSE SIGNAL
3		
4	DWPF-001	DRYWELL
5	VPPF-101	VP1 (0.5M ABOVE OUTL.)
6	VPPF-201	VP2 (0.5M ABOVE OUTL.)
7	VPPF-301	VP3 (0.5M ABOVE OUTL.)
8	VPPF-302	VP3 (6.0M ABOVE OUTL.)
9	VPPF-303	VP3 (11.5M ABOVE OUTL.)
10	VPPF-401	VP4 (0.5M ABOVE OUTL.)
11	VPPF-501	VP5 (0.5M ABOVE OUTL.)
12	VPPF-502	VP5 (6.0M ABOVE OUTL.)
13	VPPF-503	VP5 (11.5M ABOVE OUTL.)
14	WWPF-101	POOL BOTT., UNDER VP1
15	WWPF-102	POOL BOTT., UNDER VP2
16	WWPF-103	POOL BOTT., UNDER VP3
17	WWPF-104	POOL BOTT., UNDER VP4
18	WWPF-105	POOL BOTT., UNDER VP5
19	WWPF-106	POOL BOTT., BETW. VP1, VP6 & PEDESTAL
20	WWPF-107	POOL BOTT., BETW. VP2 & VP3
21	WWPF-201	WALL BESIDE VP2 (P1, 1.8M ABOVE BOTT.)
22	WWPF-202	WALL BESIDE VP2 (P1, 3.6M ABOVE BOTT.)
23	WWPF-203	WALL BESIDE VP2 (P1, 6.0M ABOVE BOTT.)
24	WWPF-301	WALL BESIDE VP3 (P2, 1.8M ABOVE BOTT.)
25	WWPF-302	WALL BESIDE VP3 (P2, 3.6M ABOVE BOTT.)
26	WWPF-303	WALL BESIDE VP3 (P2, 6.0M ABOVE BOTT.)
27	WWPF-401	SHELL BESIDE VP3 (P3, 1.8M ABOVE BOTT.)
28	WWPF-402	SHELL BESIDE VP3 (P3, 3.6M ABOVE BOTT.)
29	WWPF-501	SHELL BESIDE VP4 (P4, 1.8M ABOVE BOTT.)
30	WWPF-502	SHELL BESIDE VP4 (P4, 3.6M ABOVE BOTT.)
31	WWPF-602	WALL BESIDE VP4 (P5, 3.6M ABOVE BOTT.)
32	WWPF-702	WALL BESIDE VP7 (P6, 3.6M ABOVE BOTT.)
33	WWPF-001	WETWELL AIRSPACE (15.0M ABOVE BOTT.)
34		
35	VPSF-101	LOWER BRACE BETW. VP1 & WALL
36	VPSF-102	LOWER BRACE BETW. VP1 & VP2
37	VPSF-103	LOWER BRACE BETW. VP1 & VP6
38	VPSF-201	UPPER BRACE BETW. VP1 & PEDESTAL
39		

Table 2.7 List of Data Channels (PCM Track-2 Channels)

Channel No.	Channel Code	Measurement Location
1	RPMF-001	RUPTURE DISC BREAK SIGNAL
2	RPMF-002	MAIN DISCHARGE VALVE CLOSE SIGNAL
3		
4	VPAF-101	VP2 OUTL. (0DEG)
5	VPAF-102	VP2 OUTL. (90DEG)
6	VPAF-201	VP5 OUTL. (0DEG)
7	VPAF-202	VP5 OUTL. (90DEG)
8	WWAF-001	POOL BOTT., UNDER VP5
9	WWAF-002	POOL BOTT., BETW. VP2, VP3, VP4 & VP7
10	WWAF-003	WALL BESIDE VP2 (3.0M ABOVE BOTT.)
11	WWAF-004	WALL BESIDE VP7 (3.0M ABOVE BOTT.)
12	WWAF-005	SHELL BESIDE VP3 (3.0M ABOVE BOTT.)
13	WWAF-006	SHELL BESIDE VP3 (6.0M ABOVE BOTT.)
14	WWAF-007	SHELL BESIDE VP4 (3.0M ABOVE BOTT.)
15	WWAF-008	SHELL BESIDE VP4 (6.0M ABOVE BOTT.)
16	WWAF-009	PEDESTAL (3.0M ABOVE BOTT.)
17	WWAF-010	PEDESTAL (6.0M ABOVE BOTT.)
18	WWAF-011	SHELL AT DF LEVEL (0DEG)
19	WWAF-012	SHELL AT DF LEVEL (90DEG)
20		
21	WWLF-101	PHASE BDRY. (0.9M BELOW OUTL., CENTER)
22	WWLF-102	PHASE BDRY. (0.9M BELOW OUTL., 0DEG)
23	WWLF-104	PHASE BDRY. (0.9M BELOW OUTL., 90DEG)
24	WWLF-106	PHASE BDRY. (0.9M BELOW OUTL., 180DEG)
25	WWLF-108	PHASE BDRY. (0.9M BELOW OUTL., 270DEG)
26	WWLF-201	PHASE BDRY. (0.6M BELOW OUTL., CENTER)
27	WWLF-203	PHASE BDRY. (0.6M BELOW OUTL., 45DEG)
28	WWLF-205	PHASE BDRY. (0.6M BELOW OUTL., 135DEG)
29	WWLF-207	PHASE BDRY. (0.6M BELOW OUTL., 225DEG)
30	WWLF-209	PHASE BDRY. (0.6M BELOW OUTL., 315DEG)
31	WWLF-301	PHASE BDRY. (0.3M BELOW OUTL., CENTER)
32	WWLF-302	PHASE BDRY. (0.3M BELOW OUTL., 0DEG)
33	WWLF-304	PHASE BDRY. (0.3M BELOW OUTL., 90DEG)
34	WWLF-306	PHASE BDRY. (0.3M BELOW OUTL., 180DEG)
35	WWLF-308	PHASE BDRY. (0.3M BELOW OUTL., 270DEG)
36		
37		
38		
39		

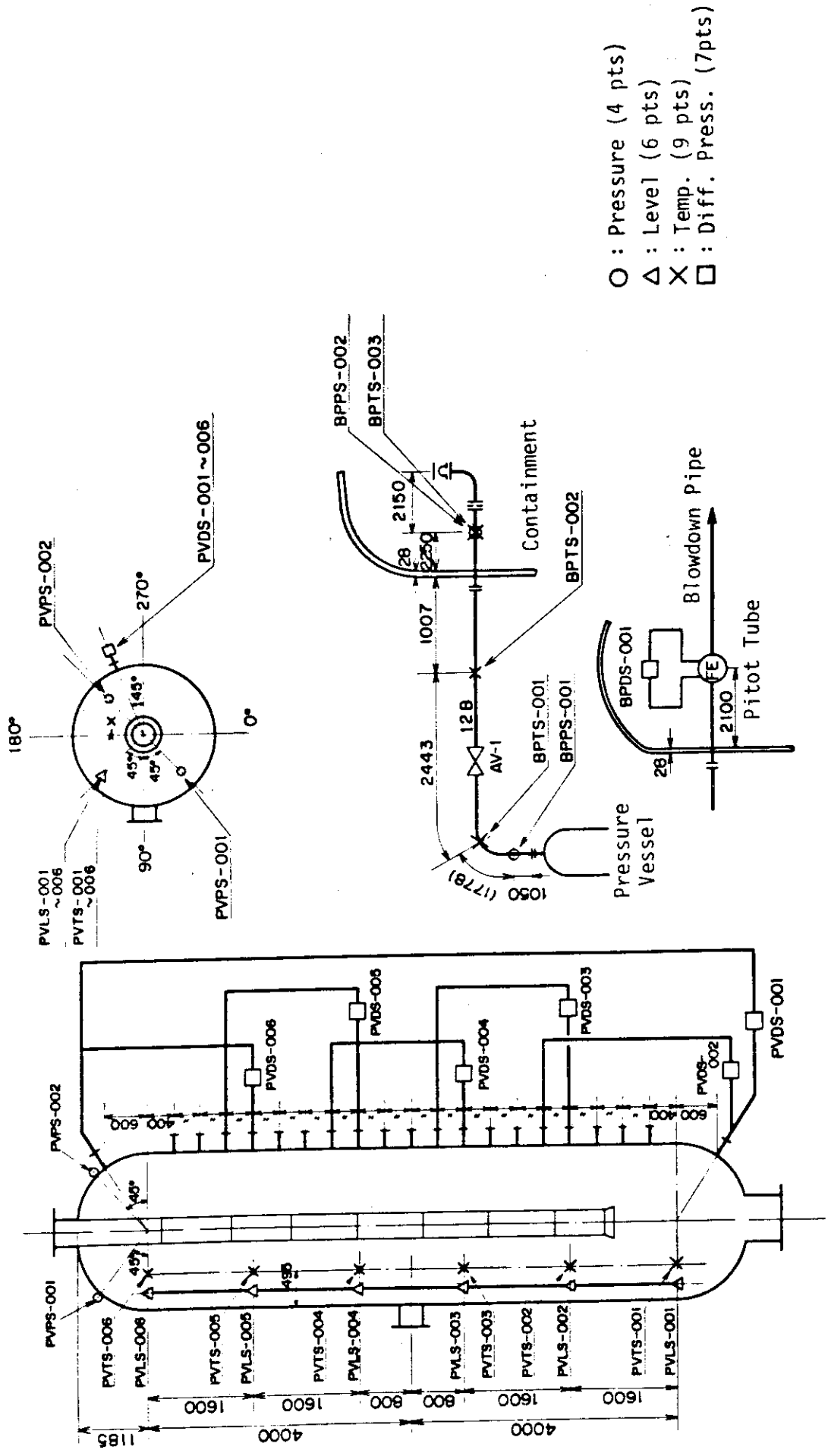

Fig.2.2 Transducer Locations for Primary System

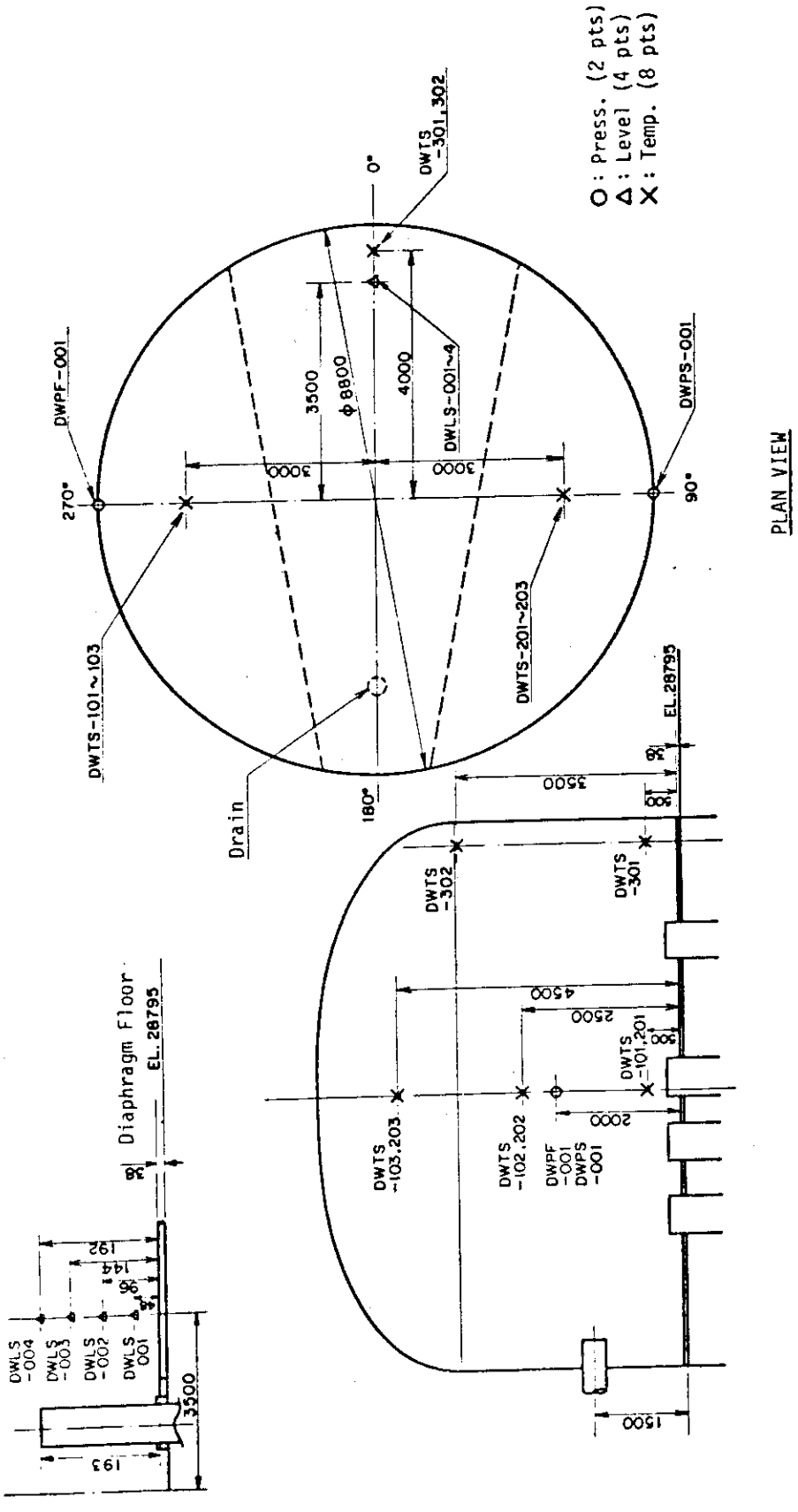

Fig.2.3 Transducer Locations for Drywell

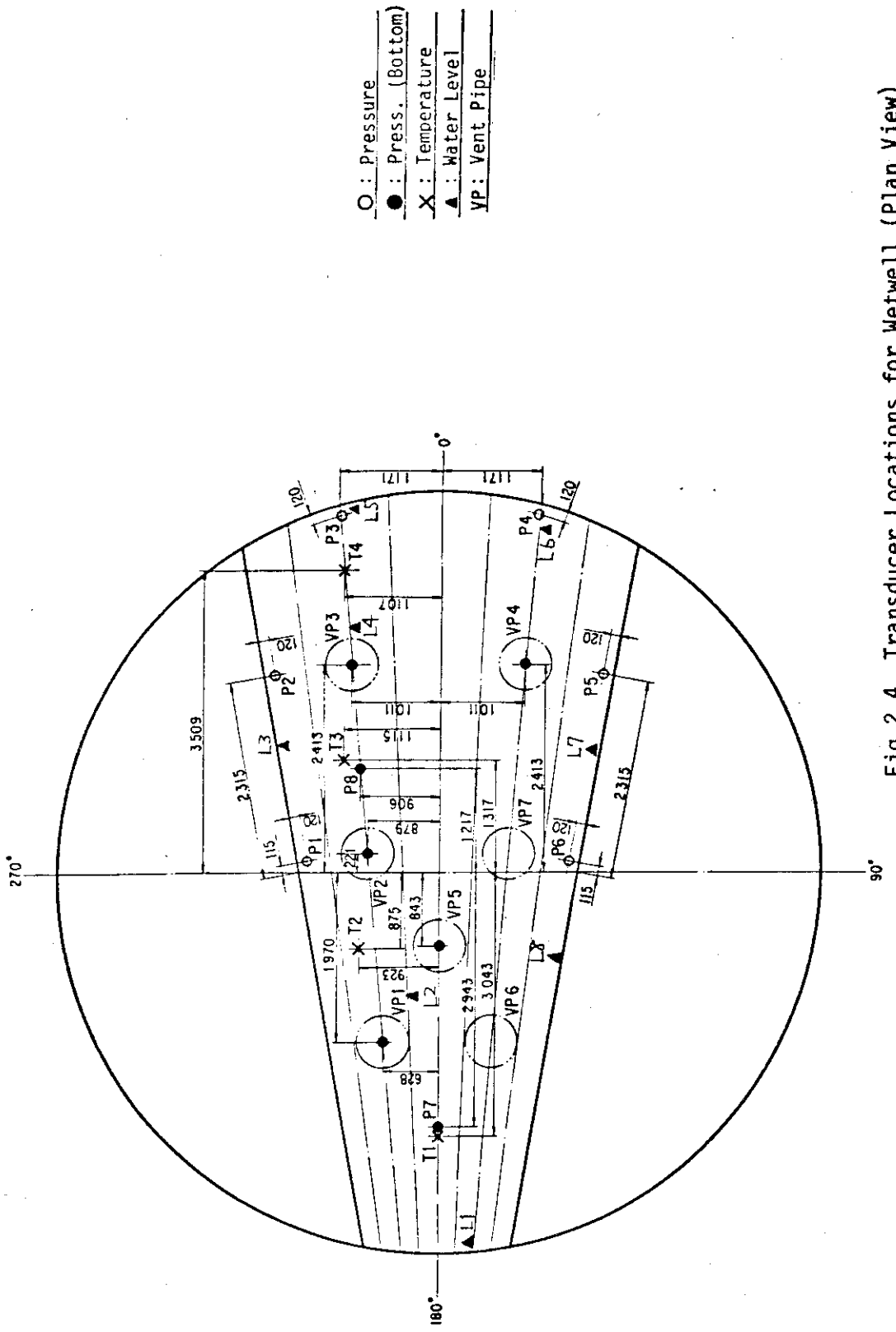

Fig.2.4 Transducer Locations for Wetwell (Plan View)

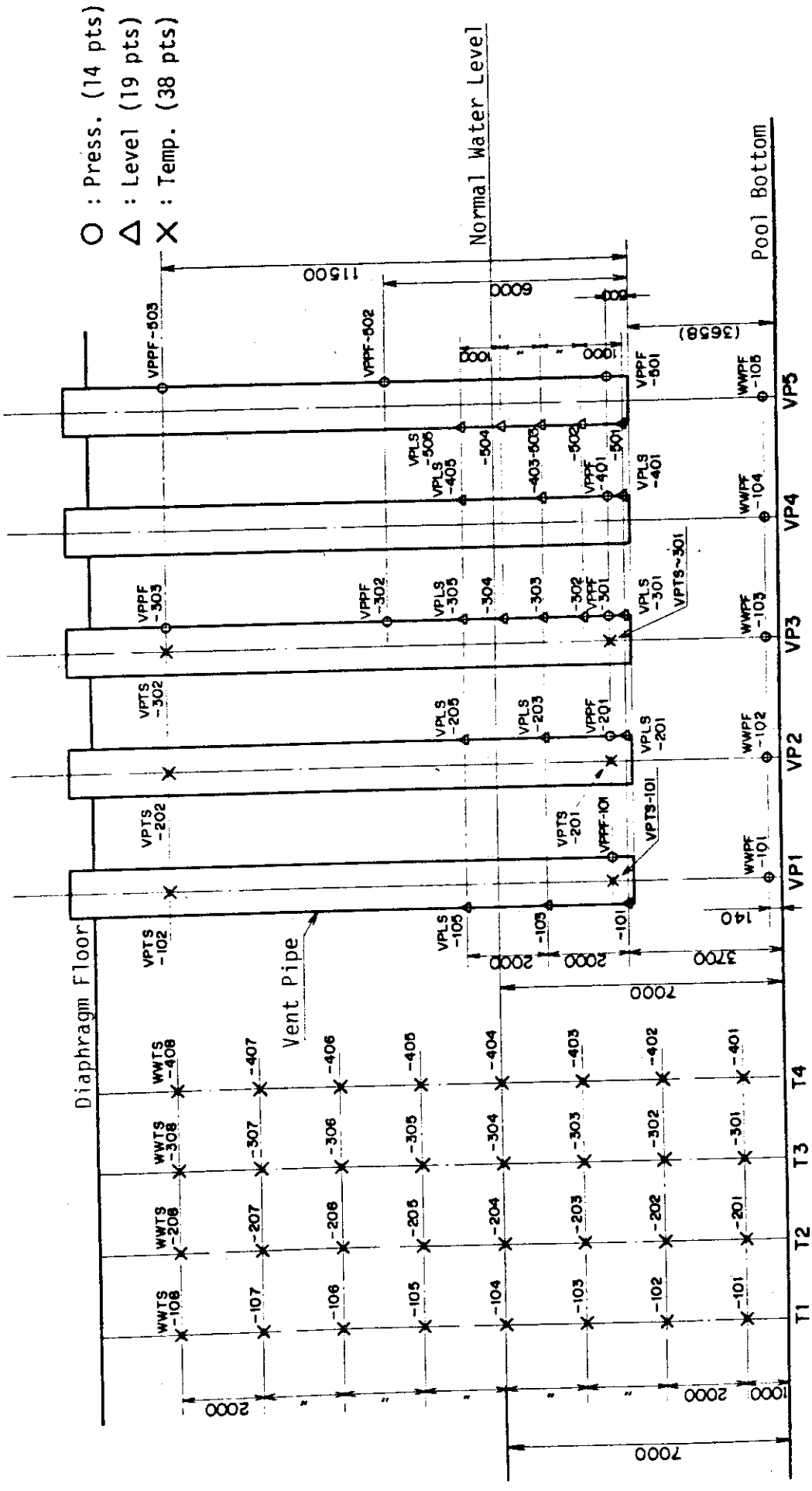

Fig.2.5 Transducer Locations for Vent Pipes and Thermocouple Locations for Wetwell

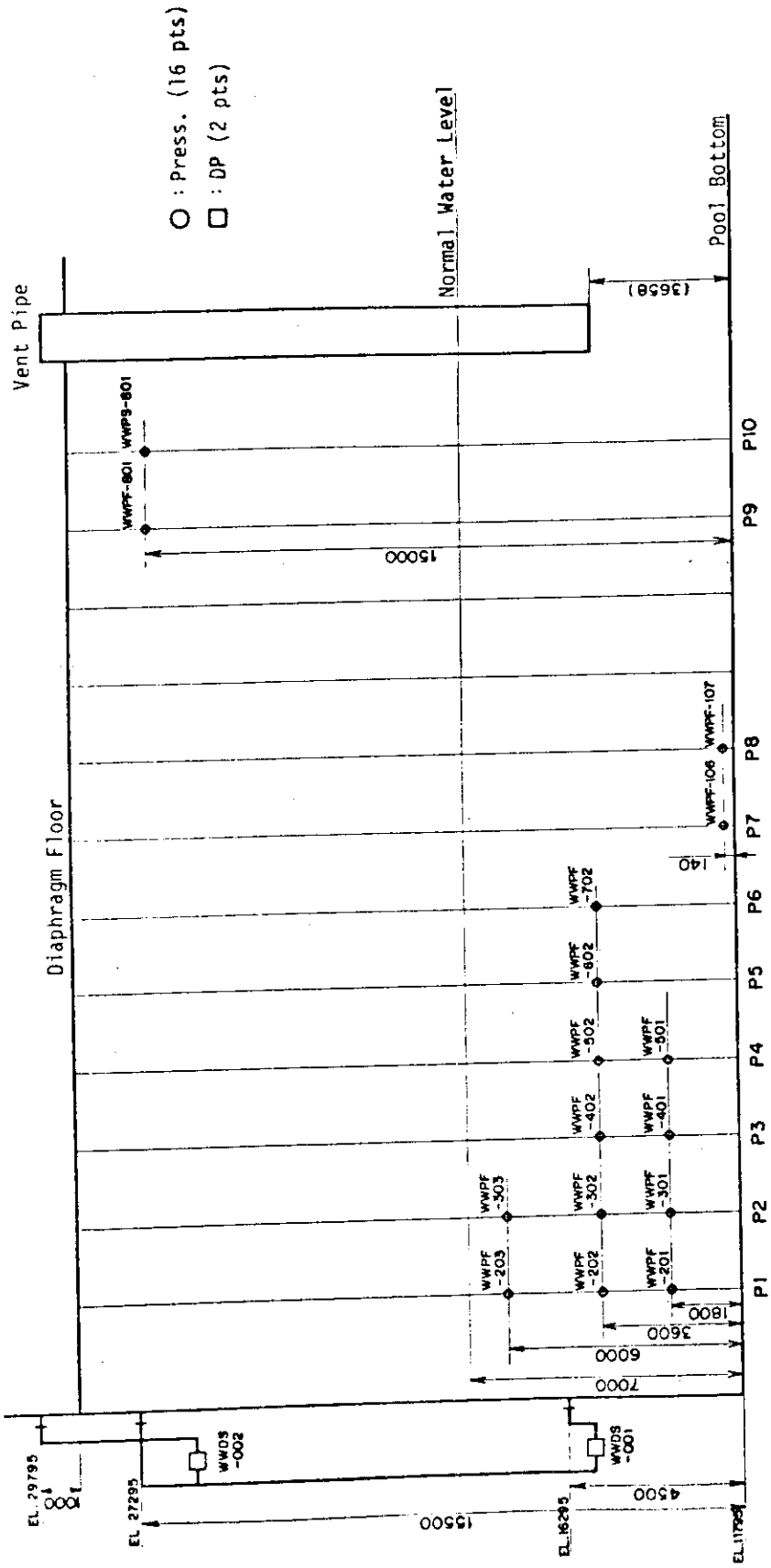

Fig.2.6 Pressure and Differential Pressure Transducer Locations for Wetwell

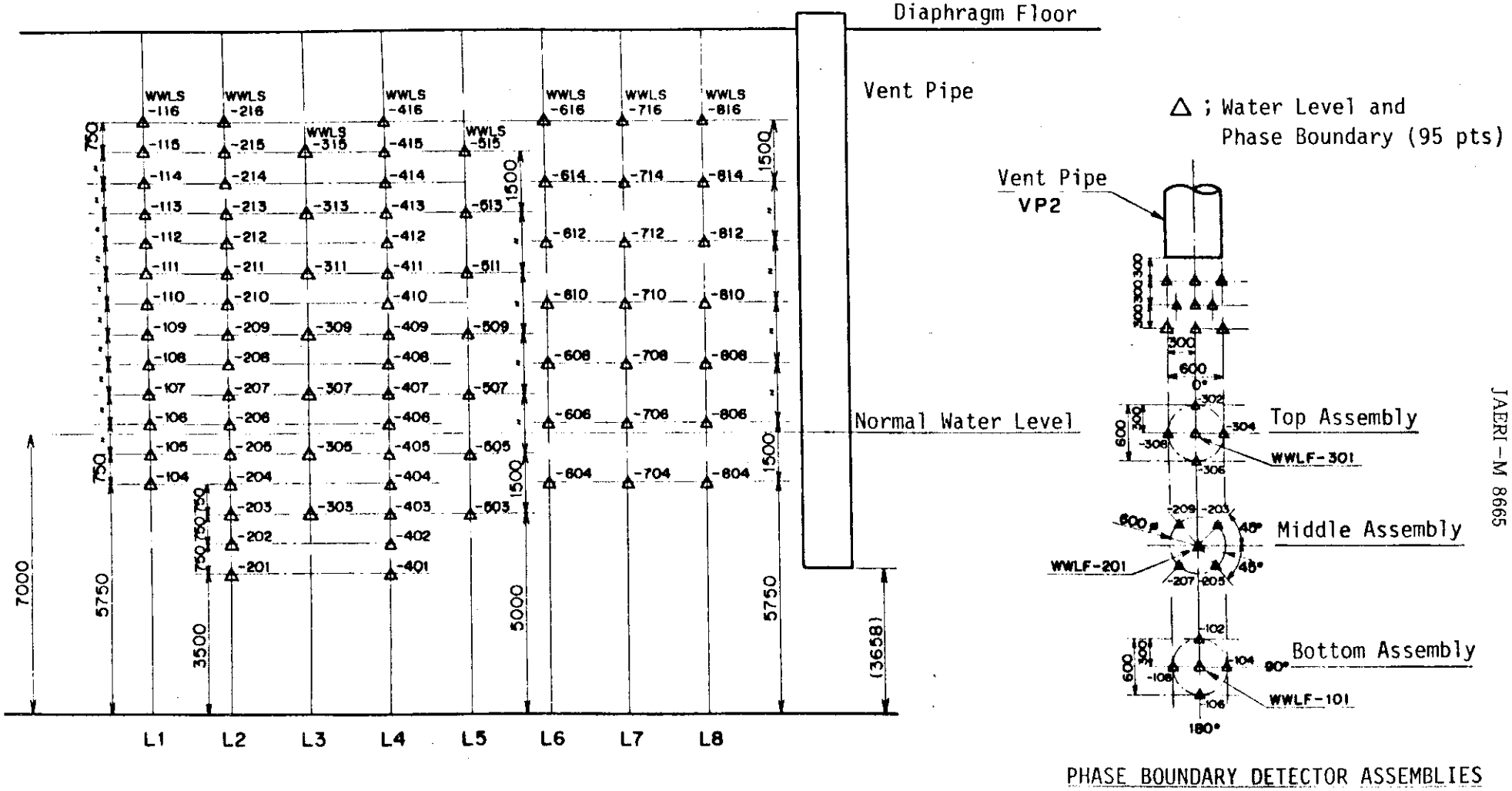

Fig.2.7 Water Level Detector and Phase Boundary Detector Locations for Wetwell

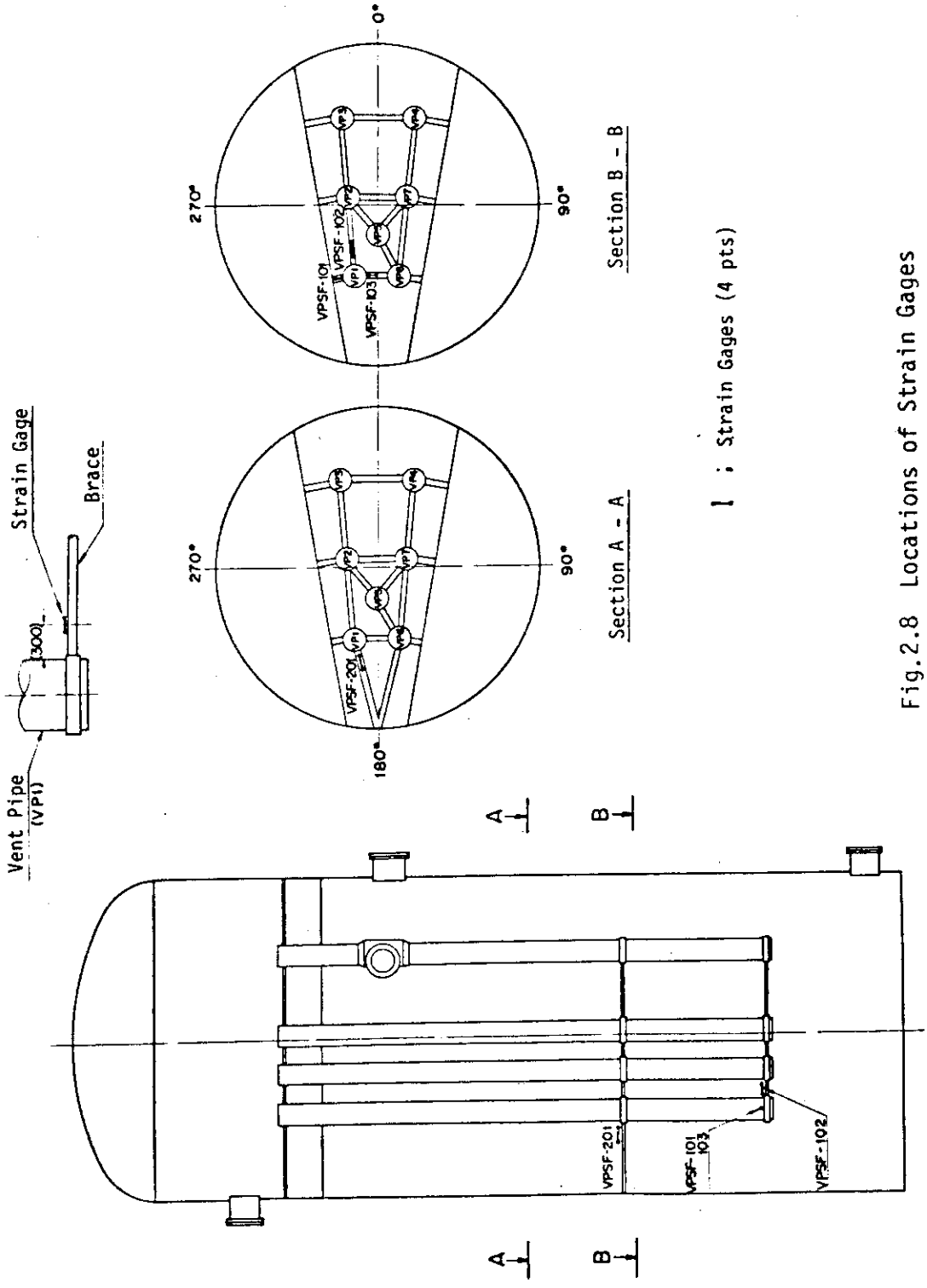

Fig.2.8 Locations of Strain Gages

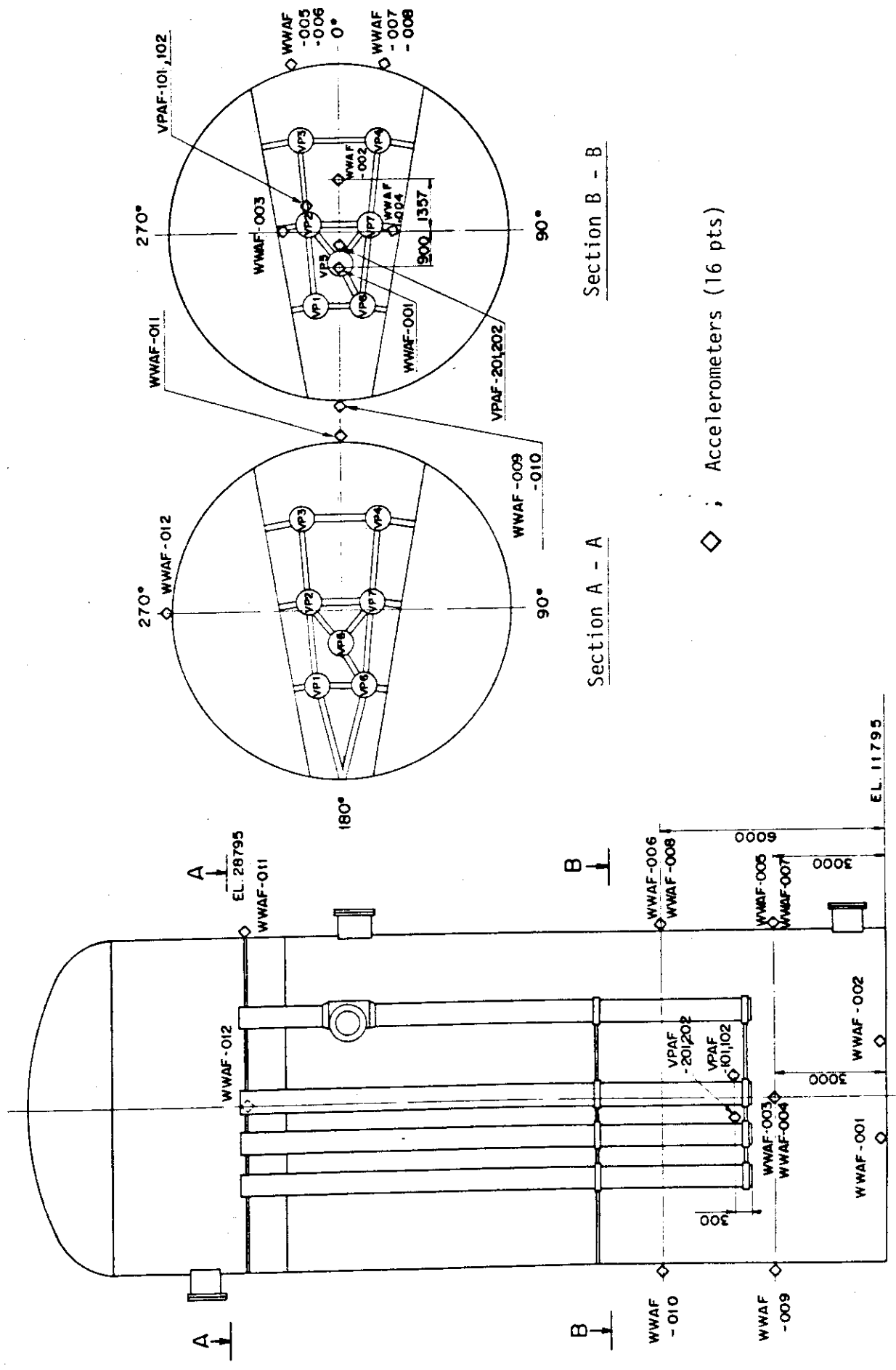

Fig. 2.9 Locations of Accelerometers

Table 2.8 State of Measurement Equipments (Computer Recorded Channels)

Channel No.	Channel Code	Acceptability o Yes ø No	Remarks
1	BPMS-001	o	
2	BPMS-002	o	
3	VPMS-001	o	
4			
5	PVPS-001	o	
6	PVPS-002	o	
7	BPPS-001	o	
8	BPPS-002	o	
9	DWPS-001	o	
10	WWPS-001	o	
11			
12	PVDS-001	o	
13	PVDS-002	o	
14	PVDS-003	o	
15	PVDS-004	o	
16	PVDS-005	o	
17	PVDS-006	o	
18	BPDS-001	o	
19	WWDS-001	o	
20	WWDS-002	o	
21			
22	PVTS-001	o	
23	PVTS-002	o	
24	PVTS-003	o	
25	PVTS-004	o	
26	PVTS-005	o	
27	PVTS-006	o	
28	BPTS-001	o	
29	BPTS-002	o	
30	BPTS-003	o	

Table 2.8 (continued)

Channel No.	Channel Code	Acceptability o Yes ø No	Remarks
31	DWTS-101	o	} Saturated at 150°C
32	DWTS-102	o	
33	DWTS-103	o	
34	DWTS-201	o	
35	DWTS-202	o	
36	DWTS-203	o	
37	DWTS-301	o	
38	DWTS-302	o	
39	VPTS-101	o	
40	VPTS-102	o	
41	VPTS-201	o	
42	VPTS-202	o	
43	VPTS-301	o	
44	VPTS-302	o	
45	WWTS-101	o	
46	WWTS-102	o	
47	WWTS-103	o	
48	WWTS-104	o	
49	WWTS-105	o	
50	WWTS-106	o	
51	WWTS-107	o	
52	WWTS-108	o	
53	WWTS-201	o	
54	WWTS-202	o	
55	WWTS-203	o	
56	WWTS-204	o	
57	WWTS-205	o	
58	WWTS-206	o	
59	WWTS-207	o	
60	WWTS-208	o	

Table 2.8 (continued)

Channel No.	Channel Code	Acceptability oYes	ø No	Remarks
61	WWTS-301	o		
62	WWTS-302	o		
63	WWTS-303	o		
64	WWTS-304	o		
65	WWTS-305	o		
66	WWTS-306	o		
67	WWTS-307	o		
68	WWTS-308	o		
69	WWTS-401	o		
70	WWTS-402	o		
71	WWTS-403	o		
72	WWTS-404	o		
73	WWTS-405	o		
74	WWTS-406	o		
75	WWTS-407	o		
76	WWTS-408		ø	Damaged during Test 2101
77				
78	PVLS-001	o		
79	PVLS-002	o		
80	PVLS-003	o		
81	PVLS-004	o		
82	PVLS-005	o		
83	PVLS-006	o		
84	DWLS-001	o		
85	DWLS-002	o		
86	DWLS-003	o		
87	DWLS-004	o		
88	VPLS-101	o		
89	VPLS-103	o		
90	VPLS-105	o		

Table 2.8 (continued)

Channel No.	Channel Code	Acceptability oYes	ØNo	Remarks
91	VPLS-201	o		
92	VPLS-203	o		
93	VPLS-205	o		
94	VPLS-301	o		
95	VPLS-302	o		
96	VPLS-303	o		
97	VPLS-304	o		
98	VPLS-305	o		
99	VPLS-401	o		
100	VPLS-403	o		
101	VPLS-405	o		
102	VPLS-501	o		
103	VPLS-502	o		
104	VPLS-503	o		
105	VPLS-504	o		
106	VPLS-505	o		
107	WWLS-104	o		
108	WWLS-105	o		
109	WWLS-106	o		
110	WWLS-107	o		
111	WWLS-108	o		
112	WWLS-109	o		
113	WWLS-110	o		
114	WWLS-111	o		
115	WWLS-112	o		
116	WWLS-113	o		
117	WWLS-114	o		
118	WWLS-115	o		
119	WWLS-116	o		
120	WWLS-201	o		

Table 2.8 (continued)

Channel No.	Channel Code	Acceptability oYes	ØNo	Remarks
121	WWLS-202	o		
122	WWLS-203	o		
123	WWLS-204	o		
124	WWLS-205	o		
125	WWLS-206	o		
126	WWLS-207	o		
127	WWLS-208	o		
128	WWLS-209	o		
129	WWLS-210	o		
130	WWLS-211	o		
131	WWLS-212	o		
132	WWLS-213	o		
133	WWLS-214	o		
134	WWLS-215	o		
135	WWLS-216	o		
136	WWLS-303	o		
137	WWLS-305	o		
138	WWLS-307	o		
139	WWLS-309	o		
140	WWLS-311	o		
141	WWLS-313	o		
142	WWLS-315	o		
143	WWLS-401	o		
144	WWLS-402	o		
145	WWLS-403	o		
146	WWLS-404	o		
147	WWLS-405	o		
148	WWLS-406	o		
149	WWLS-407	o		
150	WWLS-408	o		

Table 2.8 (continued)

Channel No.	Channel Code	Acceptability o Yes	ø No	Remarks
151	WWLS-409	o		
152	WWLS-410	o		
153	WWLS-411	o		
154	WWLS-412	o		
155	WWLS-413	o		
156	WWLS-414	o		
157	WWLS-415	o		
158	WWLS-416	o		
159	WWLS-503	o		
160	WWLS-505	o		
161	WWLS-507	o		
162	WWLS-509	o		
163	WWLS-511	o		
164	WWLS-513	o		
165	WWLS-515	o		
166	WWLS-604	o		
167	WWLS-606	o		
168	WWLS-608	o		
169	WWLS-610	o		
170	WWLS-612	o		
171	WWLS-614	o		
172	WWLS-616	o		
173	WWLS-704	o		
174	WWLS-706	o		
175	WWLS-708	o		
176	WWLS-710	o		
177	WWLS-712	o		
178	WWLS-714	o		
179	WWLS-716	o		
180	WWLS-804	o		

Table 2.8 (continued)

Channel No.	Channel Code	Acceptability oYes	Acceptability øNo	Remarks
181	WWLS-806		o	
182	WWLS-808		o	
183	WWLS-810		o	
184	WWLS-812		o	
185	WWLS-814		o	
186	WWLS-816		o	
187				
188				
189				
190				
191				
192				

Table 2.9 State of Measurement Equipments (PCM Track-1 Channels)

Channel No.	Channel No.	Acceptability o Yes ø No	Remarks
1	BPMF-001	o	
2	BPMF-002	o	
3			
4	DWPF-001	o	
5	VPPF-101	o	
6	VPPF-201	o	
7	VPPF-301	o	
8	VPPF-302	o	
9	VPPF-303	o	
10	VPPF-401	o	
11	VPPF-501	o	
12	VPPF-502	o	
13	VPPF-503	o	
14	WWPF-101	o	Saturated at 600kPa
15	WWPF-102	o	
16	WWPF-103	o	Saturated at 600kPa
17	WWPF-104	o	
18	WWPF-105	o	Saturated at 600kPa
19	WWPF-106	o	Saturated at 600kPa
20	WWPF-107	o	
21	WWPF-201	o	
22	WWPF-202	o	
23	WWPF-203	o	
24	WWPF-301	o	
25	WWPF-302	o	
26	WWPF-303	o	
27	WWPF-401	o	
28	WWPF-402	o	
29	WWPF-501	o	
30	WWPF-502	o	

Table 2.9 (continued)

Channel No.	Channel Code	Acceptability o Yes ø No	Remarks
31	WWPF-602	o	
32	WWPF-702	o	
33	WWPF-001	o	
34			
35	VPSF-101	o	
36	VPSF-102	o	
37	VPSF-103	ø	Data unreasonable
38	VPSF-201	o	
39			

Table 2.10 State of Measurement Equipments (PCM Track-2 Channels)

Channel No.	Channel Code	Acceptability o Yes ø No	Remarks
1	BPMF-001	o	
2	BPMF-002	o	
3			
4	VPAF-101	o	
5	VPAF-102	ø	Data unreasonable
6	VPAF-201	o	Overloaded and saturated at 980m/s^2
7	VPAF-202	o	Overloaded and saturated at 980m/s^2
8	WWAF-001	o	
9	WWAF-002	o	Unreasonable low freq. signal
10	WWAF-003	o	
11	WWAF-004	o	Unreasonable low freq. signal
12	WWAF-005	o	
13	WWAF-006	o	
14	WWAF-007	o	
15	WWAF-008	o	
16	WWAF-009	o	
17	WWAF-010	o	
18	WWAF-011	o	
19	WWAF-012	o	
20			
21	WWLF-101	o	
22	WWLF-102	o	
23	WWLF-104	o	
24	WWLF-106	o	
25	WWLF-108	o	
26	WWLF-201	o	
27	WWLF-203	o	
28	WWLF-205	o	
29	WWLF-207	o	Broken at 175sec.
30	WWLF-209	o	

Table 2.10 (continued)

Channel No.	Channel Code	Acceptability o Yes	ø No	Remarks
31	WWLF-301		o	
32	WWLF-302		o	
33	WWLF-304		o	
34	WWLF-306		o	
35	WWLF-308		o	
36				
37				
38				
39				

Table 2.11 Calibration Data

PRESSURE CHANNELS (COMPUTER RECORDED)

Pressure Vessel

Date of Calibration May. 21, 1979

Range of Calibration Pressure (kPa) 101 - 6976

Water Level in Pressure Vessel (m) Full

Test Containment

Date of Calibration May. 22, 1979

Range of Calibration Pressure (kPa) 101 - 439

Water Level in Wetwell (m) 7.0

Channel No.	Channel Code	kPa/Digit	Max. Deviation kPa
System Computer			
5	PVPS-001	4.933	7.7
6	PVPS-002	4.739	8.6
7	BPPS-001	4.775	9.6
8	BPPS-002	4.826	19.6
9	DWPS-001	0.2353	1.1
10	WWPS-001	0.2377	1.2

DIFFERENTIAL PRESSURE CHANNELS (COMPUTER RECORDED)

Pressure Vessel

Date of Calibration May. 21, 1979

Calibration Conducted by Filling Water into Vessel.

Test Containment

Date of Calibration Feb. 25, 1979

Calibration Conducted by:

[ ] Filling Water into Containment

[X] Applying Known Pressure on Transducer

Channel No.	Channel Code	kPa/Digit	Max. Deviation kPa
System Computer			
12	PVDS-001	0.04868	
13	PVDS-002	0.02384	
14	PVDS-003	0.02323	
15	PVDS-004	0.02310	
16	PVDS-005	0.02324	
17	PVDS-006	0.02284	
18	BPDS-001	2.221	
19	WWDS-001	0.04443	
20	WWDS-002	0.05382	

Table 2.11 (Continued)

PRESSURE CHANNELS (PCM RECORDED)

Test Containment

Date of Calibration: May. 22, 1979

Range of Calibration Pressure (kPa): 101 - 439

Water Level in Wetwell (m): 7.0

Channel No.	Channel Code	kPa/Digit	Max. Deviation kPa
PCM Track-1			
4	DWPF-001	0.9512	0.5
5	VPPF-101	0.9466	0.7
6	VPPF-201	0.9568	0.8
7	VPPF-301	0.9662	0.4
8	VPPF-302	0.9558	0.4
9	VPPF-303	0.9549	0.5
10	VPPF-401	0.9587	0.2
11	VPPF-501	0.9494	0.5
12	VPPF-502	0.9549	0.4
13	VPPF-503	0.9568	0.4
14	WWPF-101	0.9494	0.9
15	WWPF-102	0.9457	1.2
16	WWPF-103	0.9531	1.0
17	WWPF-104	0.9540	0.9
18	WWPF-105	0.9558	0.8
19	WWPF-106	0.9558	1.1
20	WWPF-107	0.9494	0.7
21	WWPF-201	0.9549	1.1
22	WWPF-202	0.9494	0.7
23	WWPF-203	0.9577	1.1
24	WWPF-301	0.9460	1.1
25	WWPF-302	0.9485	0.8
26	WWPF-303	0.9494	0.7
27	WWPF-401	0.9521	0.9
28	WWPF-402	0.9485	0.9
29	WWPF-501	0.9540	0.6
30	WWPF-502	0.9494	0.9
31	WWPF-602	0.9475	0.9
32	WWPF-702	0.9524	0.6
33	WWPF-001	0.9457	0.8

Table 2.12 Measurement Ranges

Ch. No.	Item [1]	Location [1]	Measurement Range			LPF Cut-Off Freq. (Hz)
			Manufacturer's Specification for Transducer	Expected Overall Range	Unit	
Computer Recorded Channels						
5 - 8	P	PV/BP	101 - 9908	101 - 10000	kPa	100
9	P	DW	0 - 591	0 - 600 [2]	kPa	100
10	P	WW	0 - 591	0 - 600 [2]	kPa	100
12	D	PV	0 - 98.1	0 - 100	kPa	100
13 - 17	D	PV	0 - 49	0 - 50	kPa	100
18	D	BP	0 - 4904	0 - 4950	kPa	100
19	D	WW	0 - 98.1	0 - 100	kPa	100
20	D	DW-WW	0 - 98.1	0 - 100	kPa	100
22 - 30	T	PV/BP		0 - 300	°C	250
31 - 38	T	DW		0 - 150	°C	250
39 - 44	T	VP		0 - 150	°C	250
45 - 76	T	WW		0 - 150	°C	250
PCM Track-1 Channels						
4	P	DW	0 - 591	0 - 600	kPa	250
5 - 33	P	WW	0 - 591	0 - 600	kPa	250
34 - 38	S	VP		-2300 - +2300	μm/m	250
PCM Track-2 Channels						
4 - 7	A	VP	-980 - +980 [3]	-980 - +980	m/s^2	300
8 - 19	A	WW	-980 - +980 [3]	-196 - +196	m/s^2	300

Notes:

1) For meanings of the abbreviations see Table 2.5.

2) Liner responses of transducers beyond manufacture-specified ranges were asuumed.

3) Ranges for transducers and charge preamplifiers.

3. 試験条件と試験結果

沸騰水炉（BWR）の冷却材喪失事故（LOCA）に際して，圧力抑制プール内での1次系放出蒸気の凝縮に伴って種々の圧力振動現象が発生することが予想される。なかでも，中口径破断事故時，ないしは大口径破断事故の末期のようにベント管内の蒸気重量速度が低い（約30ないし40 kg／m^2－s以下）条件の下では，ベント管内の間欠的な急減圧を特徴とするいわゆるチャギングが発生し，ベント管ならびにプール底面・壁面に比較的大きな荷重をもたらすことが予想される。また，これらの圧力振動現象は，ベント流中の空気分率が低いほど大きな振幅を示すことが知られている。

TEST 3101は，放出ノズル口径74 mmの水放出試験であり，放出に先立ってドライウエル内の空気をウエットウエル気相部に掃気する，いわゆるプリパージを行ったことを除けば，試験条件は前回の試験 TEST 2101とほぼ同様である。すなわち，比較的小さな口径*の破断を行うことによりチャギングを長時間発生させ，さらにプリパージを行うことによりベント流中の空気分率を低減し，圧力振動の振幅に関して保守的な条件を実現することを意図した。なお，昭和54年12月までに実施した試験の試験条件の要約をTable 3.1に示す。

圧力容器の昇温，昇圧は5月24日，25日の両日にわたって行った。破断時のラプチャディスクの展開を確実にすることを目的として，放出に先立ち放出配管内に窒素ガスを注入した。まず主放出弁（AV－1）を閉じ冷水放出弁（CV－2）を開いて主放出弁下流側を約2 MPaまで減圧し，放出配管内に窒素ガスを充てんして圧力容器内の圧力とほぼ等しい圧力まで加圧した後，再び主放出弁を開いて放出配管内の流体の温度上昇を待った。また，所内ボイラ（元圧5 kg／cm^2G）から供給される蒸気を用いて，約20分間にわたりドライウエルのプリパージを行った。ただし，プリパージ中に圧力容器下部フランジからわずかな漏洩を生じたため，ドライウエルの空気の約23％が掃気された段階でプリパージを中断し，放出試験を開始した。

本試験における初期条件の目標値と達成値の比較をTable 3.2に，データ収録の状況をTable 3.3に，試験前後の代表的な物理量の変化をTable 3.4に示す。また，試験前後の運転記録をFig. 3.1に，圧力容器，放出配管，格納容器内の初期温度（プリパージ終了後，放出開始直前の値）と試験終了後（放出開始後390秒）の温度の分布をFig. 3.2～3.4に示す。

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*）わが国のMark IIプラントにおいては，再循環系配管両端破断事故時の破断口断面積（臨界断面の断面積の総和）とベント管総断面積の比は約0.0101と想定されている。これに対して，本試験における断面積比は約0.0022である。

試験結果の定量的評価および解析は後報にゆずり，ここでは概要のみを述べる。

圧力容器および放出配管内の圧力，温度は TEST 2101 とほとんど同じ挙動を示した。放出直後，放出配管内には約 1 MPa の 1 時的減圧が発生した。なお，放出に先立って放出配管内に窒素ガスを充てんしたため放出配管内の初期水位は不明である。また放出配管内の初期温度は，飽和温度にほぼ一致する値を示した。圧力容器内の水位は放出開始後約 124 秒で放出配管入口レベルに達し，以後放出流体のクオリティが増大した。

本試験は比較的破断口径の小さな条件による試験であり，またプリパージを行ったため，プールスウエルはほとんど発生せず，水位上昇は最大 1.8 m 以下であった。

ドライウエル内の温度は放出開始後約 30 秒から圧力に対応する飽和温度にほぼ一致し，ライン1（ DWTS－101 ～ 103 ）とライン 2（ DWTS－201 ～ 203 ）では約 181 秒以後，ライン 3（ DWTS－301 ～ 302 ）では約 235 秒以後，それぞれ上方の計測点から順次過熱状態を示した。なお，ドライウエル内の蓄積水量は，試験終了後，大気圧下での計測において約 8230 kg であり，これは全放出量の約 45 ％に相当する。

放出開始前のプール温度分布はほぼ均一であったが，気相部はプリパージに際してダイアフラムフロア，ベント管壁により加熱されて成層状態となった。試験開始後のプール温度上昇は必ずしも空間的に均一ではないが，チャギングの発生とともに混合が促進され，均一な温度分布に近づいた。

本試験における放出流量は放出開始後約 5 秒から 120 秒の低クオリティ放出期間において約 130 kg／m^2－s，同じくベント管内蒸気重量速度は約 20 kg／m^2－s と評価される。ベント管内へのプール水の間欠的な逆流は，放出開始約 12 秒後から発生し，約 53 秒から 280 秒までチャギングが発生した。チャギングに伴うプール壁面，底面の圧力振動は約 55 秒から 120 秒にかけて顕著であり，底面における最大振幅は約 400 kPa p－p 以上に達した。また，ベント管 VP 5 の下端に計測レンジ（ 980 m／s^2 ）を超える加速度が発生した。

主放出弁は，放出開始後 298 秒で全閉とし，試験を終了した。

試験中，大振幅のチャギングが発生するとバキュームブレーカが動作することが観察されたが，試験終了後バキュームブレーカの弁体が偏心し，弁座との間に最大 15 mm の間隙を生じていることが見出された。

Table 3.1 Test Matrix

(As of November 1979)

Test Number	DISCHARGE CONDITIONS					INITIAL CONDITIONS					Number of Open Vents	Vacuum Breaker Function-ability	Date of Perform-ance	Ref. Report Number JAERI-M	REMARKS
						Pressure Vessel			Wetwell						
	Disch. Fluid	Nozzle Diam. (mm)	Pipe Inlet Level (m)	Drywell Prepurge (%)	Time of Blowdown (s)	Press. (kPa)	Temp. (°C)	Water Level (m)	Pool Temp. (°C)	Vent Subm. (m)					
0001	water	100	2.105	none		ca.600			22.5	3.342	7	yes	2/18/79		Shakedown test performed by Hitachi Ltd. Excluded from reporting.
0002	water	100	2.105	none		7015	286	6.28	24.6	3.867	7	yes	2/21	8598	Shakedown test performed by Hitachi Ltd.
0003	water	100	2.105	none		6976	286	7.35	27.8	3.802	7	yes	2/23		Shakedown test performed by Hitachi Ltd.
0004	water	200	2.105	none		7005	286	6.89	9.9	3.852	7	yes	2/28		Shakedown test performed by Hitachi Ltd.
1101	water	200	2.105	none	72	7020	286	7.17	29.9	3.632	7	yes	3/30		
2101	water	74	2.105	none	343	6966	287	7.99	14.2	3.345	7	yes	4/27		
3101	water	74	2.105	23	298	6887	286	7.79	18.9	3.347	7	yes	5/25	present	
3102	water	200	2.105	98	68.5	6966	287	7.73	33.2	3.622	7	yes	6/29		
1201	steam	200	9.105	none	85	6894	286	5.71	52.3	3.327	7	yes	8/24		
1202	steam	240	9.105	none	89.0	6976	286	5.44	53.5	3.342	7	yes	9/14		
1203	steam	220	9.105	none	91.9	6974	286	5.06	53.9	3.340	7	yes	10/05		
1204	steam	220	9.105	none	89.9	6971	286	5.32	18.7	3.338	7	yes	10/22		
1205	steam	220	9.105	none	94.5	6966	287	5.77	53.5	3.350	7	no	11/09		
1206	steam	220	9.105	none	85.1	6966				1.962	7	yes	11/29		

TEST NO. = A B C D

A = 1 Pool Swell Test
A = 2 Condensation Oscillation Test without Prepurge
A = 3 Condensation Oscillation Test with Prepurge
B = 1 Water Blowdown
B = 2 Steam Blowdown
B = 3 Air Blowdown
CD = Sequential Number

Table 3.2 Test Specifications

FULL-SCALE MARK II CRT DATA SHEET (TEST SPECIFICATIONS)

TEST NUMBER 3101 DATE OF PERFORMANCE May. 25, 1979

(A) SPECIFICATIONS FOR TEST FACILITY CONFIGURATION AND TEST PROCEDURE

(1) Diameter of Discharge Nozzle (mm) 74

(2) Inlet Level of Blowdown Pipe (m) 2.105

(3) Percentage of Prepurge, Specified/Performed (%) 100/23

(4) Number of Open Vent Pipes 7

(5) Vacuum Breaker Functionability yes

(B) SPECIFICATIONS FOR INITIAL CONDITIONS

(1) Pressure Vessel

Item	Specified	Performed
Pressure (kPa)	6966	6887 *
Temperature (°C)	285	285.8
Water Level (m)	5.0	7.8

(2) Test Containment

Item		Specified	Performed	
			Before Prepurge	Before Break
Pressure (kPa)	Drywell	101	101	148
	Wetwell	101	101	139
Pool Temp. (°C)		25	18.9	18.7
Pool Level (m)		7.5	7.005	

* Pressure vessel slightly leaked before the test.

(C) AMBIENT CONDITIONS

Pressure (kPa) 101 Temperature (°C) 21.5

Table 3.3 Summary of Data Recording

(A) Structure of Computer Processed Tapes

Tape No.		31010		31011		31012	
File No.	Index	Contents	Period (s)	Contents	Period (s)	Contents	Period (s)
1		Tape No. Heading		Tape No. Heading		Tape No. Heading	
2	1	R0		R0		R0	
3	2	R1		R1		R1	
4	3	R2		R2		R2	
5	4	Data	-17-372	Data	-17-329	Data	-17-329
6	5						

(B) Structure of PCM Tape

Record No.	Tape Counter Indication	Time Code *	Contents
1	4500 - 4553	17°18'36" -17°18'46"	R0
2	4553 - 4599	17°19'46" -17°19'52"	R1
3	4599 - 4647	17°20'45" -17°20'53"	R2
4	4647 - 6400	17°42'25" -17°48'11"	Data
5			
6			

Notes: 1. Last digit of tape number indicates contents of the tape;
0 Online data recorded by the system computer.
1 Data transferred from PCM recorder track 1.
2 Data transferred from PCM recorder track 2.
2. R0, R1, R2 are records for calibration of data channels;
R0 Zero scale calibration outputs.
R1 Full scale calibration outputs.
R2 Initial values.
* Break at 17°42'42"657.

Table 3.4 Initial and Final Conditions

TEST NUMBER 3101 DATE OF PERFORMANCE May. 25, 1979

	Unit	Before Prepurge	Before Break	300 seconds after Break*	Change during Blowdown
PRESSURE VESSEL					
Pressure	kPa		6887		
Averaged Liquid Temperature	°C		285.8	170.8	
Max./Min. Liquid Temperature	°C		286.1/285.6		
Averaged Steam Temperature	°C		286.1	190.0	
Sat. Press. Based on Liquid Temp.	kPa		7001	808	
Liquid Level Based on PVDS-001	m		7.790	1.065	
Liquid Level Based on PVDS-002 - 006	m		7.790	1.035	
Mass of Water	kg		2.25×10^{4}	4.19×10^{3}	-1.83×10^{4}
Energy of Water	kJ		2.88×10^{7}	3.30×10^{6}	-2.55×10^{7}
BLOWDOWN PIPE					
Max./Min. Temperature	°C		285.4/284.3		
DRYWELL					
Pressure	kPa	101	148	(245)	
Sat. Temp. Based on Pressure	°C		111.0	128.5	
Averaged Gas Phase Temperature	°C	45.9	93.6	150.0 **	
Max./Min. Gas Phase Temperature	°C	53.7/36.3	94.1/92.0	N/A**	
Liquid Level	m			N/A**	
VENT PIPES					
Max./Min. Inlet Temperature	°C	19.8/19.5	87.8/27.5	141.0/133.5	
Max./Min. Outlet Temperature	°C	19.0/18.7	19.2/18.9	133.9/133.5	
WETWELL					
Pressure	kPa	101	139	(246)	
Averaged Pool Temperature	°C	18.9	18.7	40.3	
Max./Min. Pool temperature	°C	19.1/18.5	19.0/17.2	42.3/38.5	
Averaged Airspace Temperature	°C	19.3	26.2	51.2	
Max./Min. Airspace Temperature	°C	19.9/18.7	32.2/20.7	60.4/41.1	
Liquid Level	m	7.005		(7.435)	
Mass of Water	kg	1.92×10^{5}		2.03×10^{5}	1.18×10^{4}
Energy of Water	kJ	1.52×10^{7}		3.42×10^{7}	1.90×10^{7}
Mass of Air	kg	315		689	

REMARKS

* Numbers in parentheses are data measured after opening the equalizer valve between drywell and wetwell.

** Temperature channels overranged at 150 °C.

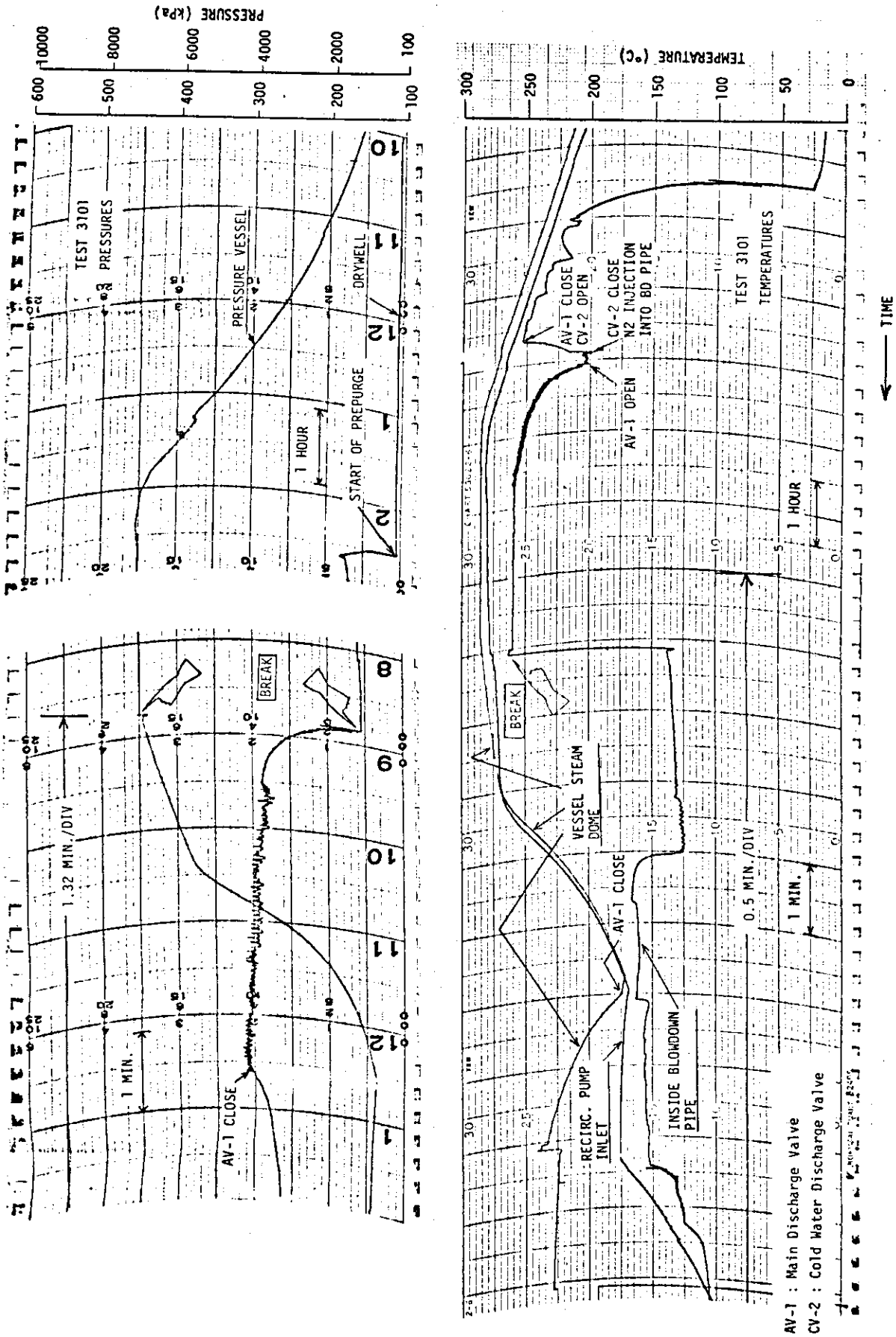


Fig. 3.1 Operation Records

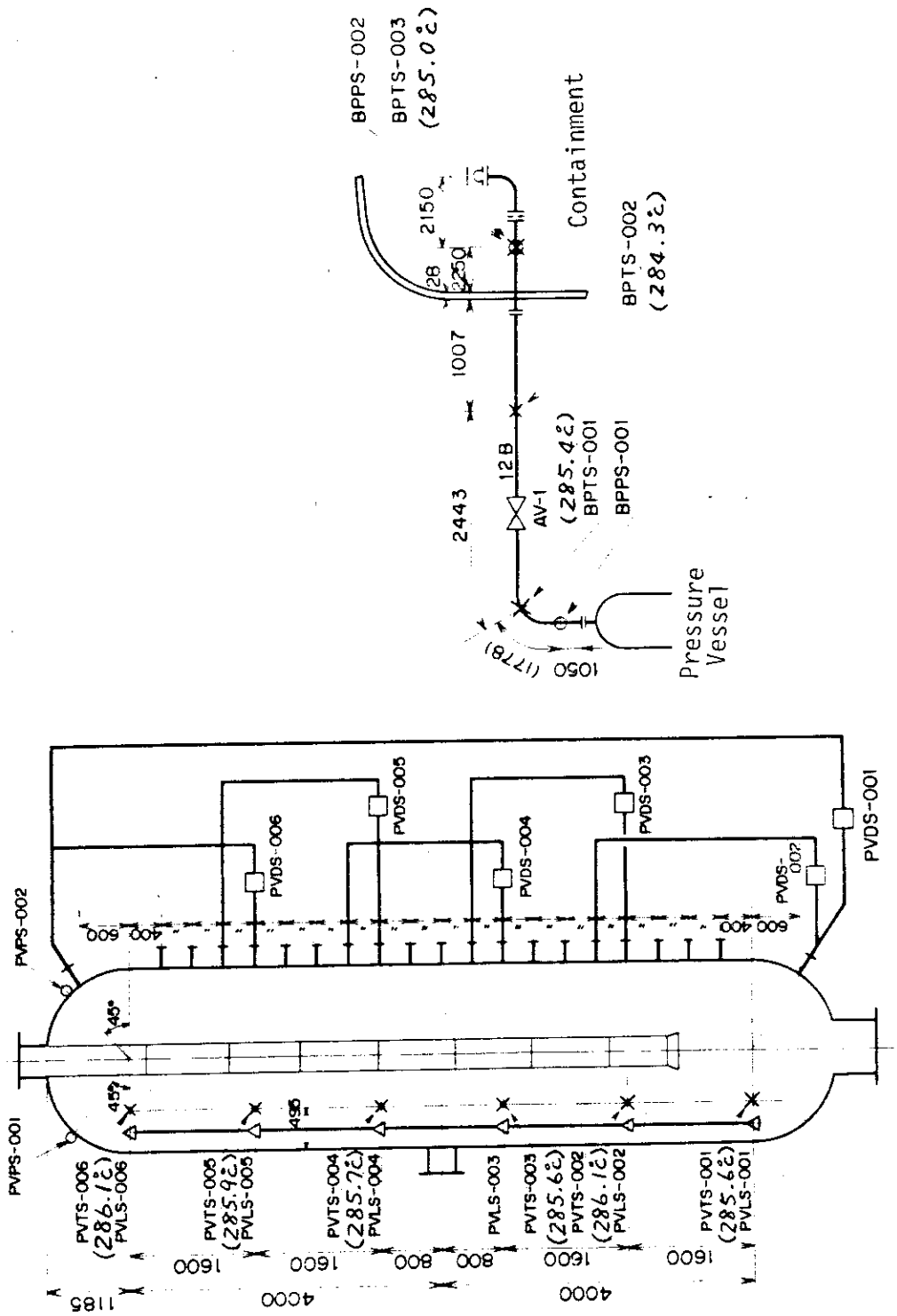


Fig.3.2 Initial Temperature Distribution in Primary System

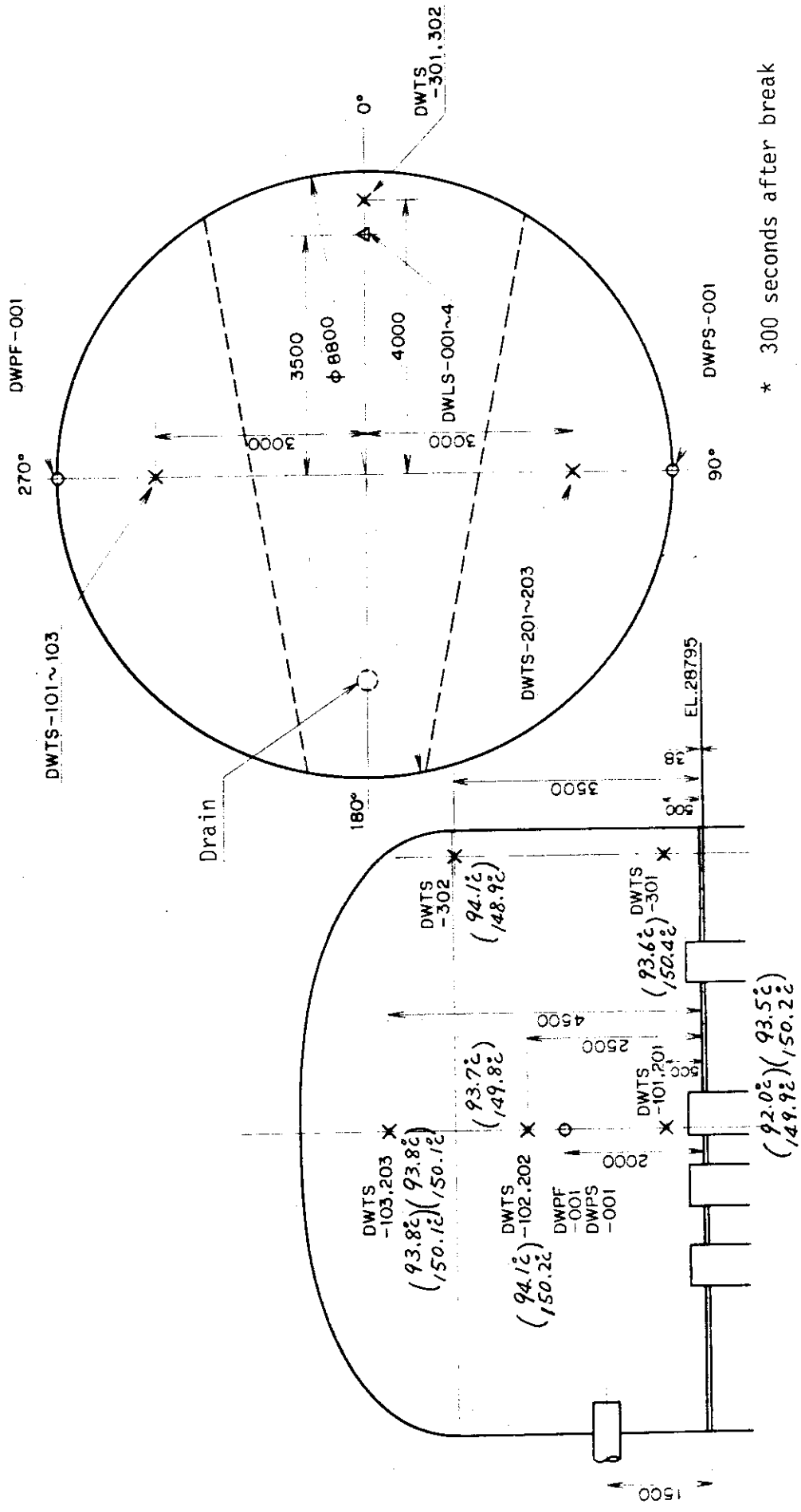


Fig.3.3 Initial and Final* Temperature Distributions in Drywell

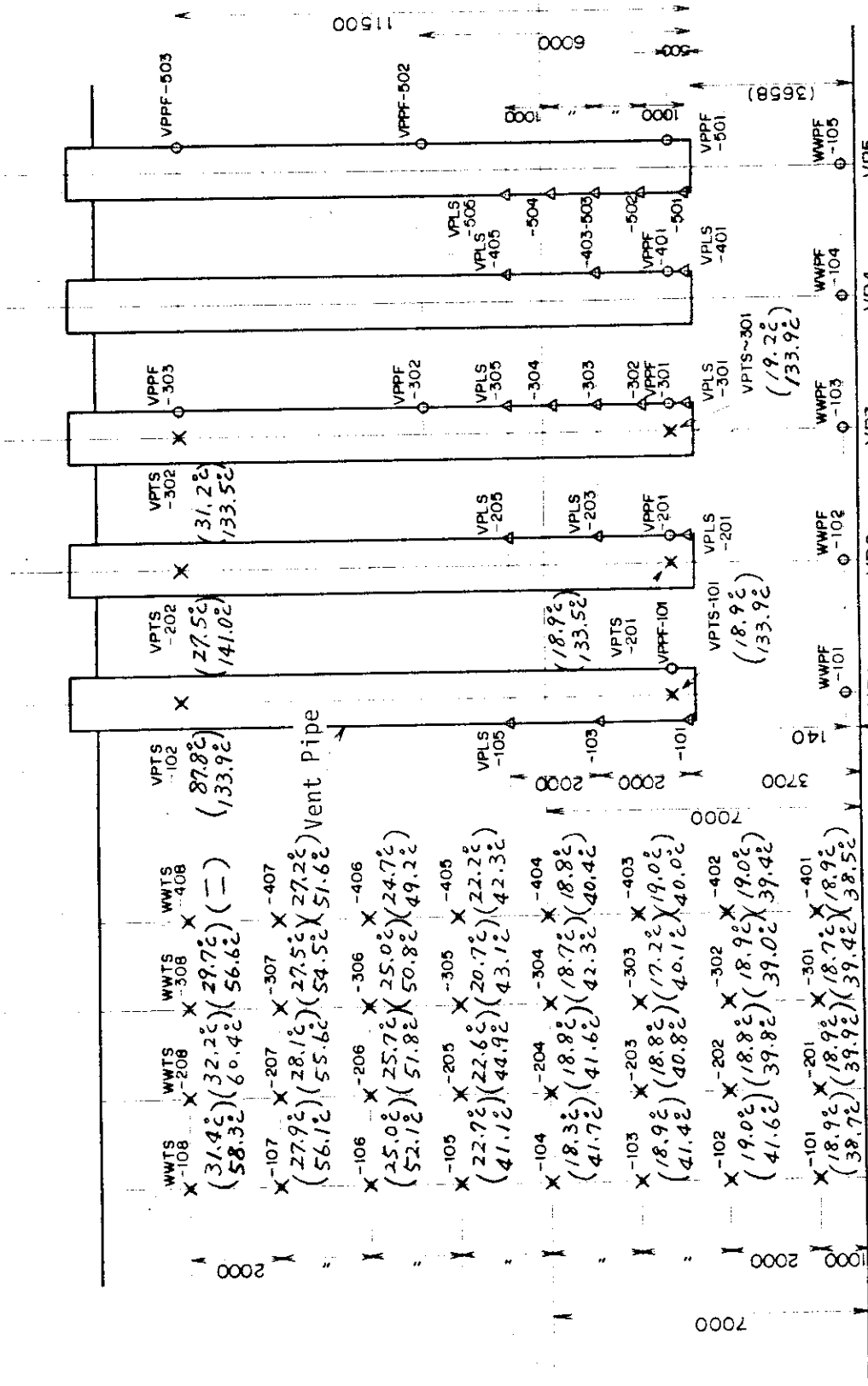


Fig.3.4 Initial and Final* Temperature Distributions in Wetwell

謝　　辞

本報告は，先に作成した非公開資料 JAERI － memo 8455（昭和 54 年 9 月）の内容に検討，修正を加えたものを科学技術庁原子力局技術振興課の指導のもとに公開に付するものである。

試験装置の管理・運転は安全工学部安全試験技術室の関口一雄室長，三森武男氏，宮本善夫氏，千葉辰夫氏，伊藤秀雄氏，大崎秀機氏，塚本導雄氏が担当した。

本報告の刊行にあたり，これらの各位に深甚なる謝意を表する。

Long Term Plots of Data

Long Term Plot Specification

Period 0-300 s

Plot No.	Recording System	Recording Rate (data/s)	Sampling Rate for Plots	Interval for Envelope Plots(s)	Remarks
L-0-1 -37	Computer	50	1/8	-	
L-1-1 -32	PCM Track-1	455.6	1/78	3.596	
L-2-1 -19	PCM Track-2	455.6	1/78	3.596	

List of Long Term Plots

Computer Recorded Channels

Plot L-0- 1	Vacuum Breaker, Main Discharge Valve, and Rupture Disc Actuation Signals	
Plot L-0- 2	Pressures in Pressure Vessel and Blowdown Pipe	
Plot L-0- 3	Pressures in Drywell and Wetwell Airspace	
Plot L-0- 4	DP over Pressure Vessel	
Plot L-0- 5	DP across Wetwell Pool Surface	
Plot L-0- 6	DP across Diaphragm Floor	
Plot L-0- 7	Temperatures in Pressure Vessel	
Plot L-0- 8	Temperatures in Blowdown Pipe	
Plot L-0- 9	Temperatures in Drywell	(DWTS-101 - 103)
Plot L-0-10	Temperatures in Drywell	(DWTS-201 - 203)
Plot L-0-11	Temperatures in Drywell	(DWTS-301 - 302)
Plot L-0-12	Temperatures in Vent Pipe	(VP1)
Plot L-0-13	Temperatures in Vent Pipe	(VP2)
Plot L-0-14	Temperatures in Vent Pipe	(VP3)
Plot L-0-15	Temperatures in Wetwell	(WWTS-101 - 104)
Plot L-0-16	Temperatures in Wetwell	(WWTS-105 - 108)
Plot L-0-17	Temperatures in Wetwell	(WWTS-201 - 204)
Plot L-0-18	Temperatures in Wetwell	(WWTS-205 - 208)
Plot L-0-19	Temperatures in Wetwell	(WWTS-301 - 304)
Plot L-0-20	Temperatures in Wetwell	(WWTS-305 - 308)
Plot L-0-21	Temperatures in Wetwell	(WWTS-401 - 404)
Plot L-0-22	Temperatures in Wetwell	(WWTS-405 - 408)
Plot L-0-23	Water Level in Pressure Vessel	
Plot L-0-24	Water Level in Drywell	
Plot L-0-25	Water Level in Vent Pipe	(VP1)
Plot L-0-26	Water Level in Vent Pipe	(VP2)
Plot L-0-27	Water Level in Vent Pipe	(VP3)
Plot L-0-28	Water Level in Vent Pipe	(VP4)
Plot L-0-29	Water Level in Vent Pipe	(VP5)
Plot L-0-30	Water Level in Wetwell	(WWLS-104 - 116)
Plot L-0-31	Water Level in Wetwell	(WWLS-201 - 216)
Plot L-0-32	Water Level in Wetwell	(WWLS-303 - 315)
Plot L-0-33	Water Level in Wetwell	(WWLS-401 - 416)
Plot L-0-34	Water Level in Wetwell	(WWLS-503 - 515)
Plot L-0-35	Water Level in Wetwell	(WWLS-604 - 616)
Plot L-0-36	Water Level in Wetwell	(WWLS-704 - 716)
Plot L-0-37	Water Level in Wetwell	(WWLS-804 - 816)

List of Long Term Plots (continued)

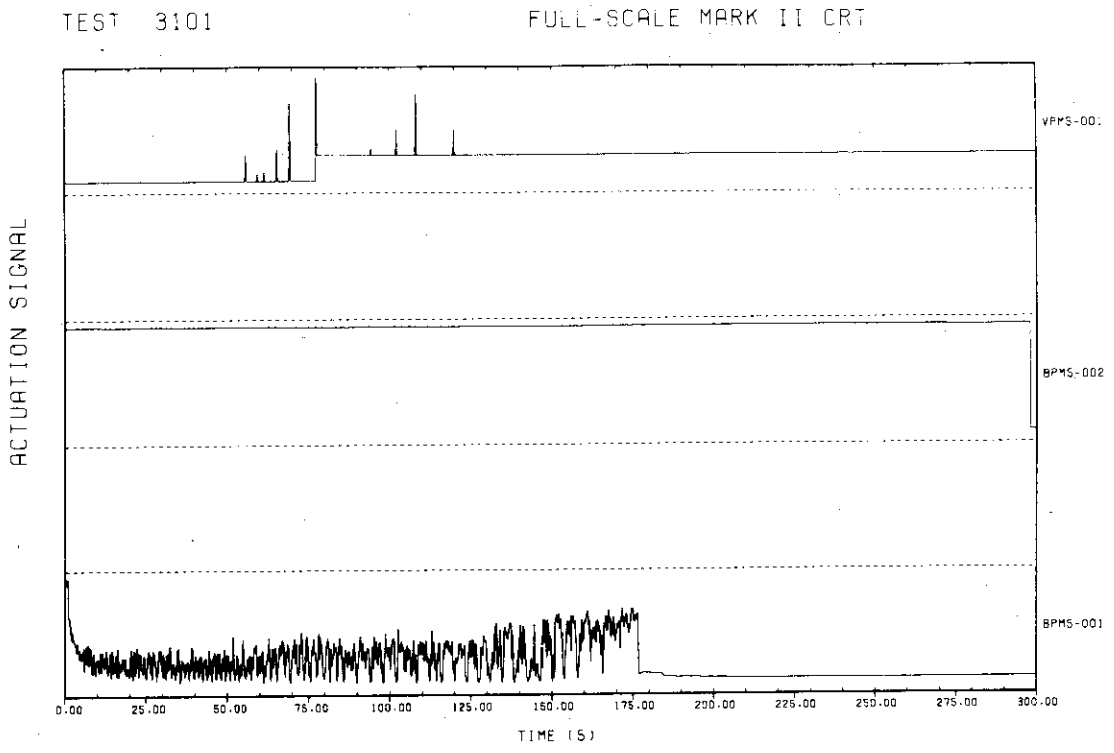
PCM Track-1 Channels

Plot L-1- 1	Pressures in Drywell and Wetwell Airspace	
Plot L-1- 2	Pressure in Vent Pipe	(VPPF-101)
Plot L-1- 3	Pressure in Vent Pipe	(VPPF-201)
Plot L-1- 4	Pressure in Vent Pipe	(VPPF-301)
Plot L-1- 5	Pressure in Vent Pipe	(VPPF-302)
Plot L-1- 6	Pressure in Vent Pipe	(VPPF-303)
Plot L-1- 7	Pressure in Vent Pipe	(VPPF-401)
Plot L-1- 8	Pressure in Vent Pipe	(VPPF-501)
Plot L-1- 9	Pressure in Vent Pipe	(VPPF-502)
Plot L-1-10	Pressure in Vent Pipe	(VPPF-503)
Plot L-1-11	Pressure in Wetwell	(WWPF-101)
Plot L-1-12	Pressure in Wetwell	(WWPF-102)
Plot L-1-13	Pressure in Wetwell	(WWPF-103)
Plot L-1-14	Pressure in Wetwell	(WWPF-104)
Plot L-1-15	Pressure in Wetwell	(WWPF-105)
Plot L-1-16	Pressure in Wetwell	(WWPF-106)
Plot L-1-17	Pressure in Wetwell	(WWPF-107)
Plot L-1-18	Pressure in Wetwell	(WWPF-201)
Plot L-1-19	Pressure in Wetwell	(WWPF-202)
Plot L-1-20	Pressure in Wetwell	(WWPF-203)
Plot L-1-21	Pressure in Wetwell	(WWPF-301)
Plot L-1-22	Pressure in Wetwell	(WWPF-302)
Plot L-1-23	Pressure in Wetwell	(WWPF-303)
Plot L-1-24	Pressure in Wetwell	(WWPF-401)
Plot L-1-25	Pressure in Wetwell	(WWPF-402)
Plot L-1-26	Pressure in Wetwell	(WWPF-501)
Plot L-1-27	Pressure in Wetwell	(WWPF-502)
Plot L-1-28	Pressure in Wetwell	(WWPF-602)
Plot L-1-29	Pressure in Wetwell	(WWPF-702)
Plot L-1-30	Strain of Vent Pipe Brace	(VPSF-101)
Plot L-1-31	Strain of Vent Pipe Brace	(VPSF-102)
Plot L-1-32	Strain of Vent Pipe Brace	(VPSF-201)

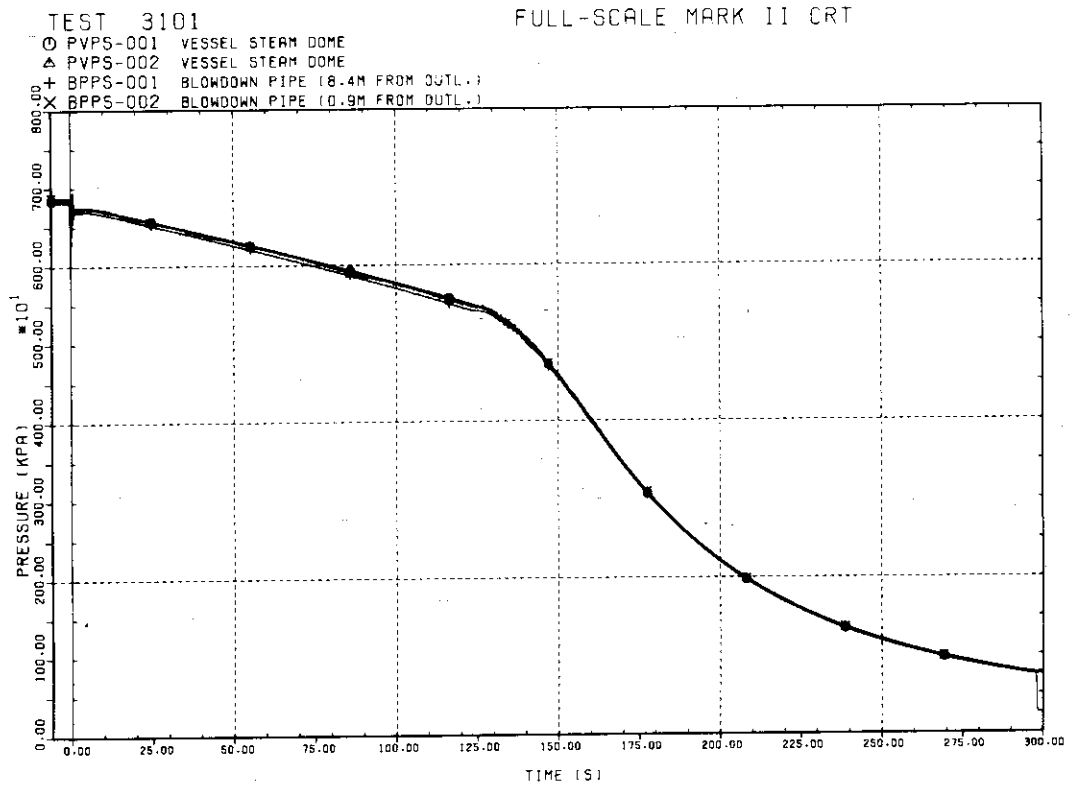
List of Long Term Plots (continued)

PCM Track-2 Channels

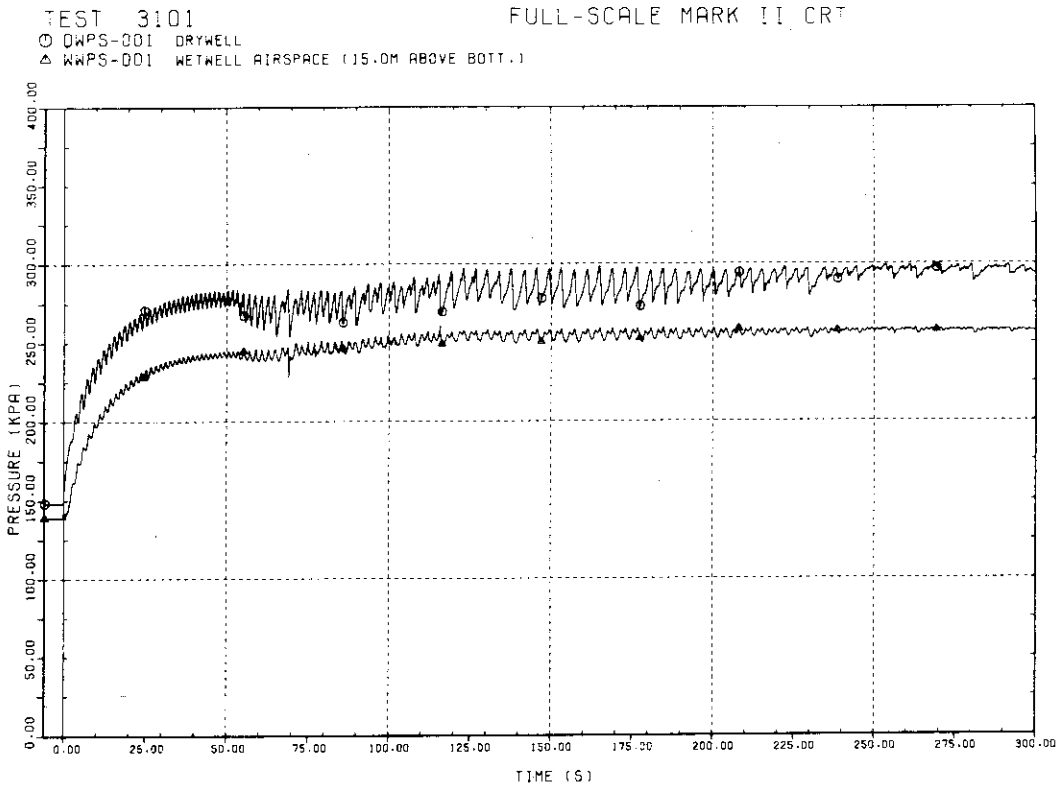
Plot L-2- 1	Acceleration of Vent Pipe Outlet	(VPAF-101)
Plot L-2- 2	Acceleration of Vent Pipe Outlet	(VPAF-102)
Plot L-2- 3	Acceleration of Vent Pipe Outlet	(VPAF-201)
Plot L-2- 4	Acceleration of Vent Pipe Outlet	(VPAF-202)
Plot L-2- 5	Acceleration of Containment Structure	(WWAF-001)
Plot L-2- 6	Acceleration of Containment Structure	(WWAF-002)
Plot L-2- 7	Acceleration of Containment Structure	(WWAF-003)
Plot L-2- 8	Acceleration of Containment Structure	(WWAF-004)
Plot L-2- 9	Acceleration of Containment Structure	(WWAF-005)
Plot L-2-10	Acceleration of Containment Structure	(WWAF-006)
Plot L-2-11	Acceleration of Containment Structure	(WWAF-007)
Plot L-2-12	Acceleration of Containment Structure	(WWAF-008)
Plot L-2-13	Acceleration of Containment Structure	(WWAF-009)
Plot L-2-14	Acceleration of Containment Structure	(WWAF-010)
Plot L-2-15	Acceleration of Containment Structure	(WWAF-011)
Plot L-2-16	Acceleration of Containment Structure	(WWAF-012)
Plot L-2-17	Phase Boundary Signals	(WWLF-101 - 108)
Plot L-2-18	Phase Boundary Signals	(WWLF-201 - 209)
Plot L-2-19	Phase Boundary Signals	(WWLF-301 - 308)



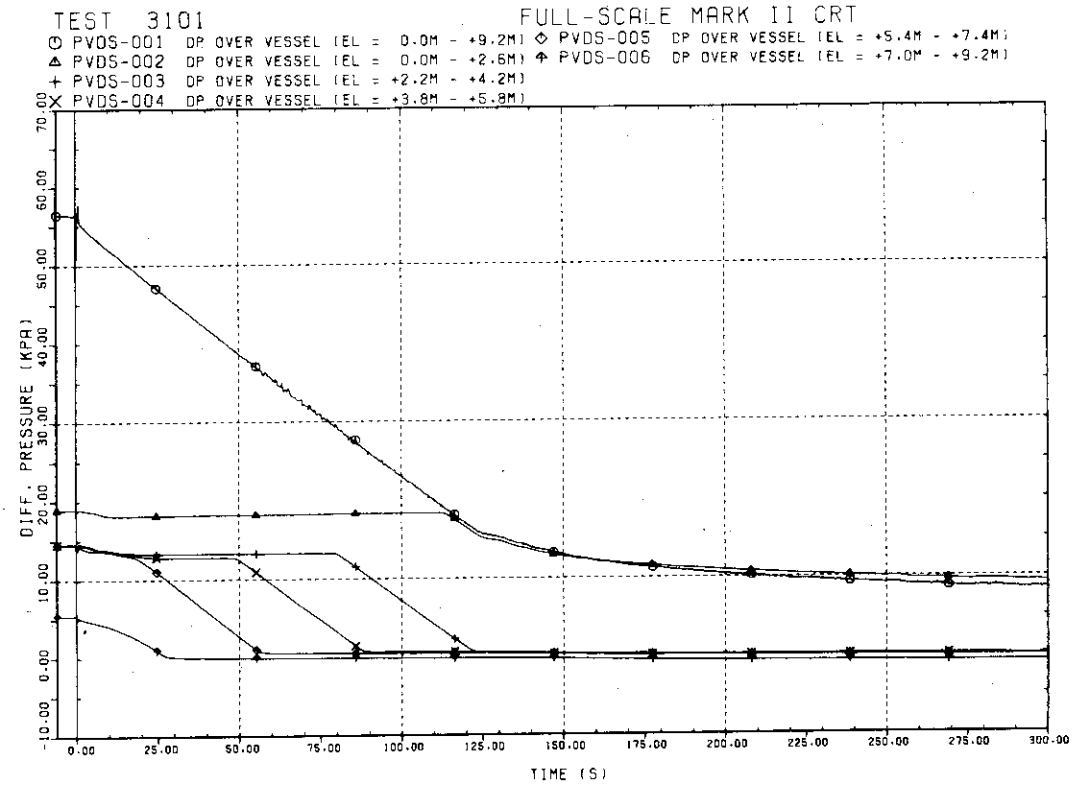
Plot L-0- 1 Vacuum Breaker, Main Discharge Valve, and Rupture Disc Actuation Signals



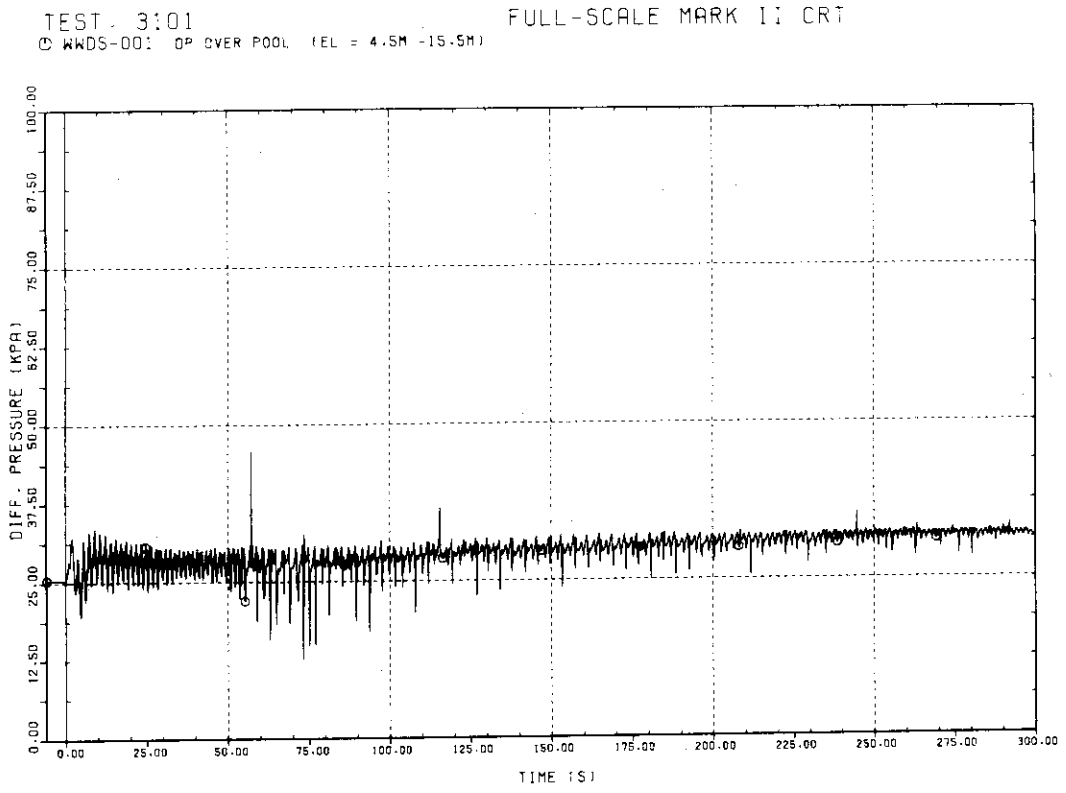
Plot L-0- 2 Pressures in Pressure Vessel and Blowdown Pipe



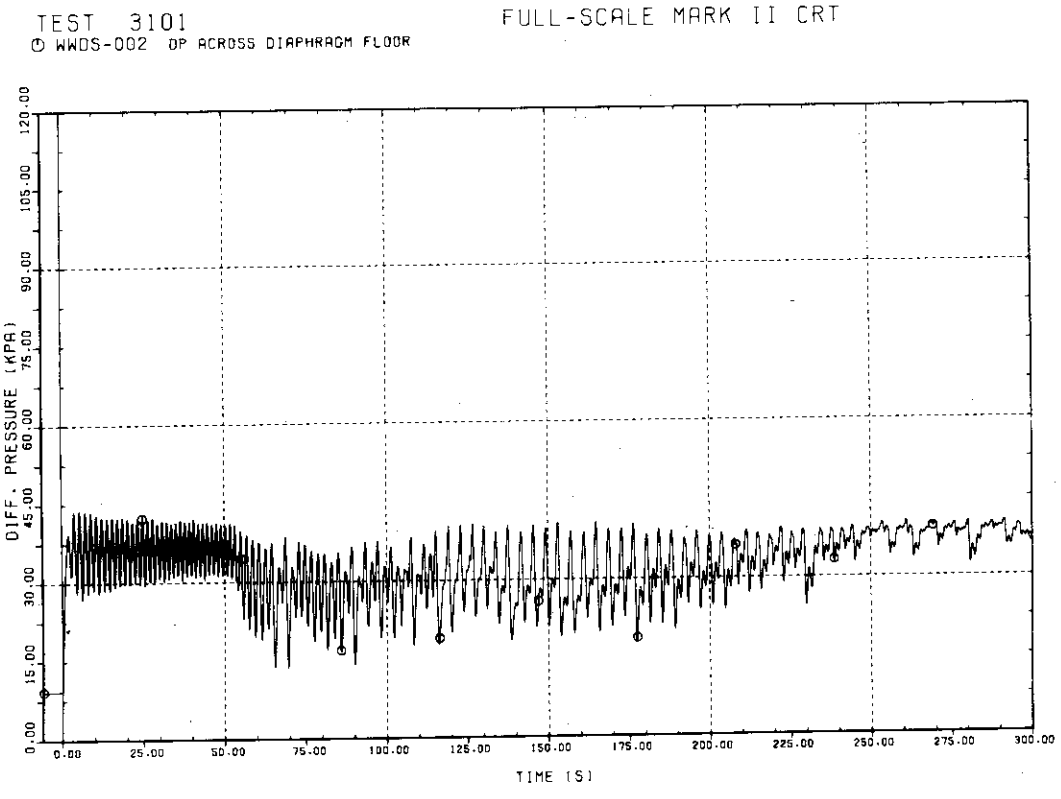
Plot L-0- 3 Pressures in Drywell and Wetwell Airspace



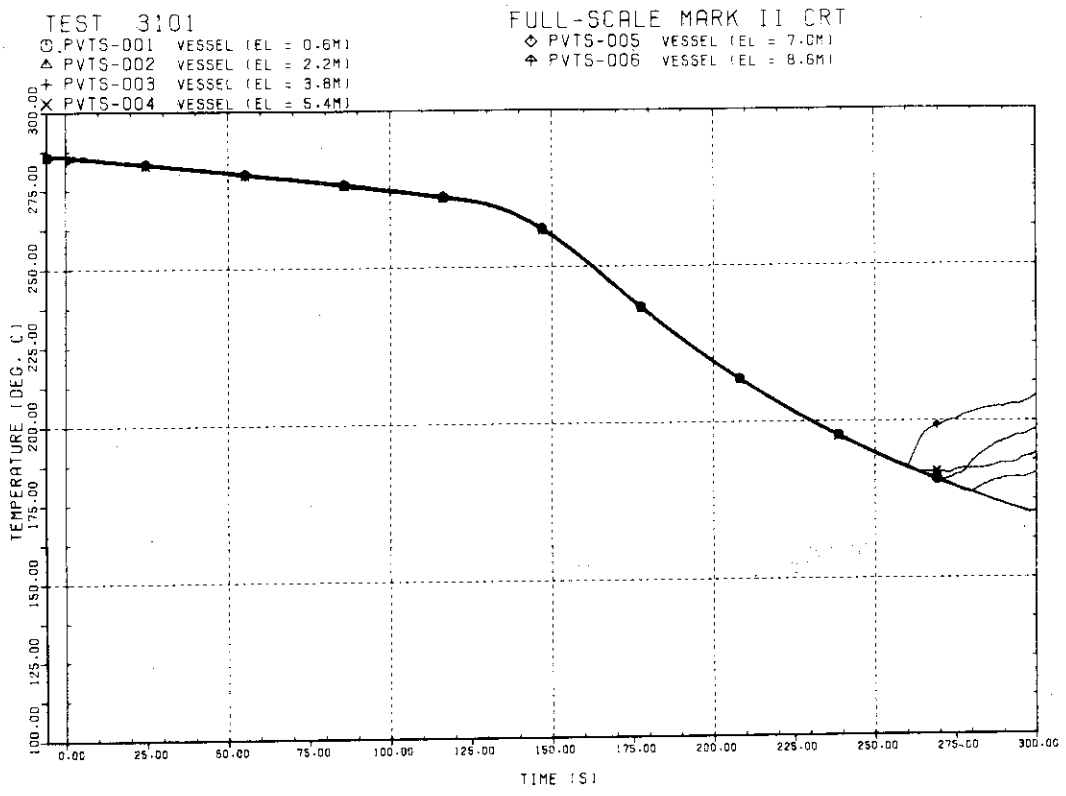
Plot L-0- 4 DP over Pressure Vessel



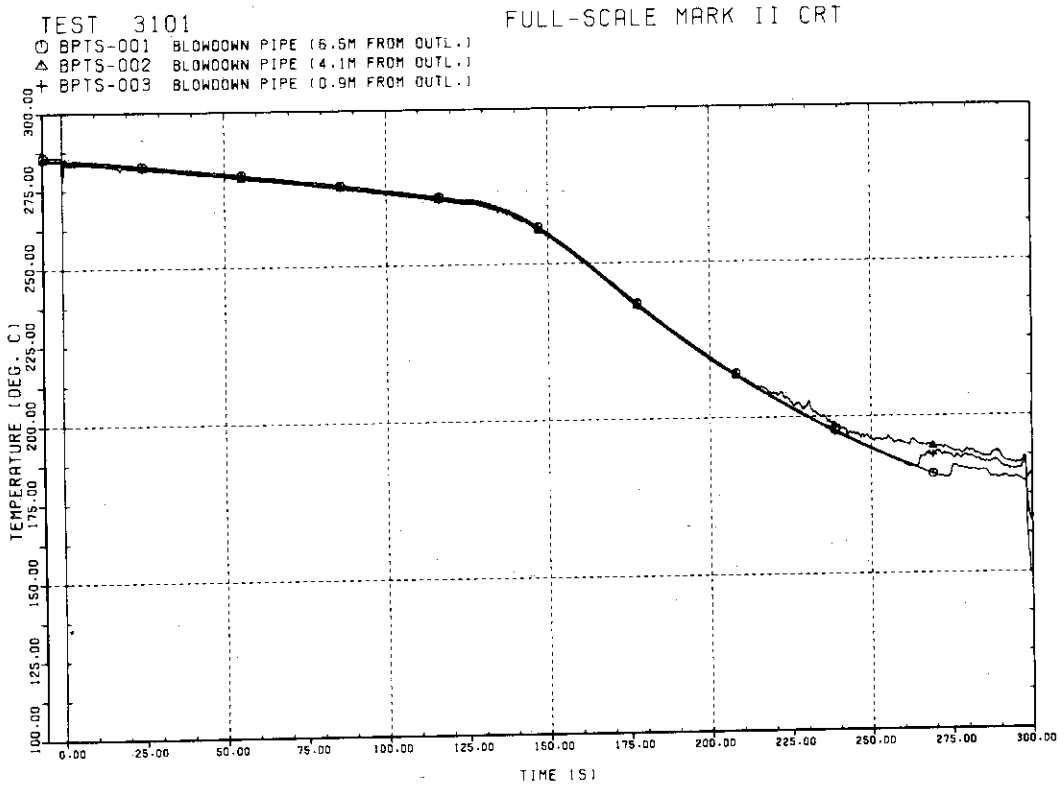
Plot L-0- 5 DP across Wetwell Pool Surface



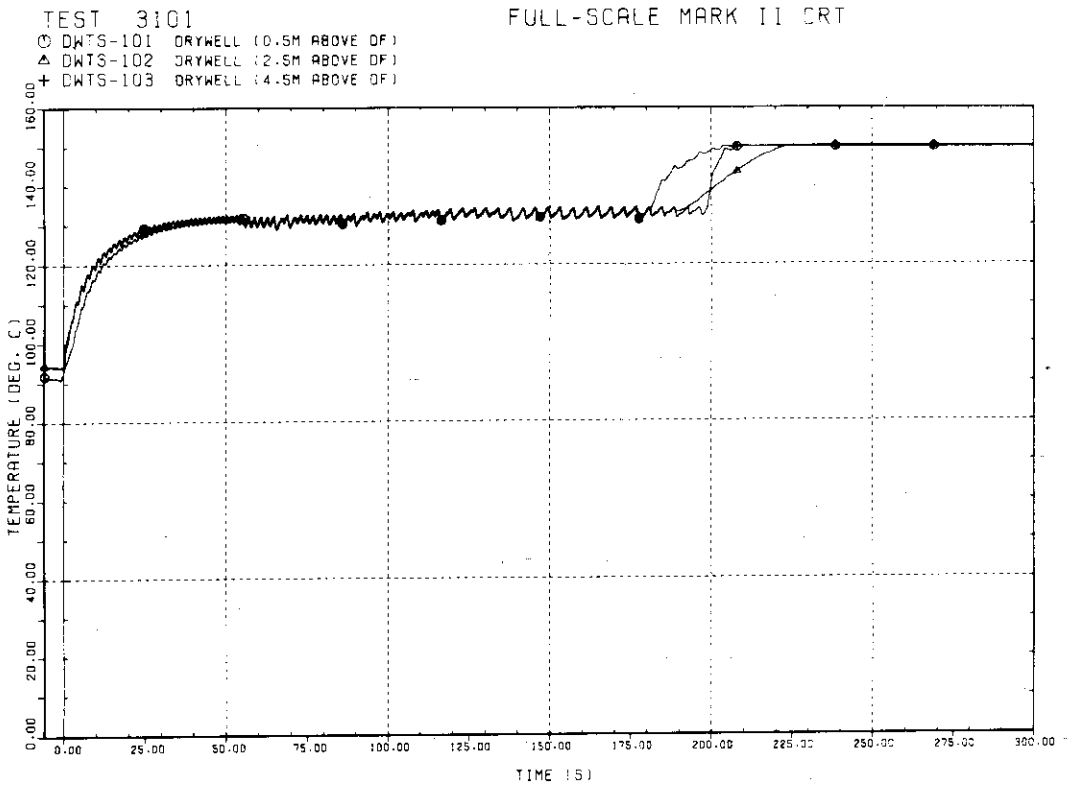
Plot L-0- 6 DP across Diaphragm Floor



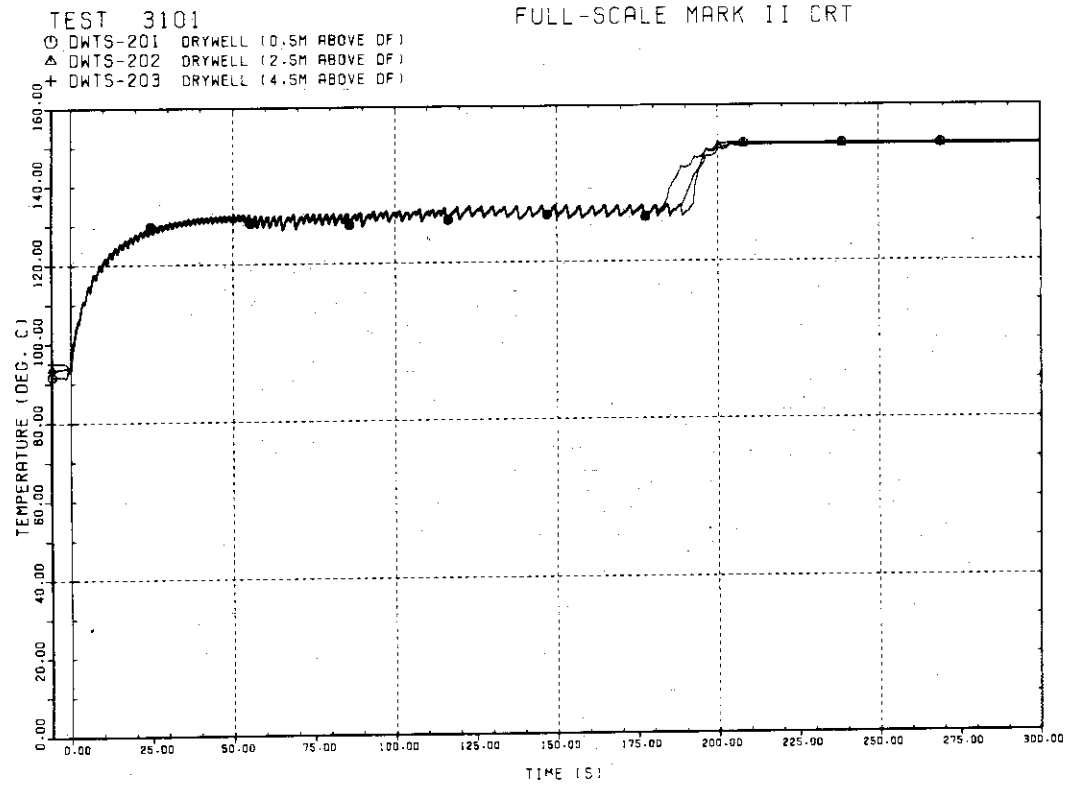
Plot L-0- 7 Temperatures in Pressure Vessel



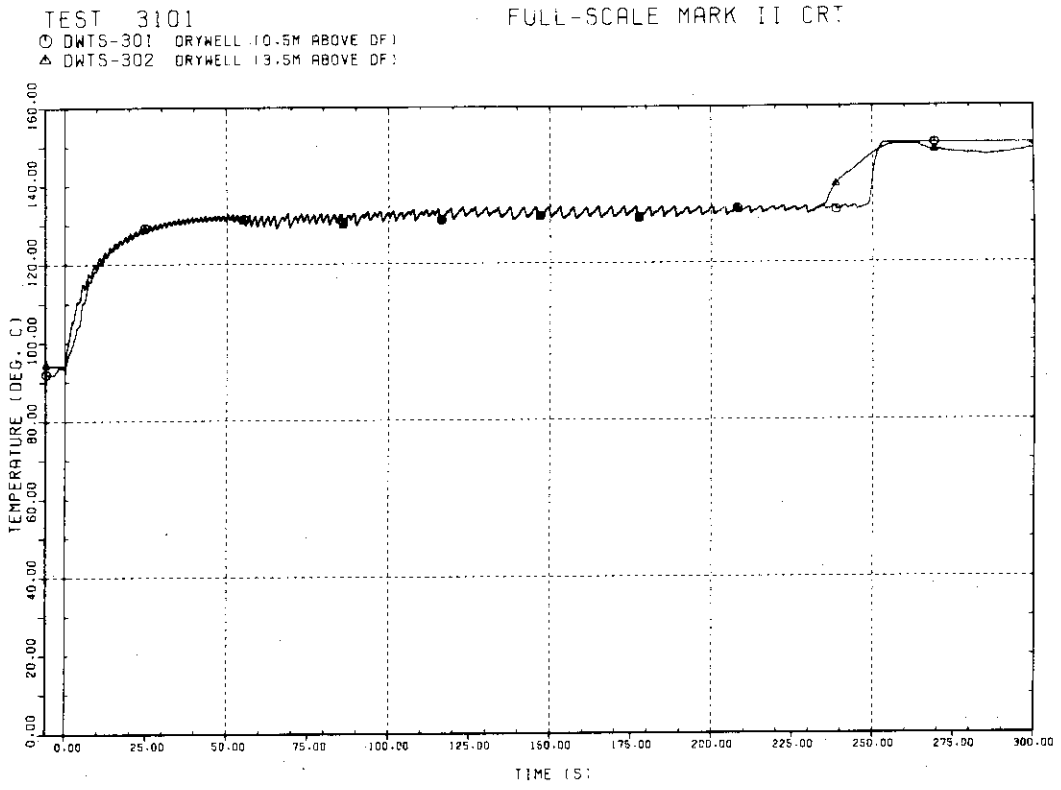
Plot L-0- 8 Temperatures in Blowdown Pipe



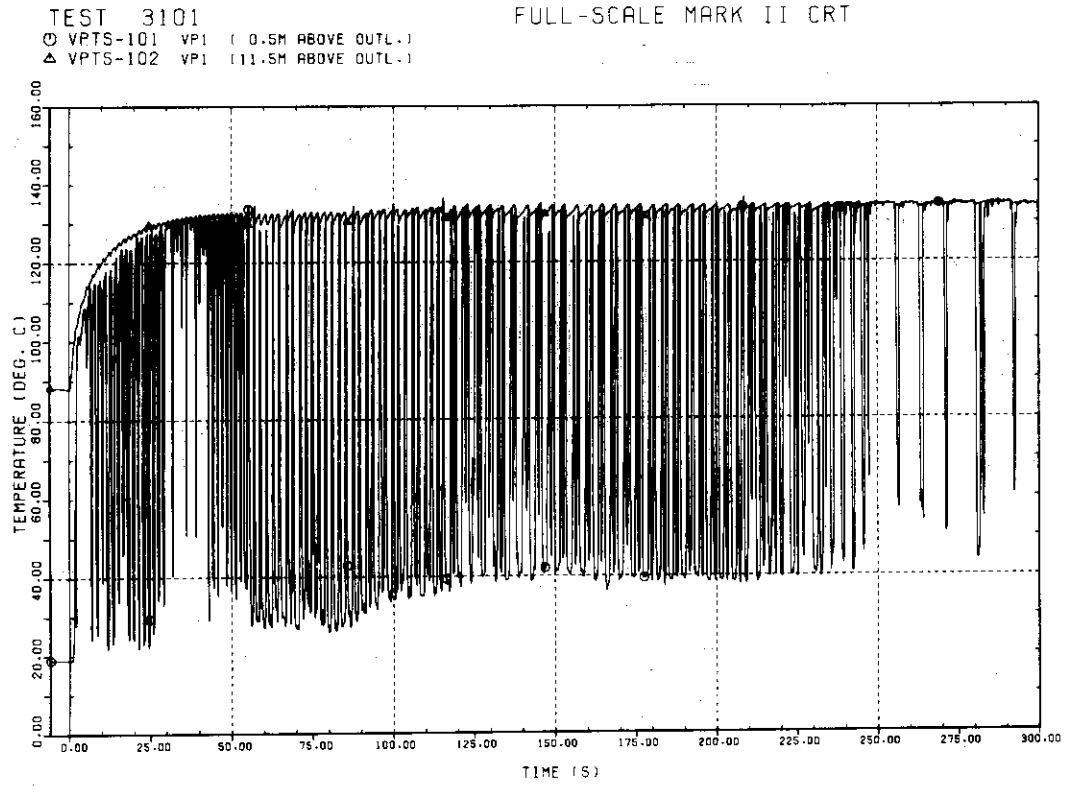
Plot L-0- 9 Temperatures in Drywell



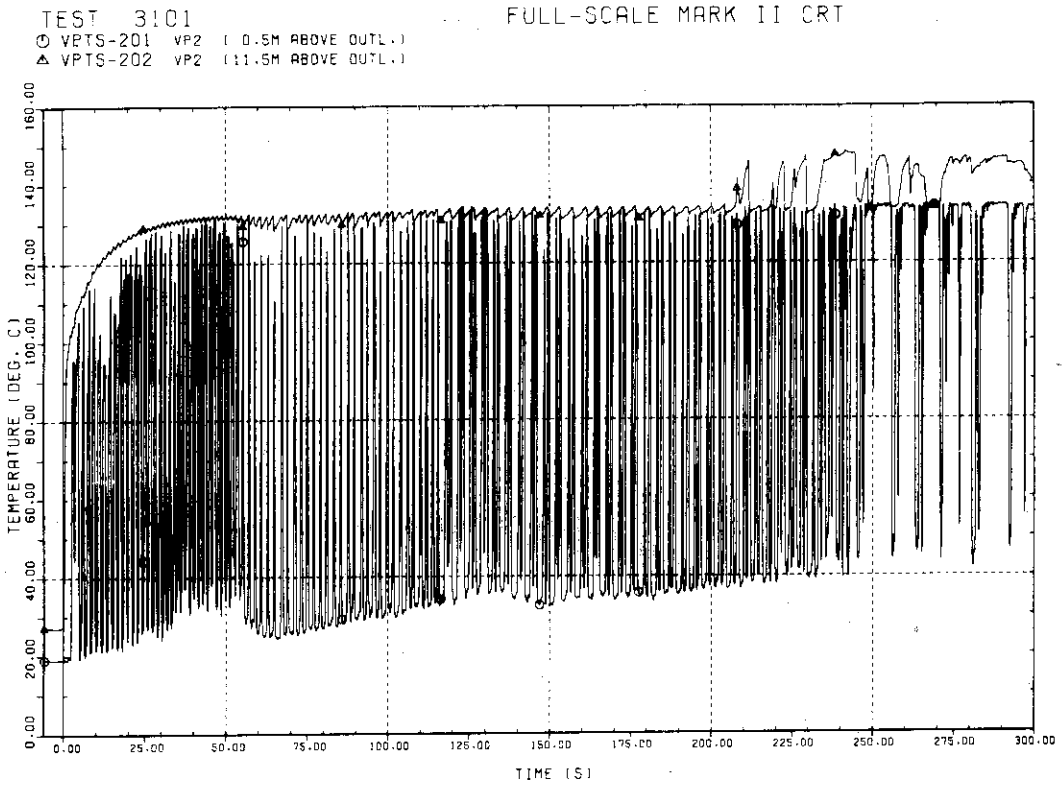
Plot L-0-10 Temperatures in Drywell



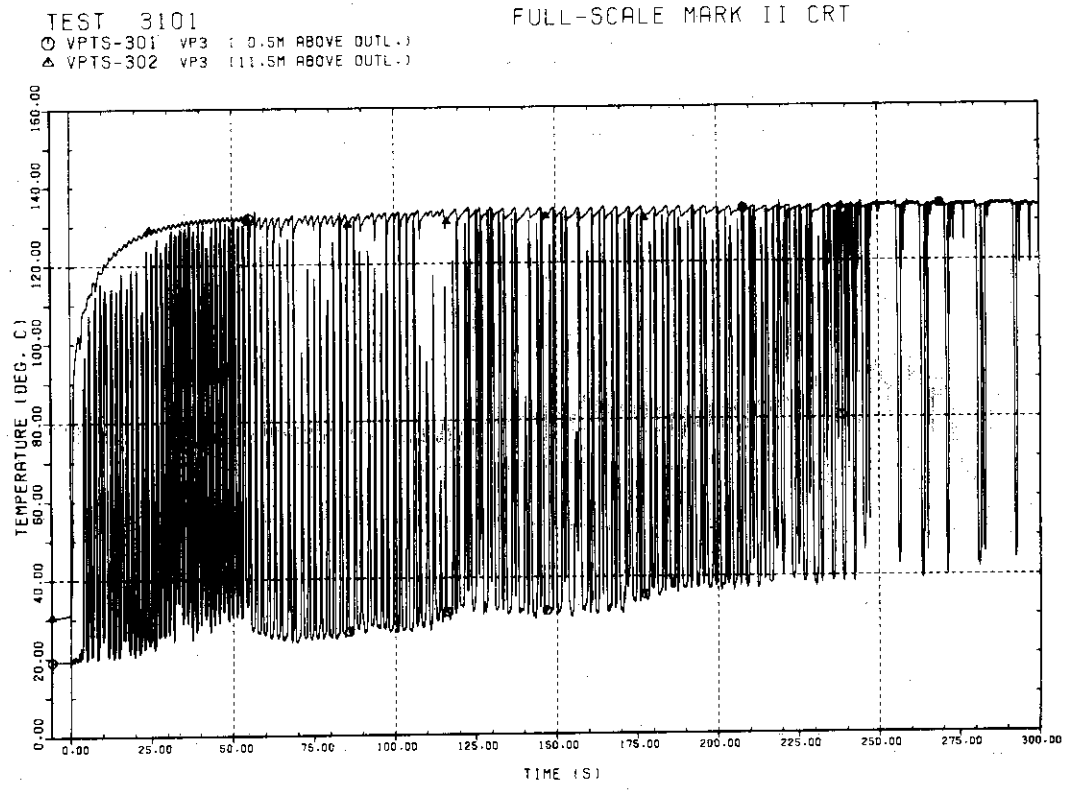
Plot L-0-11 Temperatures in Drywell



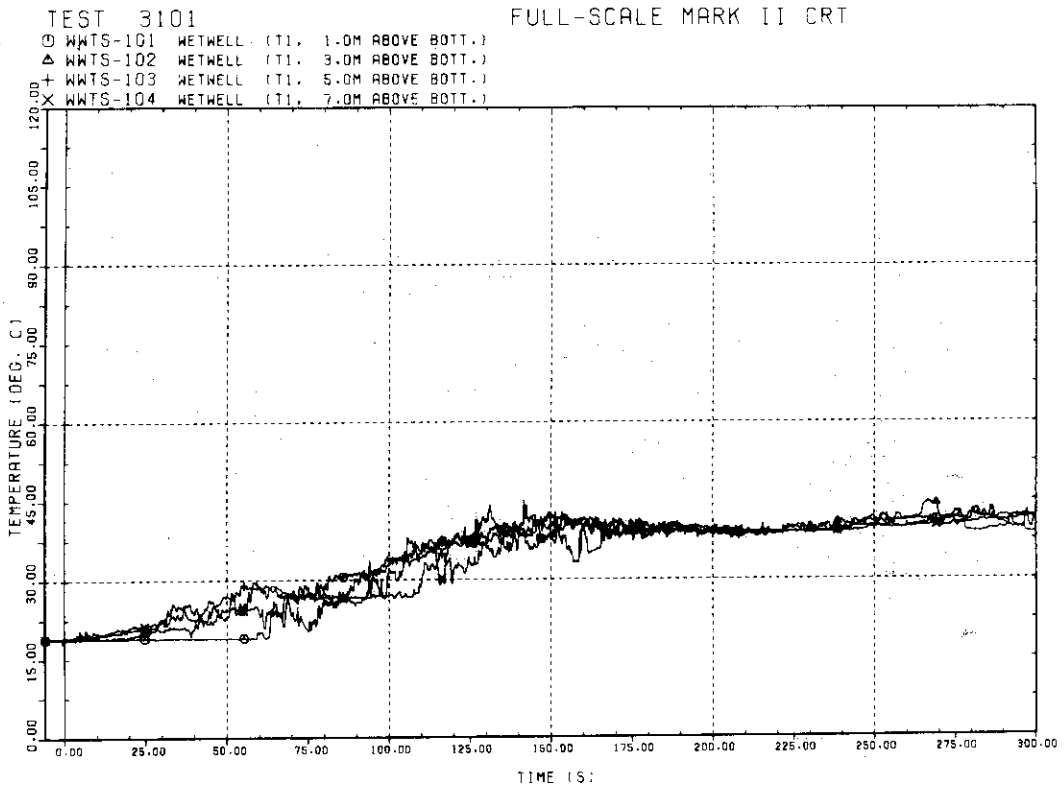
Plot L-0-12 Temperatures in Vent Pipe



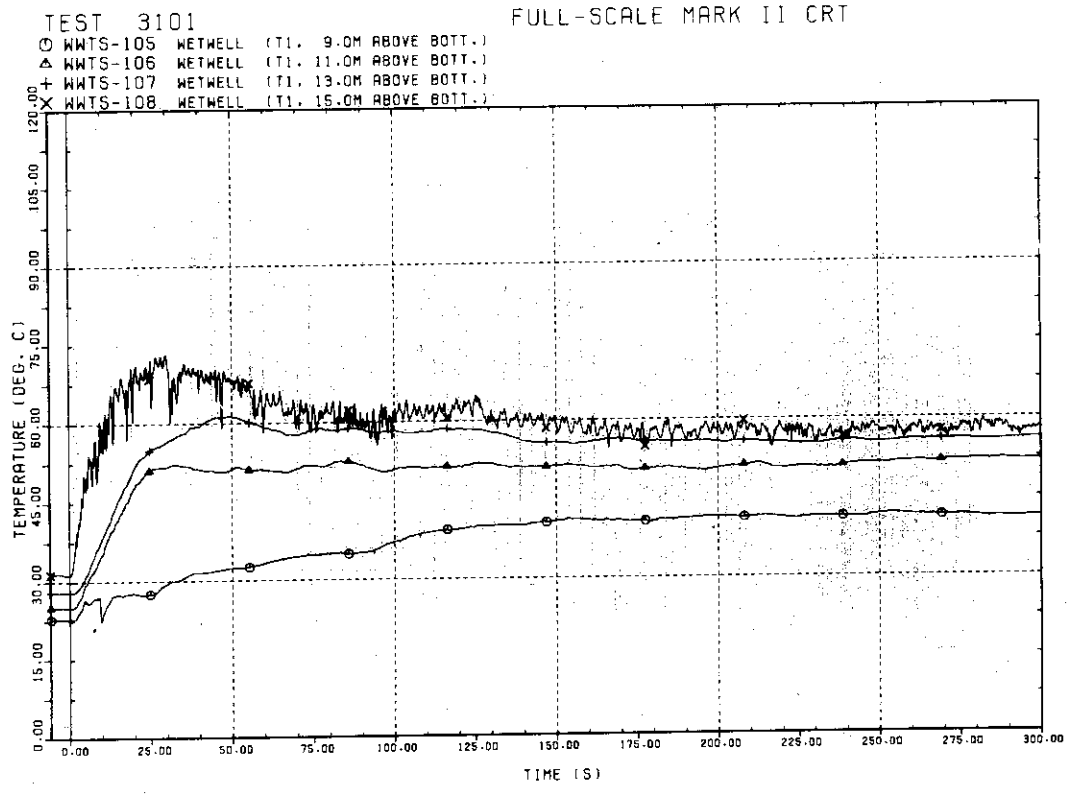
Plot L-0-13 Temperatures in Vent Pipe



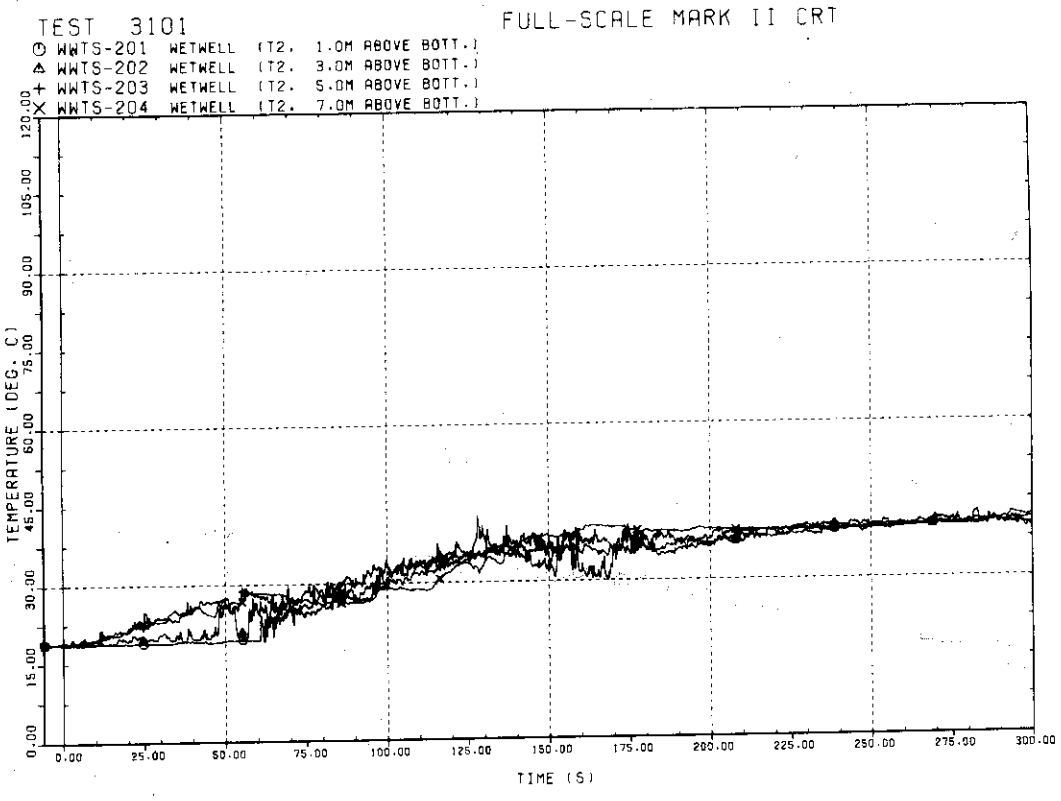
Plot L-0-14 Temperatures in Vent Pipe



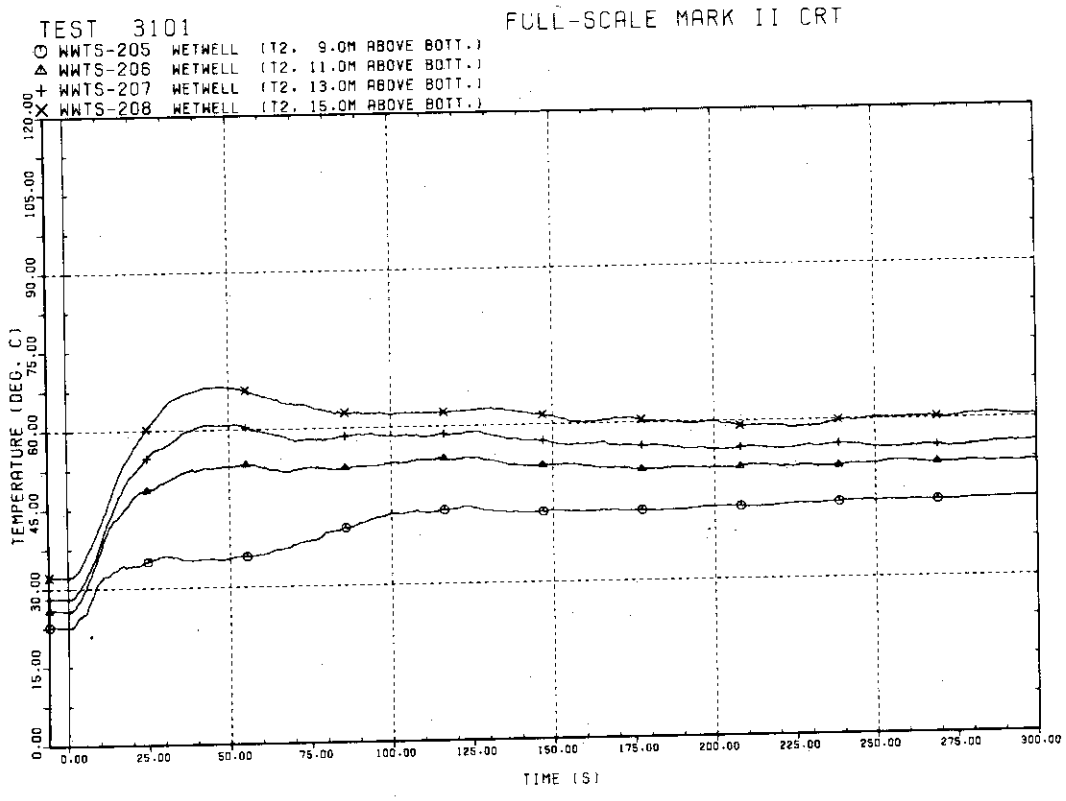
Plot L-0-15 Temperatures in Wetwell



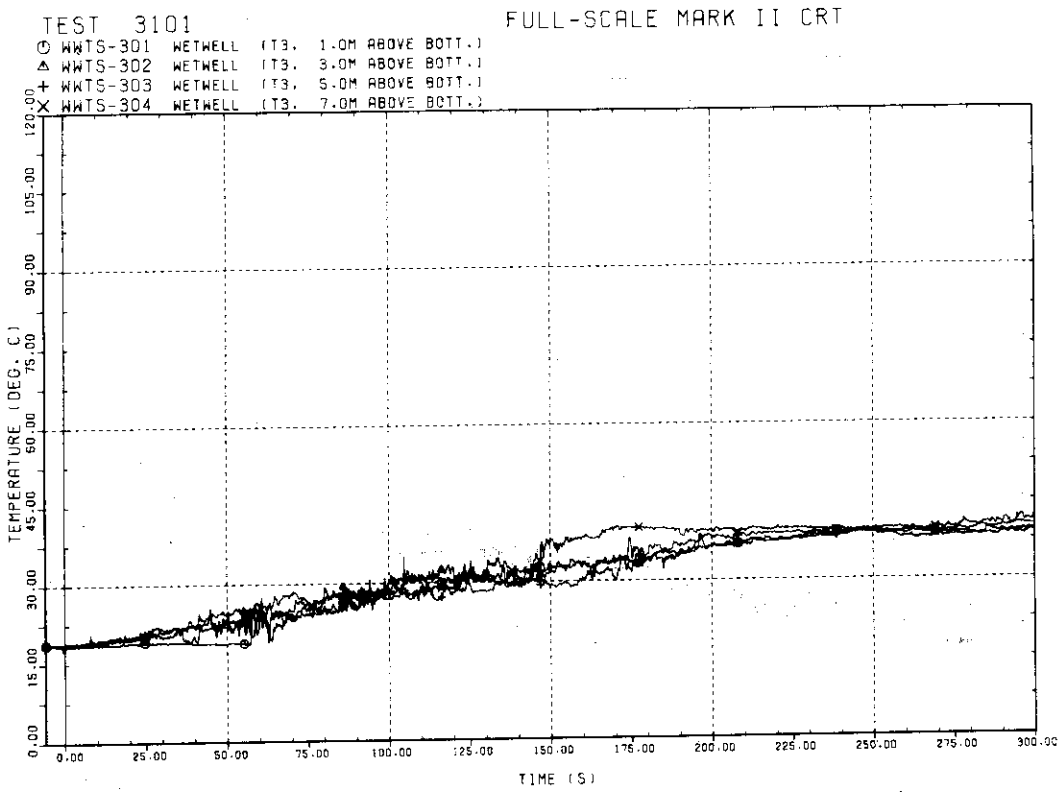
Plot L-0-16 Temperatures in Wetwell



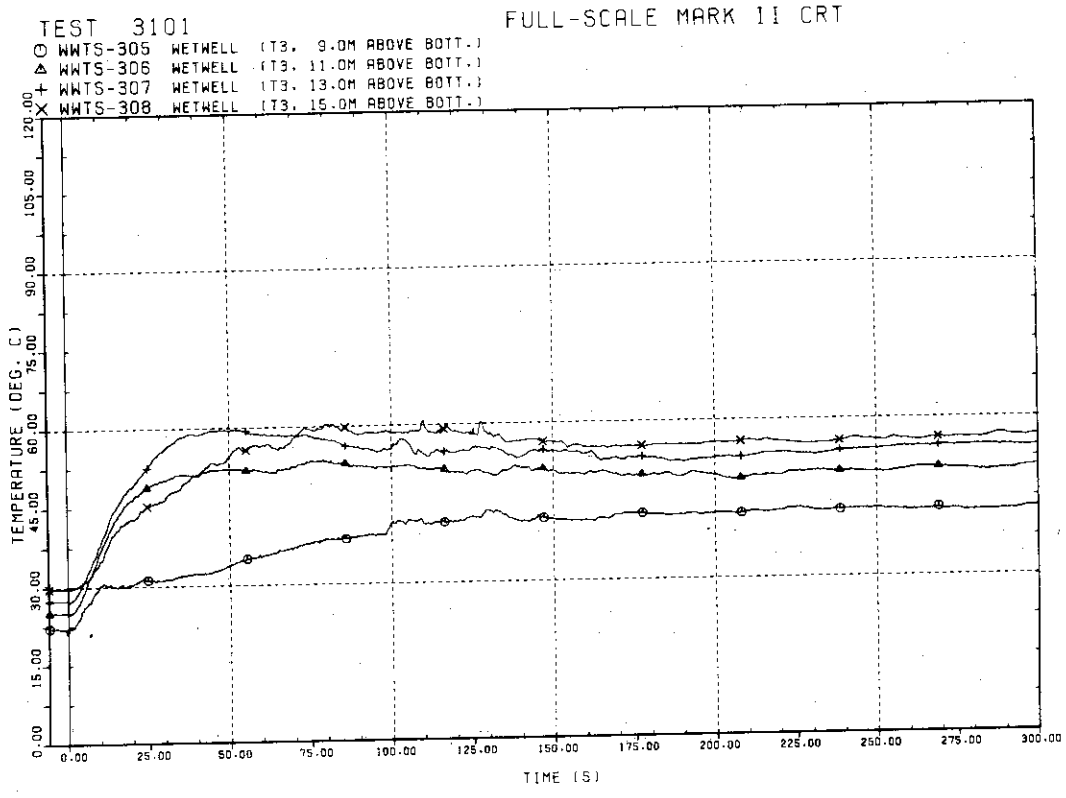
Plot L-0-17 Temperatures in Wetwell



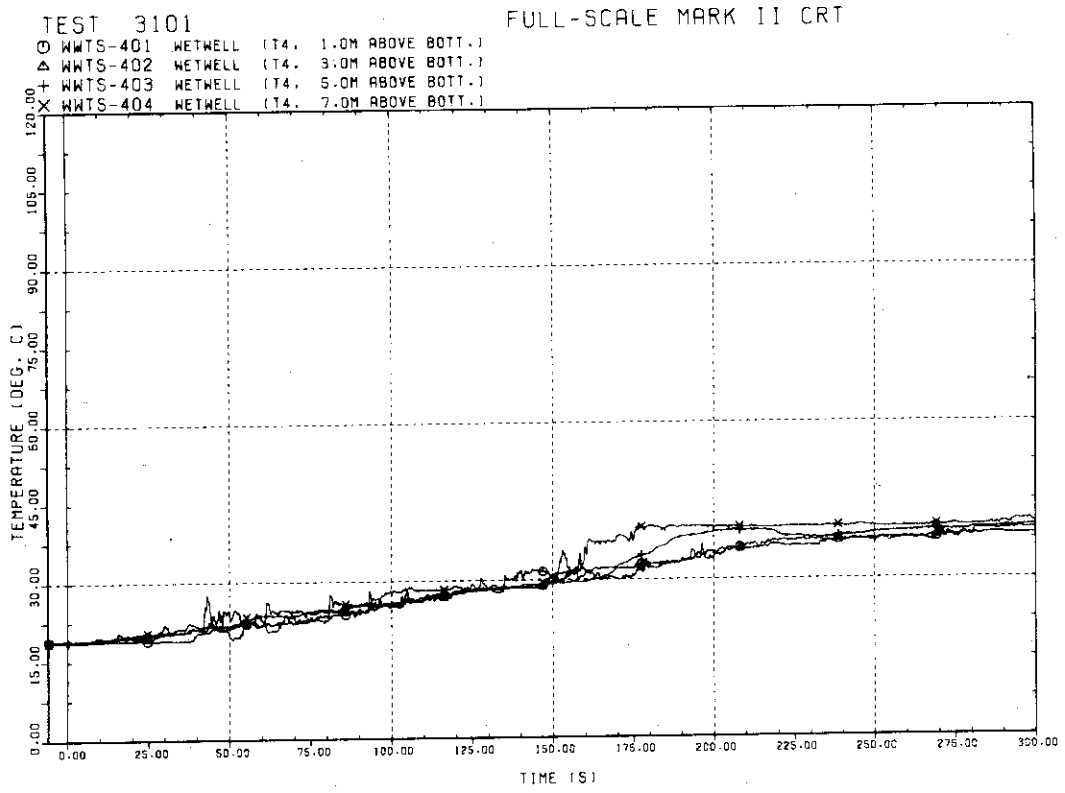
Plot L-0-18 Temperatures in Wetwell



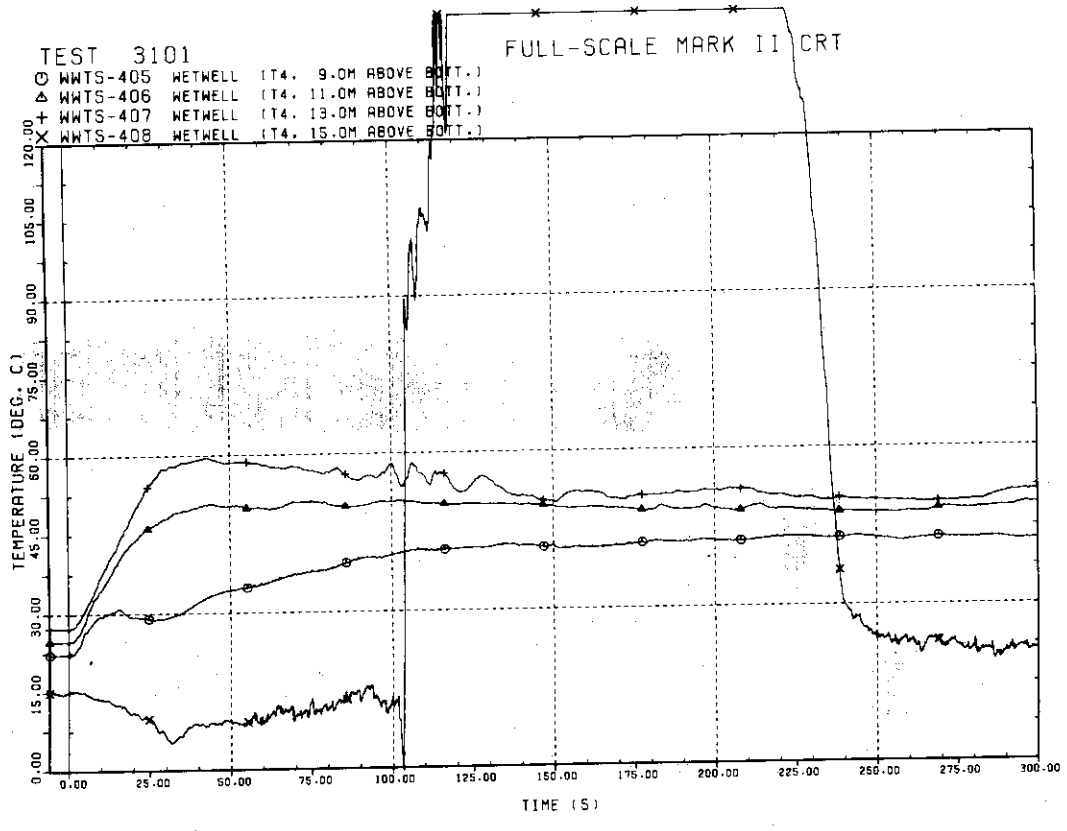
Plot L-0-19 Temperatures in Wetwell



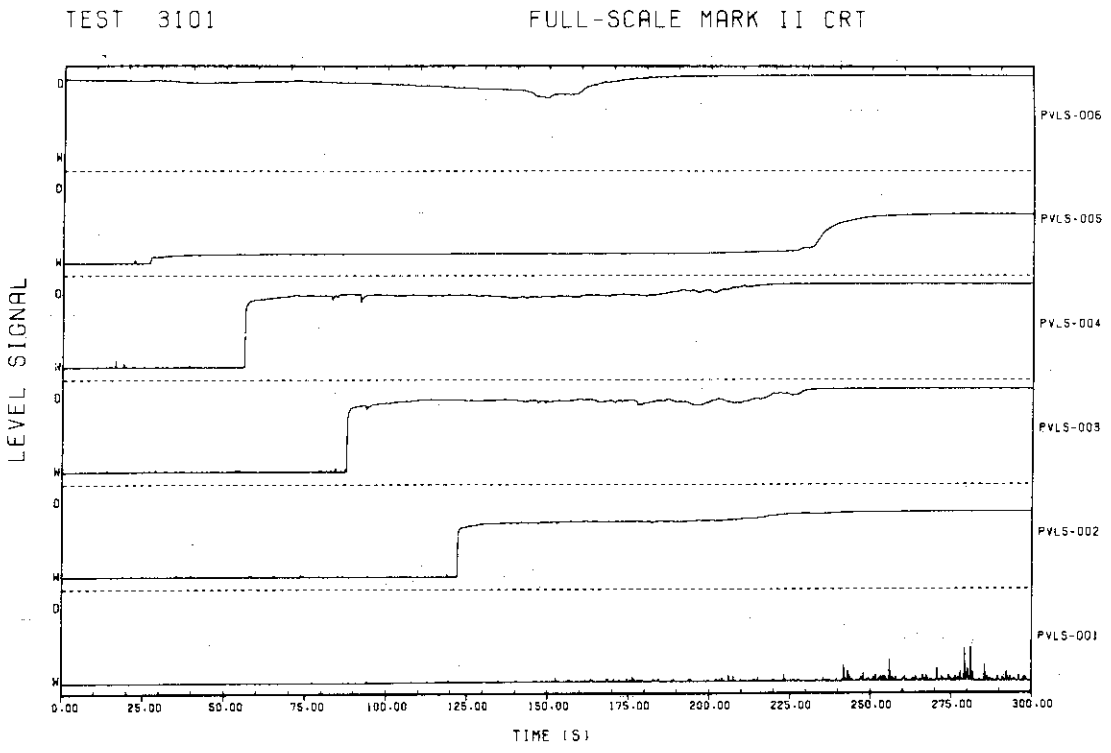
Plot L-0-20 Temperatures in Wetwell



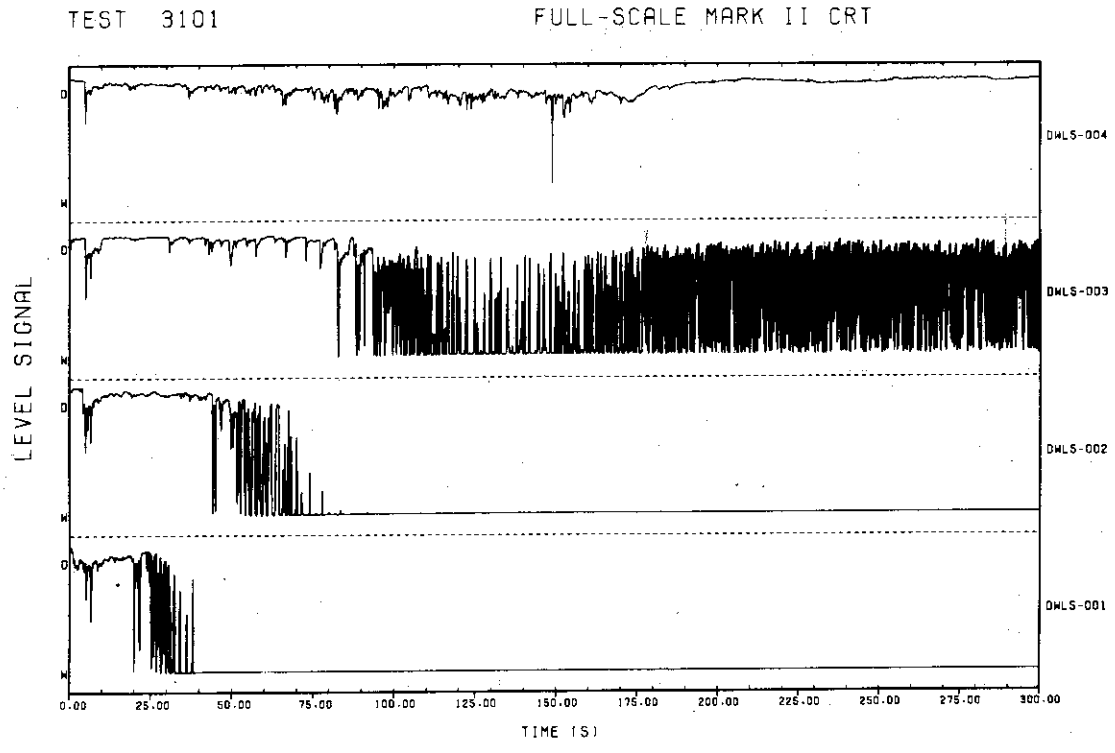
Plot L-0-21 Temperatures in Wetwell



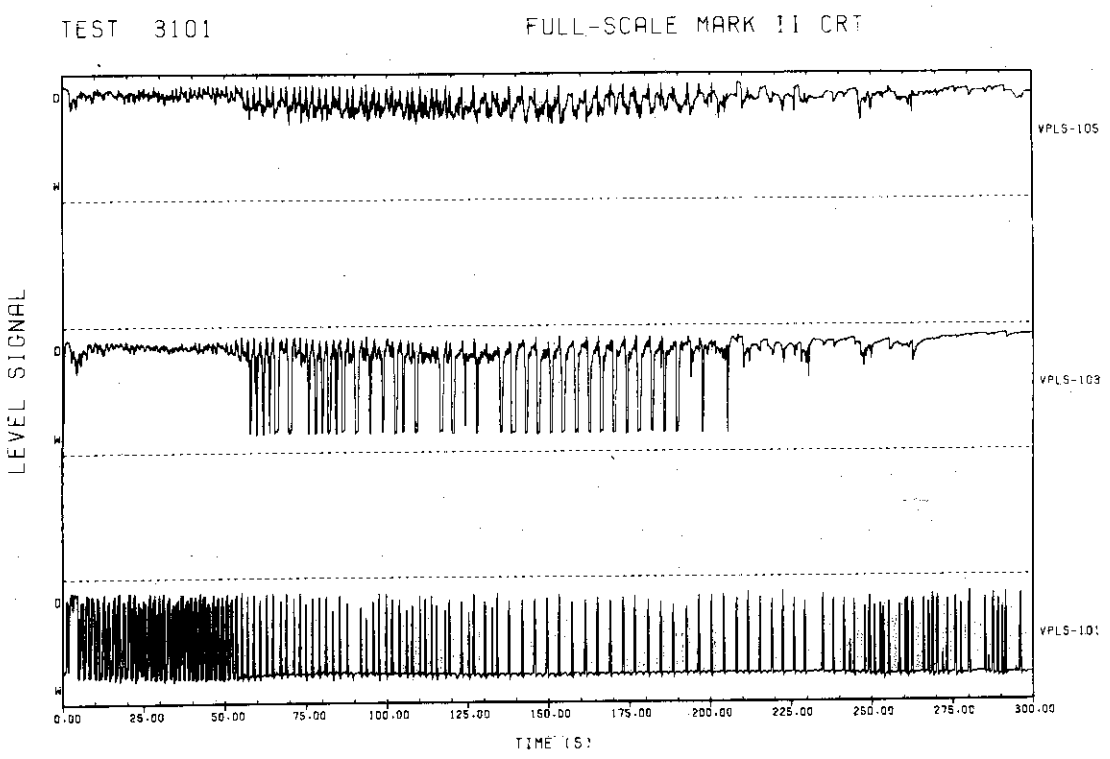
Plot L-0-22 Temperatures in Wetwell



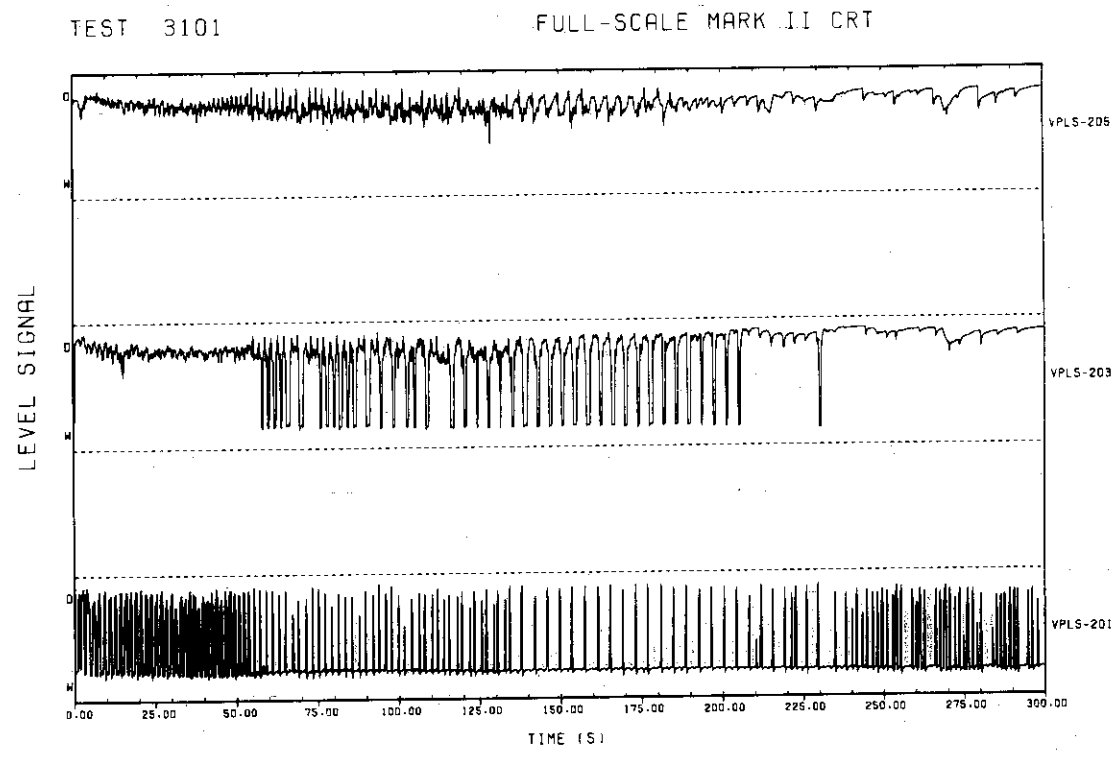
Plot L-0-23 Water Level in Pressure Vessel



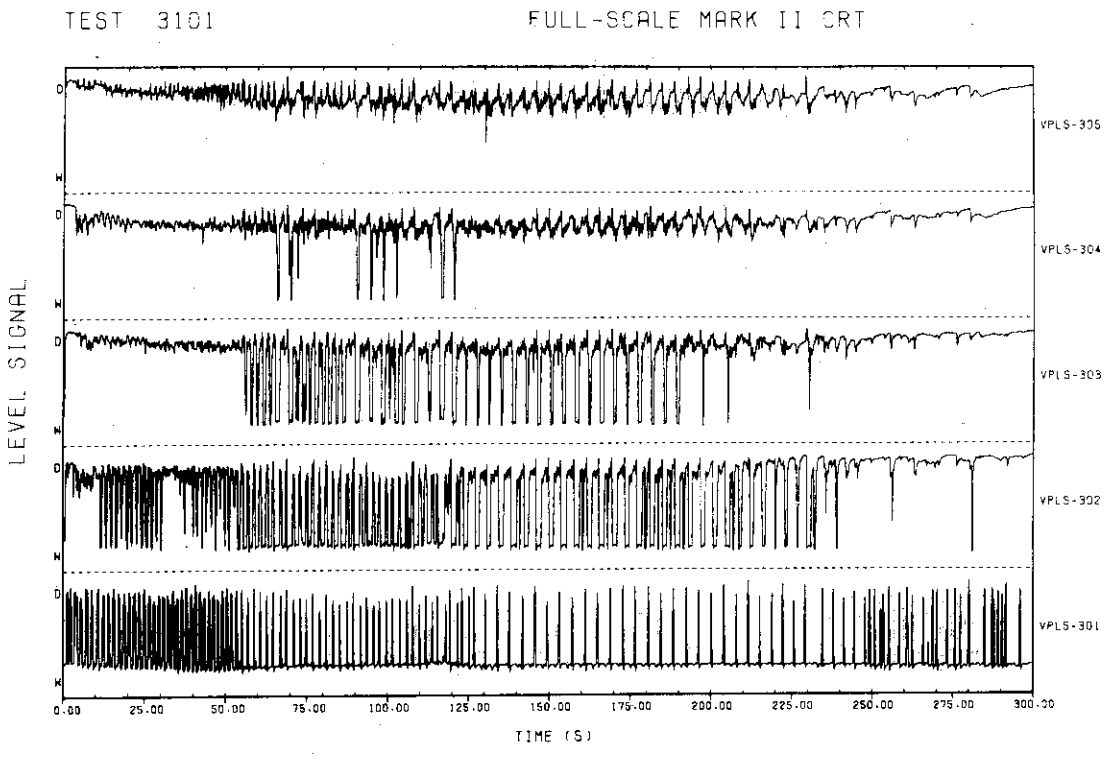
Plot L-0-24 Water Level in Drywell



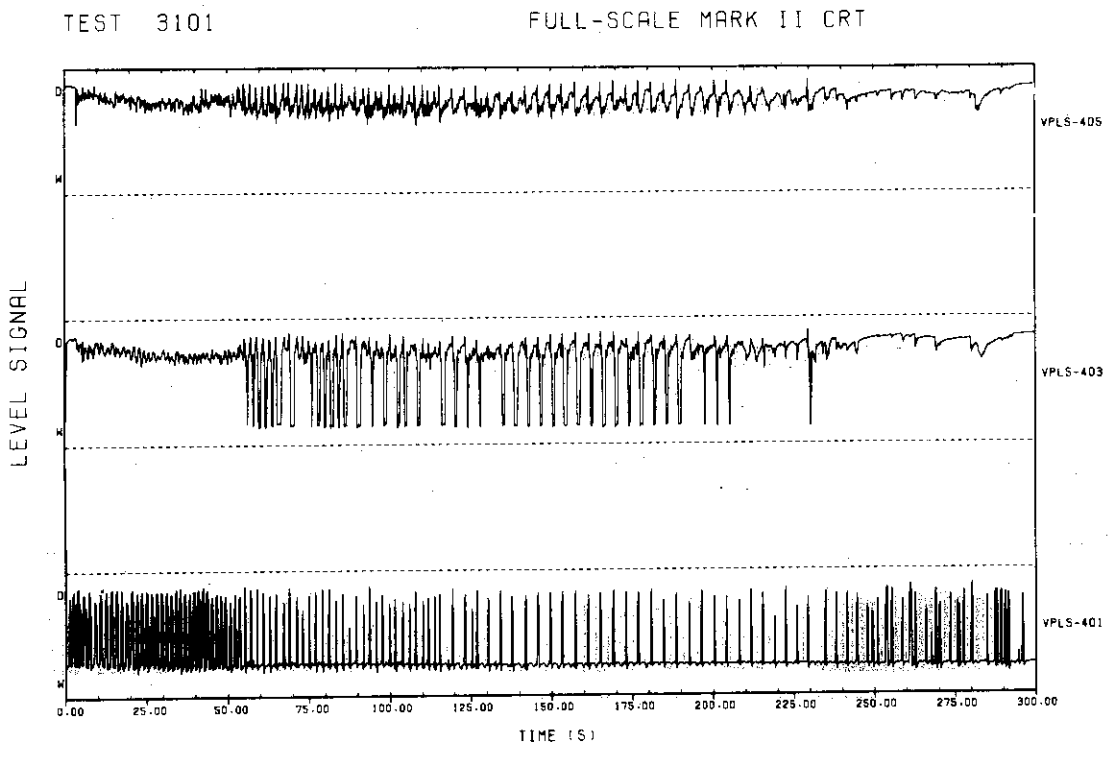
Plot L-0-25 Water Level in Vent Pipe



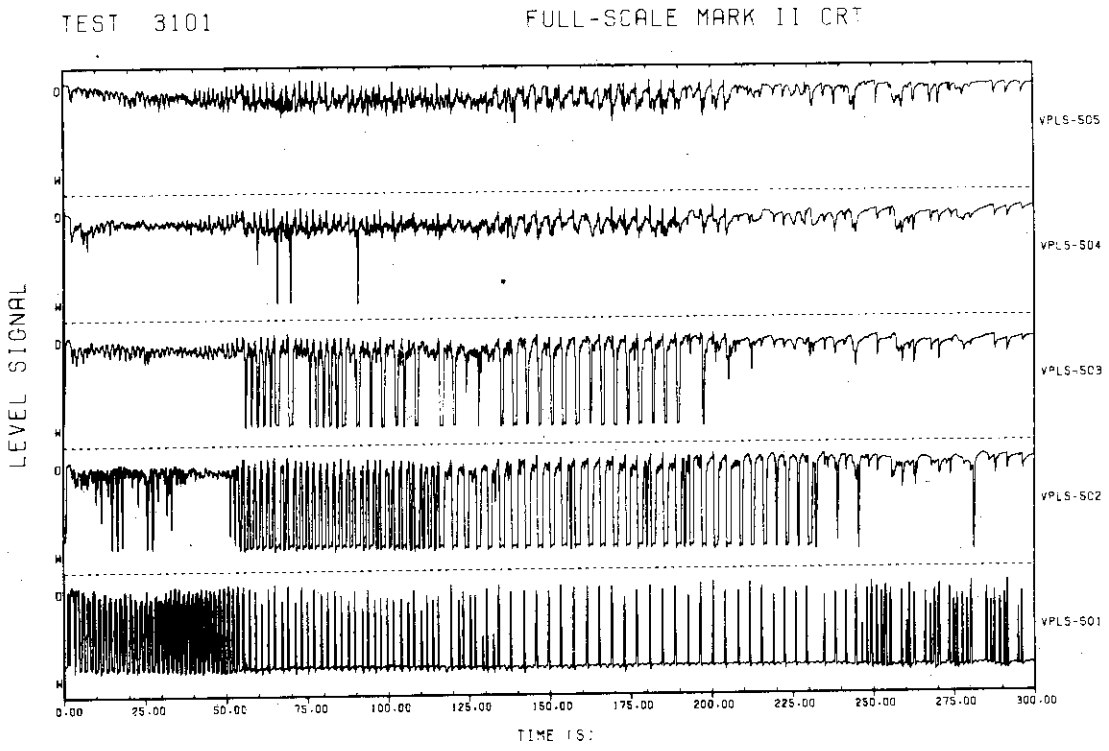
Plot L-0-26 Water Level in Vent Pipe



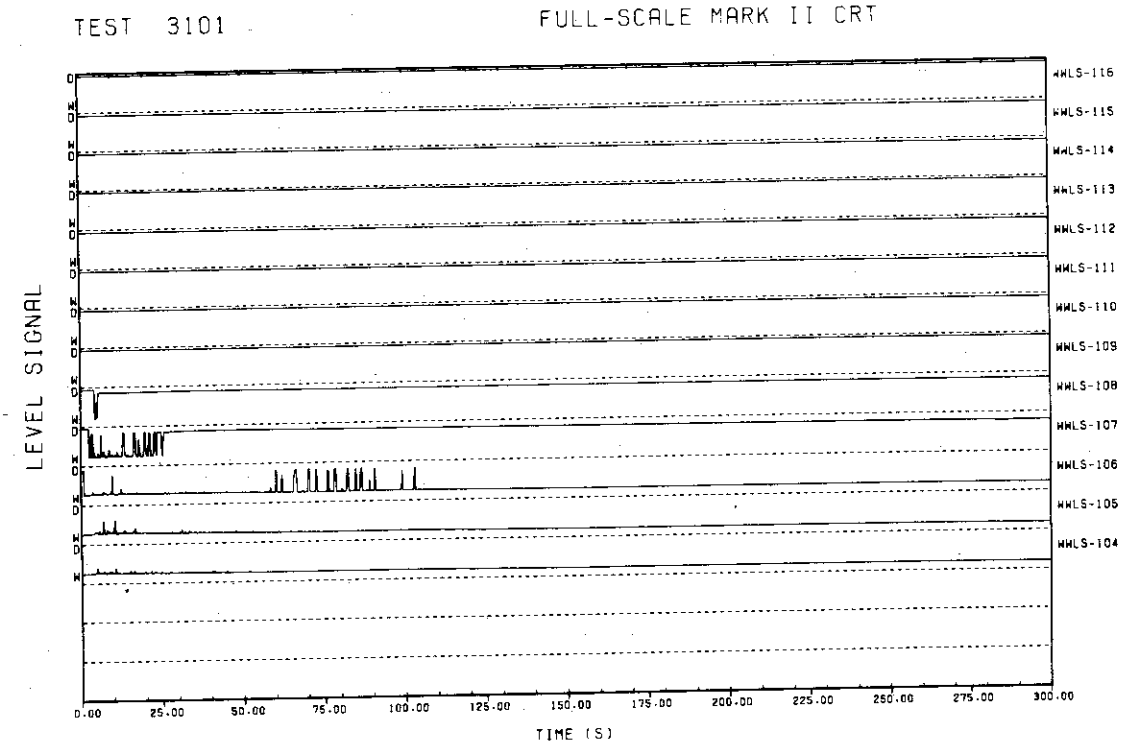
Plot L-0-27 Water Level in Vent Pipe



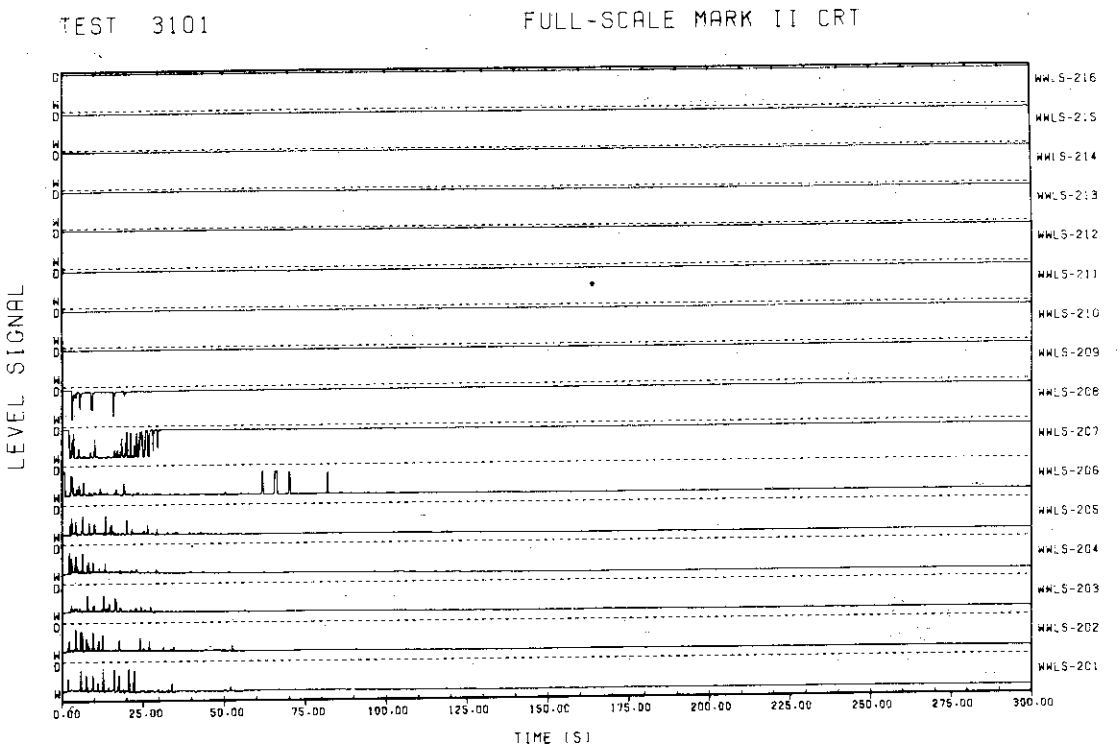
Plot L-0-28 Water Level in Vent Pipe



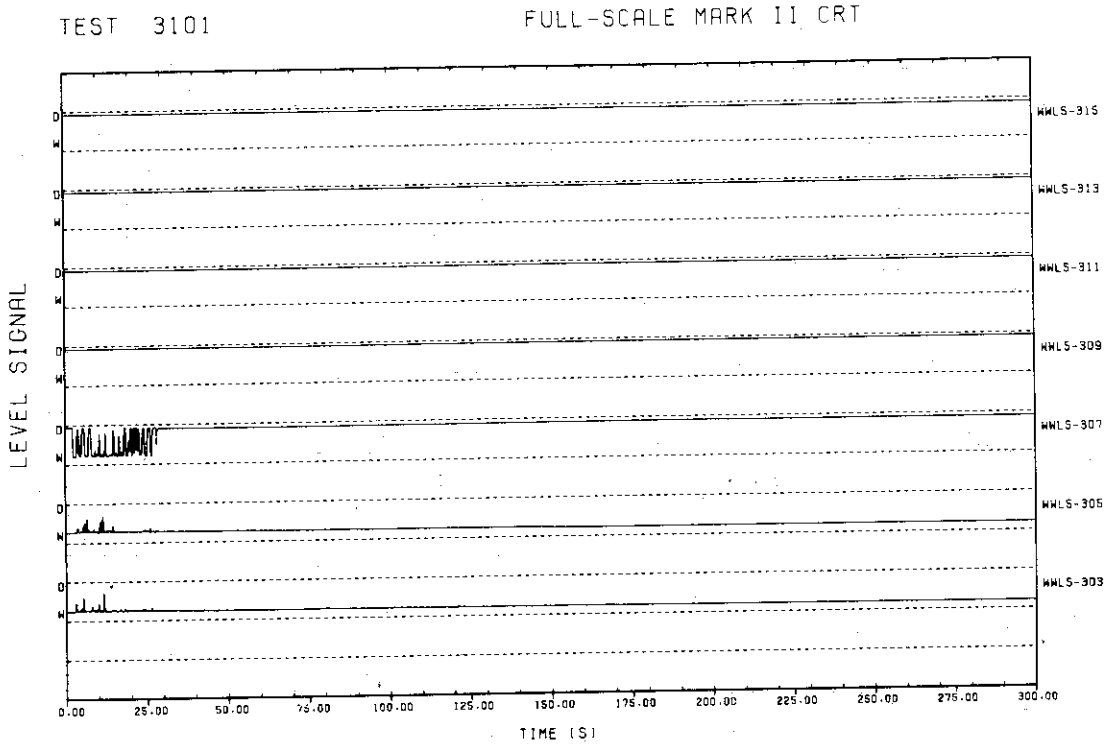
Plot L-0-29 Water Level in Vent Pipe



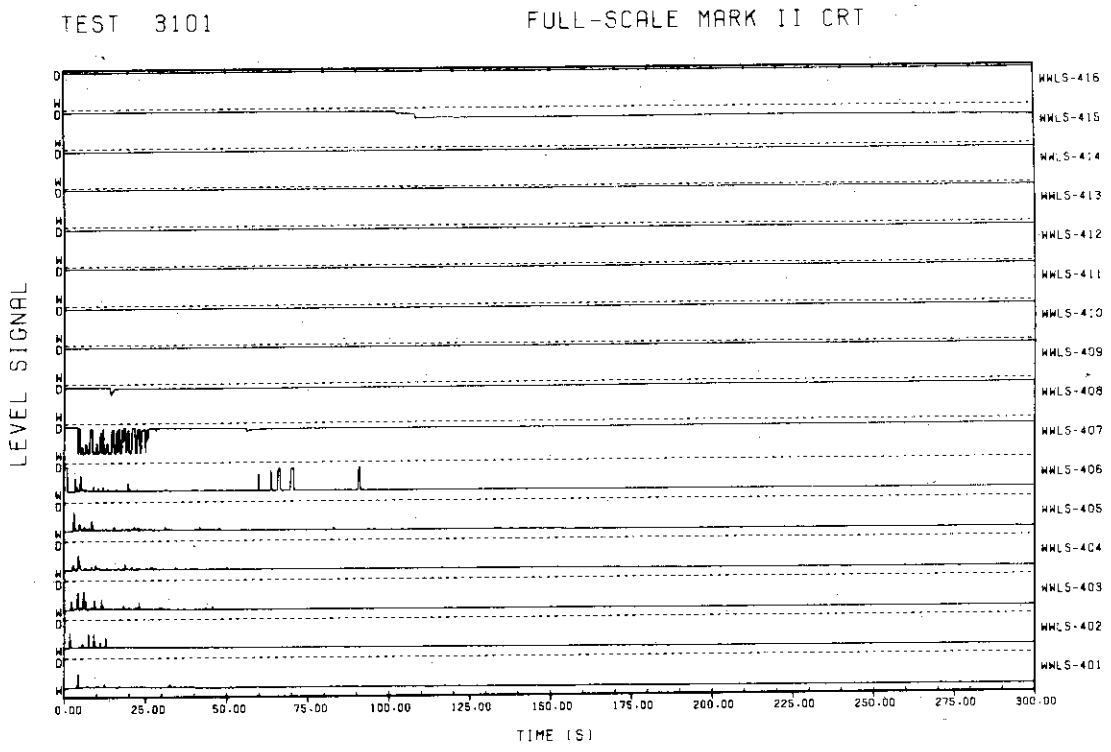
Plot L-0-30 Water Level in Wetwell



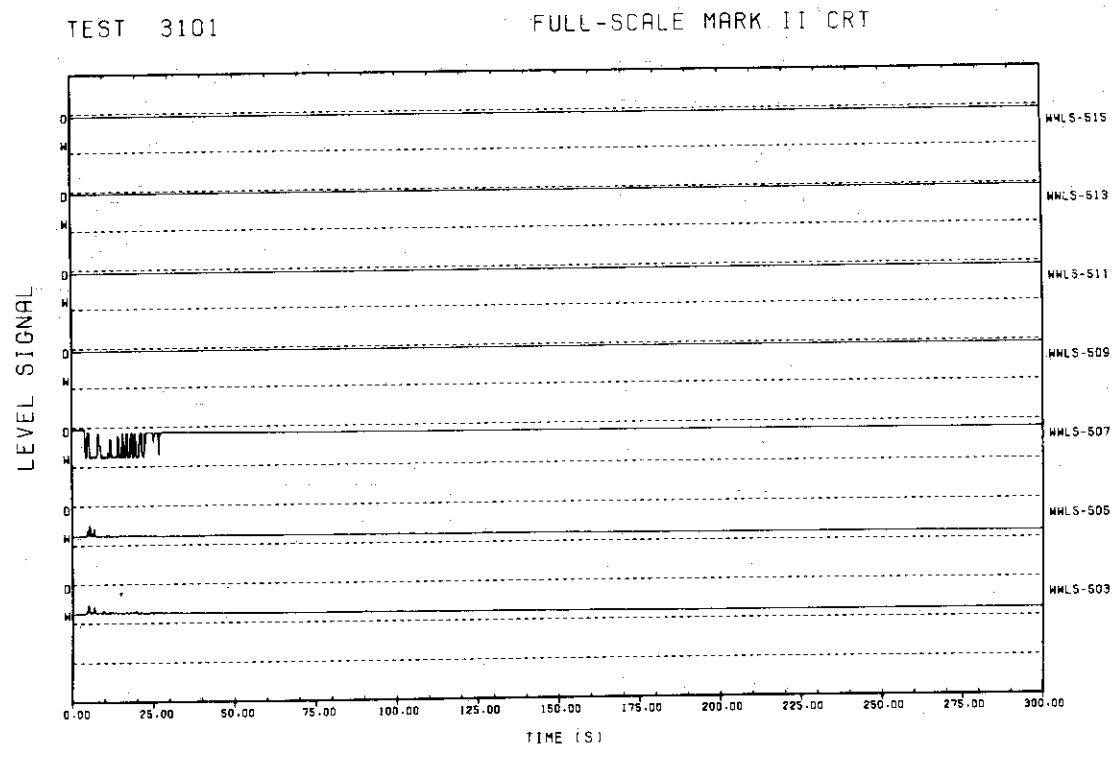
Plot L-0-31 Water Level in Wetwell



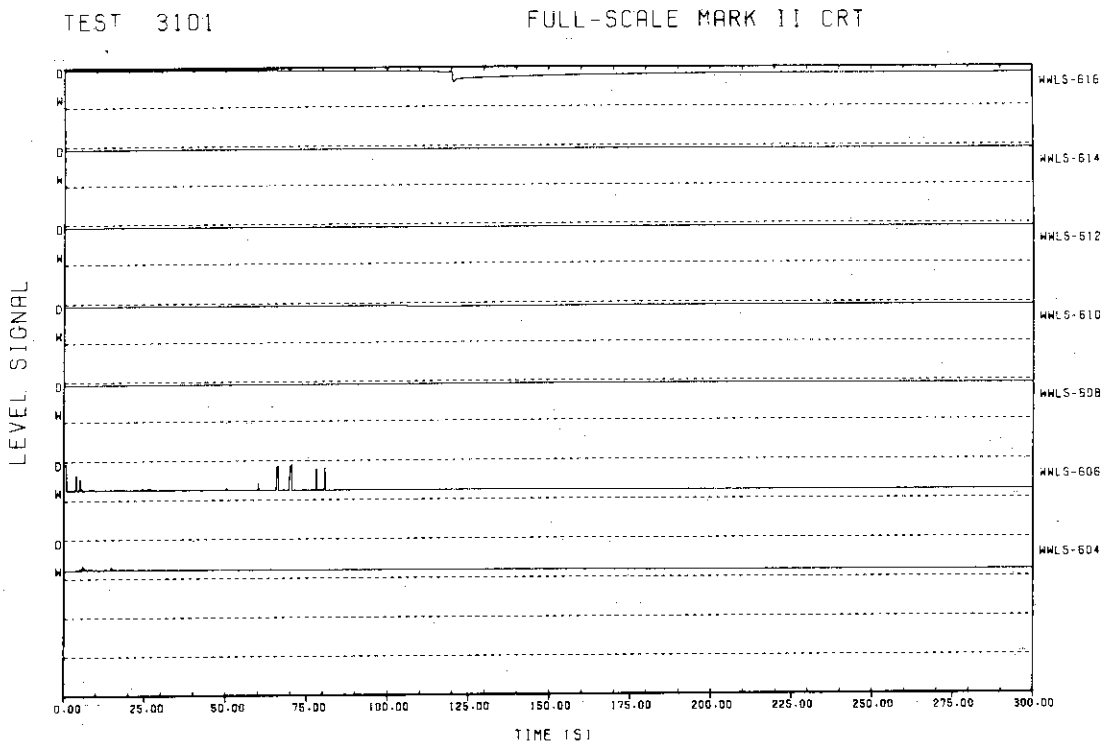
Plot L-0-32 Water Level in Wetwell



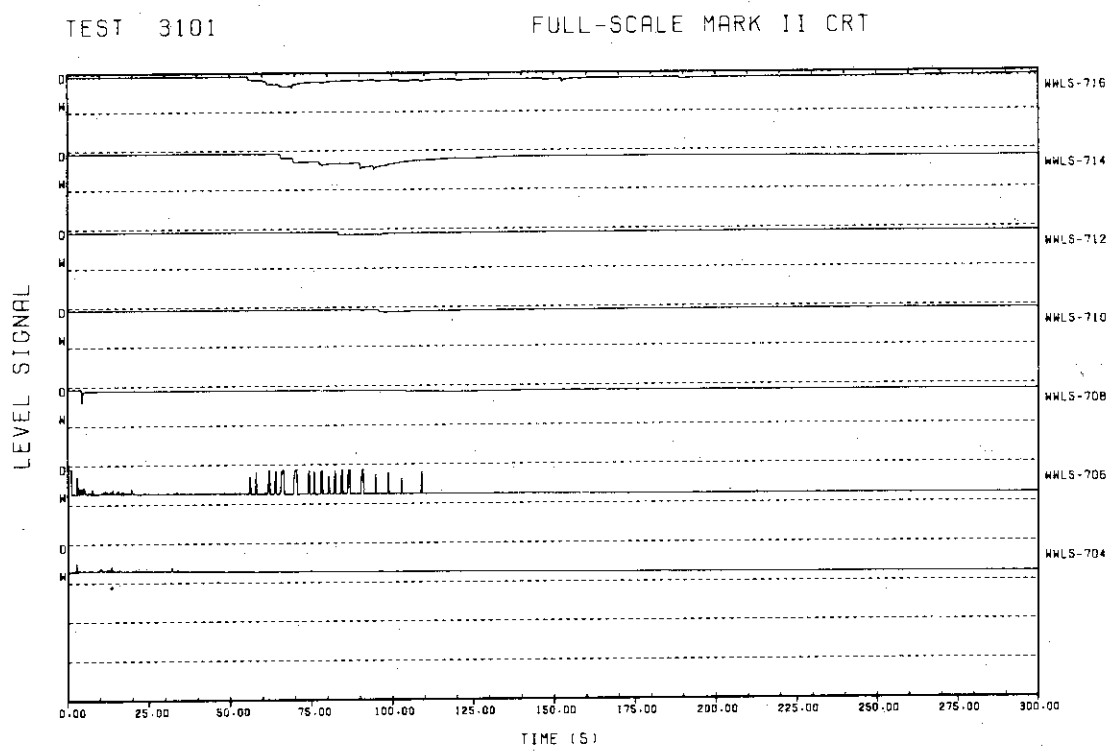
Plot L-0-33 Water Level in Wetwell



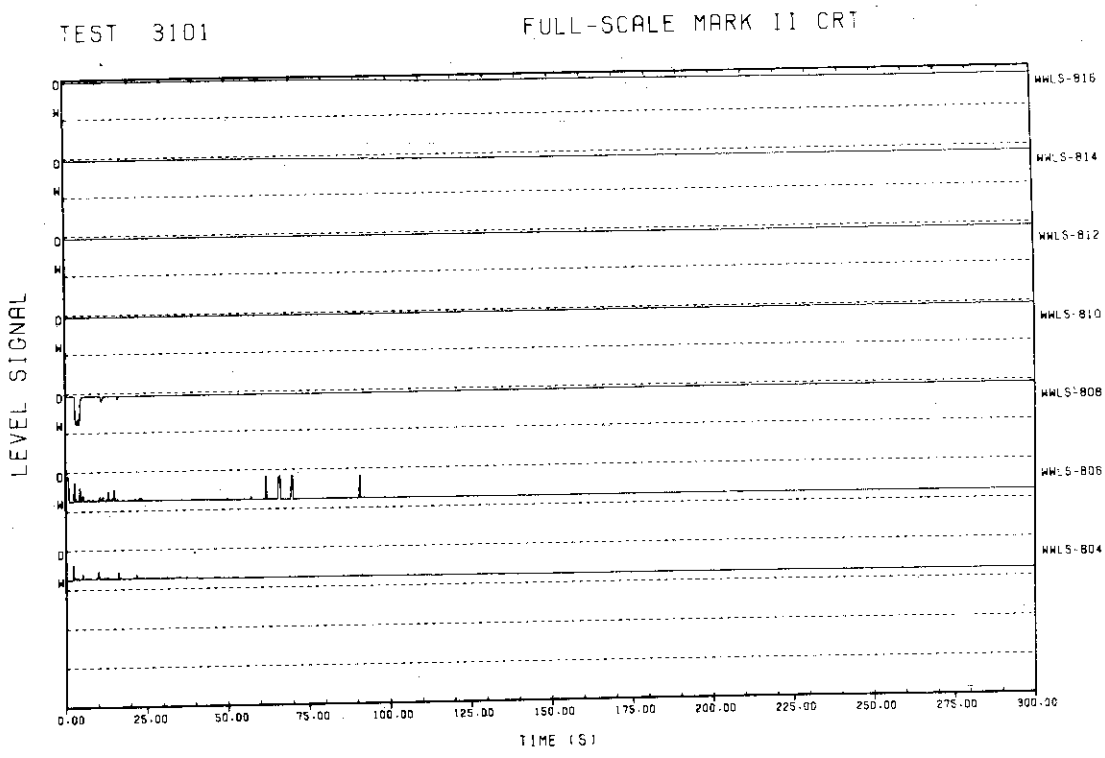
Plot L-0-34 Water Level in Wetwell



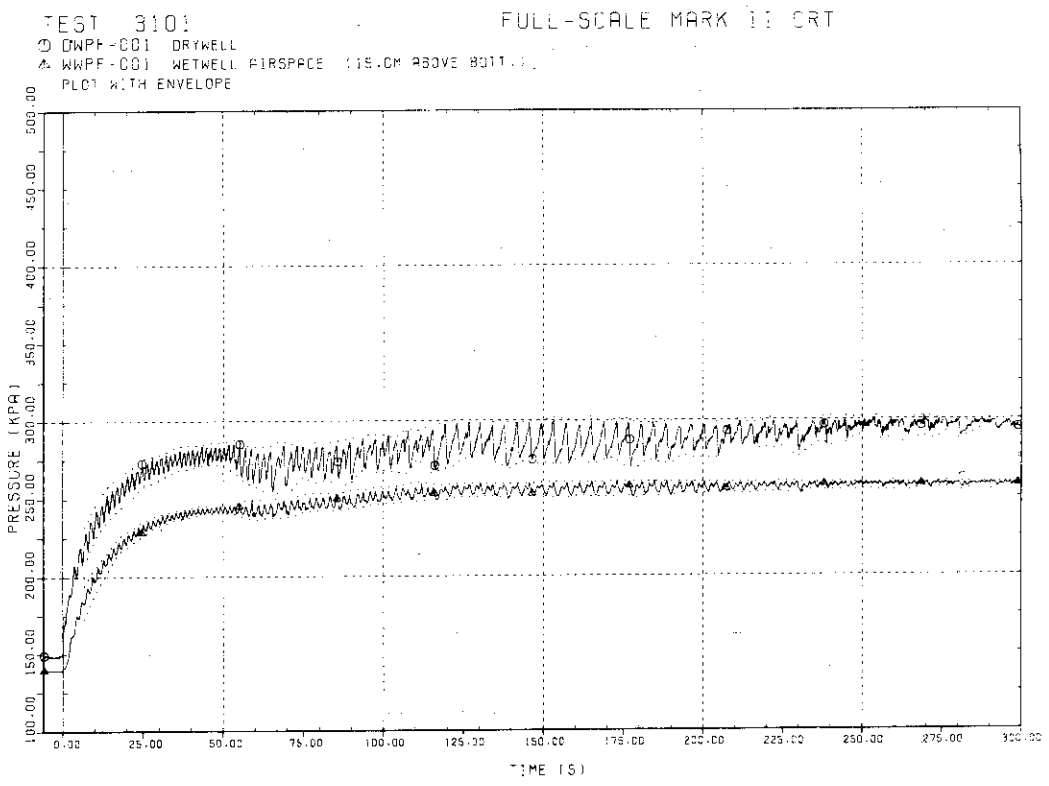
Plot L-0-35 Water Level in Wetwell



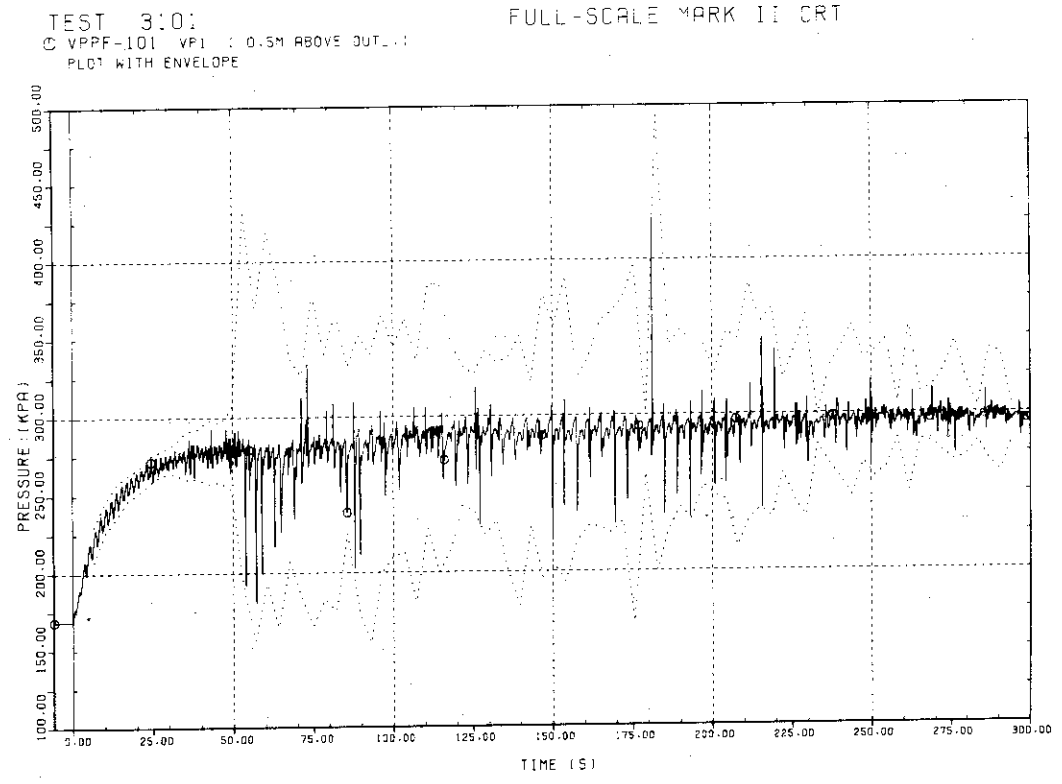
Plot L-0-36 Water Level in Wetwell



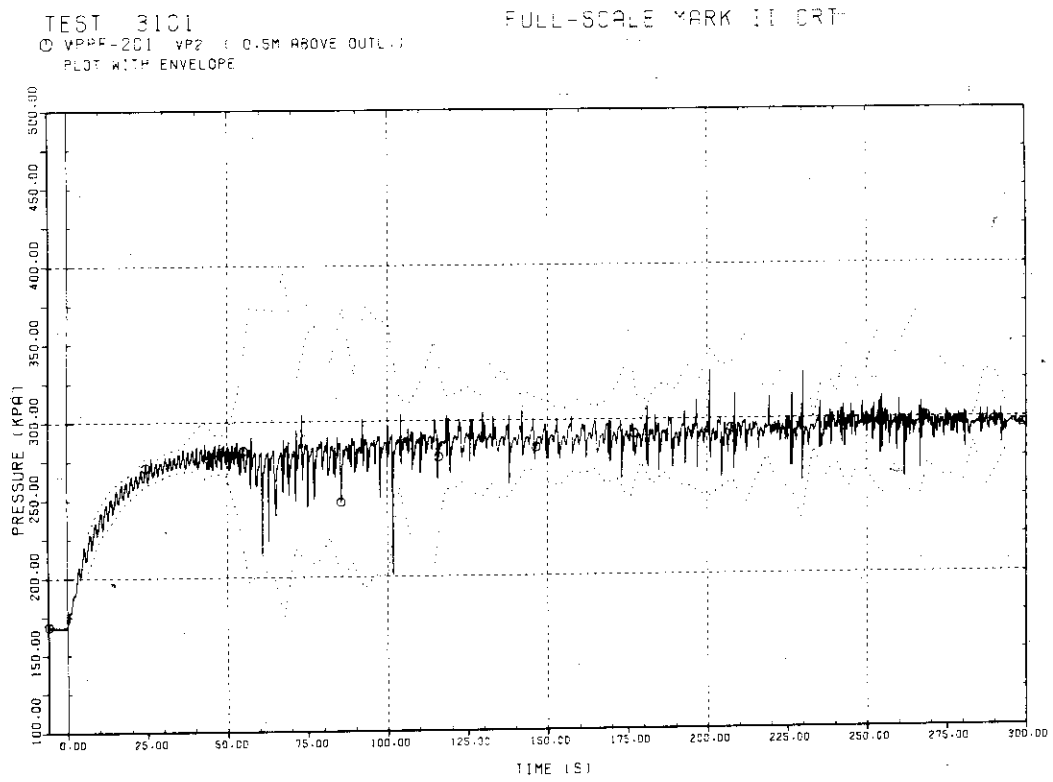
Plot L-0-37 Water Level in Wetwell



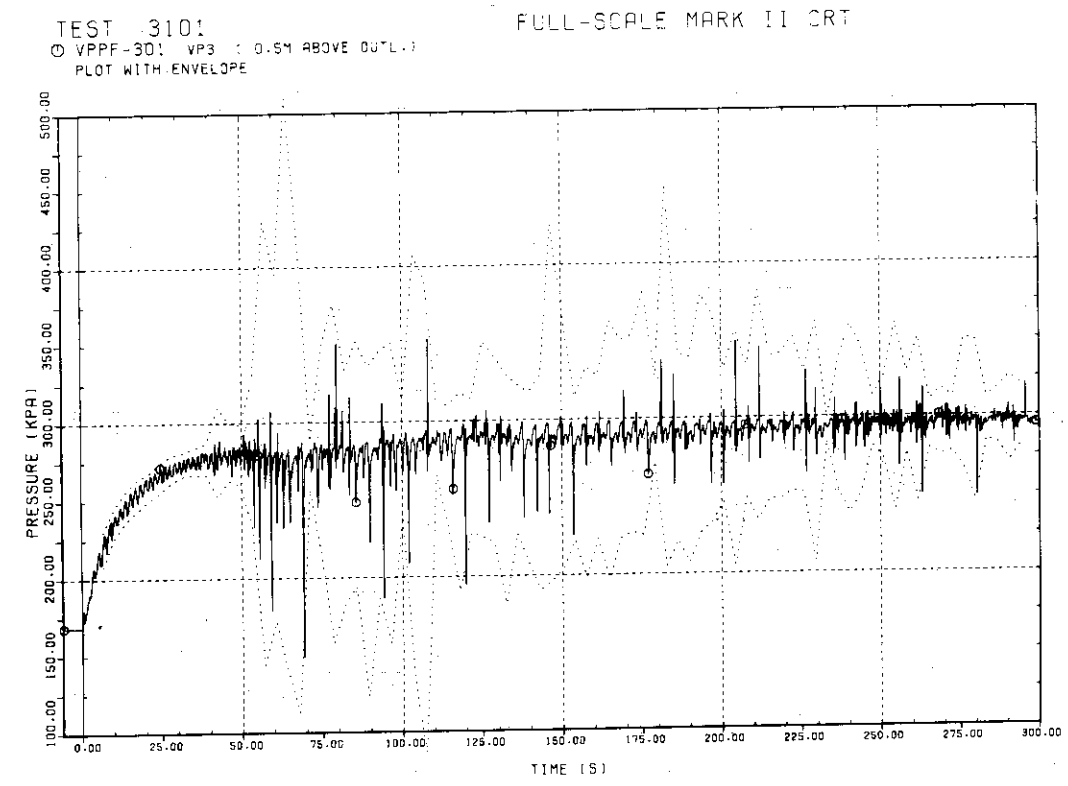
Plot L-1- 1 Pressures in Drywell and Wetwell Airspace



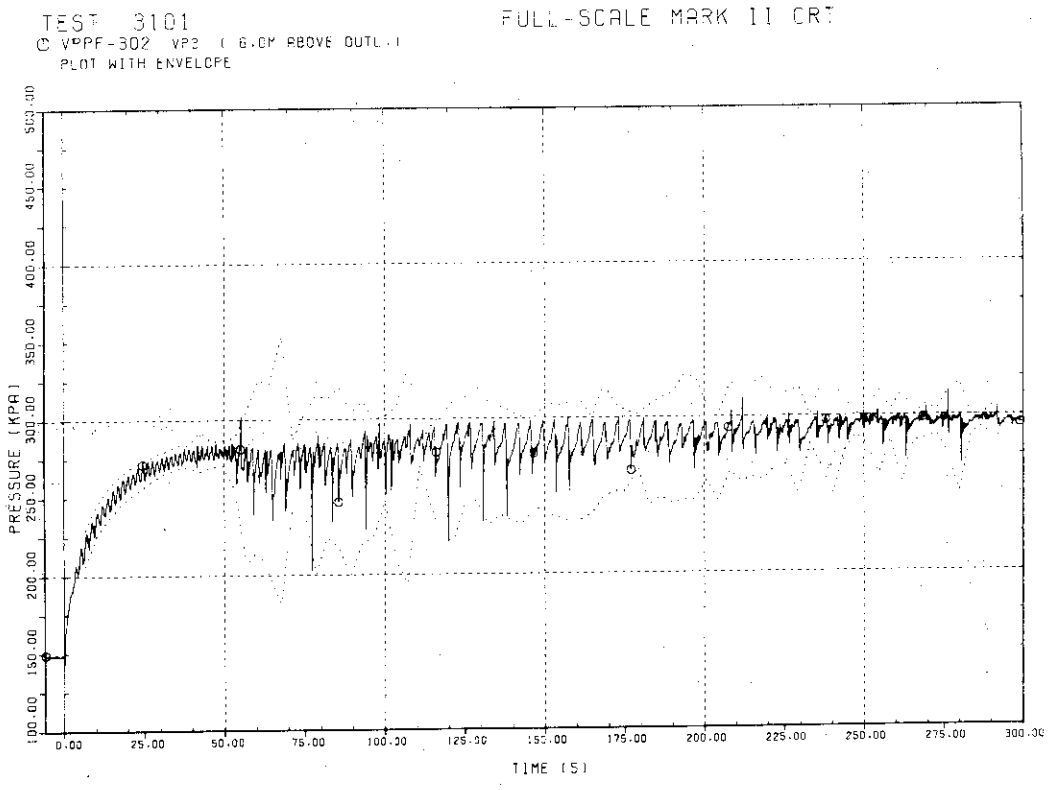
Plot L-1- 2 Pressure in Vent Pipe



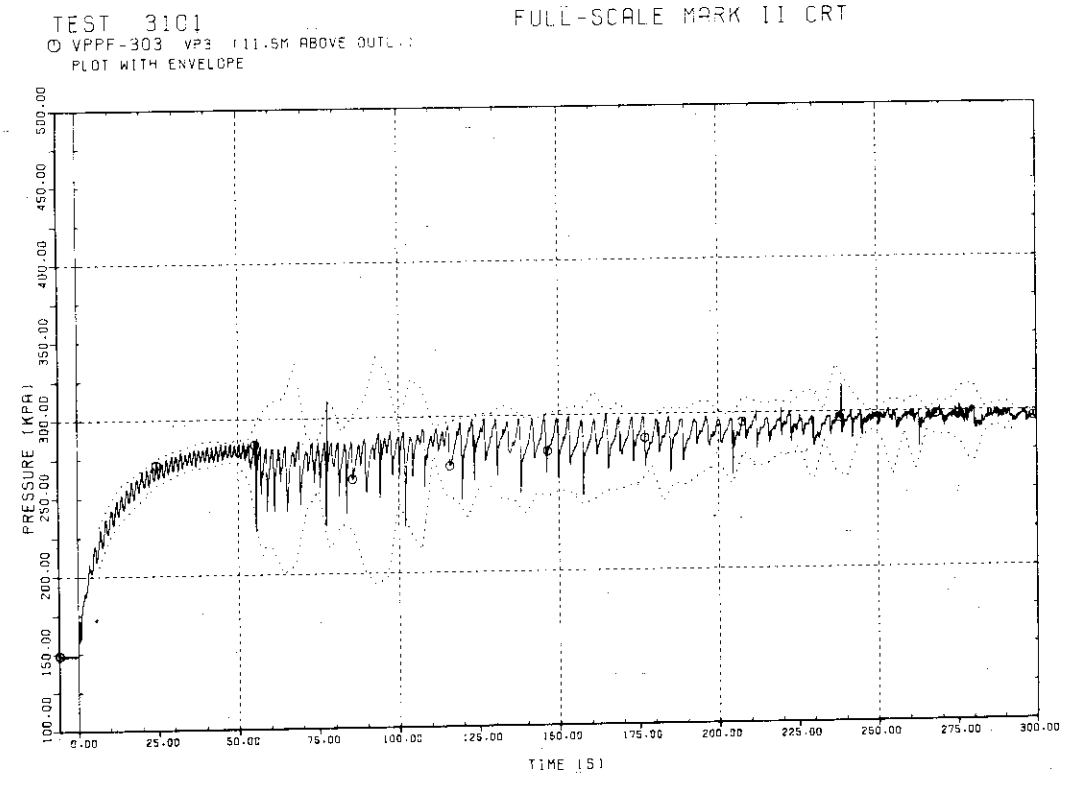
Plot L-1- 3　Pressure in Vent Pipe



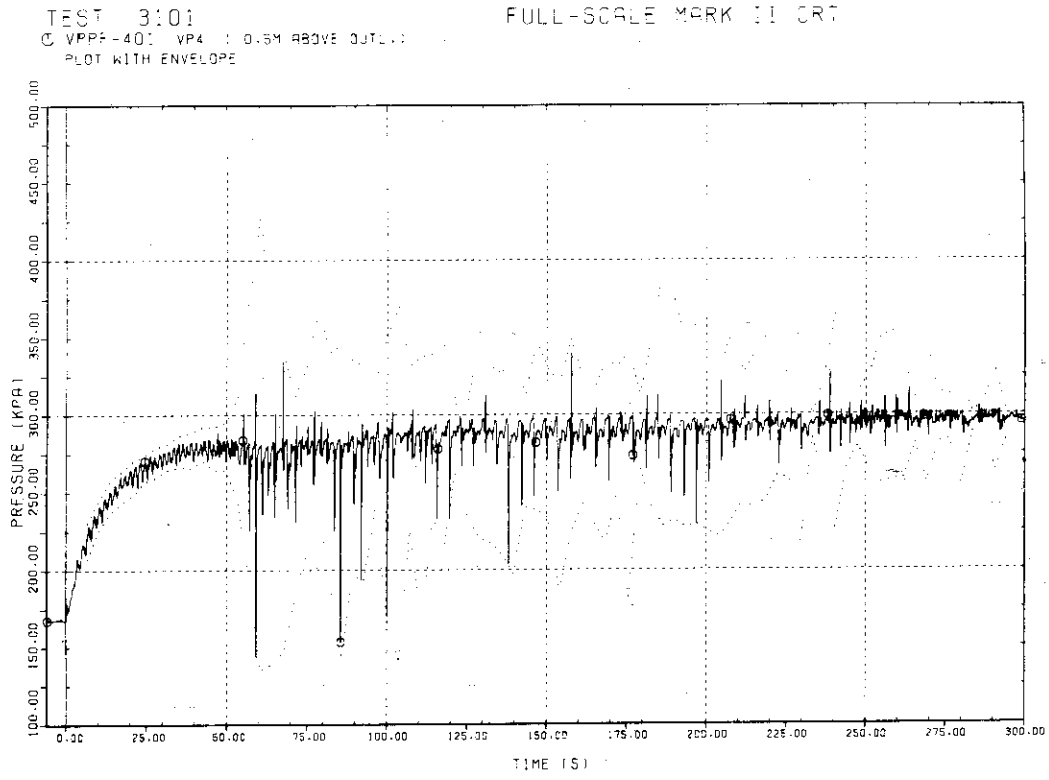
Plot L-1- 4　Pressure in Vent Pipe



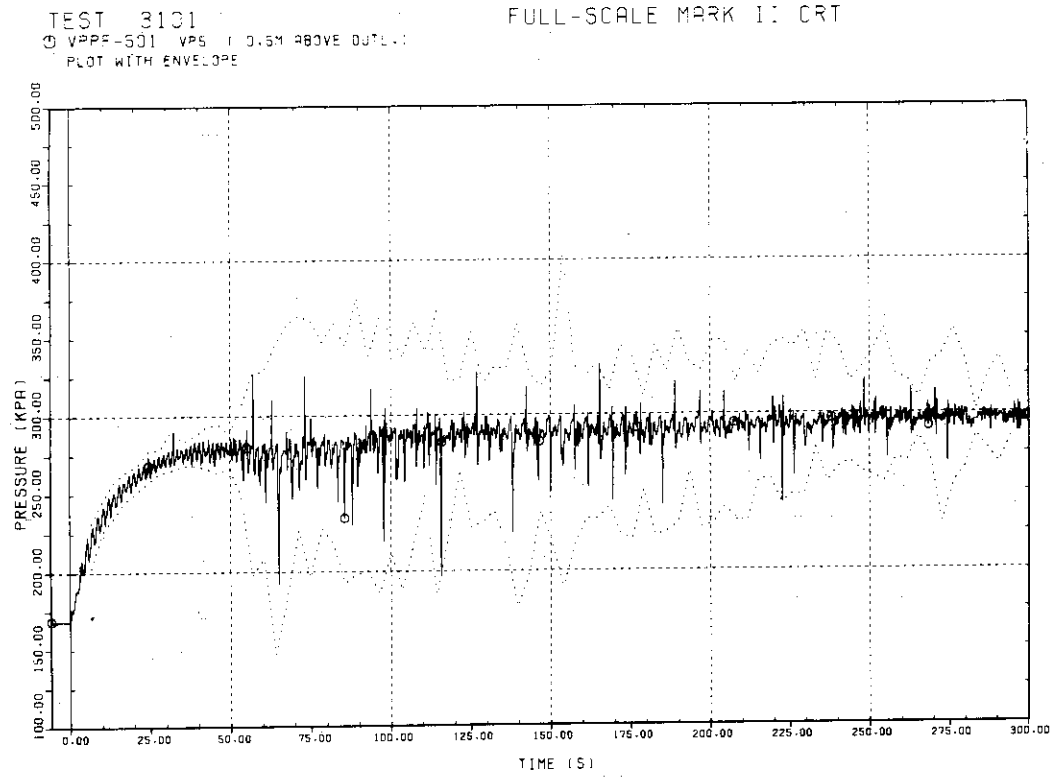
Plot L-1- 5 Pressure in Vent Pipe



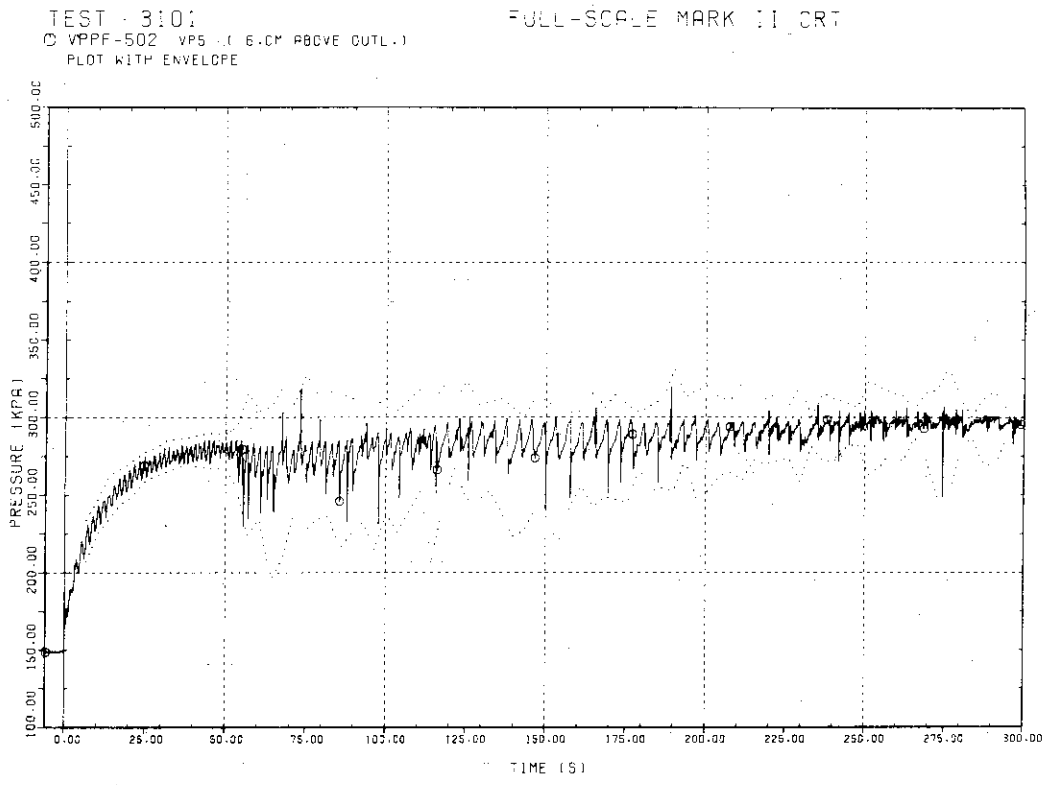
Plot L-1- 6 Pressure in Vent Pipe



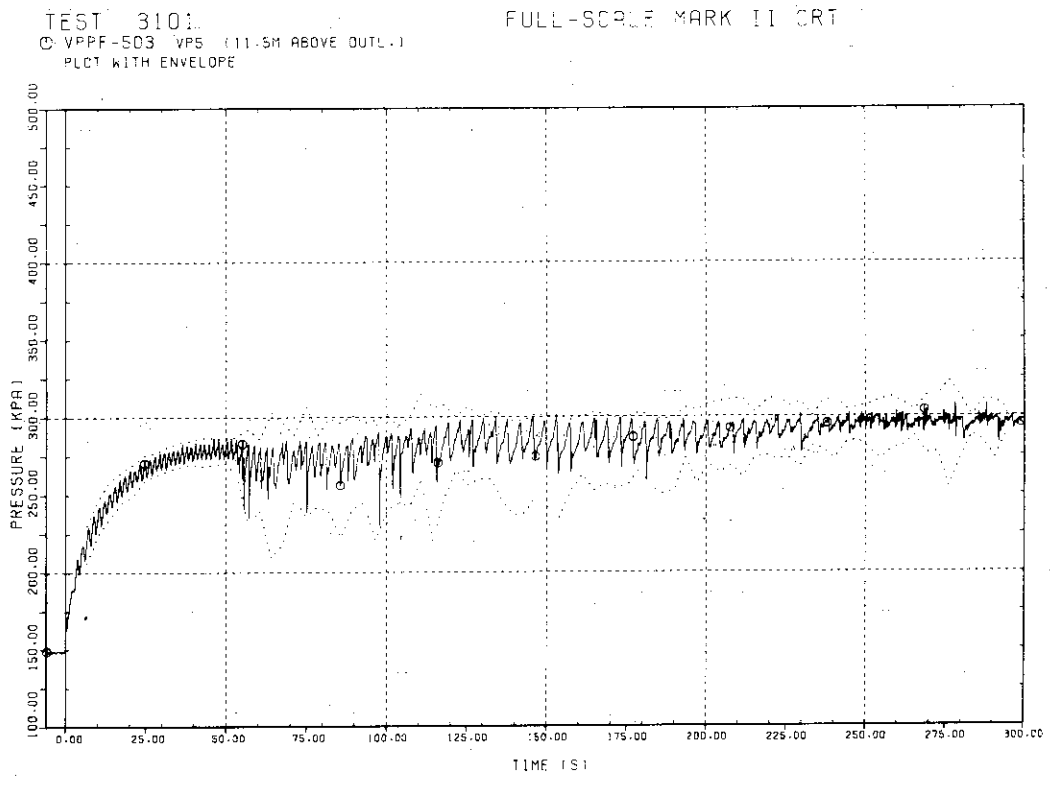
Plot L-1- 7　Pressure in Vent Pipe



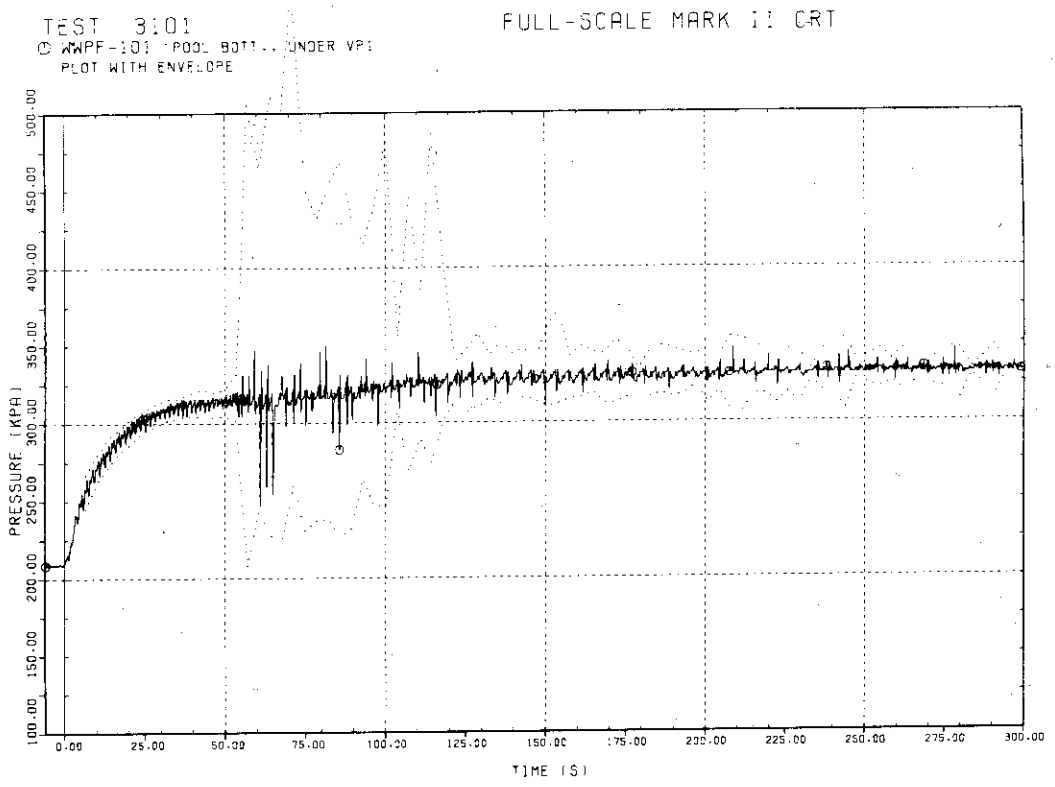
Plot L-1- 8　Pressure in Vent Pipe



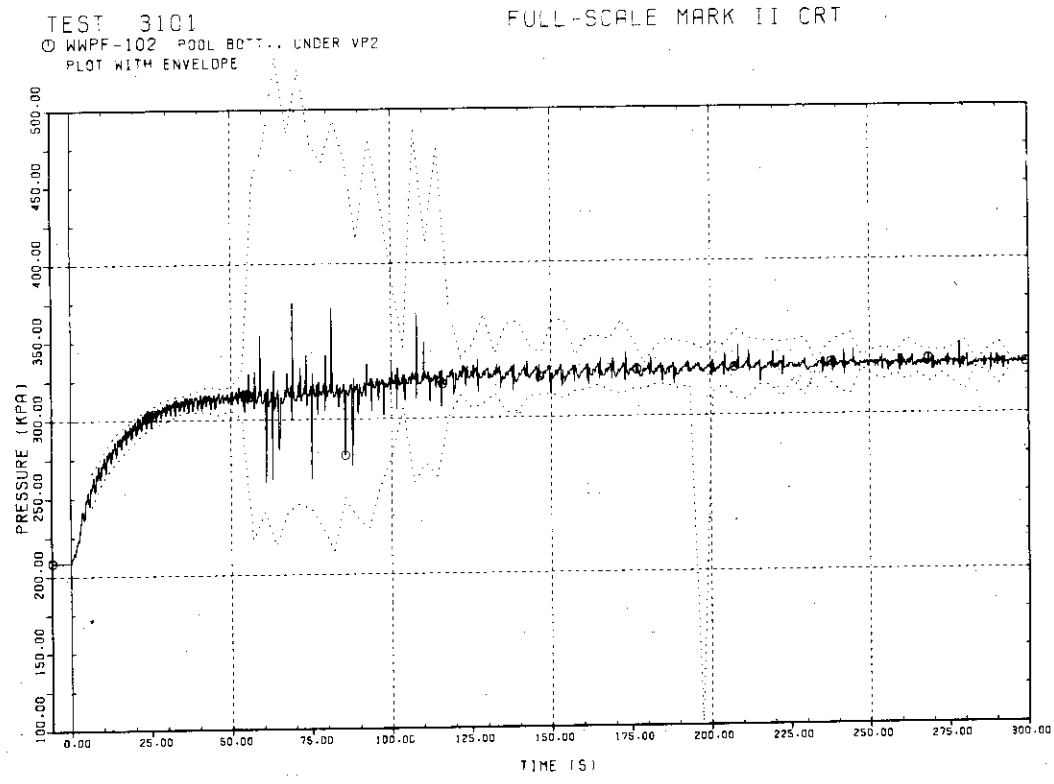
Plot L-1- 9　Pressure in Vent Pipe



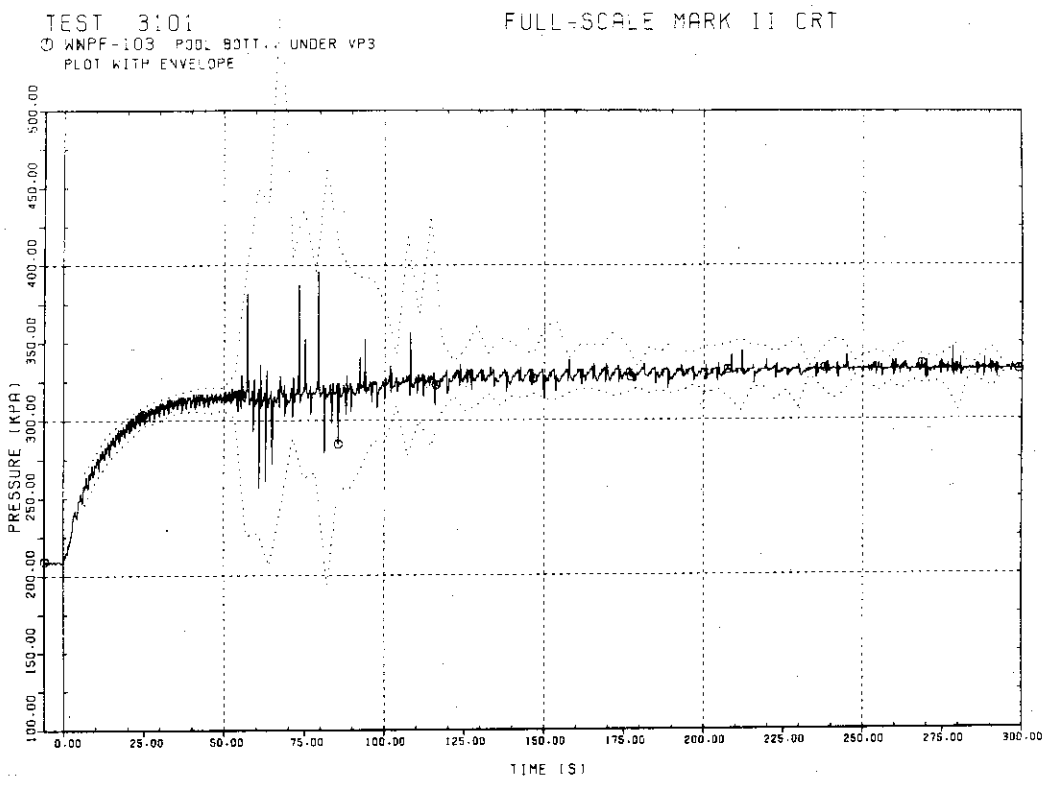
Plot L-1-10　Pressure in Vent Pipe



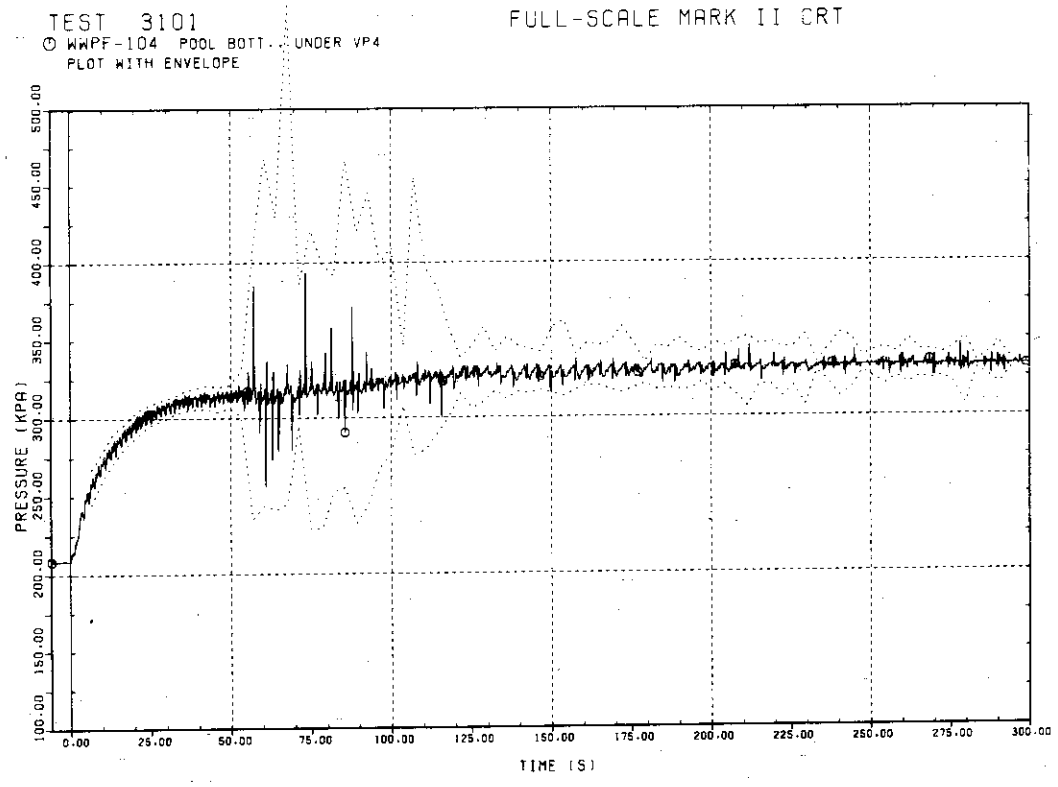
Plot L-1-11 Pressure in Wetwell



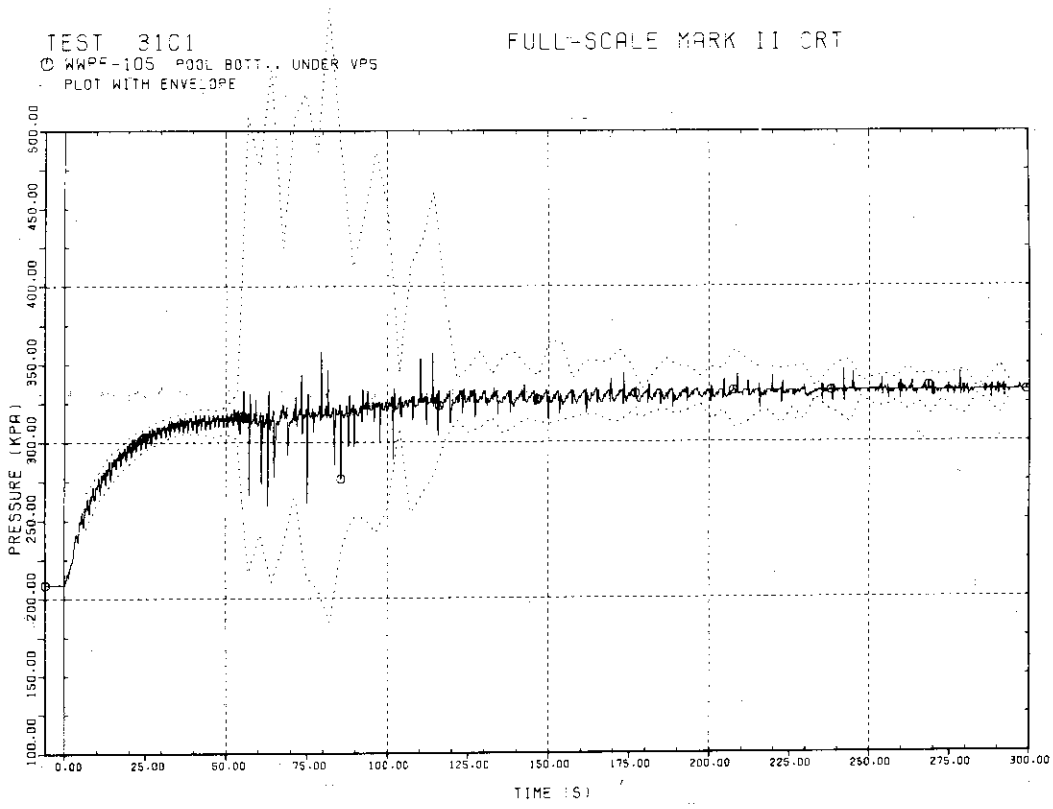
Plot L-1-12 Pressure in Wetwell



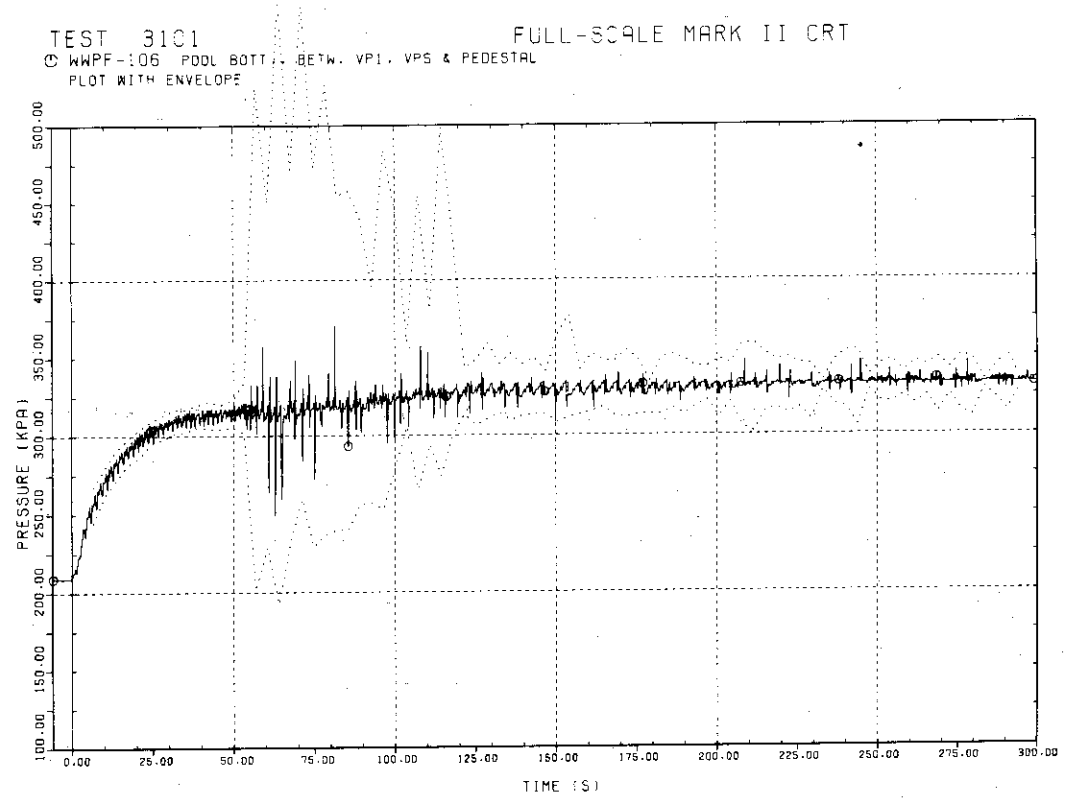
Plot L-1-13 Pressure in Wetwell



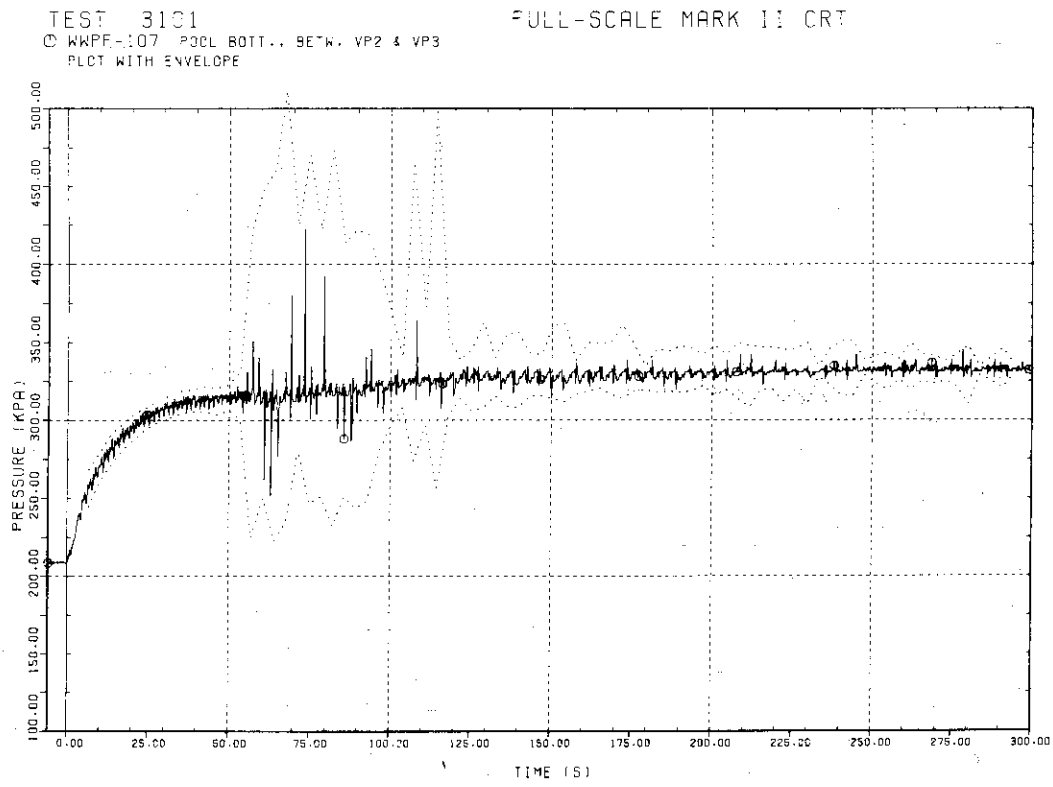
Plot L-1-14 Pressure in Wetwell



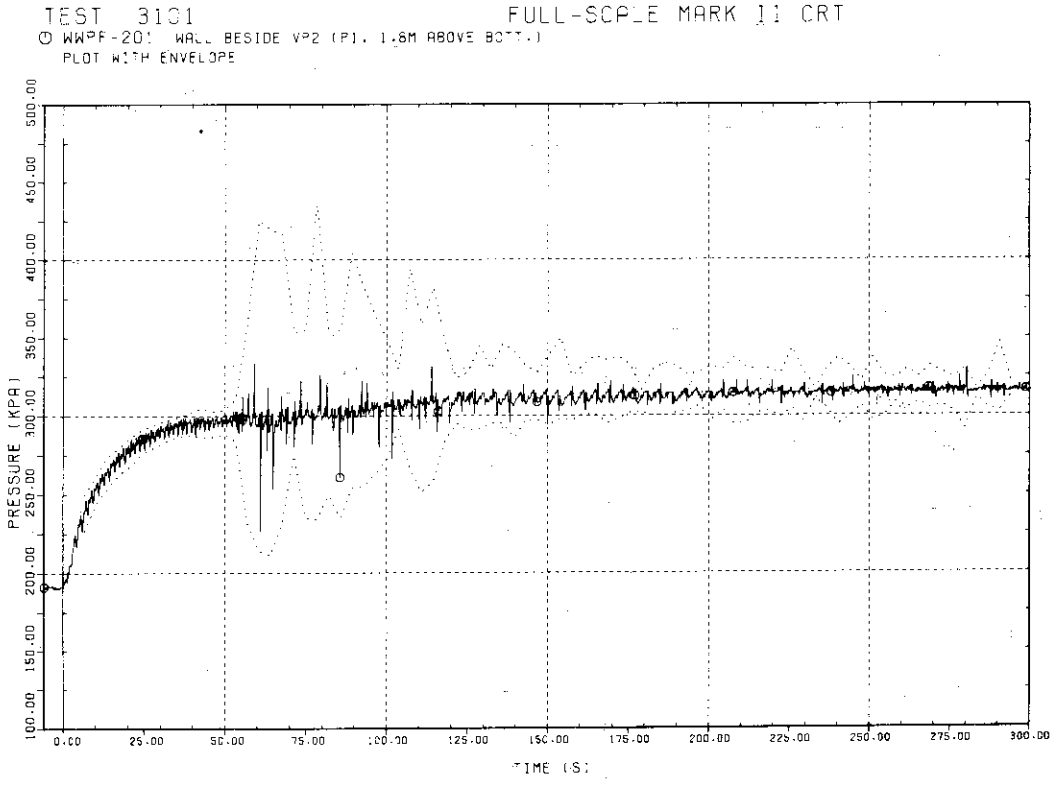
Plot L-1-15 Pressure in Wetwell



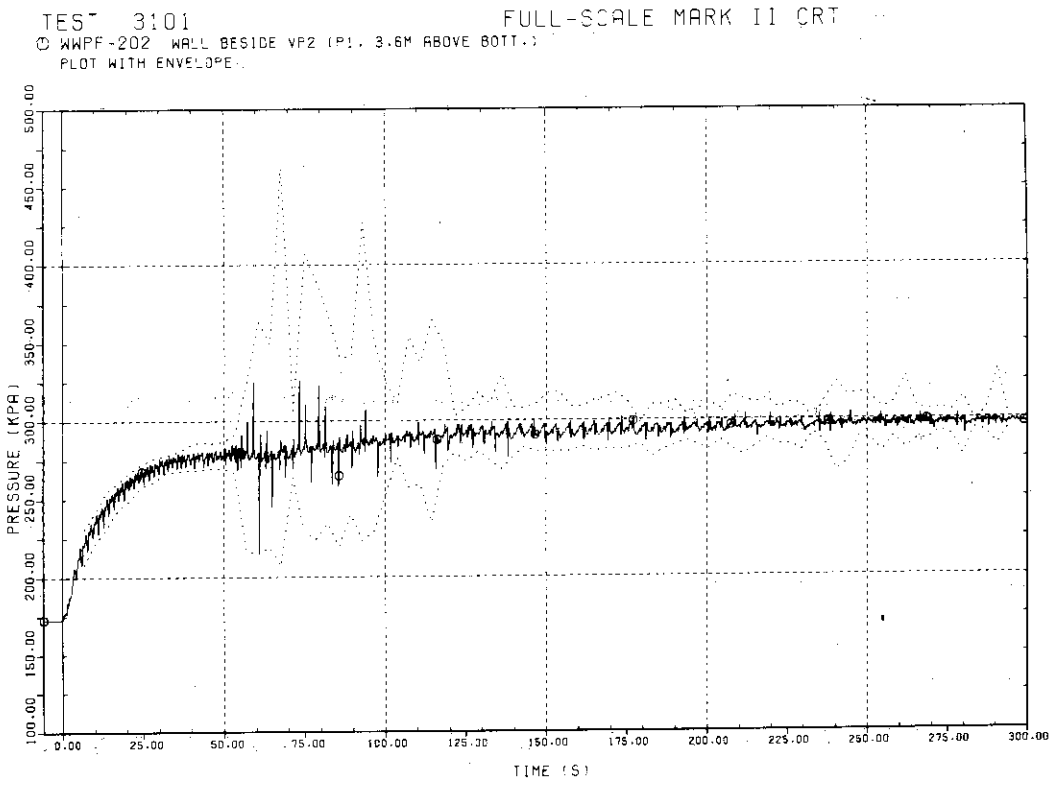
Plot L-1-16 Pressure in Wetwell



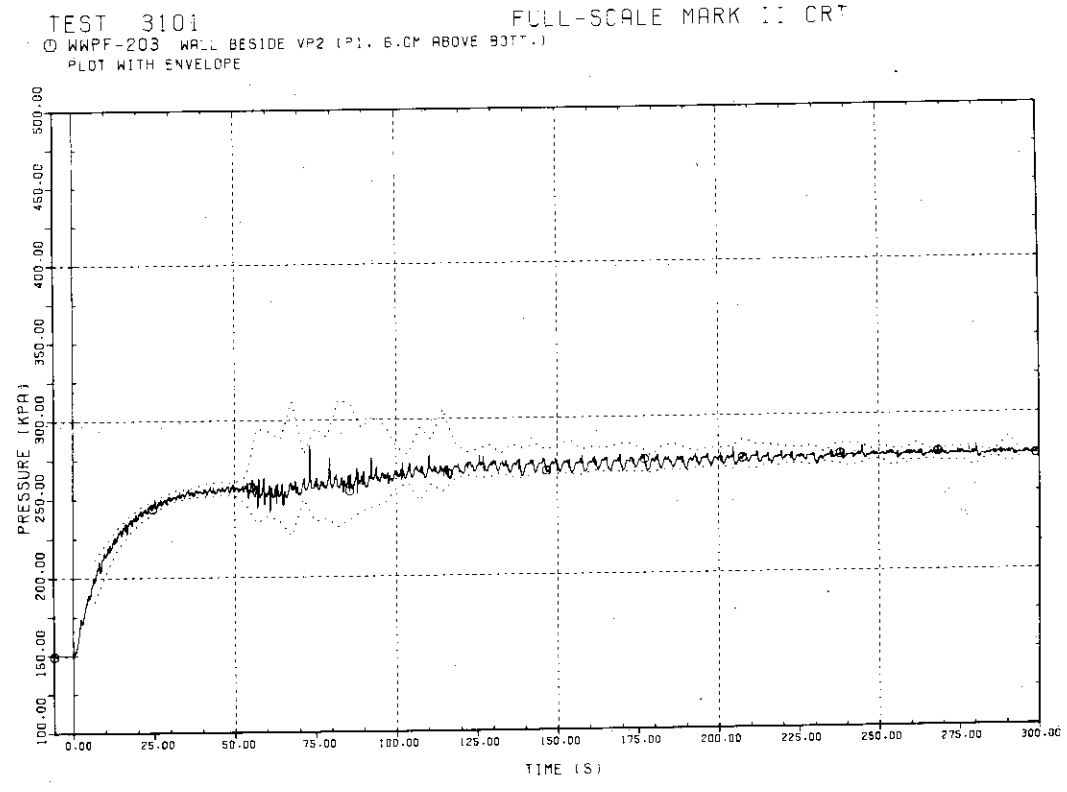
Plot L-1-17　Pressure in Wetwell



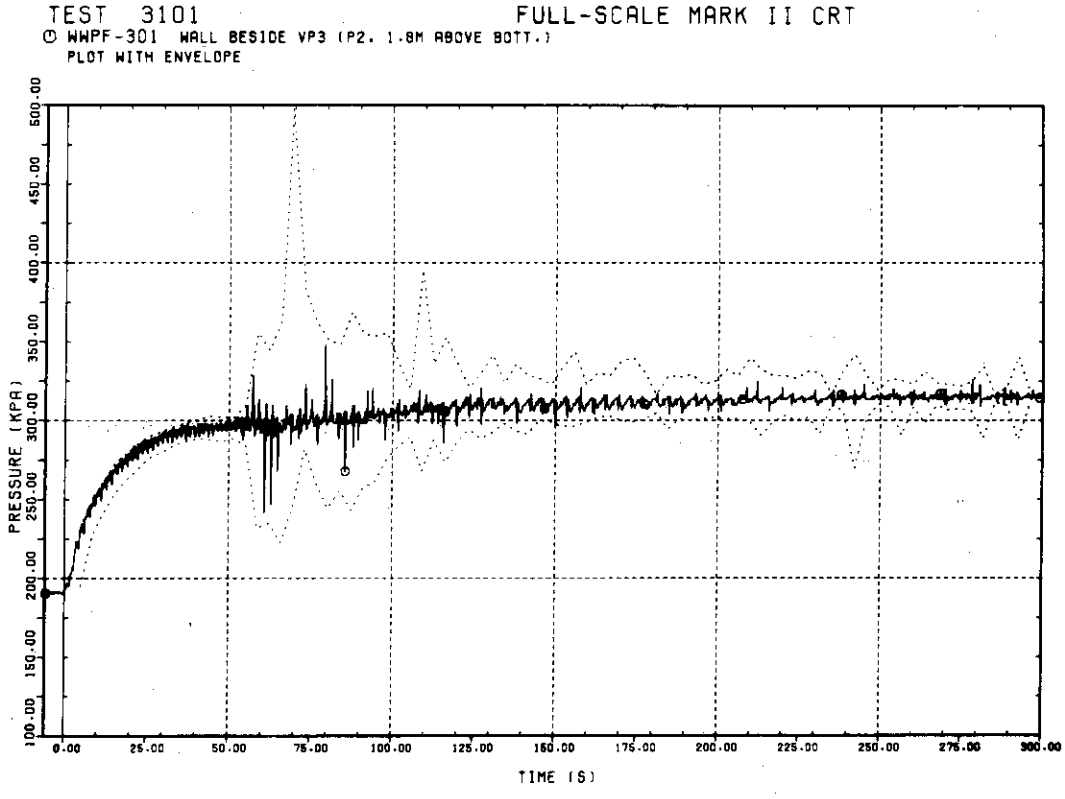
Plot L-1-18　Pressure in Wetwell



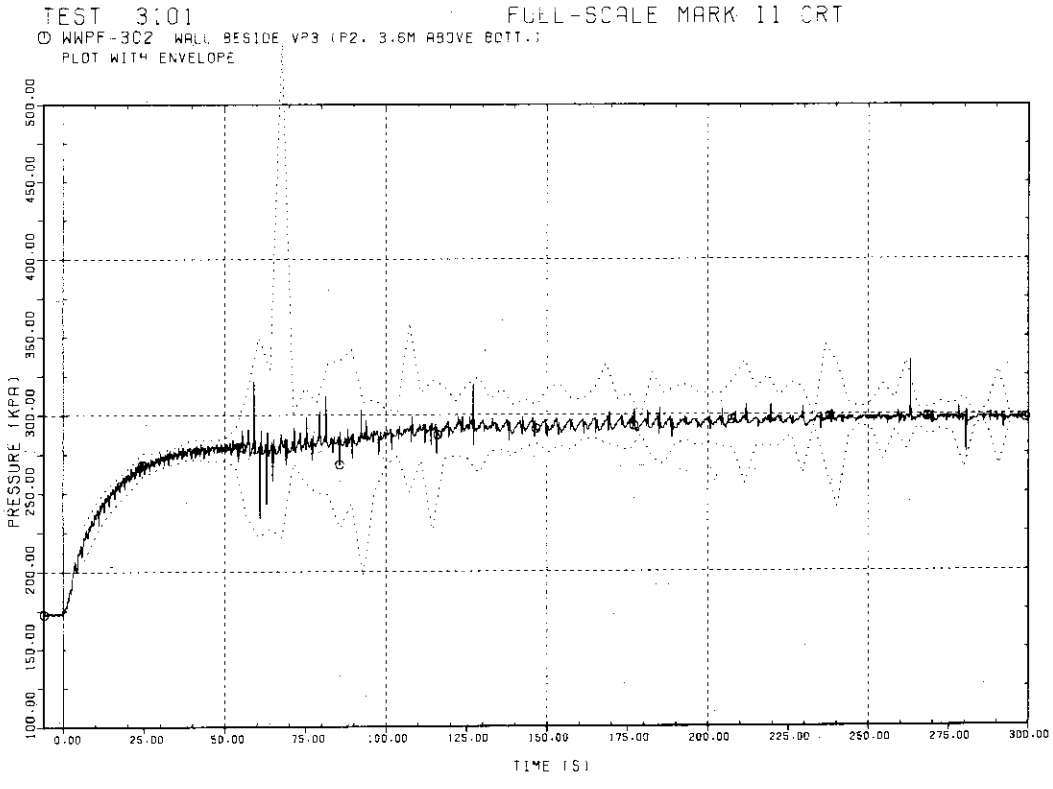
Plot L-1-19 Pressure in Wetwell



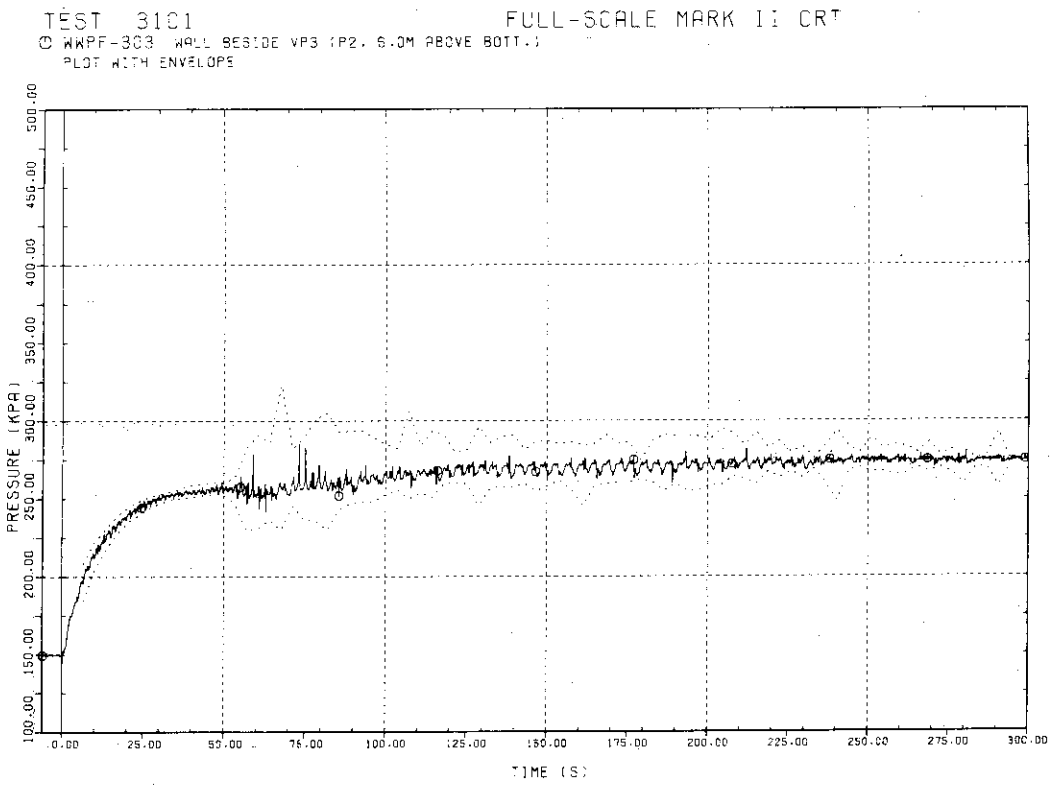
Plot L-1-20 Pressure in Wetwell



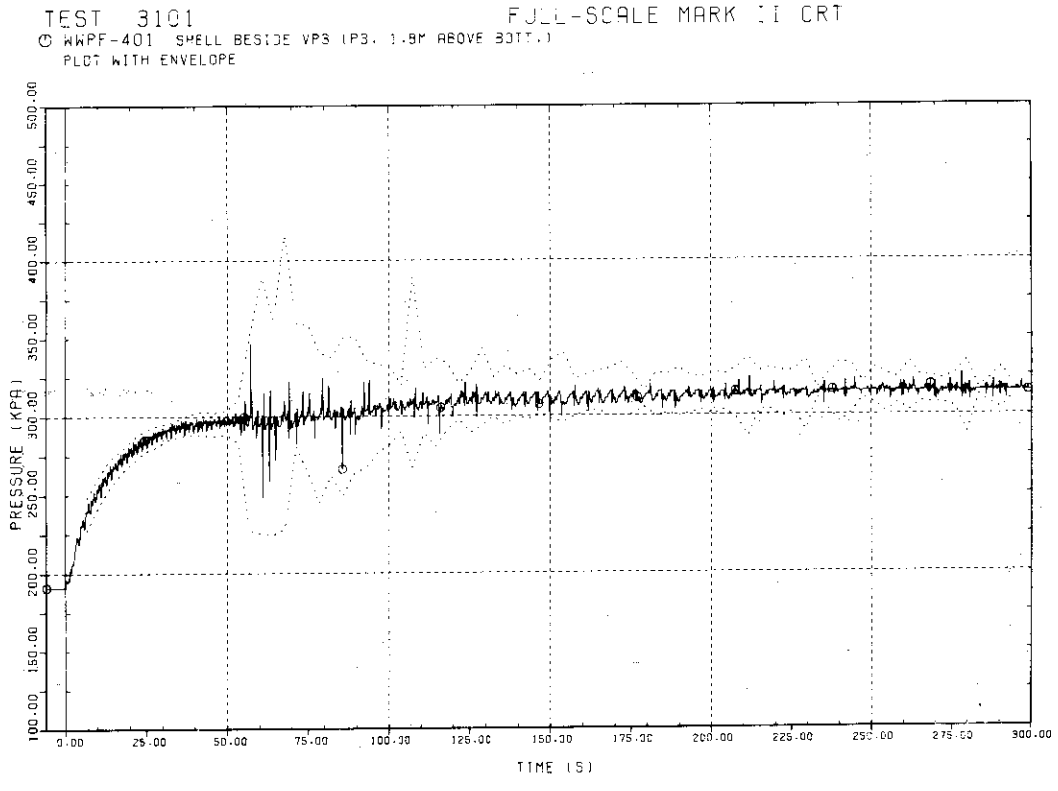
Plot L-1-21 Pressure in Wetwell



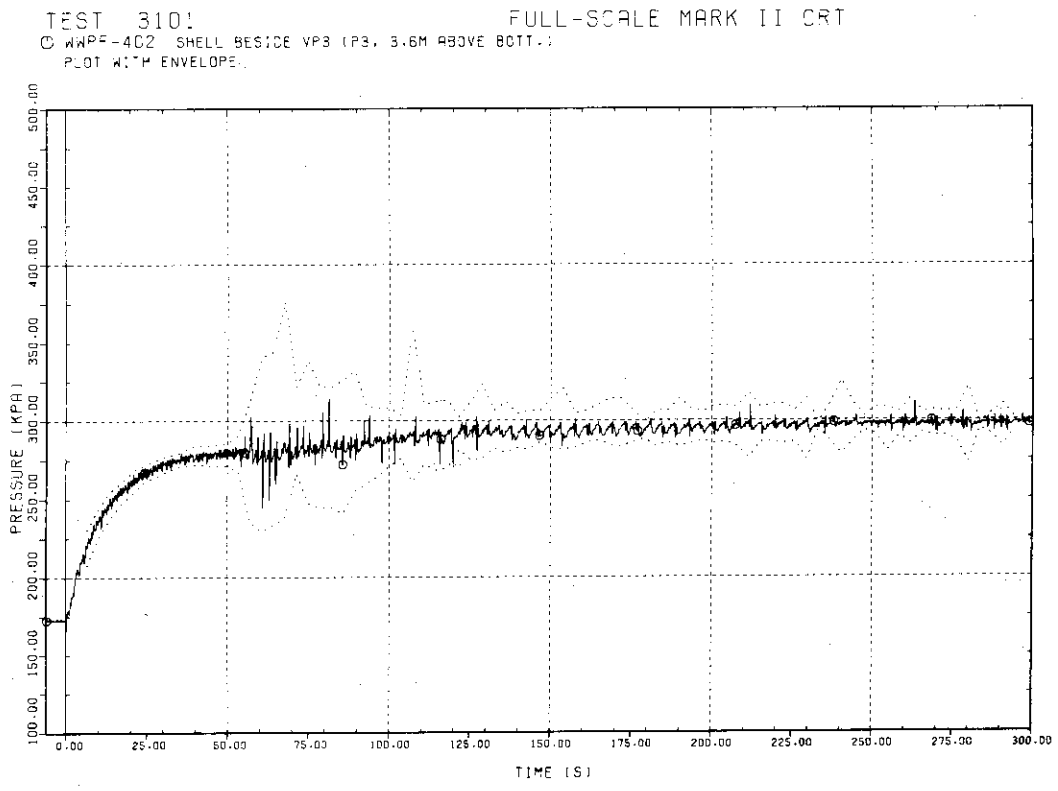
Plot L-1-22 Pressure in Wetwell



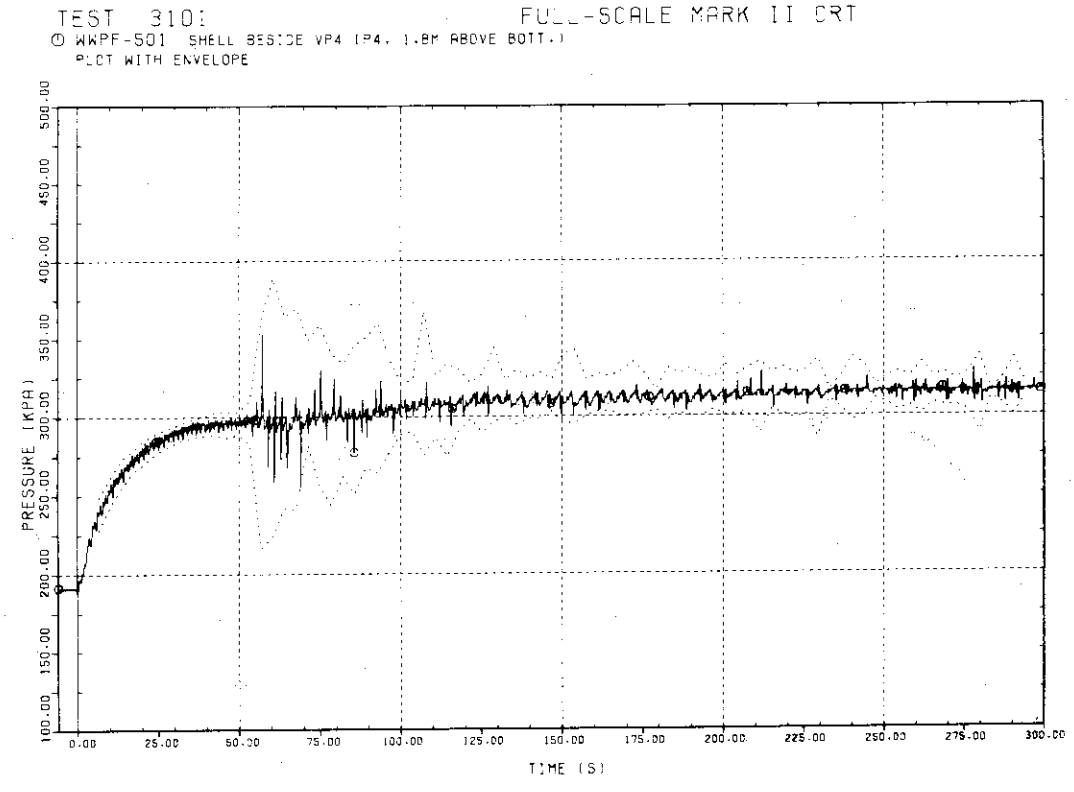
Plot L-1-23 Pressure in Wetwell



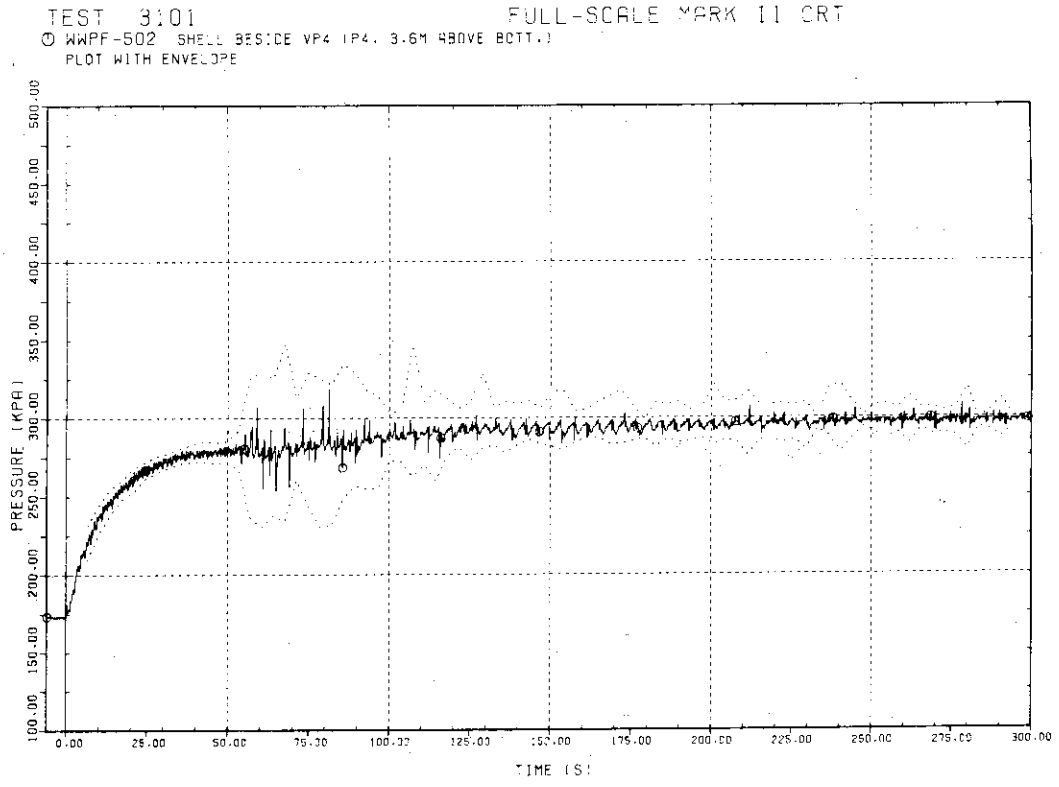
Plot L-1-24 Pressure in Wetwell



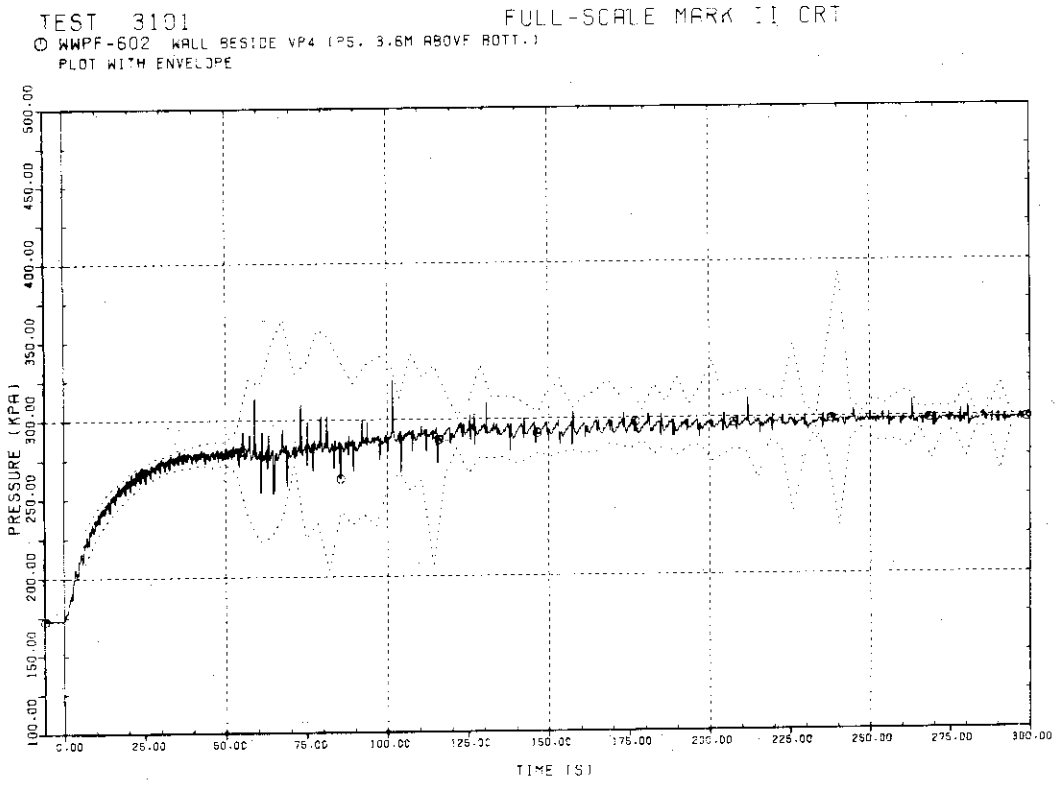
Plot L-1-25 Pressure in Wetwell



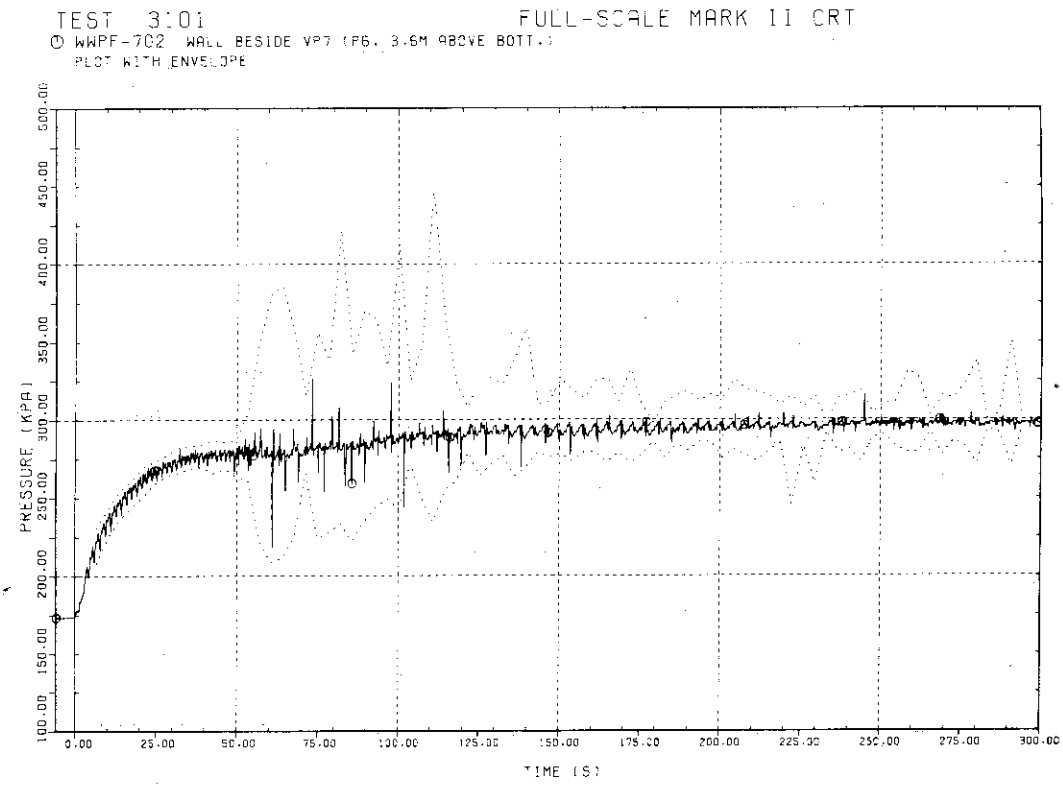
Plot L-1-26 Pressure in Wetwell



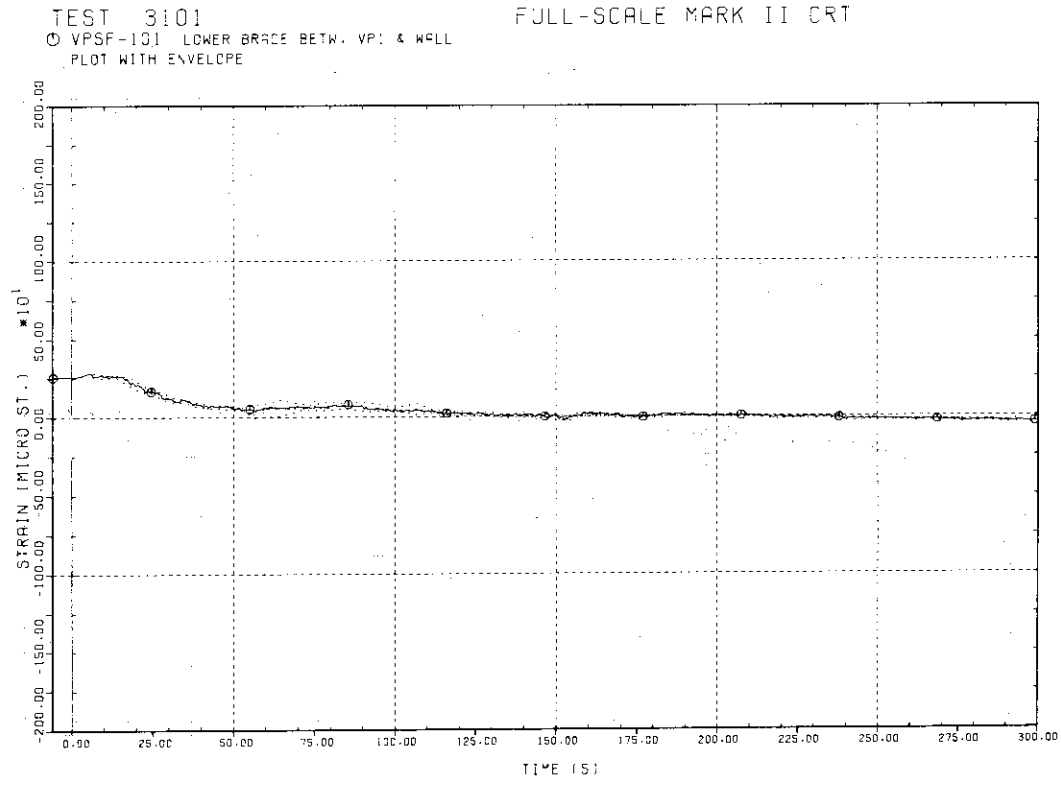
Plot L-1-27 Pressure in Wetwell



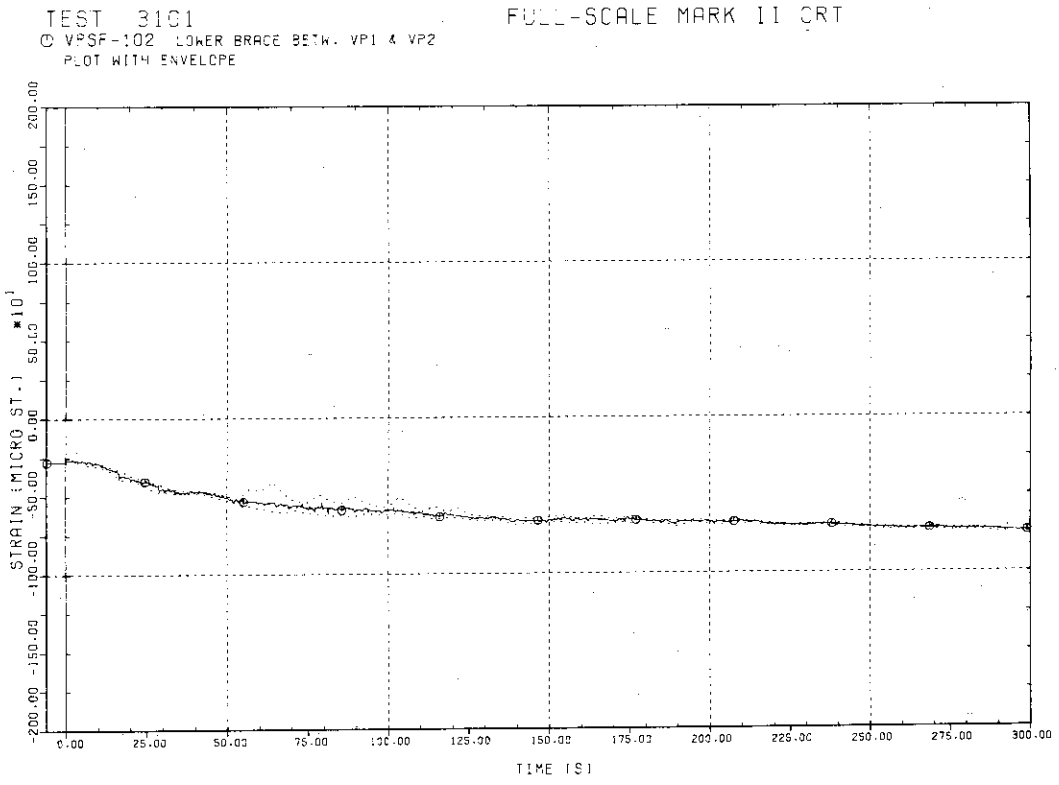
Plot L-1-28 Pressure in Wetwell



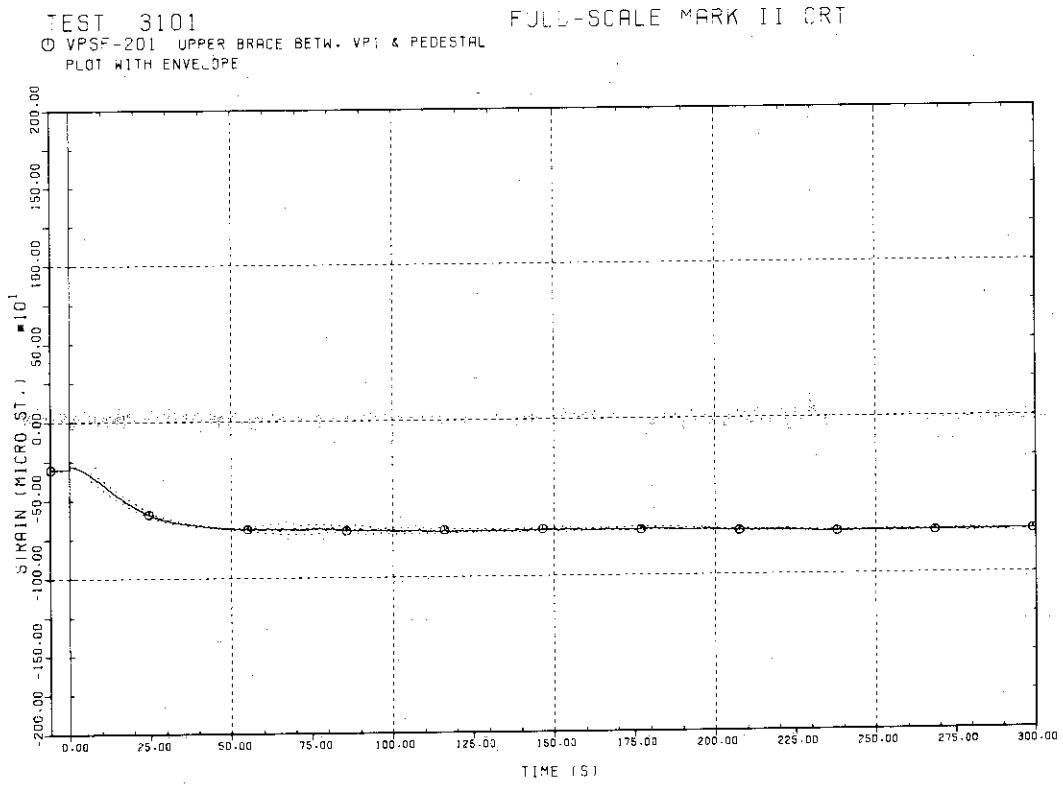
Plot L-1-29 Pressure in Wetwell



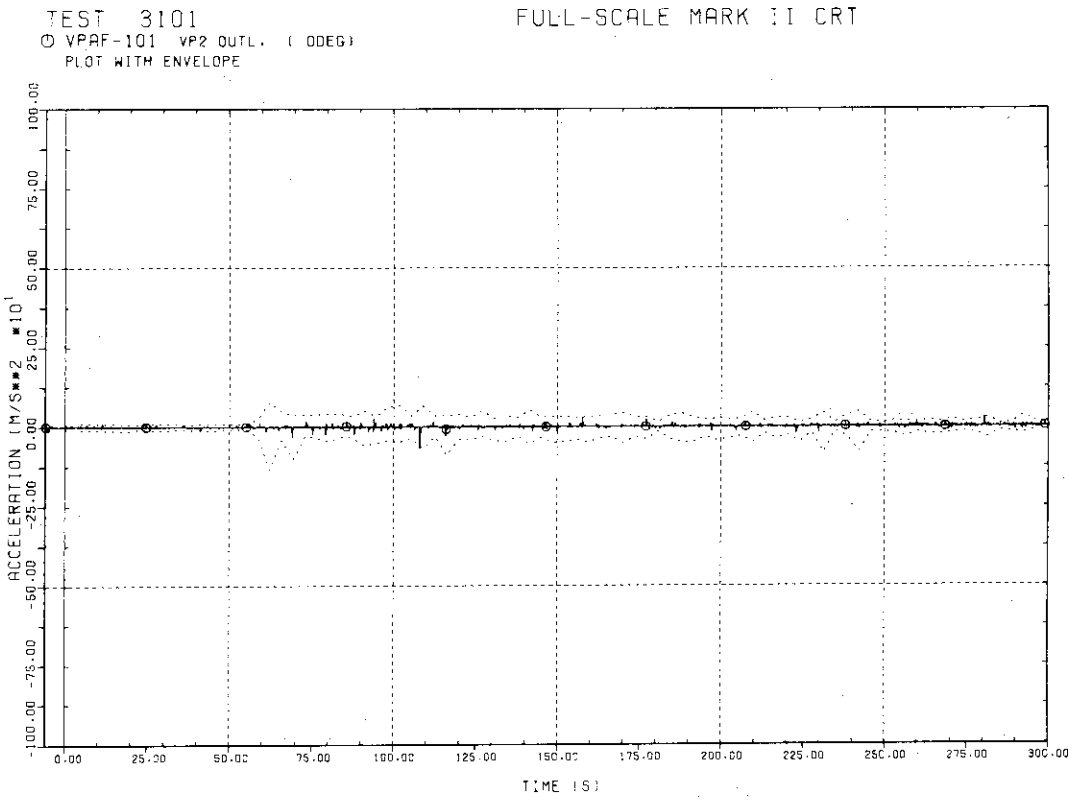
Plot L-1-30 Strain of Vent Pipe Brace



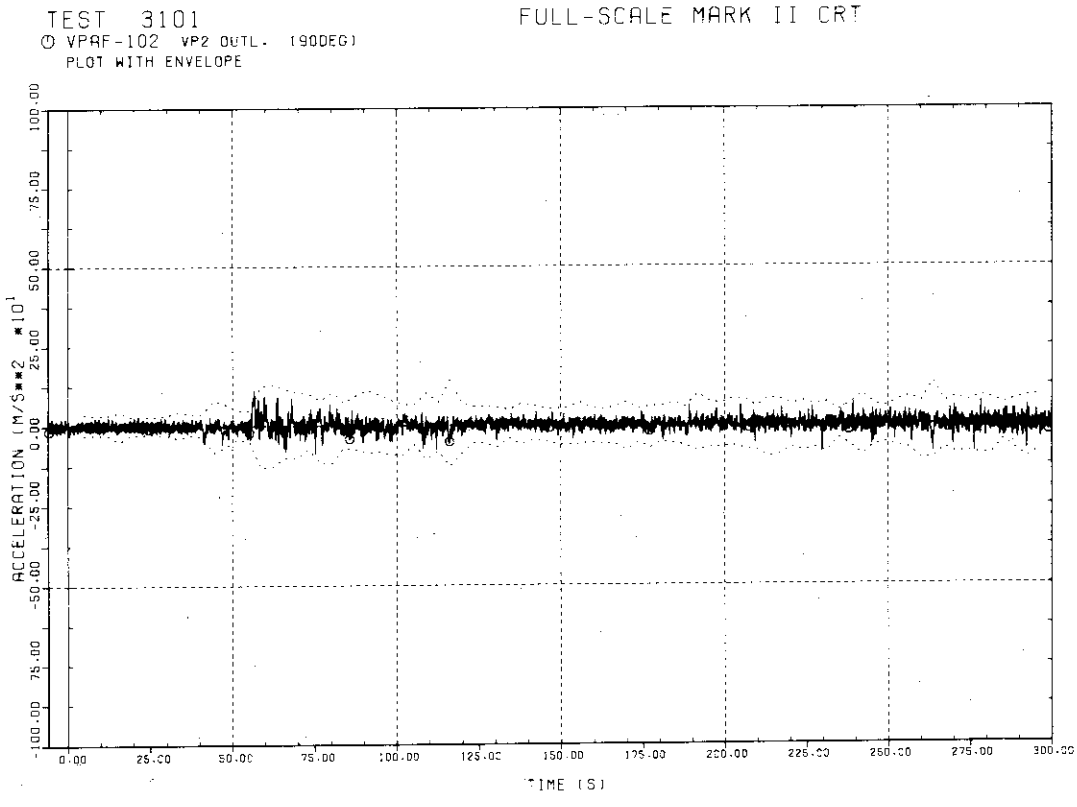
Plot L-1-31 Strain of Vent Pipe Brace



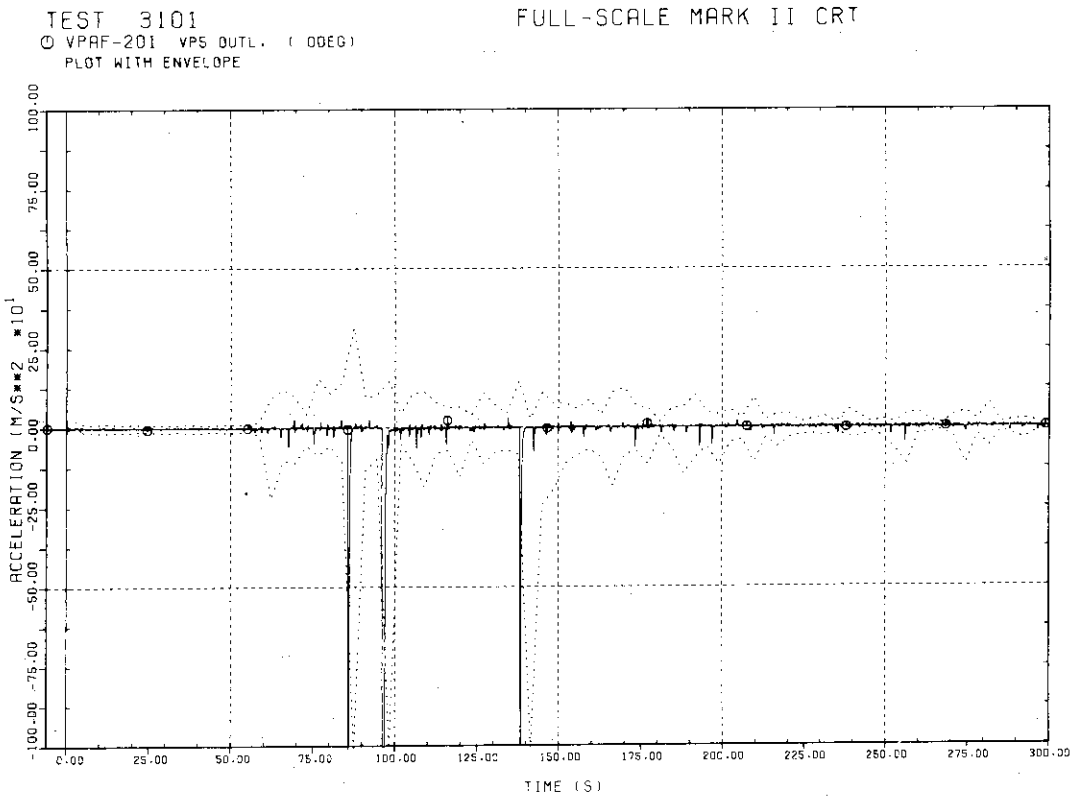
Plot L-1-32 Strain of Vent Pipe Brace



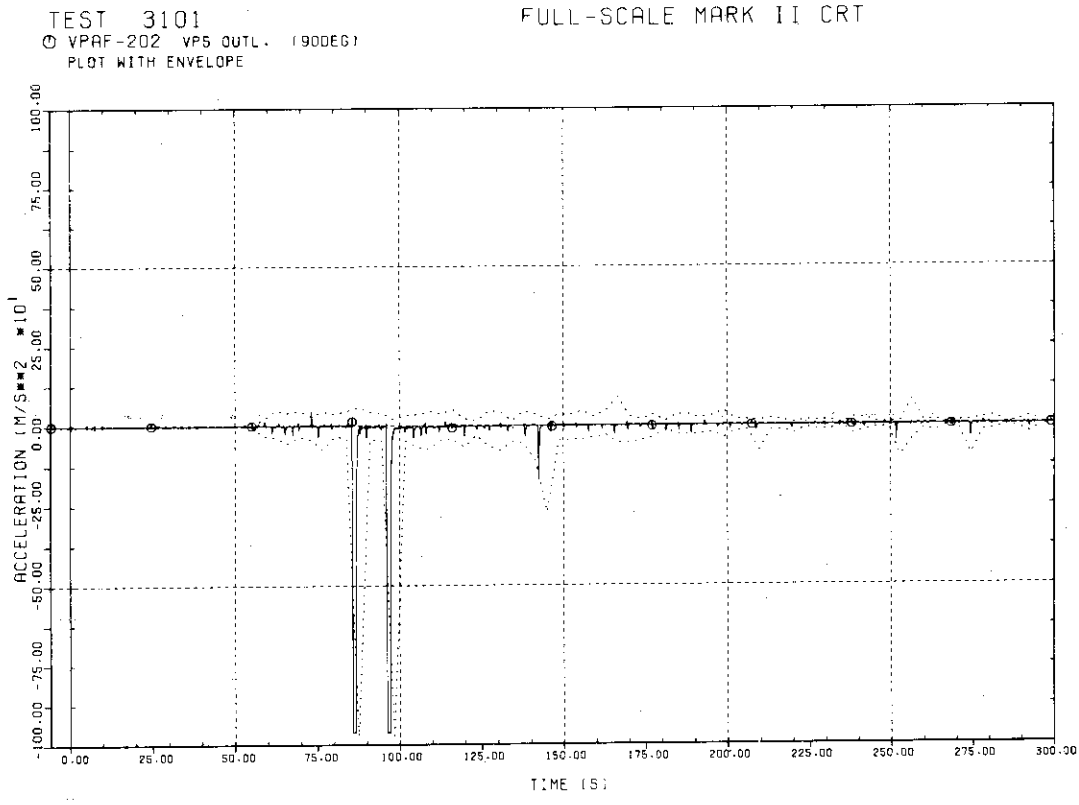
Plot L-2- 1 Acceleration of Vent Pipe Outlet



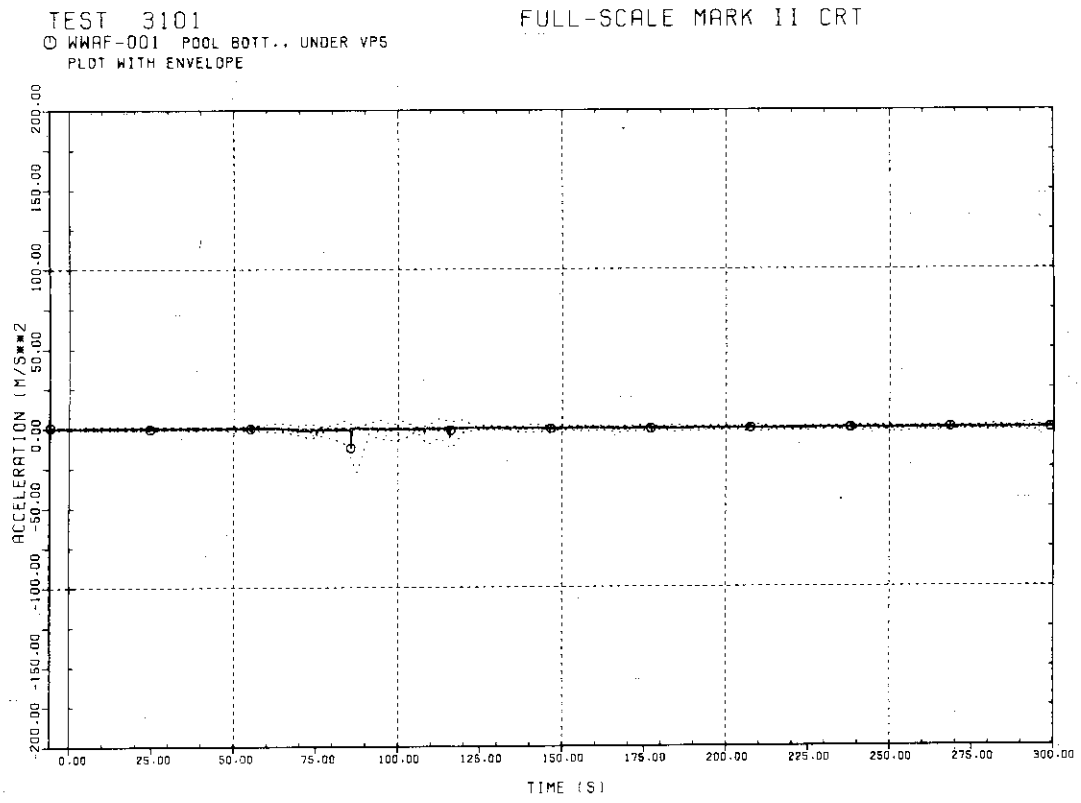
Plot L-2- 2 Acceleration of Vent Pipe Outlet



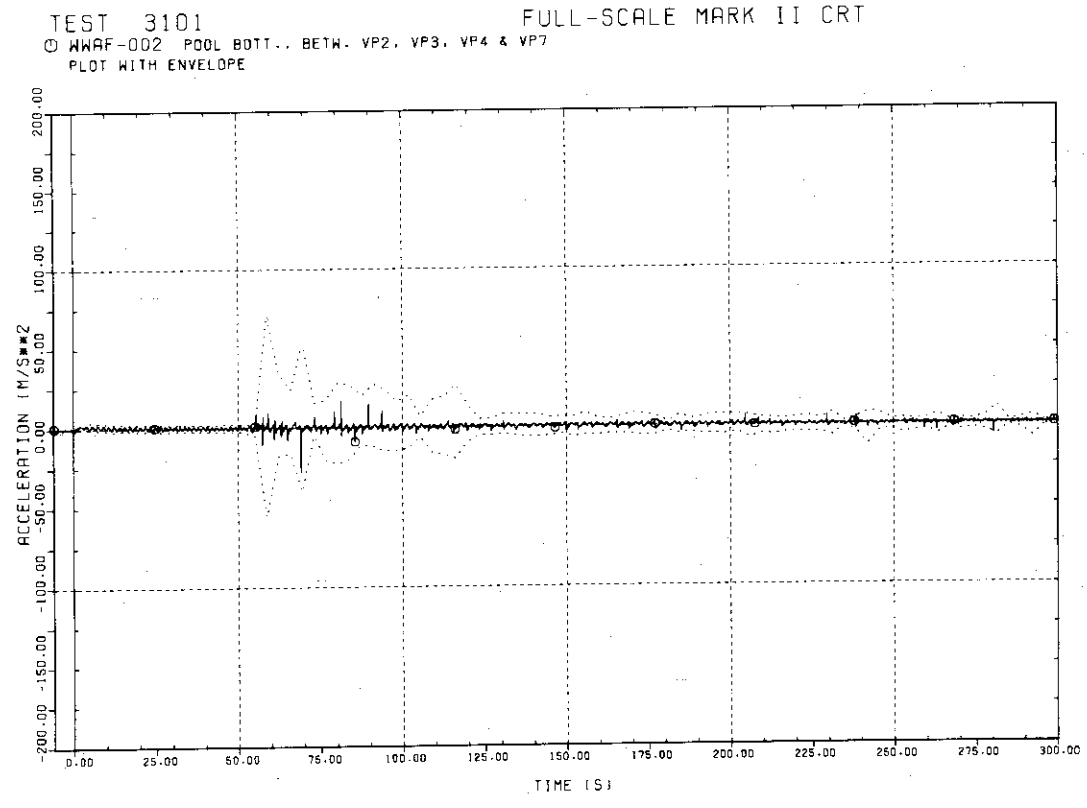
Plot L-2- 3 Acceleration of Vent Pipe Outlet



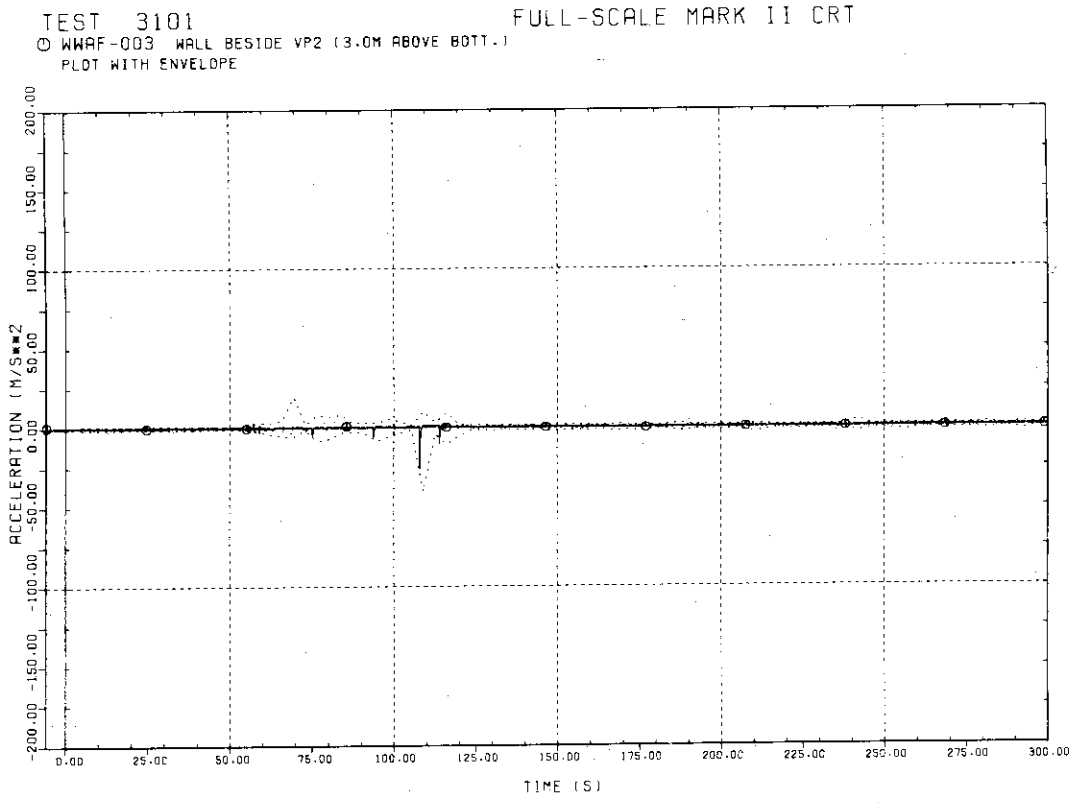
Plot L-2- 4 Acceleration of Vent Pipe Outlet



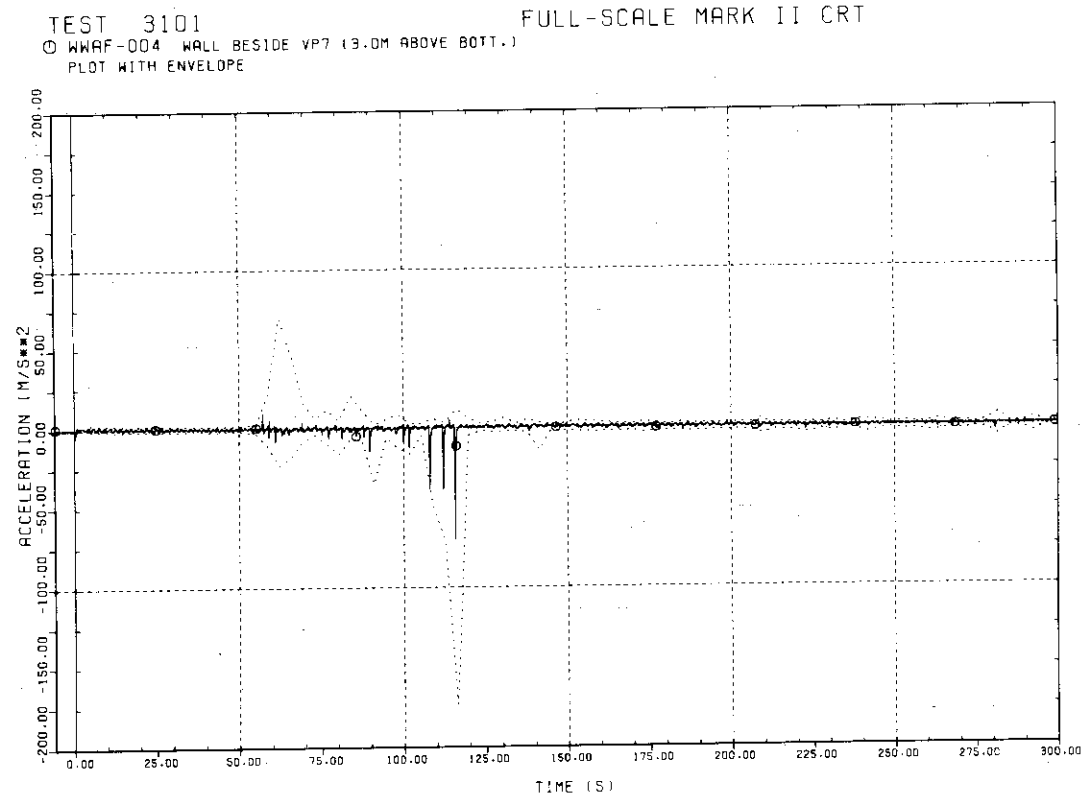
Plot L-2- 5　Acceleration of Containment Structure



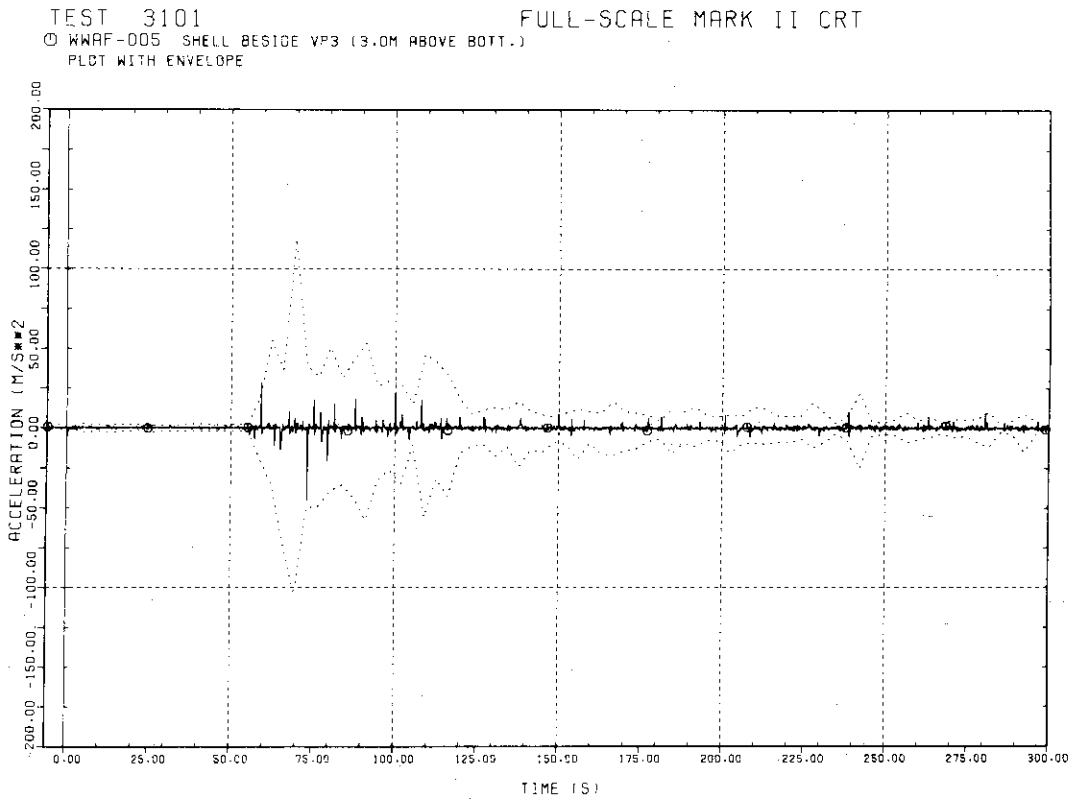
Plot L-2- 6　Acceleration of Containment Structure



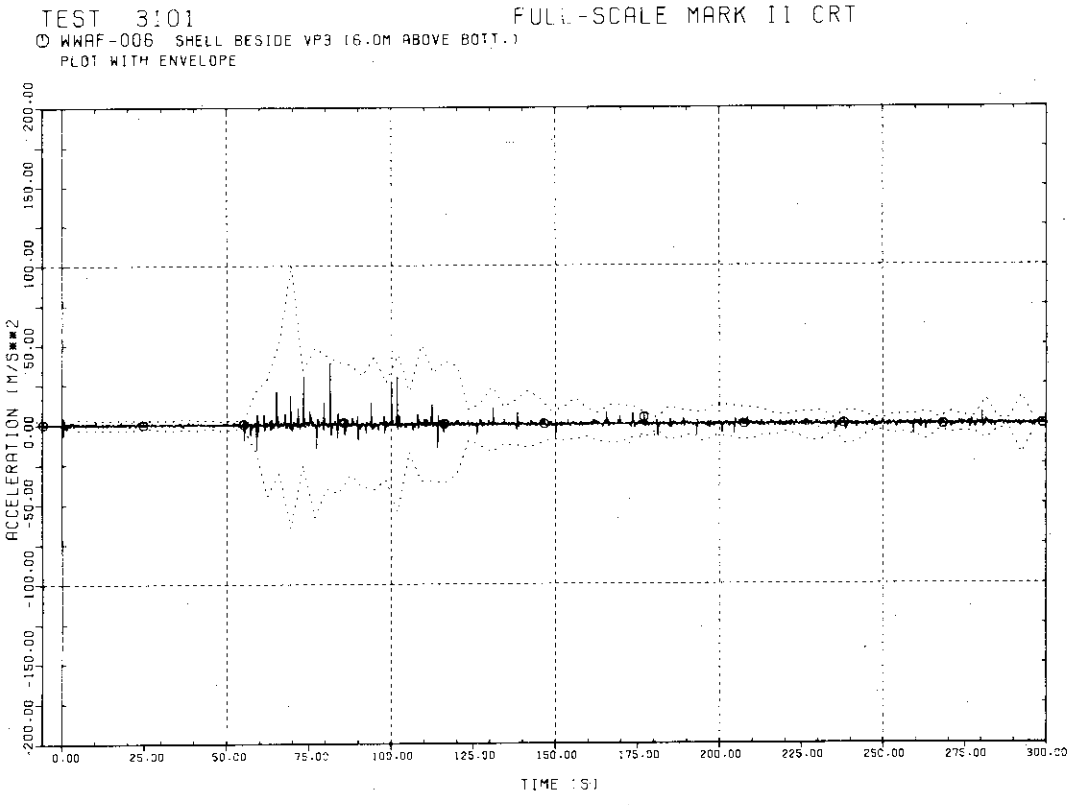
Plot L-2- 7 Acceleration of Containment Structure



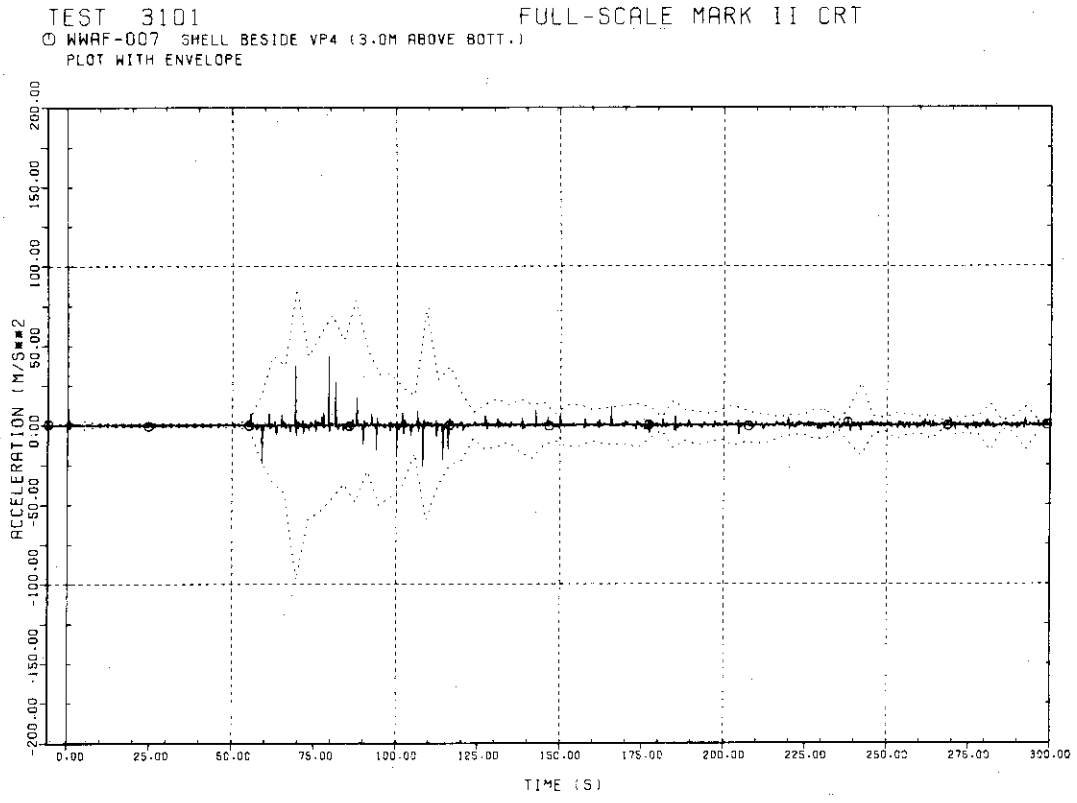
Plot L-2- 8 Acceleration of Containment Structure



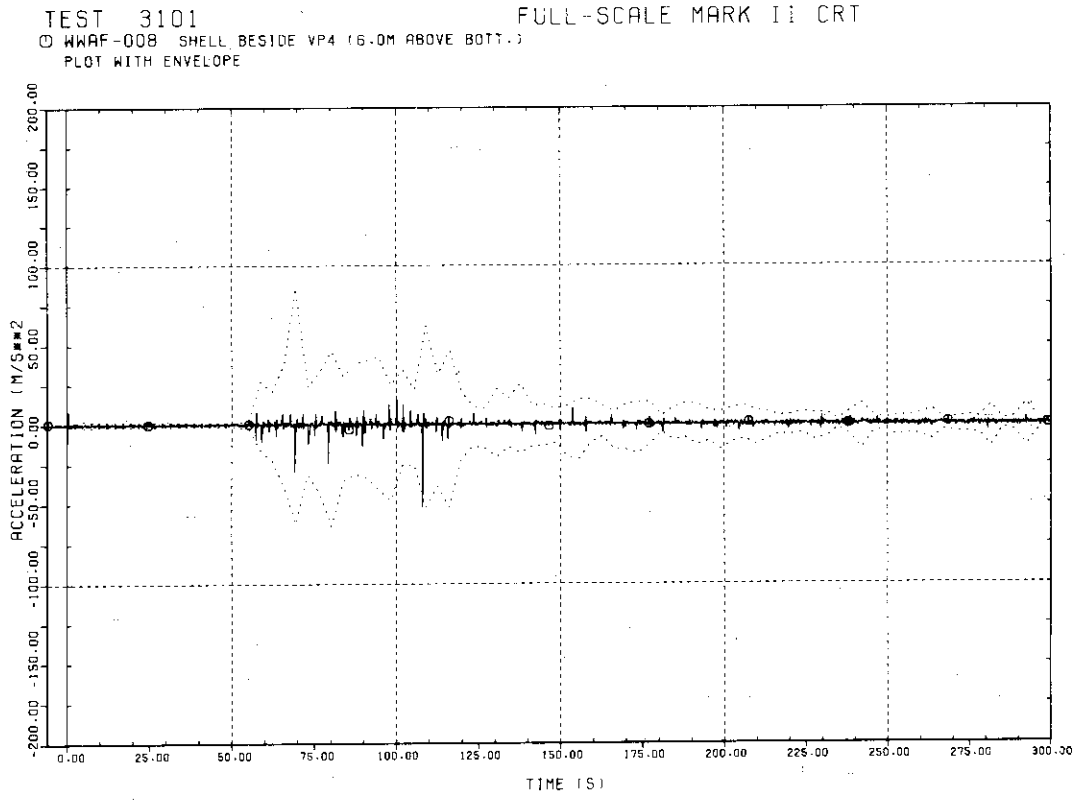
Plot L-2- 9 Acceleration of Containment Structure



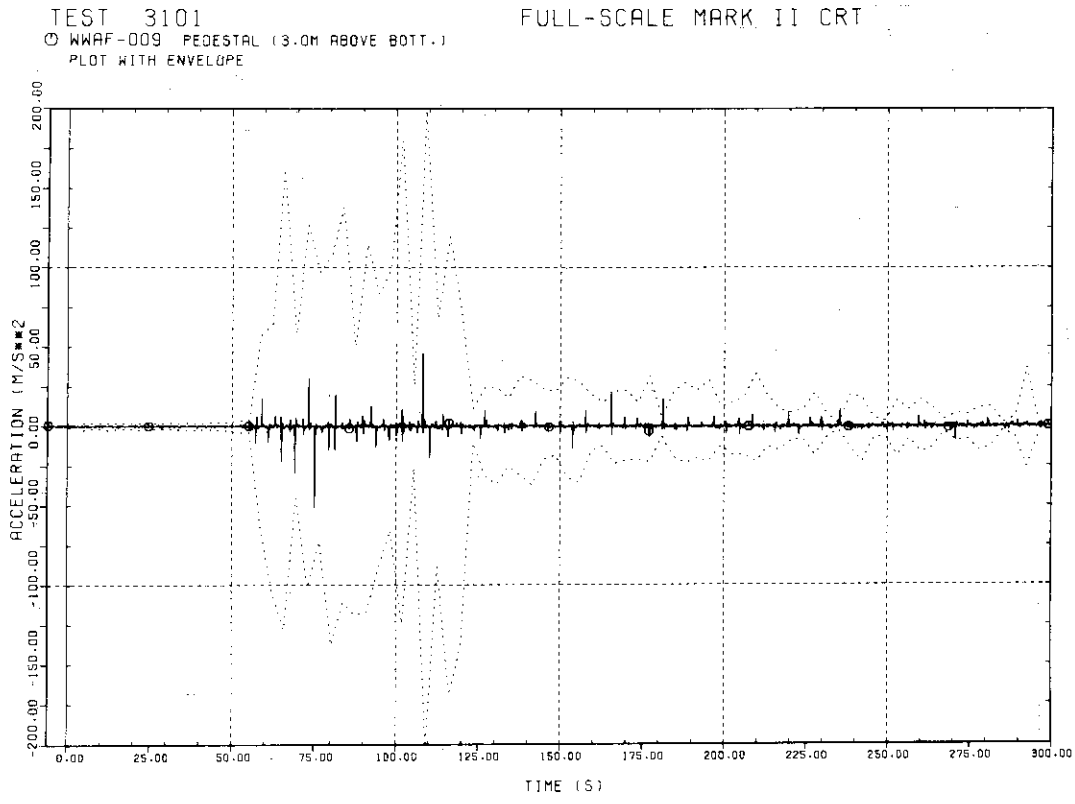
Plot L-2-10 Acceleration of Containment Structure



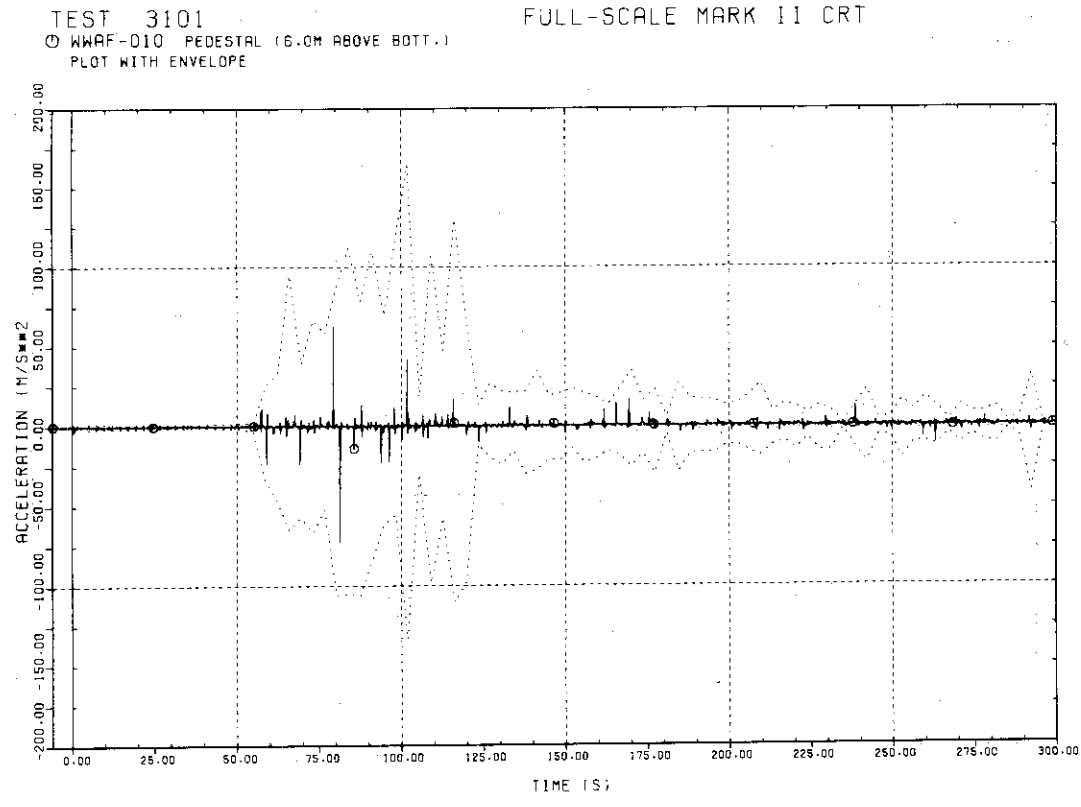
Plot L-2-11 Acceleration of Containment Structure



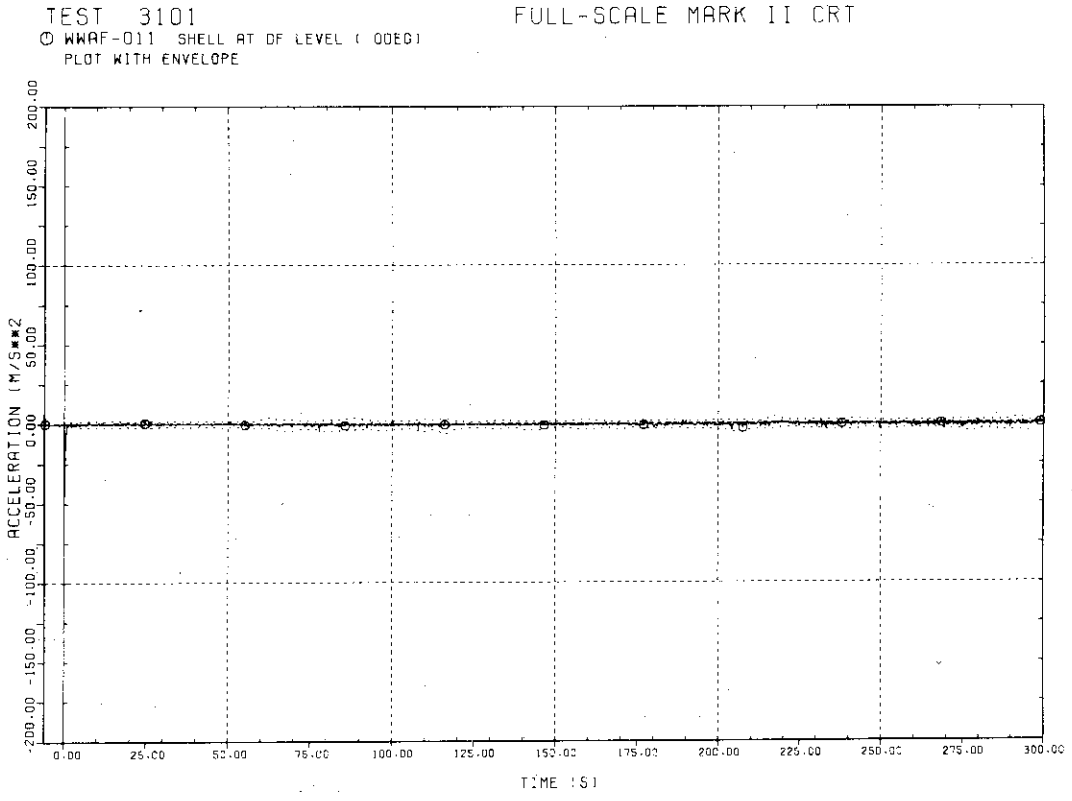
Plot L-2-12 Acceleration of Containment Structure



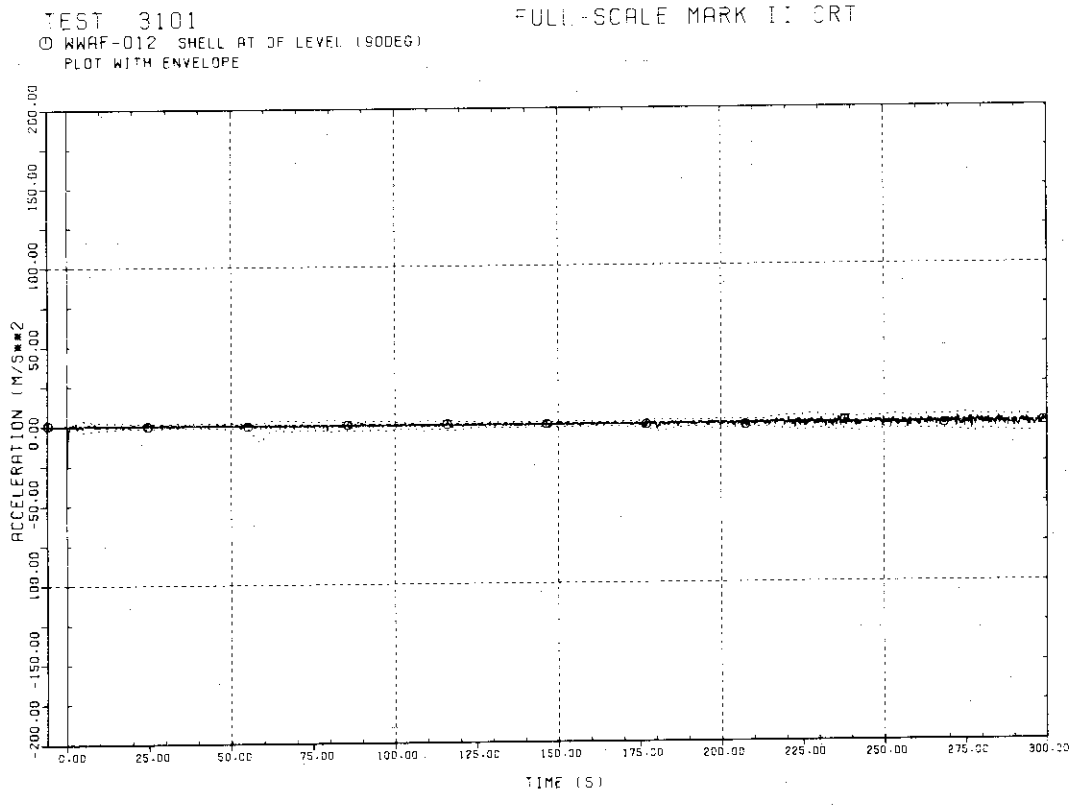
Plot L-2-13 Acceleration of Containment Structure



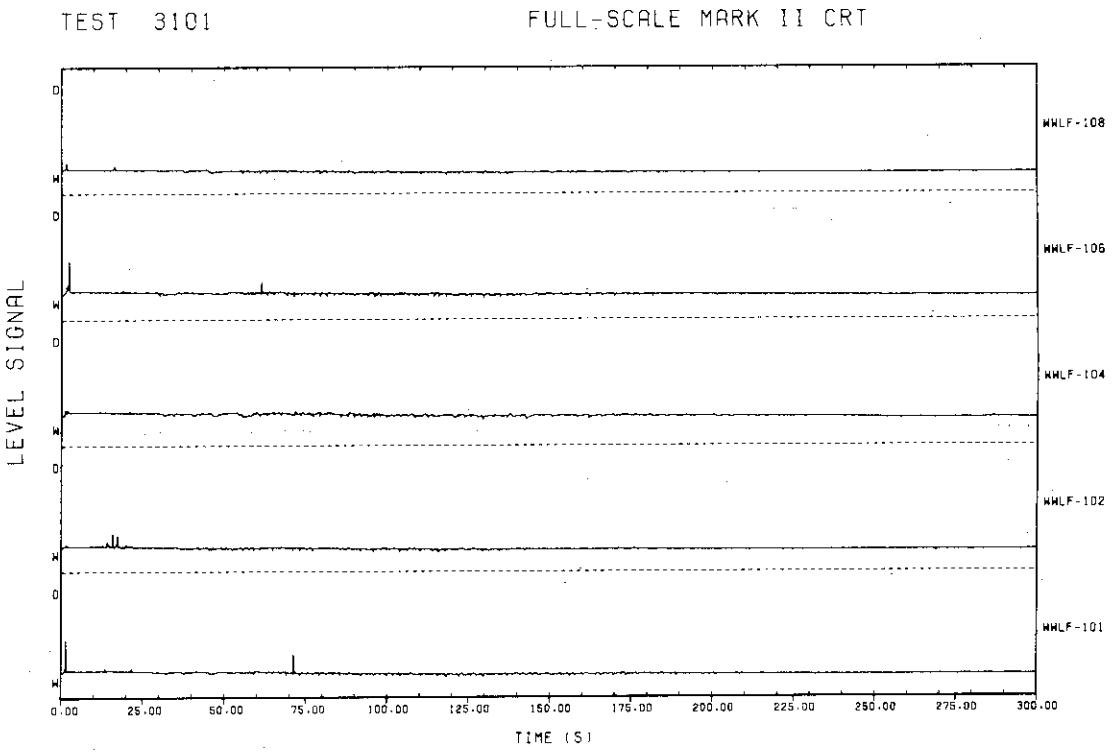
Plot L-2-14 Acceleration of Containment Structure



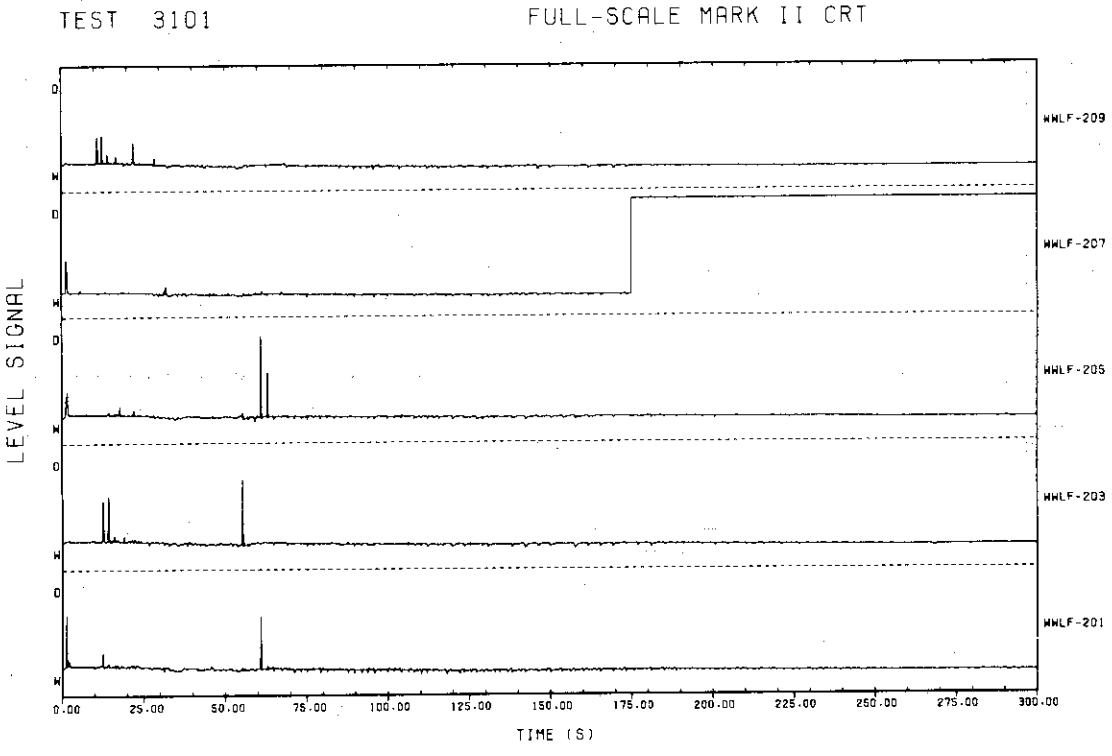
Plot L-2-15 Acceleration of Containment Structure



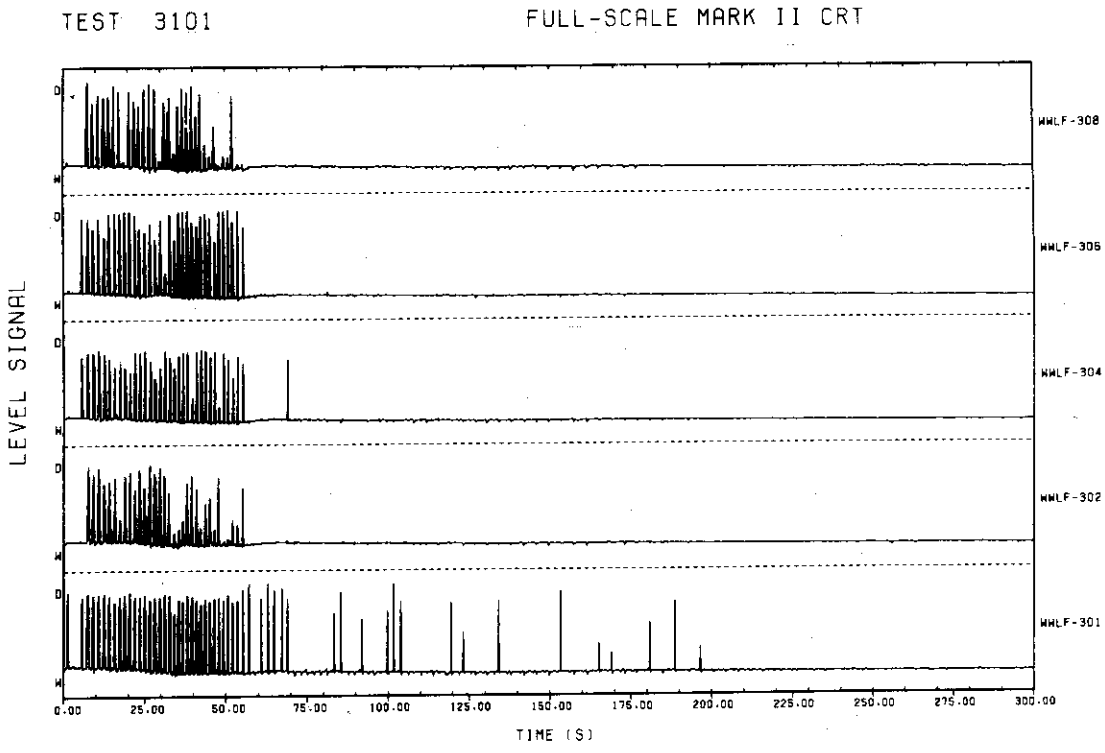
Plot L-2-16 Acceleration of Containment Structure



Plot L-2-17 Phase Boundary Signals



Plot L-2-18 Phase Boundary Signals



Plot L-2-19 Phase Boundary Signals

Short Term Plots of Data

Short Term Plot Specification

Period 60-70 s

Objective : Detailed Presentation of [ ] Pool Swell.
[ ] High and Medium Steam Flux Condensation Oscillation.
[X] Chugging.

Plot No.	Recofding System	Recording Rate (Data/s)	Sampling Rate for Plots	Remarks
S-0-1 -10	Computer	50	1/1	
S-1-1 -32	PCM Track-1	455.6	1/1	
S-2-1 -14	PCM Track-2	455.6	1/1	

List of Short Term Plots

Computer Recorded Channels

Plot S-0- 1	Temperatures in Vent Pipe	(VP1)
Plot S-0- 2	Temperatures in Vent Pipe	(VP2)
Plot S-0- 3	Temperatures in Vent Pipe	(VP3)
Plot S-0- 4	Actuation Signal of Vacuum Breaker	
Plot S-0- 5	Water Level in Vent Pipe	(VP1)
Plot S-0- 6	Water Level in Vent Pipe	(VP2)
Plot S-0- 7	Water Level in Vent Pipe	(VP3)
Plot S-0- 8	Water Level in Vent Pipe	(VP4)
Plot S-0- 9	Water Level in Vent Pipe	(VP5)
Plot S-0-10	Water Level in Wetwell	

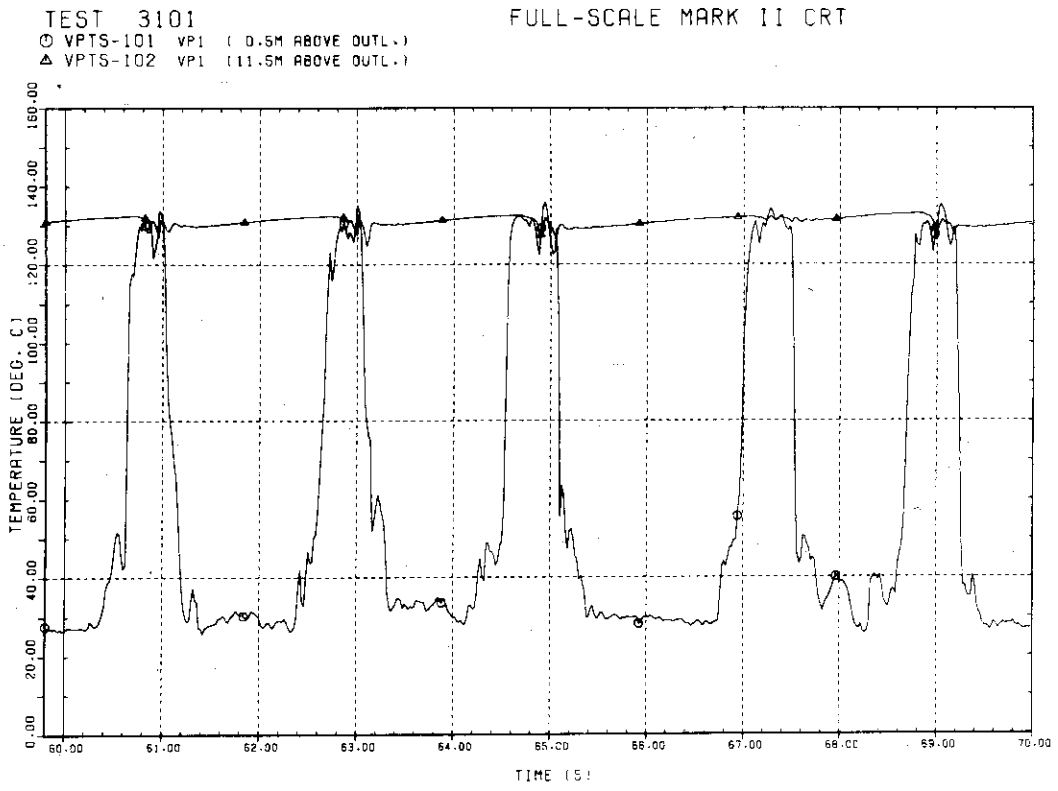
PCM Track-1 Channels

Plot S-1- 1	Pressures in Drywell and Wetwell Airspace	
Plot S-1- 2	Pressure in Vent Pipe	(VPPF-101)
Plot S-1- 3	Pressure in Vent Pipe	(VPPF-201)
Plot S-1- 4	Pressure in Vent Pipe	(VPPF-301)
Plot S-1- 5	Pressure in Vent Pipe	(VPPF-302)
Plot S-1- 6	Pressure in Vent Pipe	(VPPF-303)
Plot S-1- 7	Pressure in Vent Pipe	(VPPF-401)
Plot S-1- 8	Pressure in Vent Pipe	(VPPF-501)
Plot S-1- 9	Pressure in Vent Pipe	(VPPF-502)
Plot S-1-10	Pressure in Vent Pipe	(VPPF-503)
Plot S-1-11	Pressure in Wetwell	(WWPF-101)
Plot S-1-12	Pressure in Wetwell	(WWPF-102)
Plot S-1-13	Pressure in Wetwell	(WWPF-103)
Plot S-1-14	Pressure in Wetwell	(WWPF-104)
Plot S-1-15	Pressure in Wetwell	(WWPF-105)
Plot S-1-16	Pressure in Wetwell	(WWPF-106)
Plot S-1-17	Pressure in Wetwell	(WWPF-107)
Plot S-1-18	Pressure in Wetwell	(WWPF-201)
Plot S-1-19	Pressure in Wetwell	(WWPF-202)
Plot S-1-20	Pressure in Wetwell	(WWPF-203)
Plot S-1-21	Pressure in Wetwell	(WWPF-301)
Plot S-1-22	Pressure in Wetwell	(WWPF-302)
Plot S-1-23	Pressure in Wetwell	(WWPF-303)
Plot S-1-24	Pressure in Wetwell	(WWPF-401)
Plot S-1-25	Pressure in Wetwell	(WWPF-402)
Plot S-1-26	Pressure in Wetwell	(WWPF-501)
Plot S-1-27	Pressure in Wetwell	(WWPF-502)
Plot S-1-28	Pressure in Wetwell	(WWPF-602)
Plot S-1-29	Pressure in Wetwell	(WWPF-702)
Plot S-1-30	Strain of Vent Pipe Brace	(VPSF-101)
Plot S-1-31	Strain of Vent Pipe Brace	(VPSF-102)
Plot S-1-32	Strain of Vent Pipe Brace	(VPSF-201)

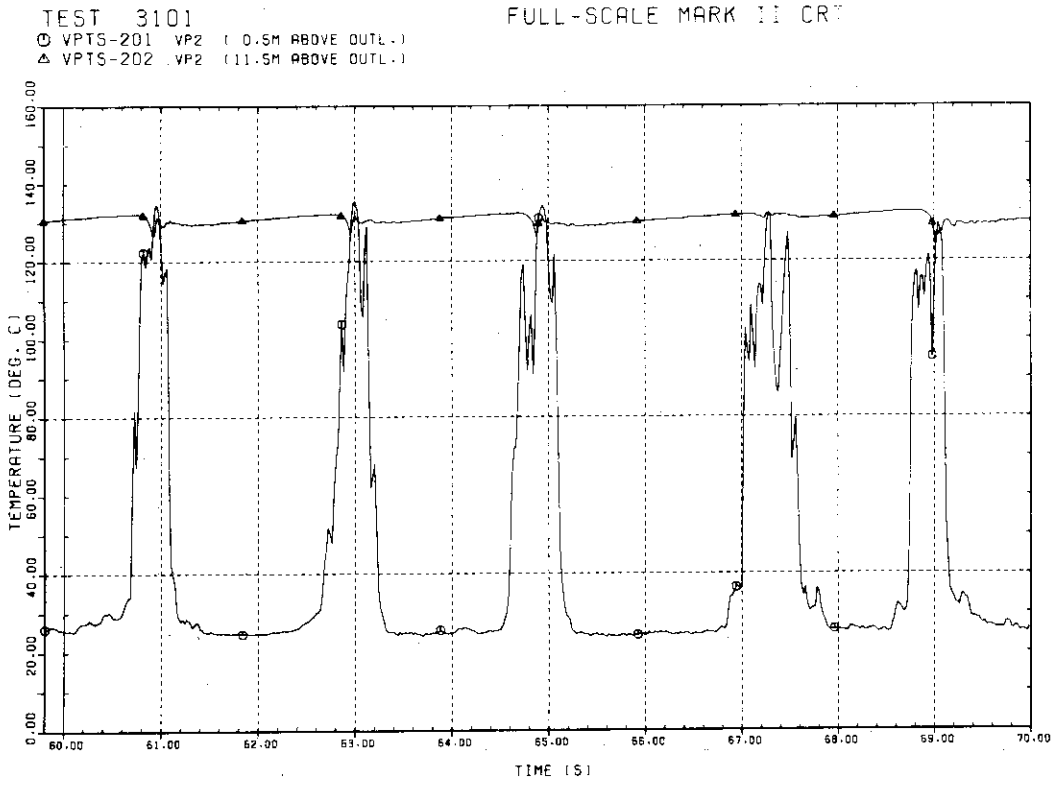
List of Short Term Plots (Continued)

PCM Track-2 Channels

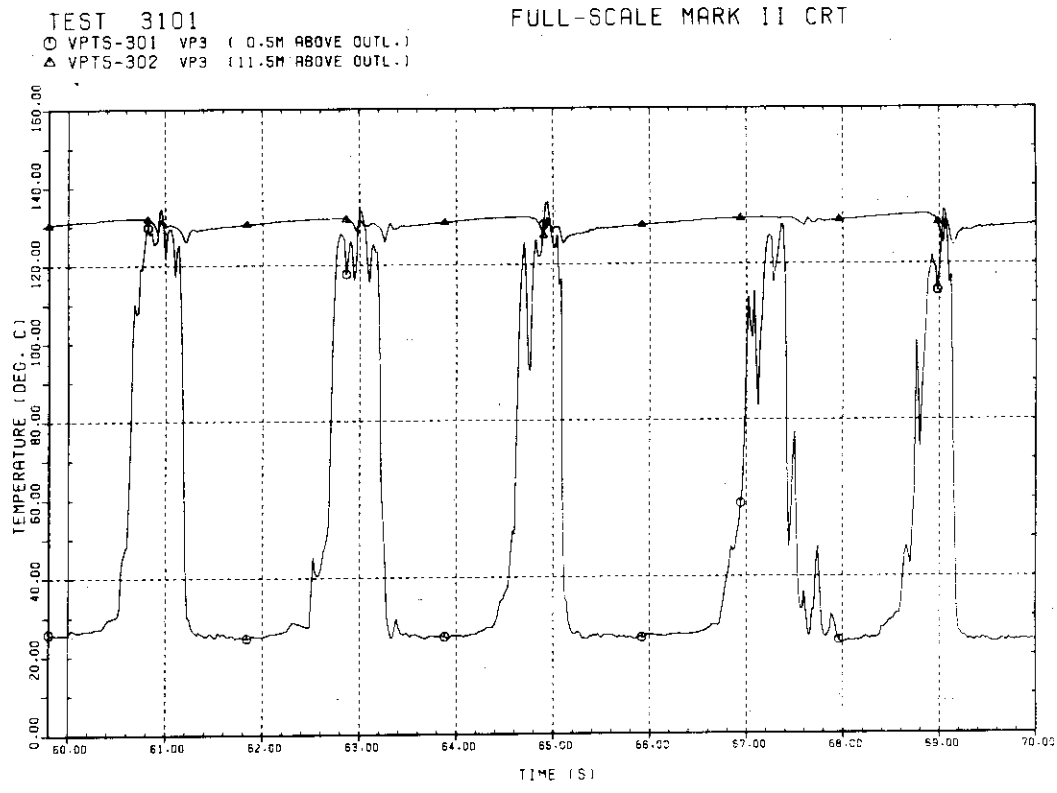
Plot S-2- 1	Acceleration of Vent Pipe Outlet	(VPAF-101)
Plot S-2- 2	Acceleration of Vent Pipe Outlet	(VPAF-201)
Plot S-2- 3	Acceleration of Vent Pipe Outlet	(VPAF-202)
Plot S-2- 4	Acceleration of Containment Structure	(WWAF-005)
Plot S-2- 5	Acceleration of Containment Structure	(WWAF-006)
Plot S-2- 6	Acceleration of Containment Structure	(WWAF-007)
Plot S-2- 7	Acceleration of Containment Structure	(WWAF-008)
Plot S-2- 8	Acceleration of Containment Structure	(WWAF-009)
Plot S-2- 9	Acceleration of Containment Structure	(WWAF-010)
Plot S-2-10	Acceleration of Containment Structure	(WWAF-011)
Plot S-2-11	Acceleration of Containment Strucutre	(WWAF-012)
Plot S-2-12	Phase Boundary Signals	(WWLF-101 - 108)
Plot S-2-13	Phase Boundary Signals	(WWLF-201 - 209)
Plot S-2-14	Phase Boundary Signals	(WWLF-301 - 308)



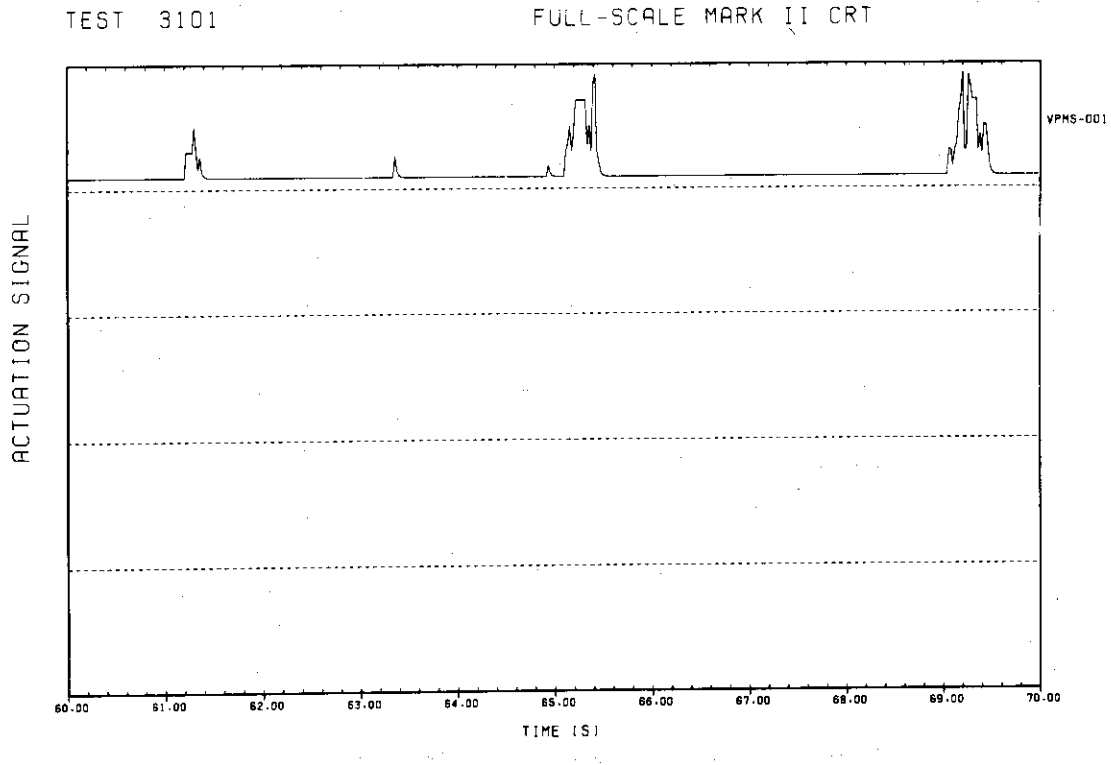
Plot S-0- 1 Temperatures in Vent Pipe



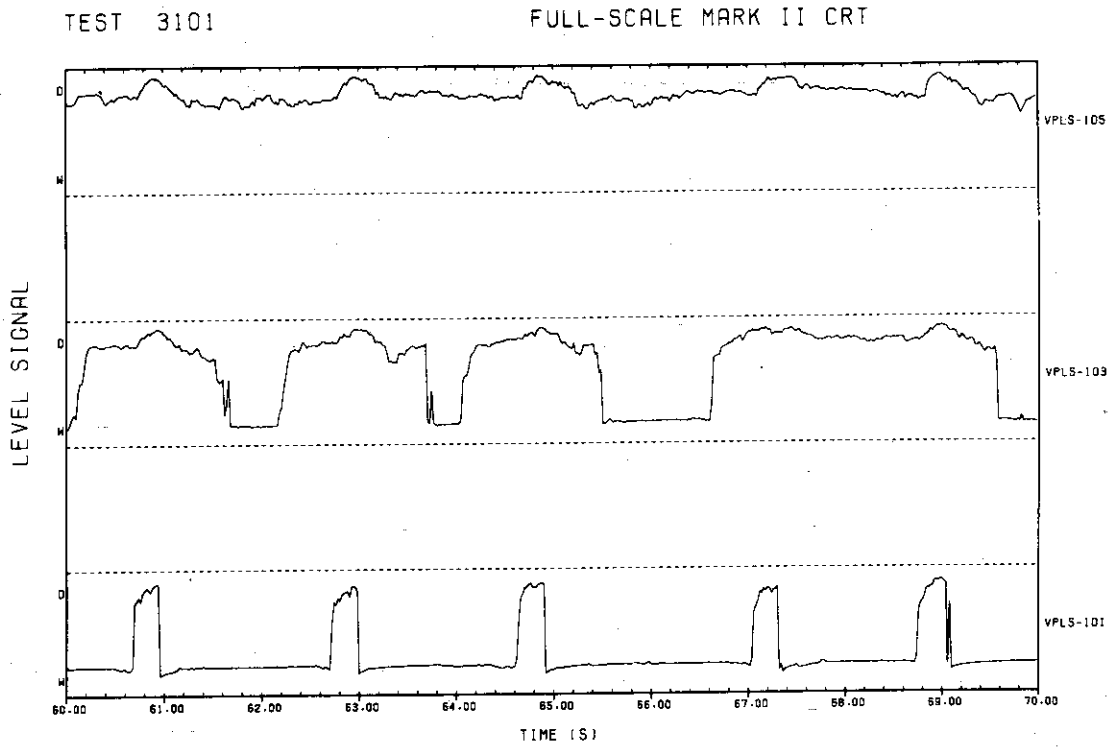
Plot S-0- 2 Temperatures in Vent Pipe



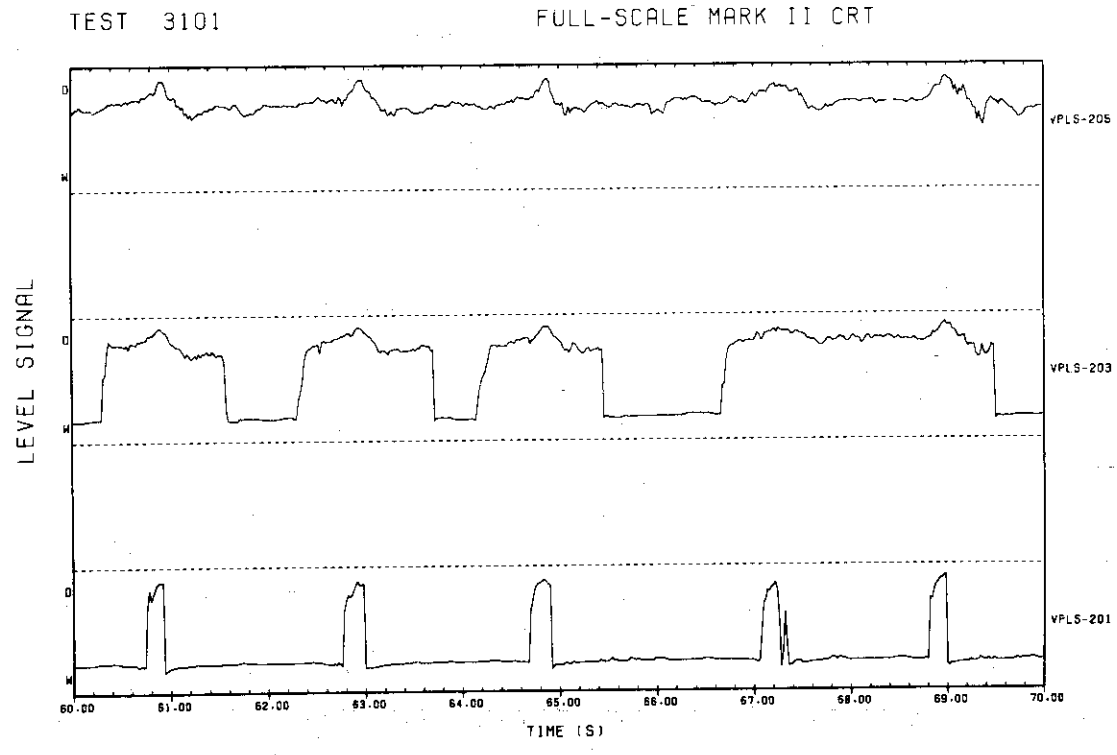
Plot S-0- 3 Temperatures in Vent Pipe



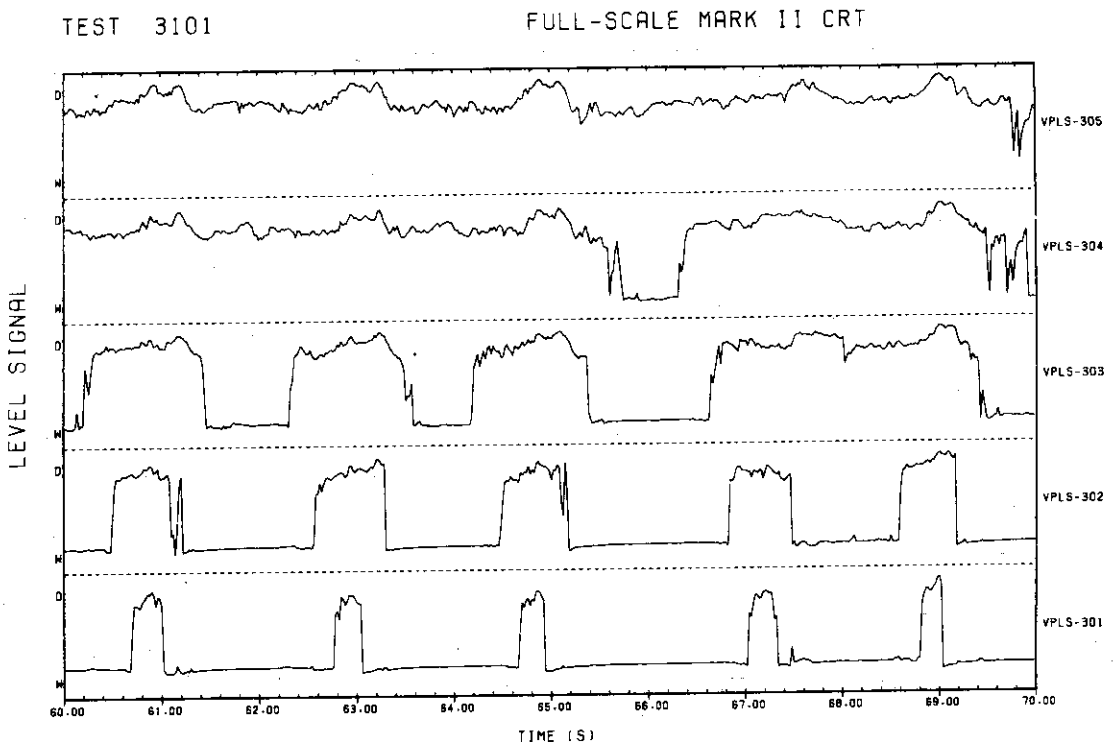
Plot S-0- 4 Actuation Signal of Vacuum Breaker



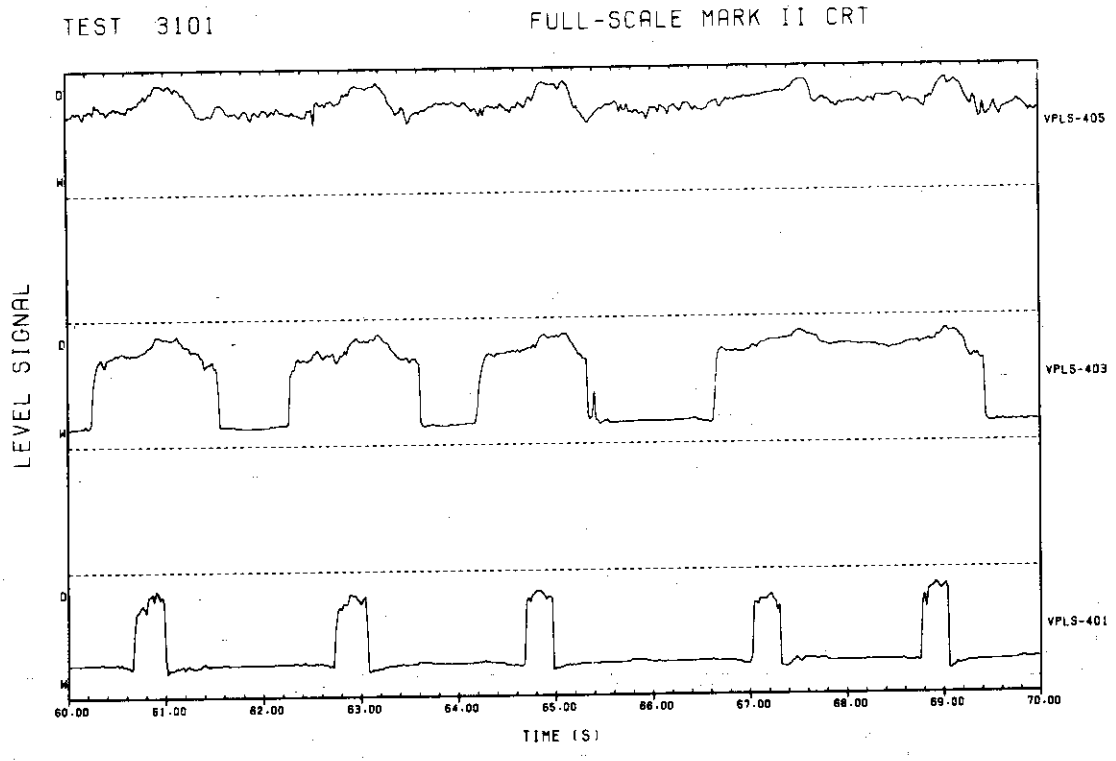
Plot S-0- 5 Water Level in Vent Pipe



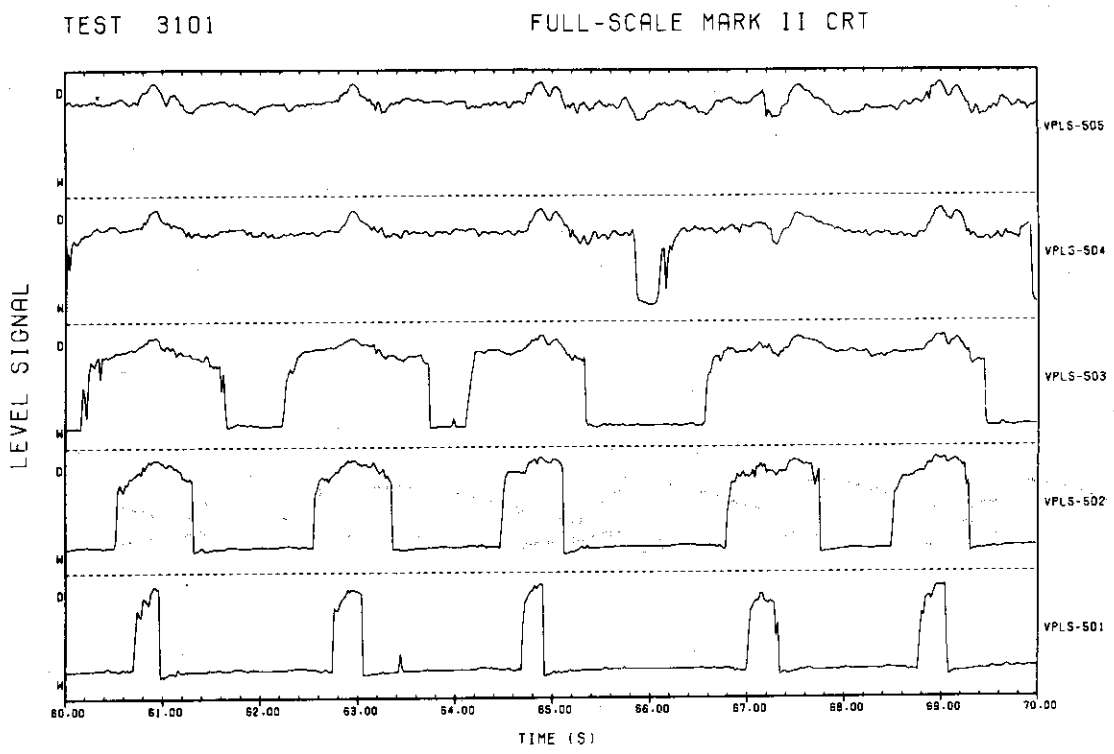
Plot S-0- 6 Water Level in Vent Pipe



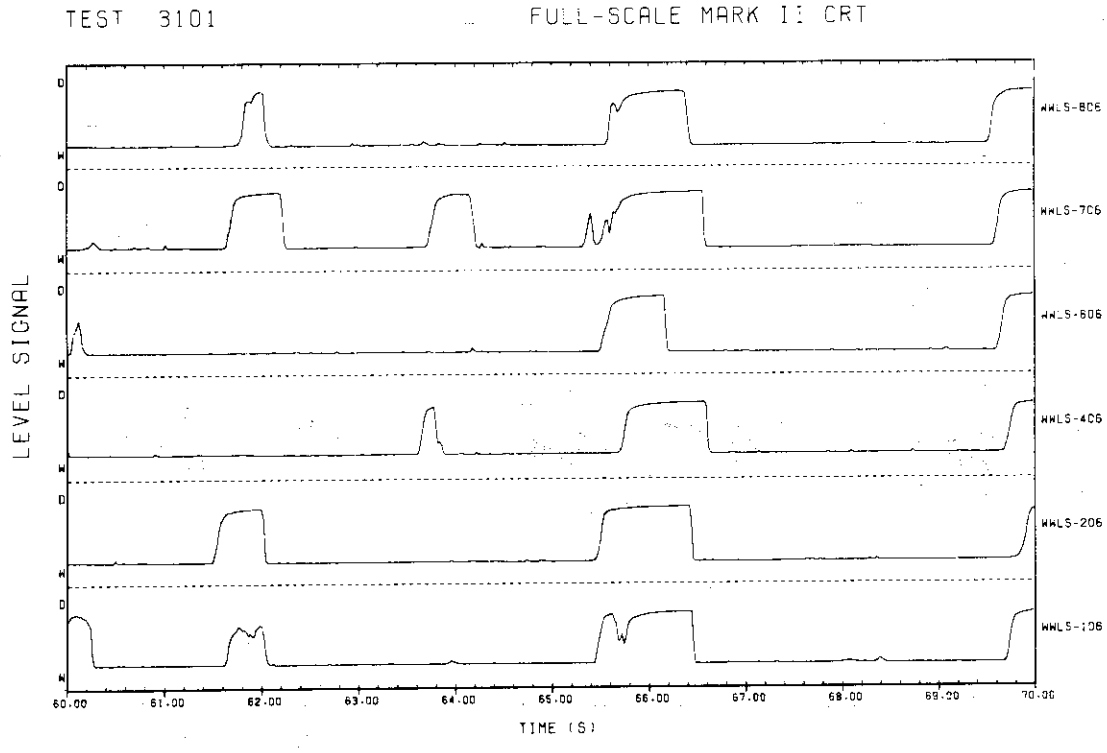
Plot S-0- 7 Water Level in Vent Pipe



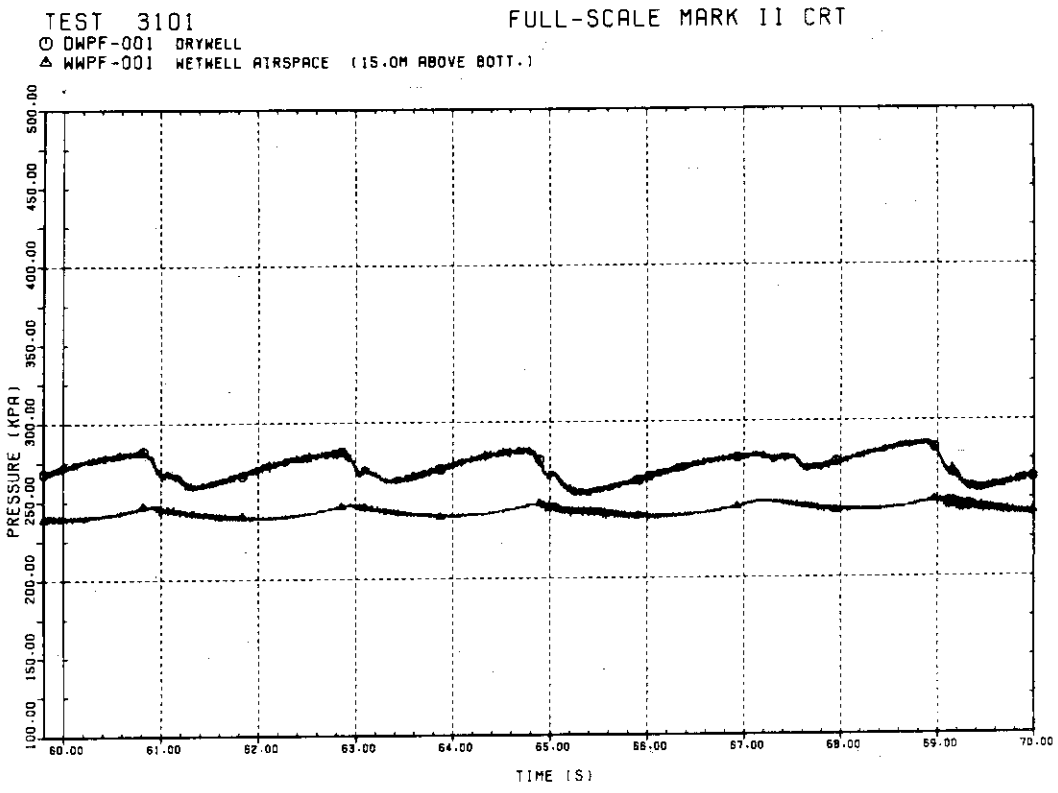
Plot S-0- 8 Water Level in Vent Pipe



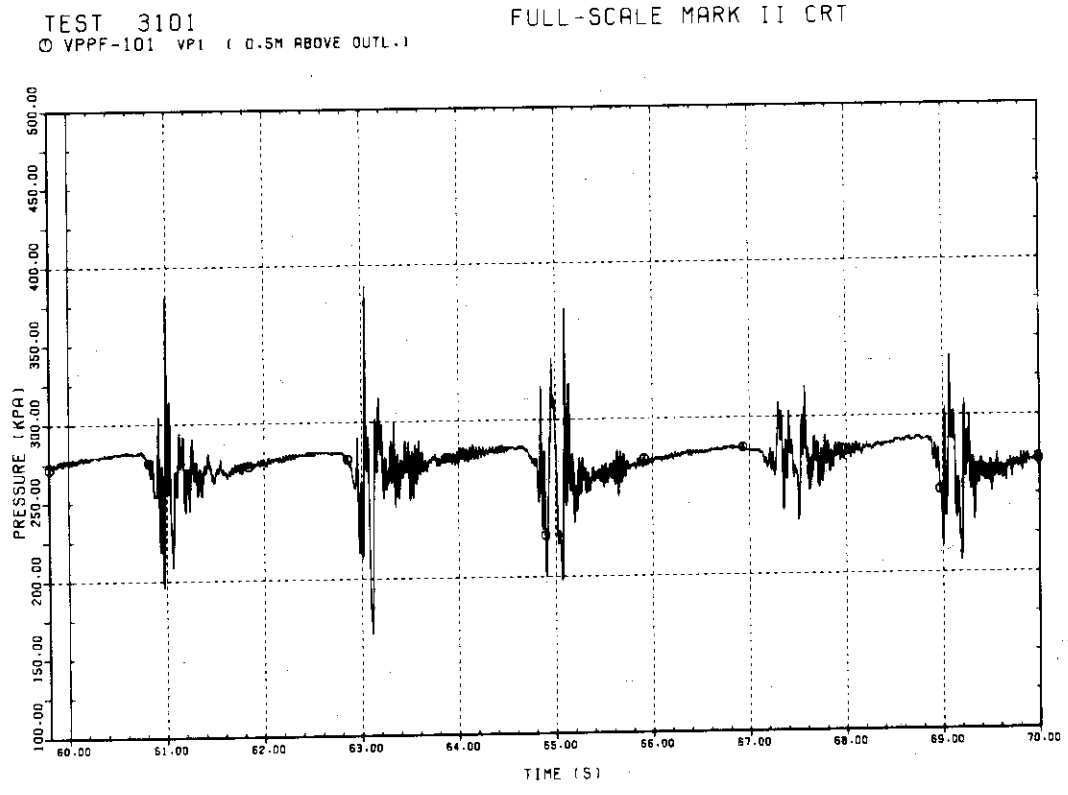
Plot S-0- 9 Water Level in Vent Pipe



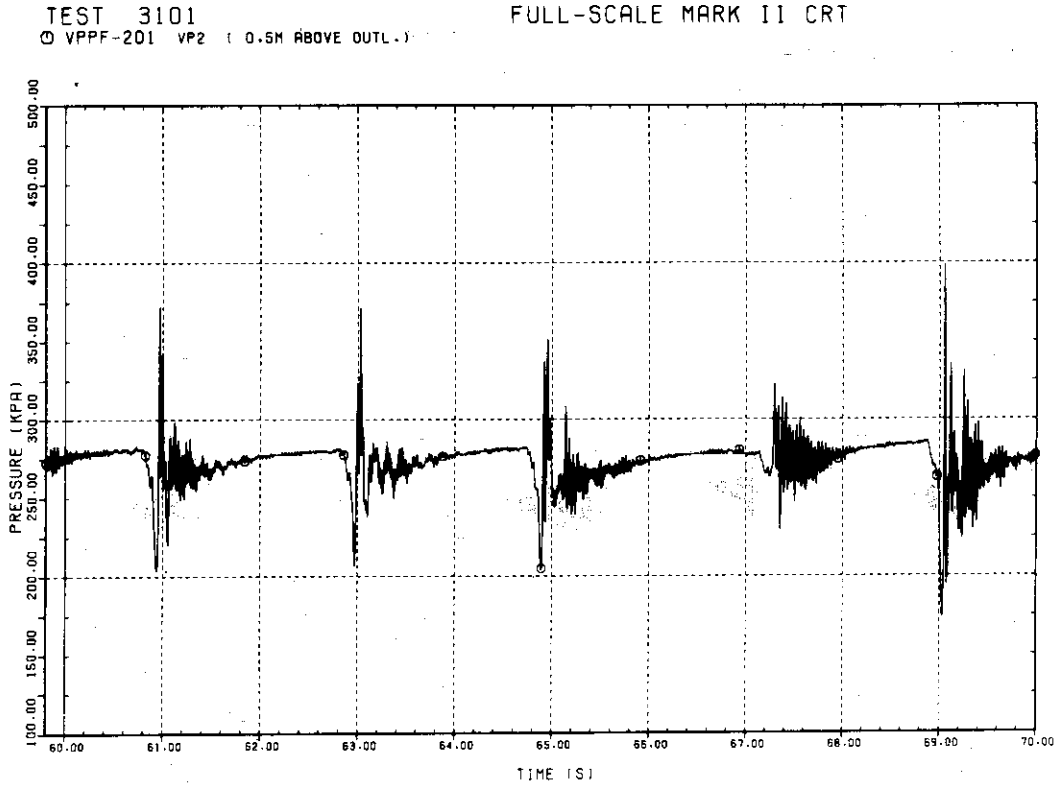
Plot S-0-10 Water Level in Wetwell



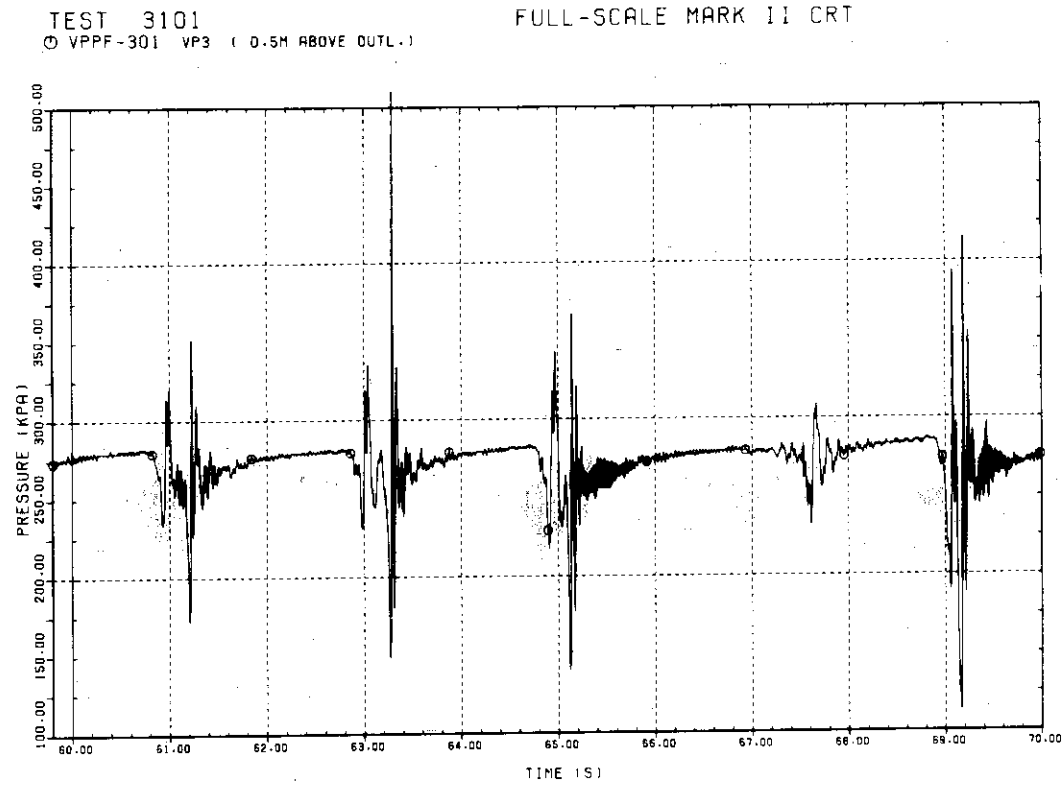
Plot S-1- 1 Pressures in Drywell and Wetwell Airspace



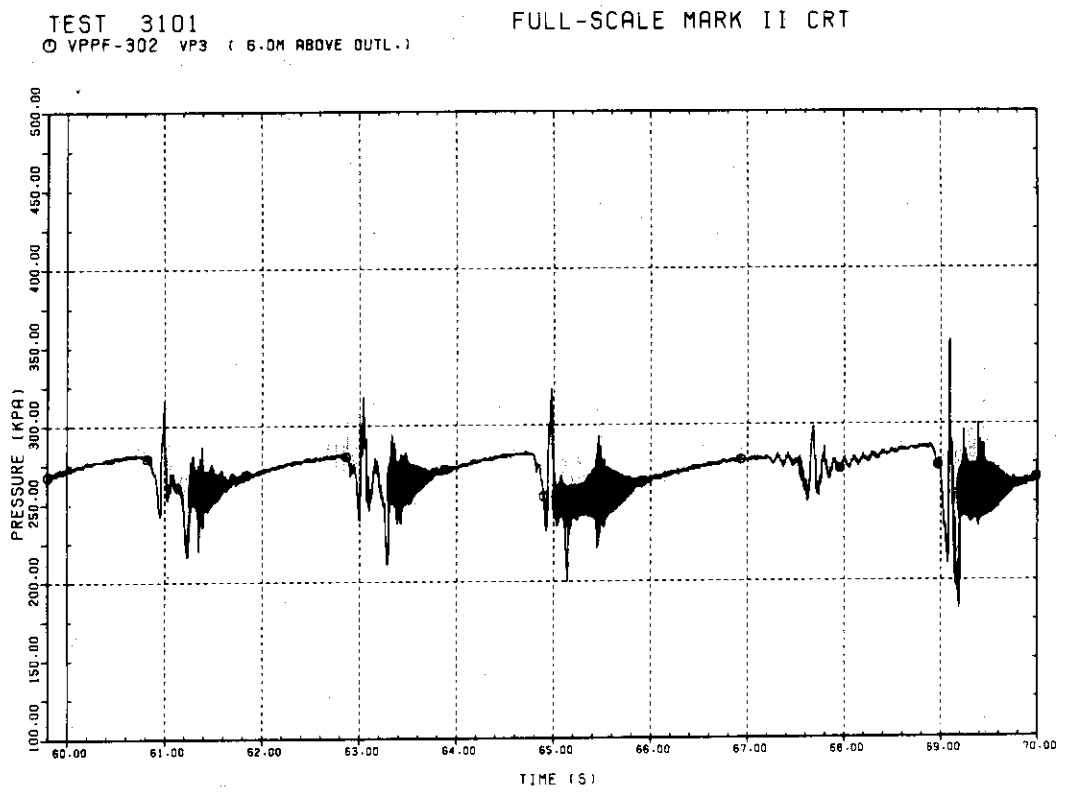
Plot S-1- 2 Pressure in Vent Pipe



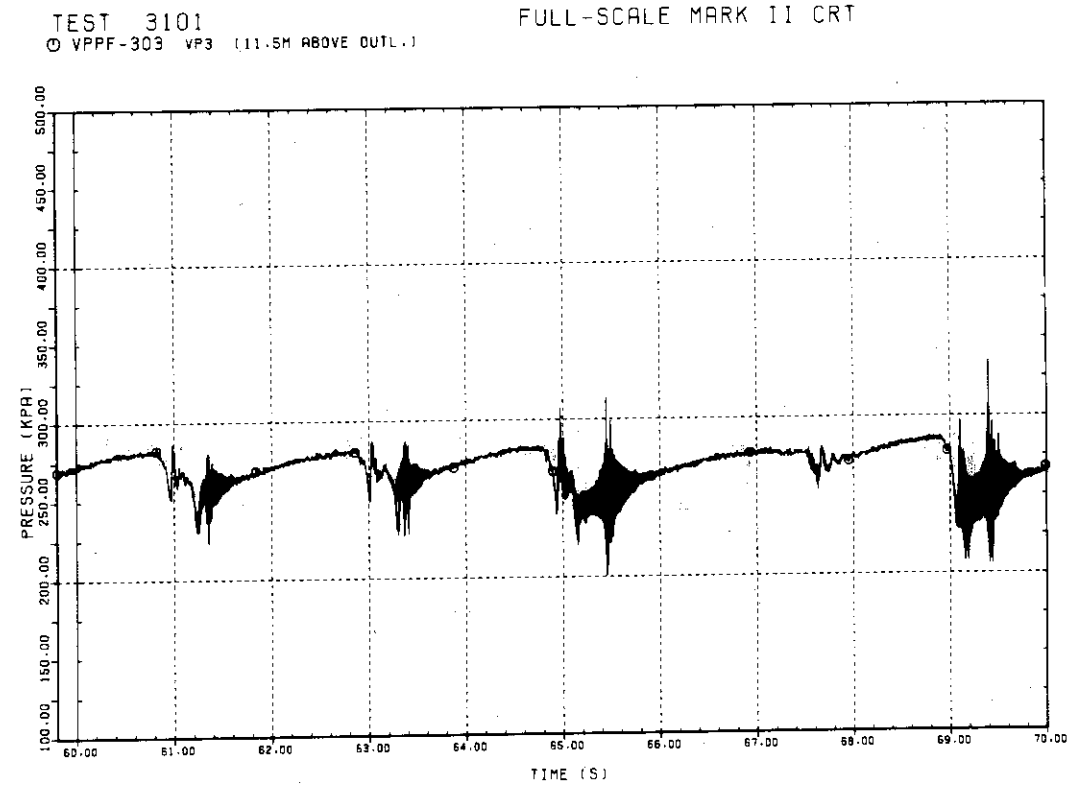
Plot S-1- 3 Pressure in Vent Pipe



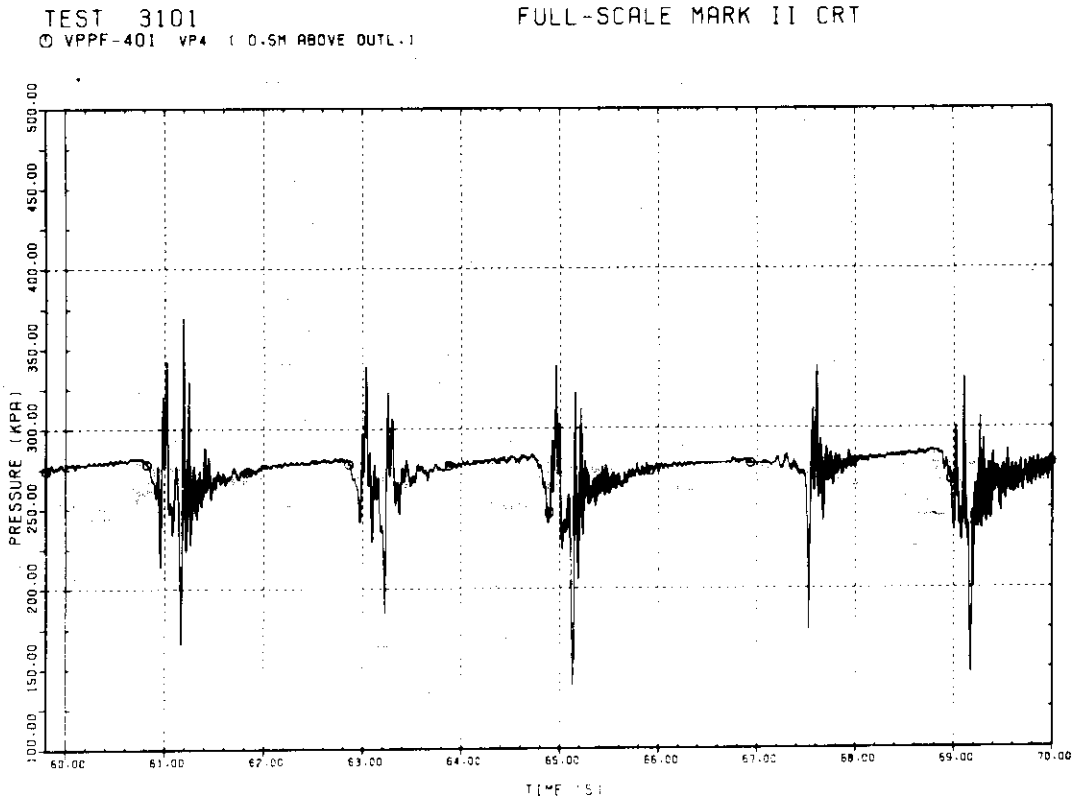
Plot S-1- 4 Pressure in Vent Pipe



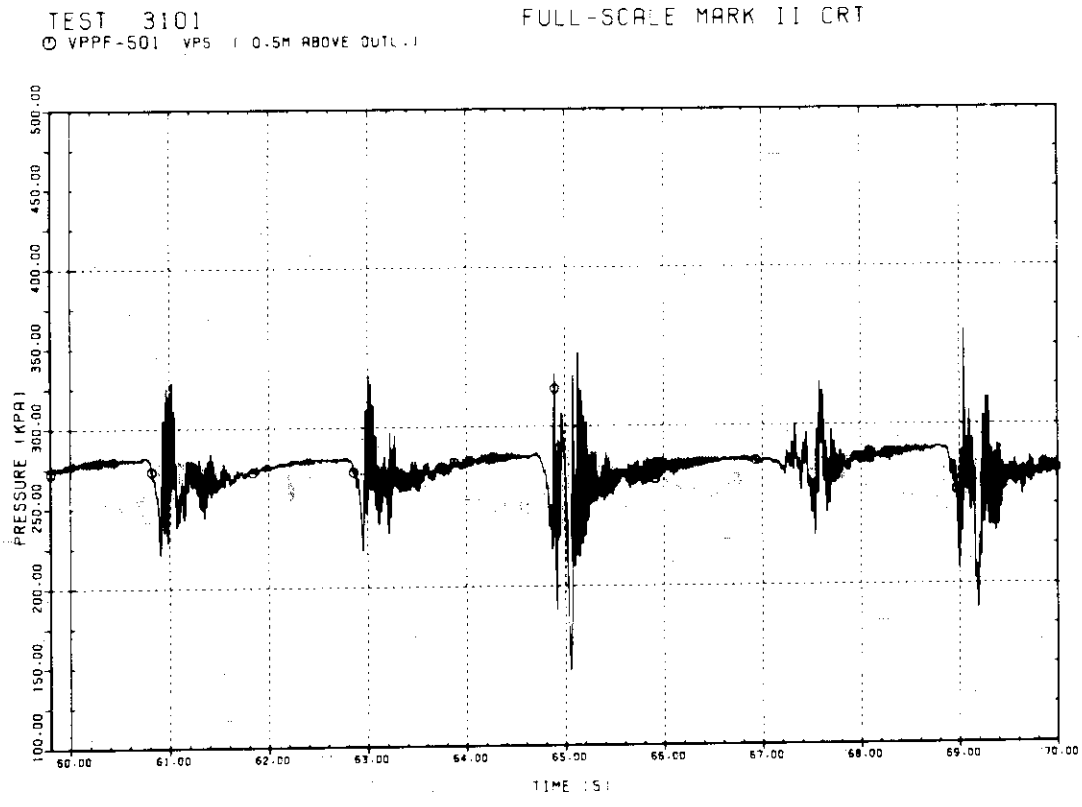
Plot S-1- 5 Pressure in Vent Pipe



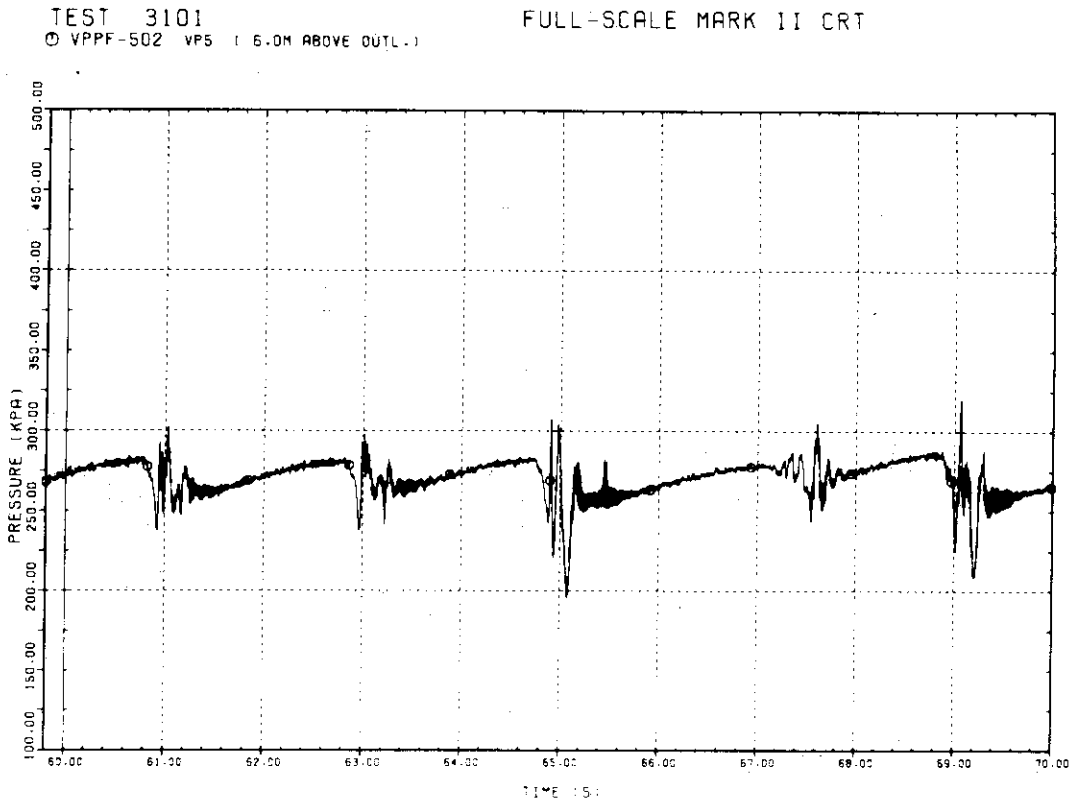
Plot S-1- 6 Pressure in Vent Pipe



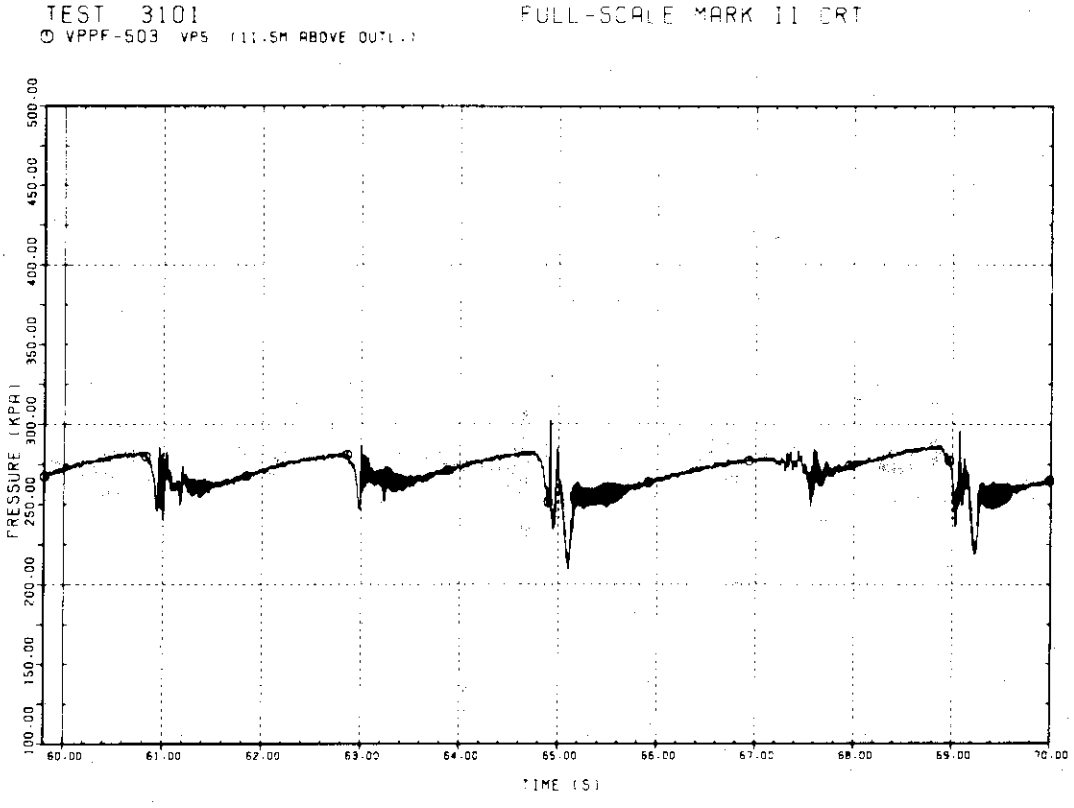
Plot S-1- 7 Pressure in Vent Pipe



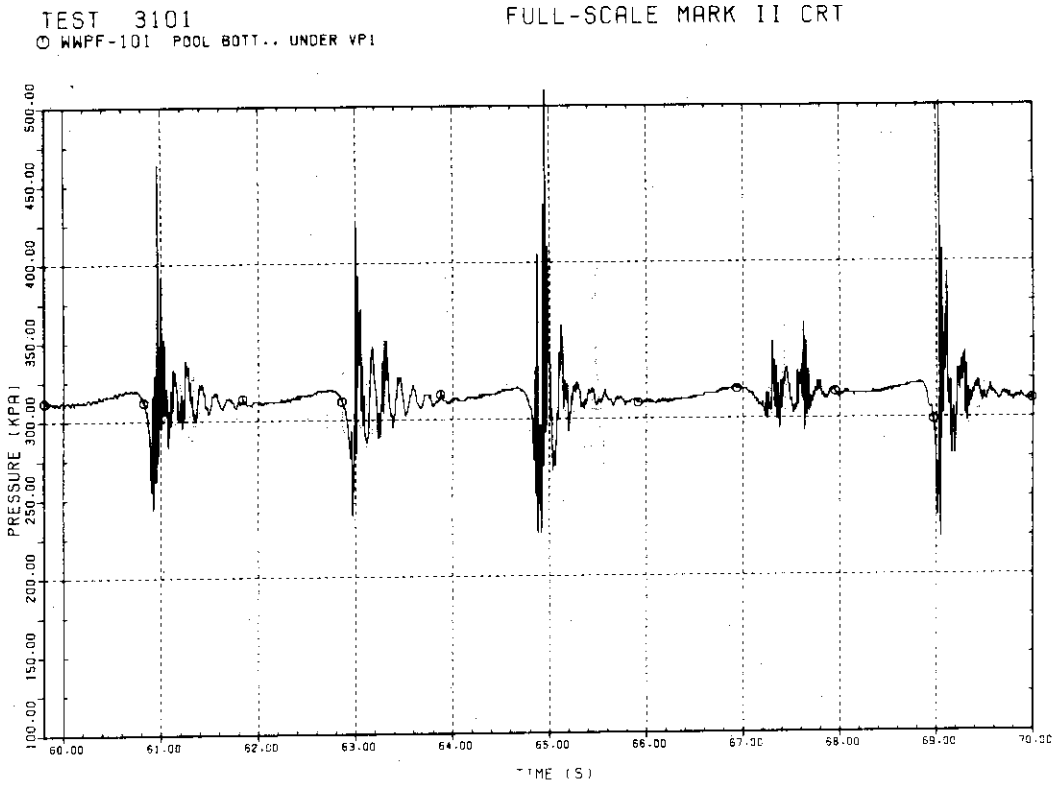
Plot S-1- 8 Pressure in Vent Pipe



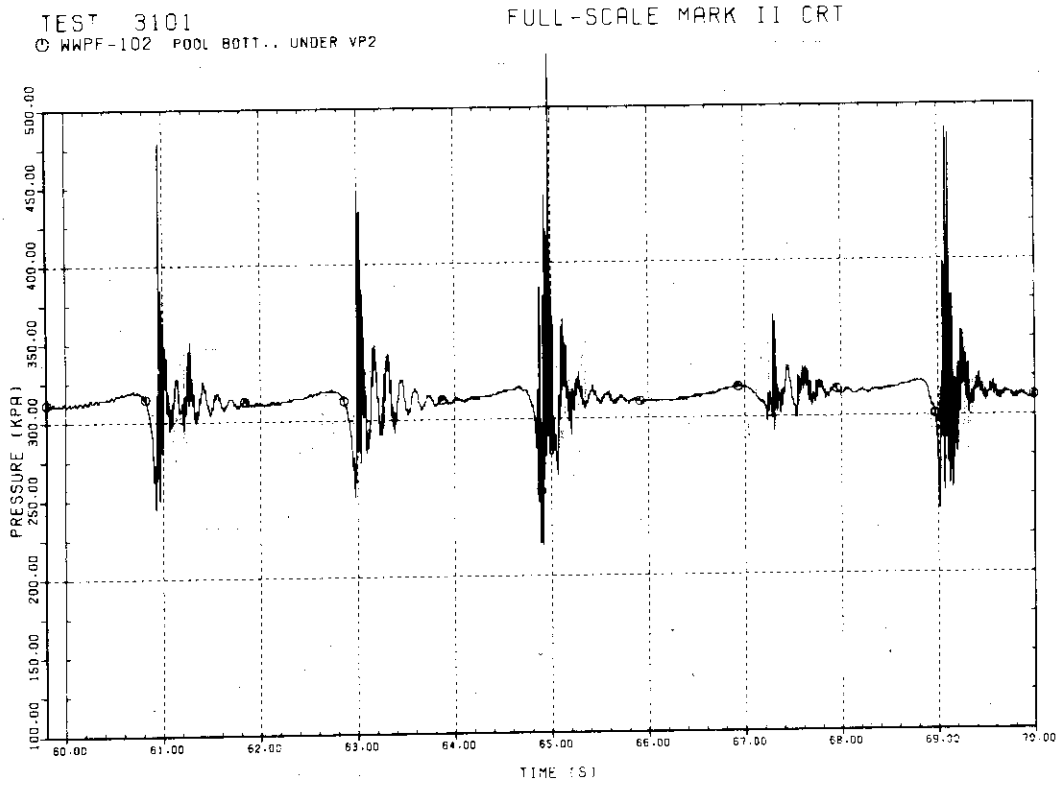
Plot S-1- 9 Pressure in Vent Pipe



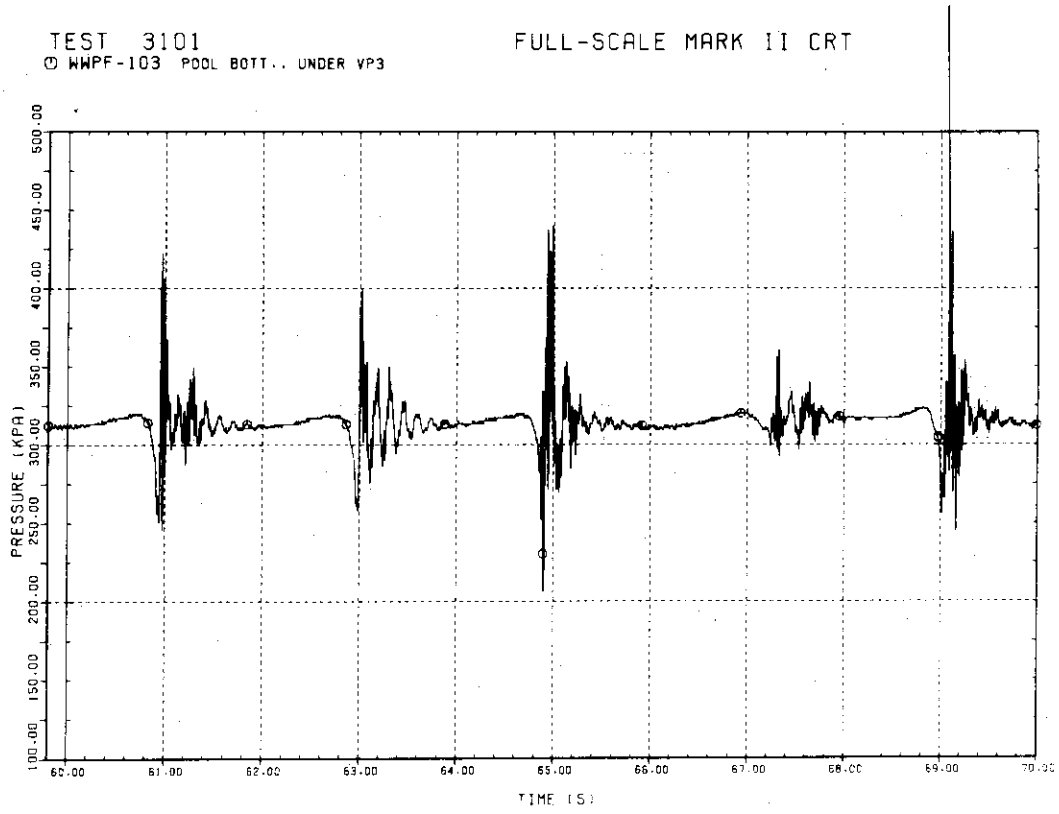
Plot S-1-10 Pressure in Vent Pipe



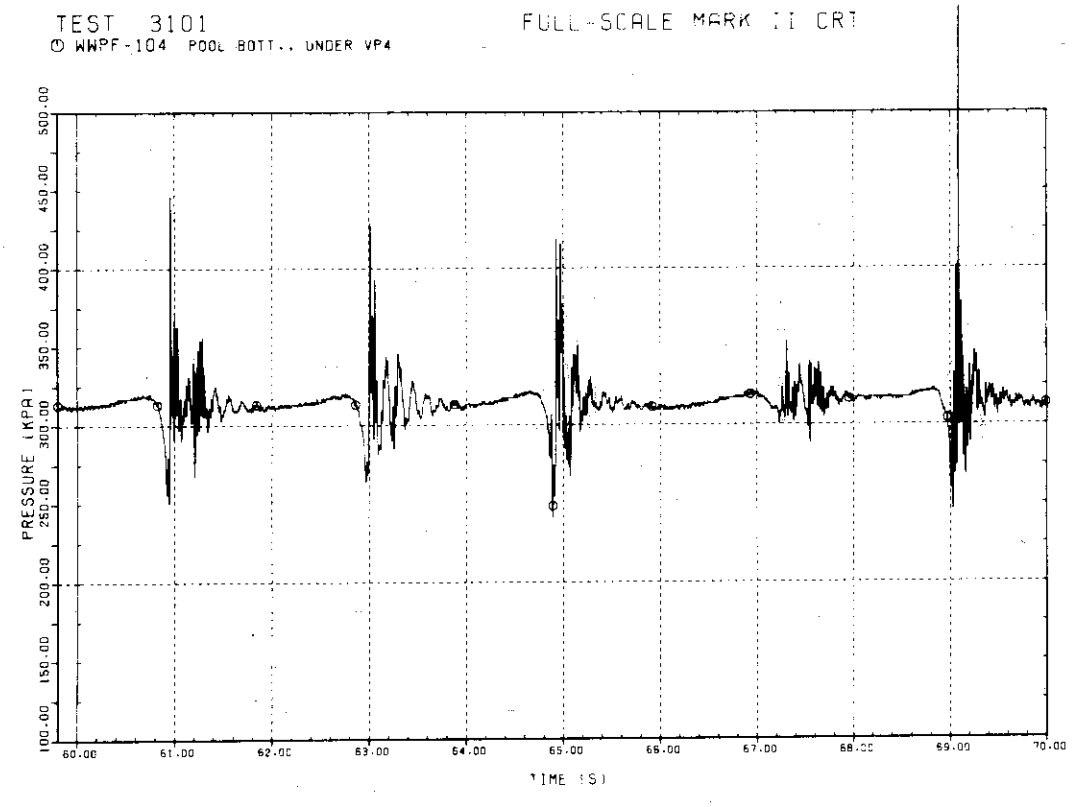
Plot S-1-11 Pressure in Wetwell



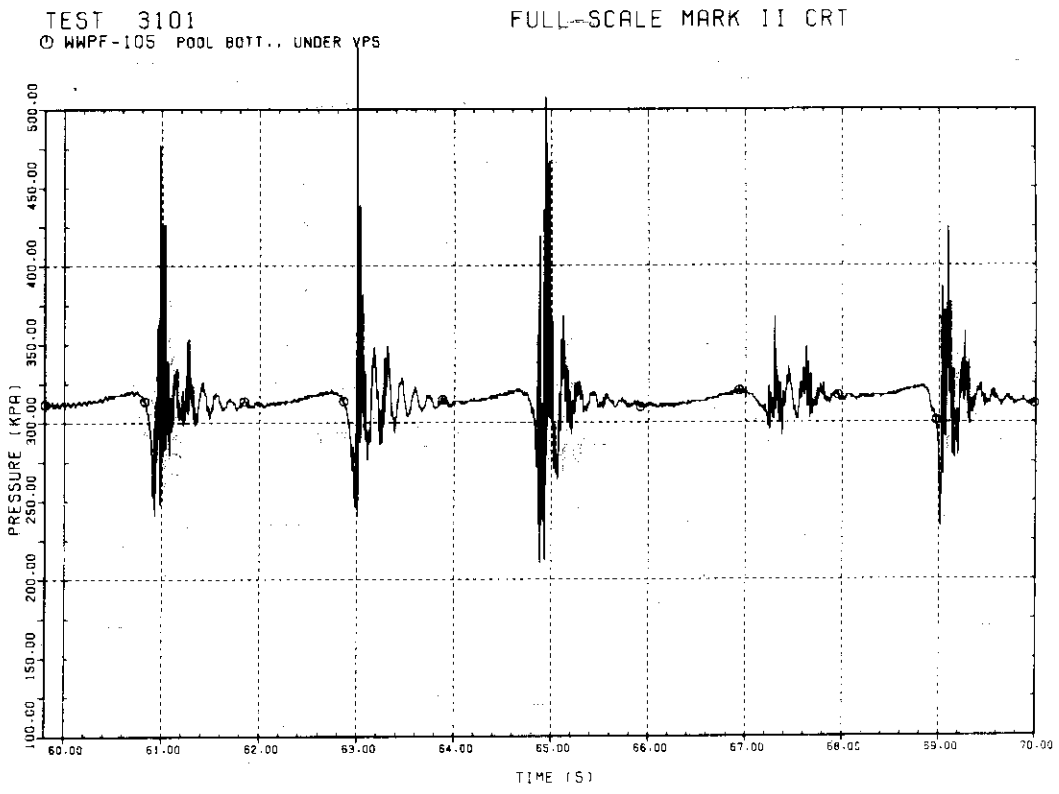
Plot S-1-12 Pressure in Wetwell



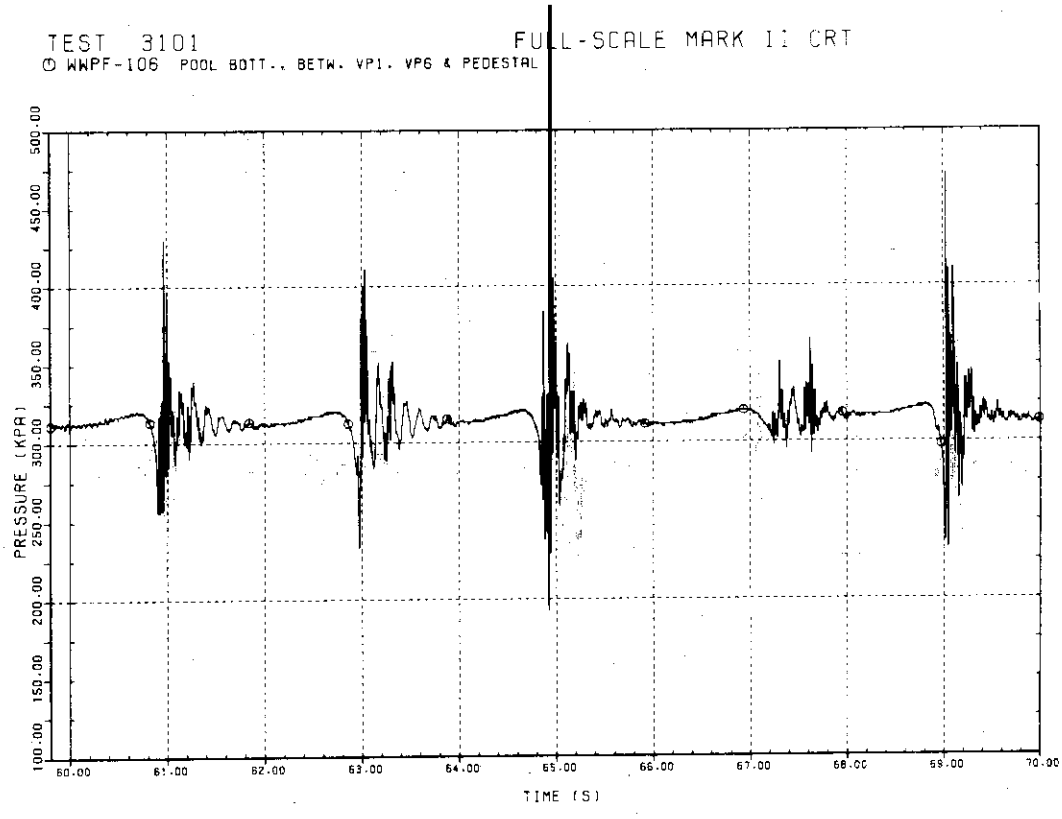
Plot S-1-13 Pressure in Wetwell



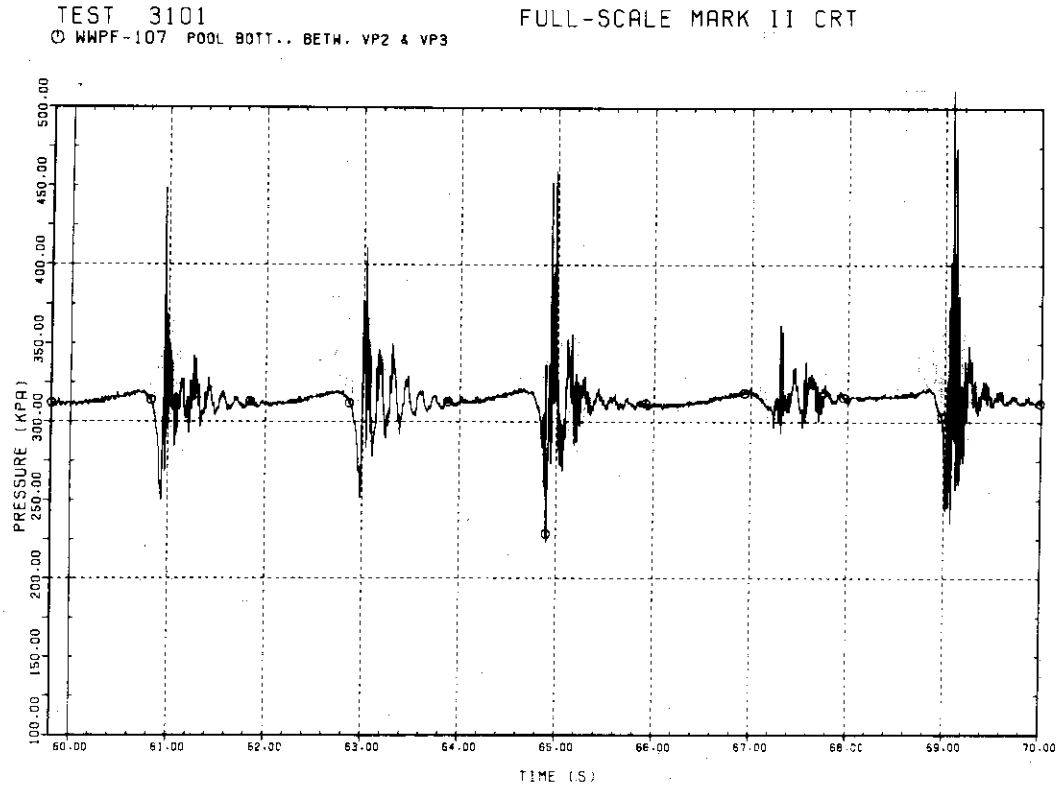
Plot S-1-14 Pressure in Wetwell



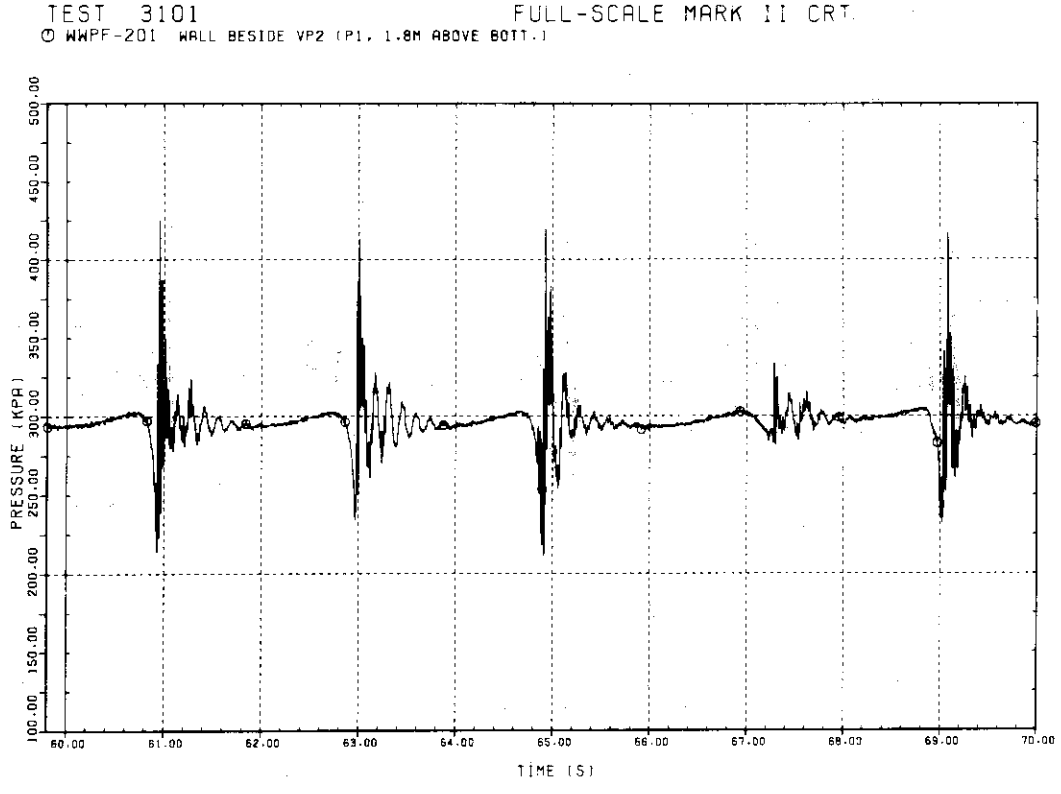
Plot S-1-15 Pressure in Wetwell



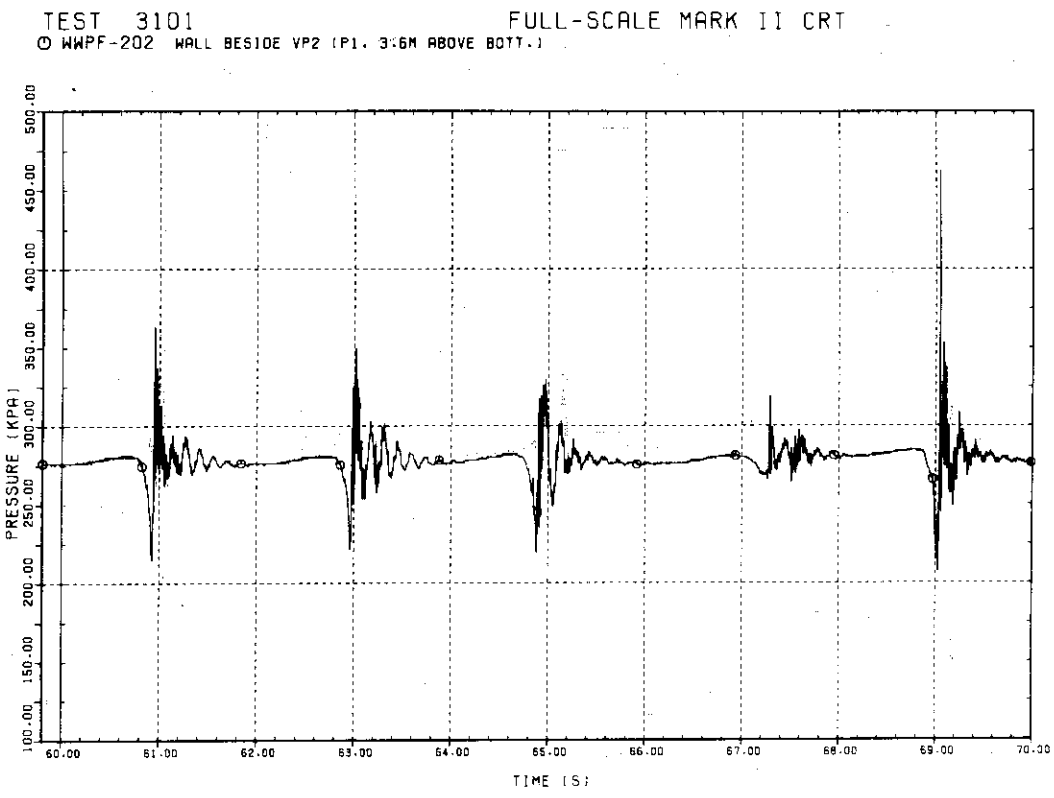
Plot S-1-16 Pressure in Wetwell



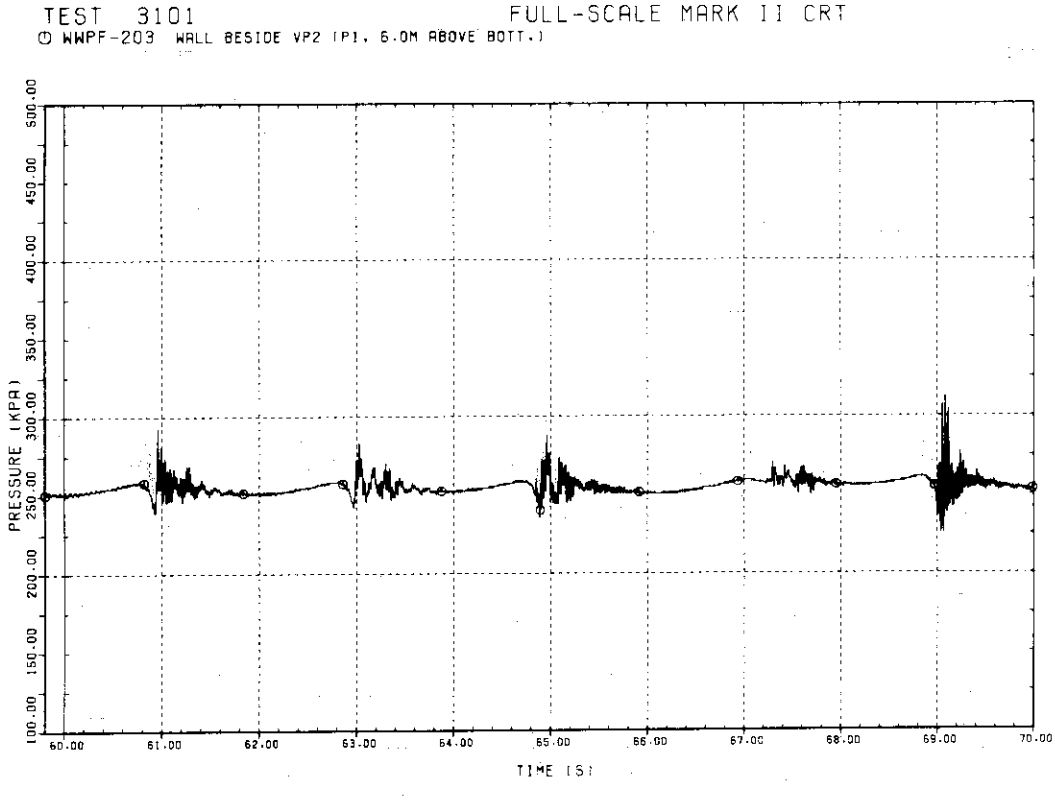
Plot S-1-17 Pressure in Wetwell



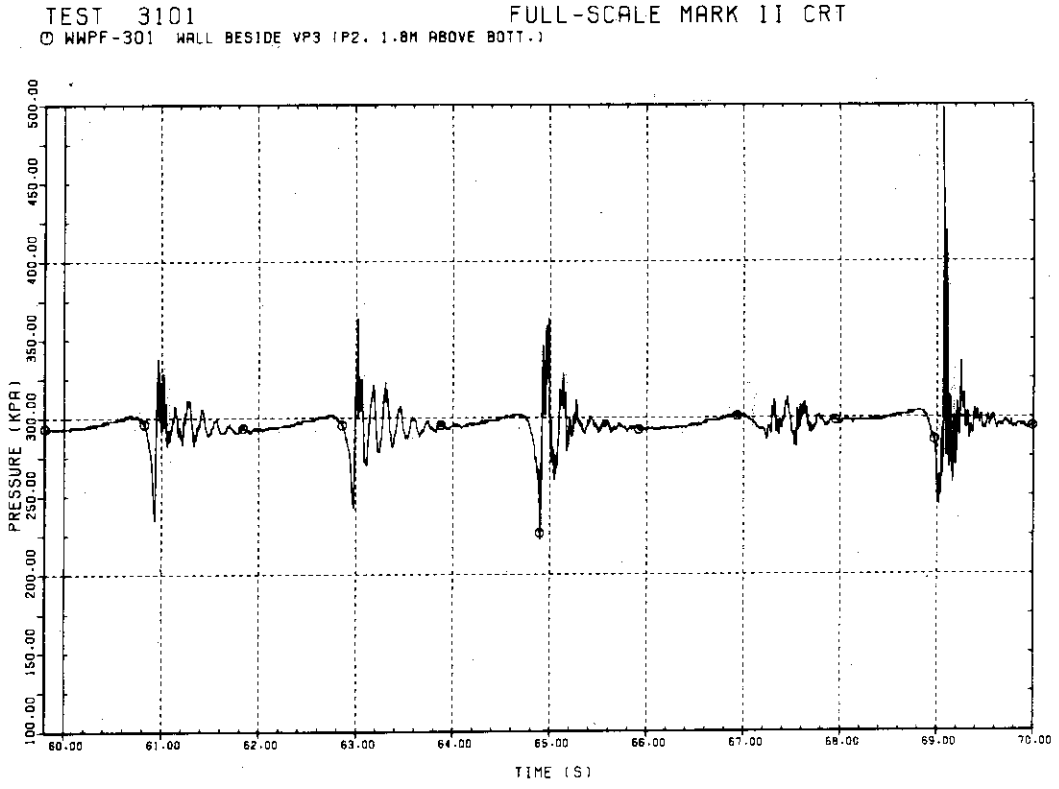
Plot S-1-18 Pressure in Wetwell



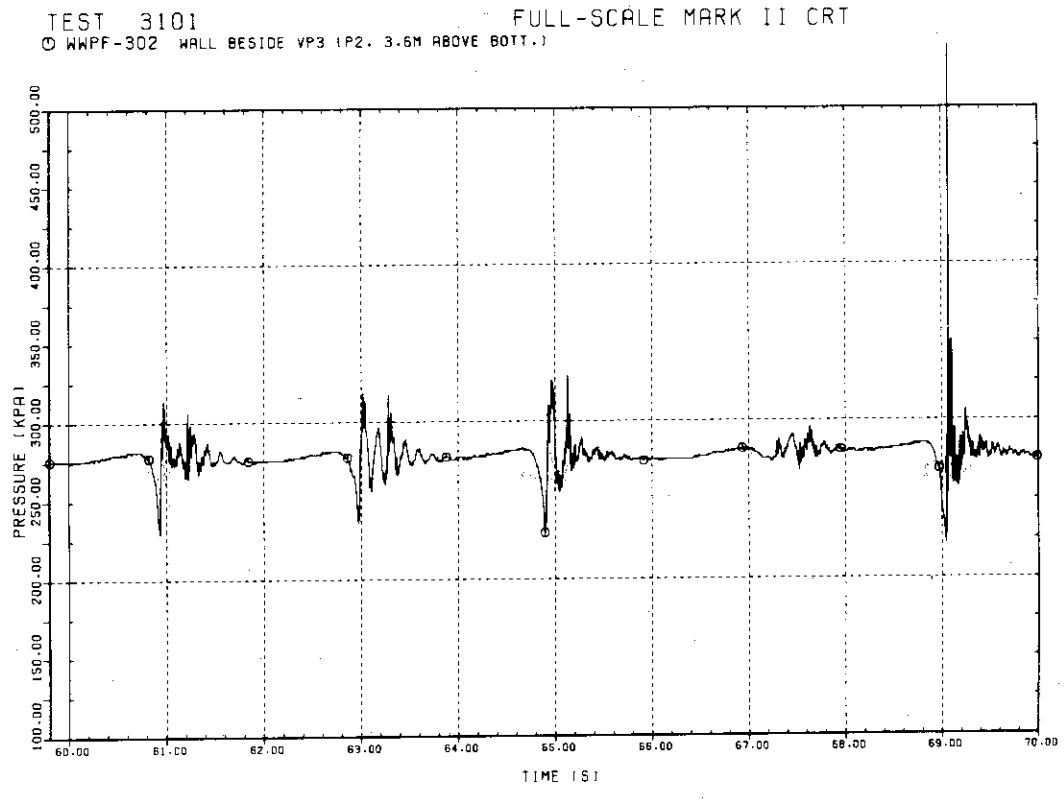
Plot S-1-19 Pressure in Wetwell



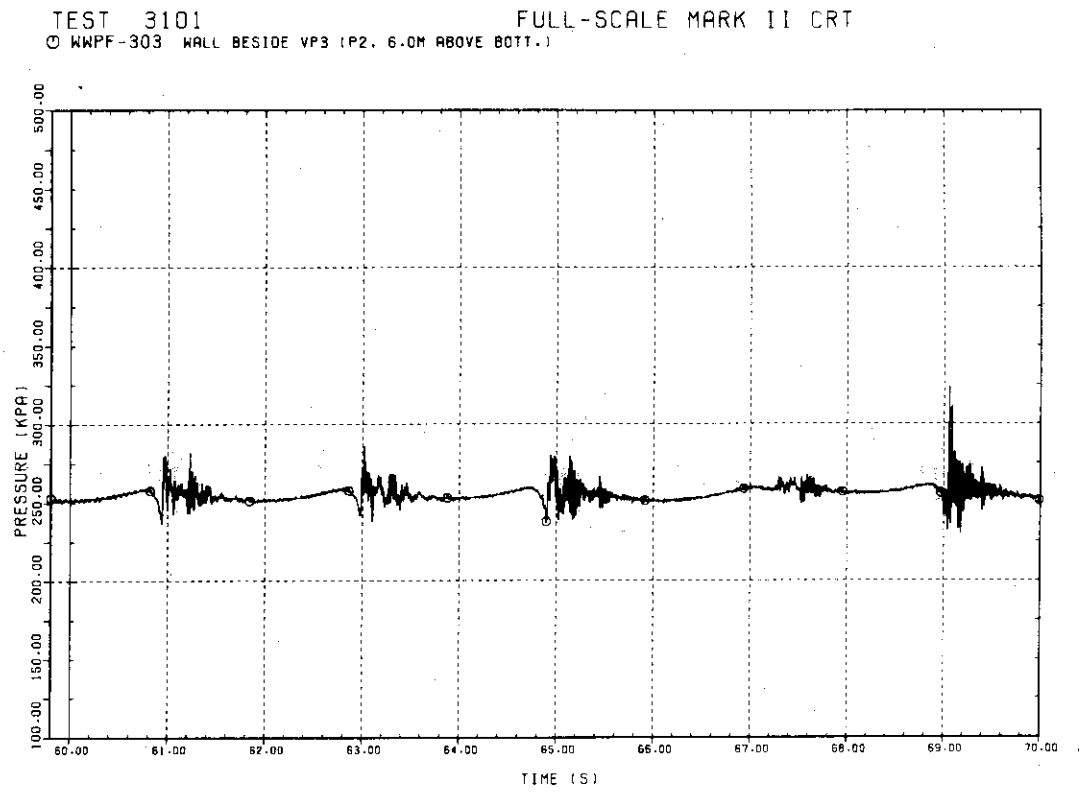
Plot S-1-20 Pressure in Wetwell



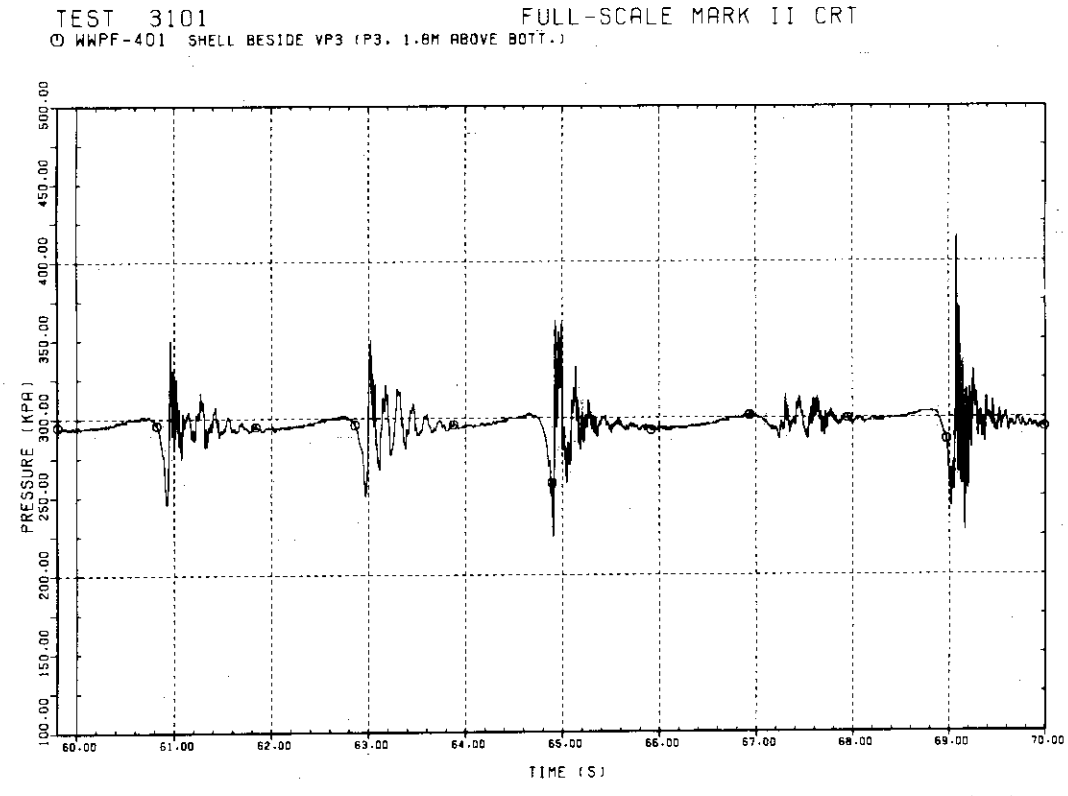
Plot S-1-21 Pressure in Wetwell



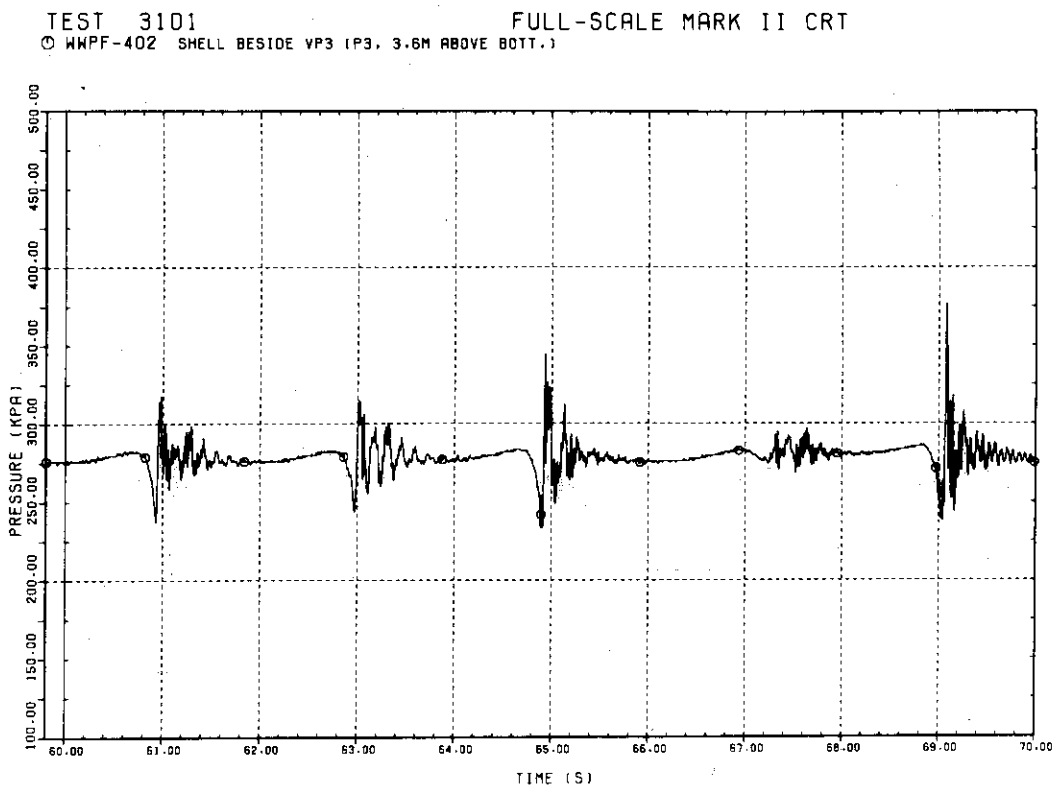
Plot S-1-22 Pressure in Wetwell



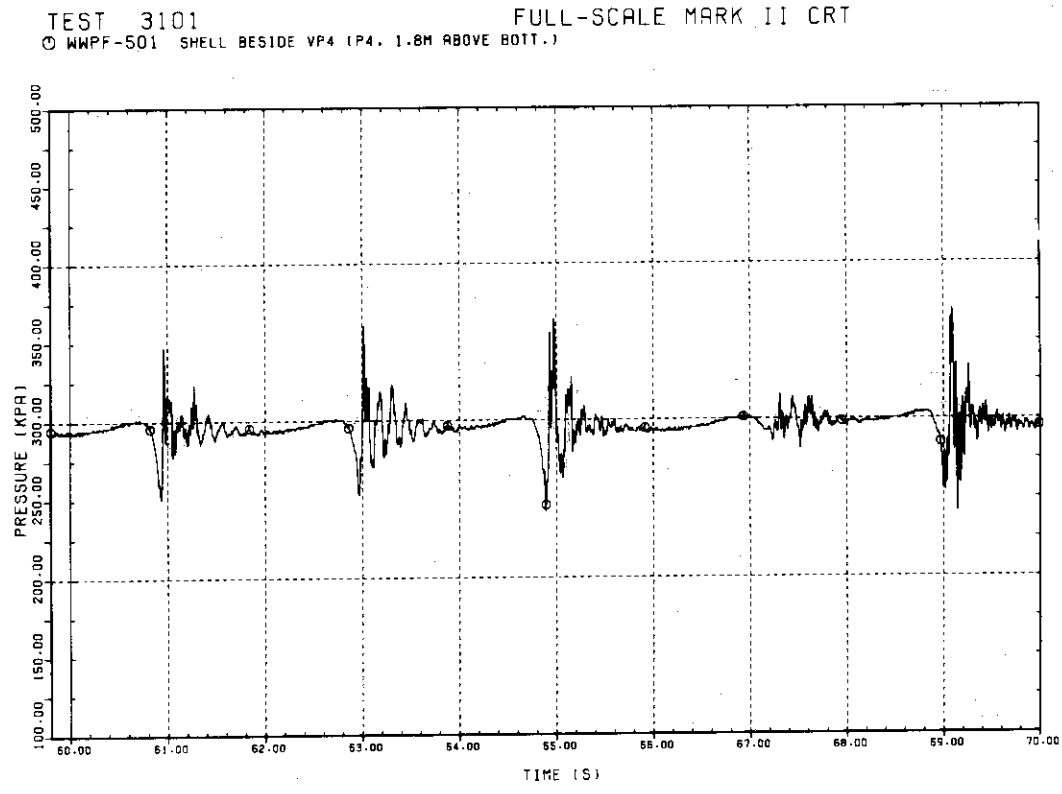
Plot S-1-23 Pressure in Wetwell



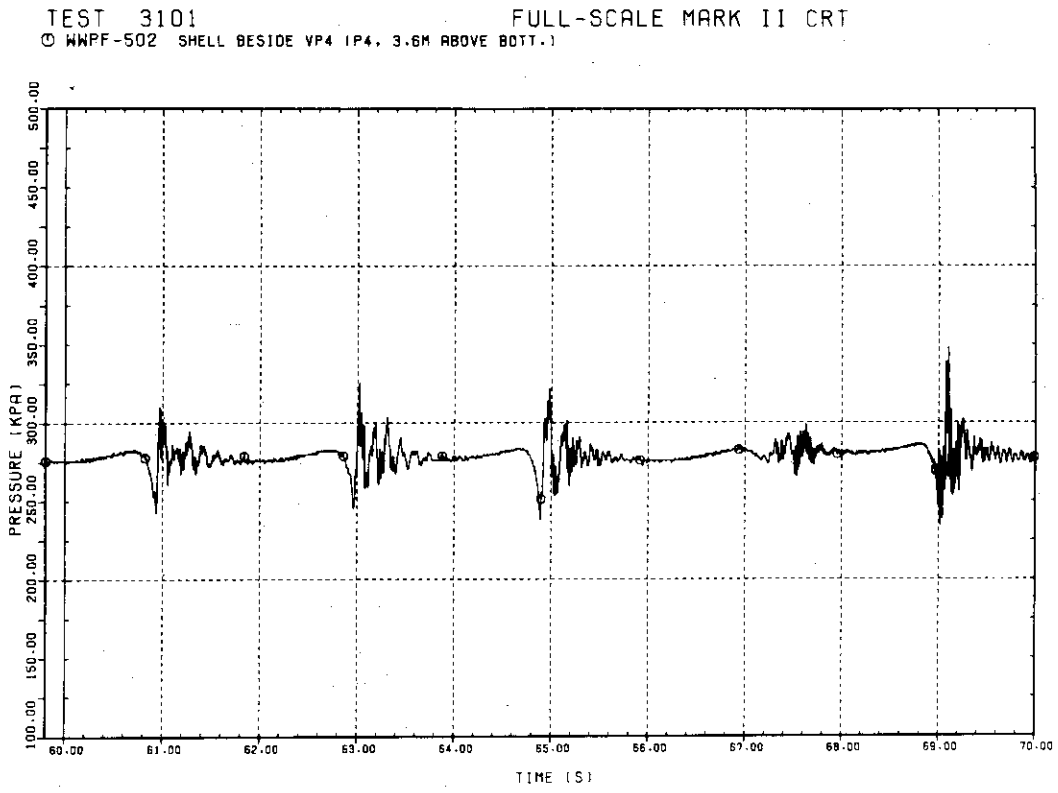
Plot S-1-24 Pressure in Wetwell



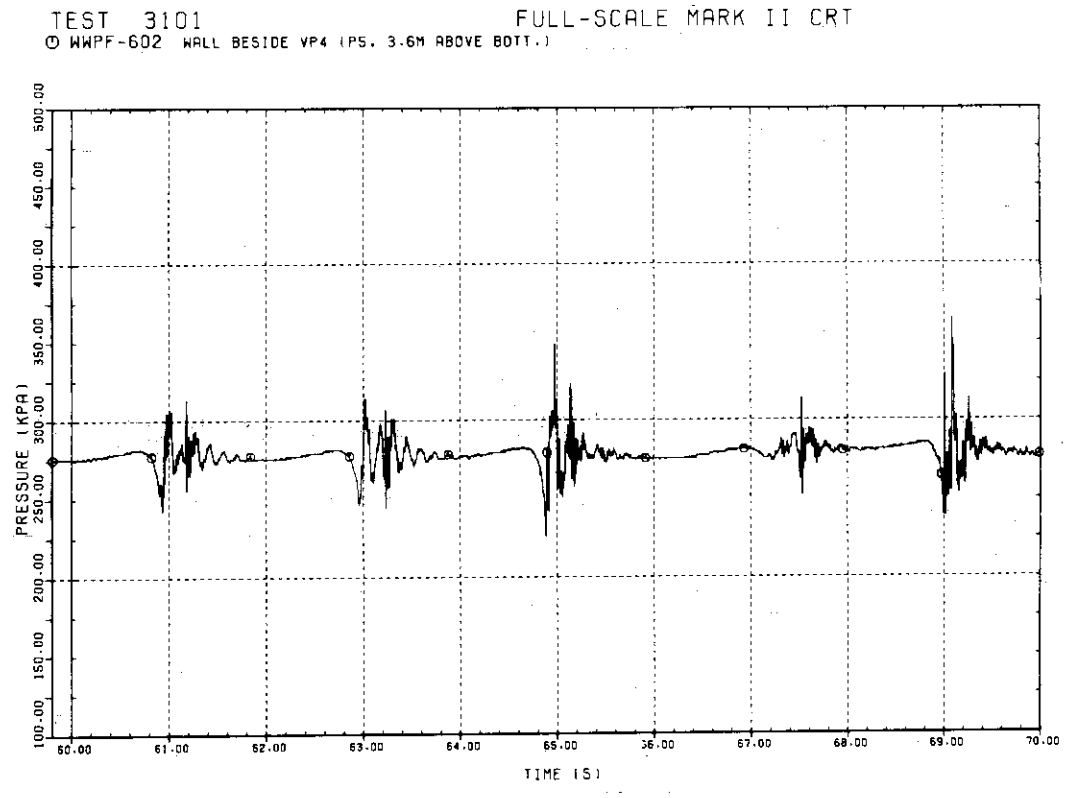
Plot S-1-25 Pressure in Wetwell



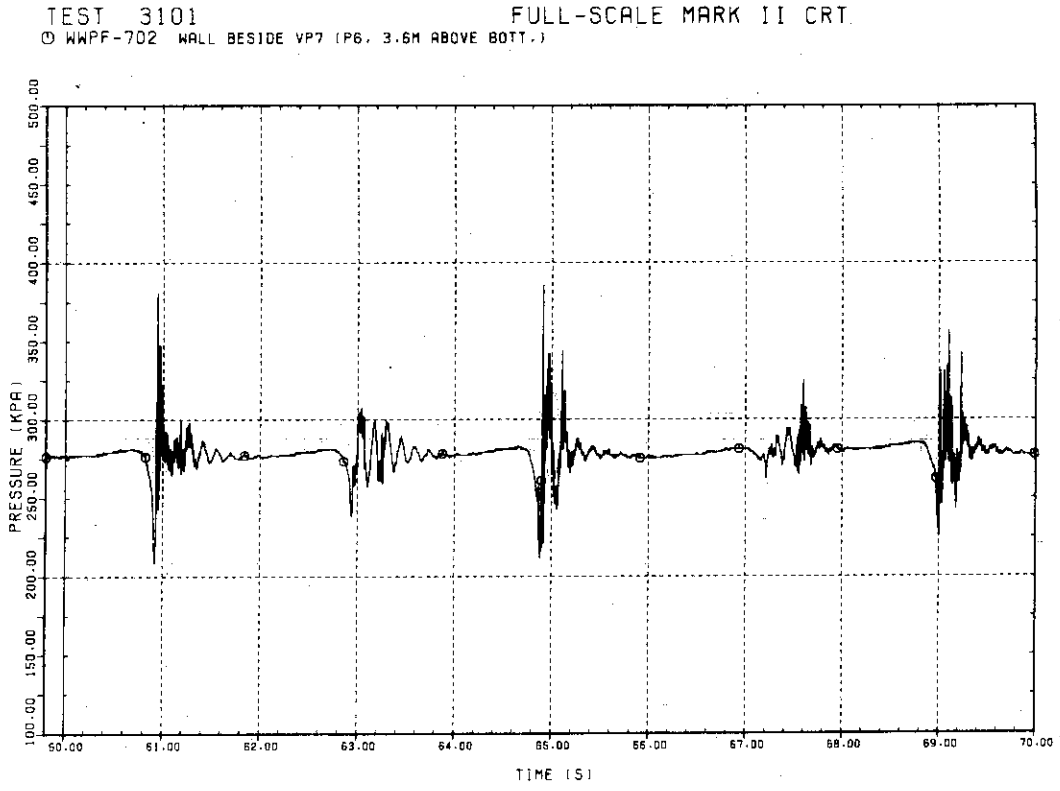
Plot S-1-26 Pressure in Wetwell



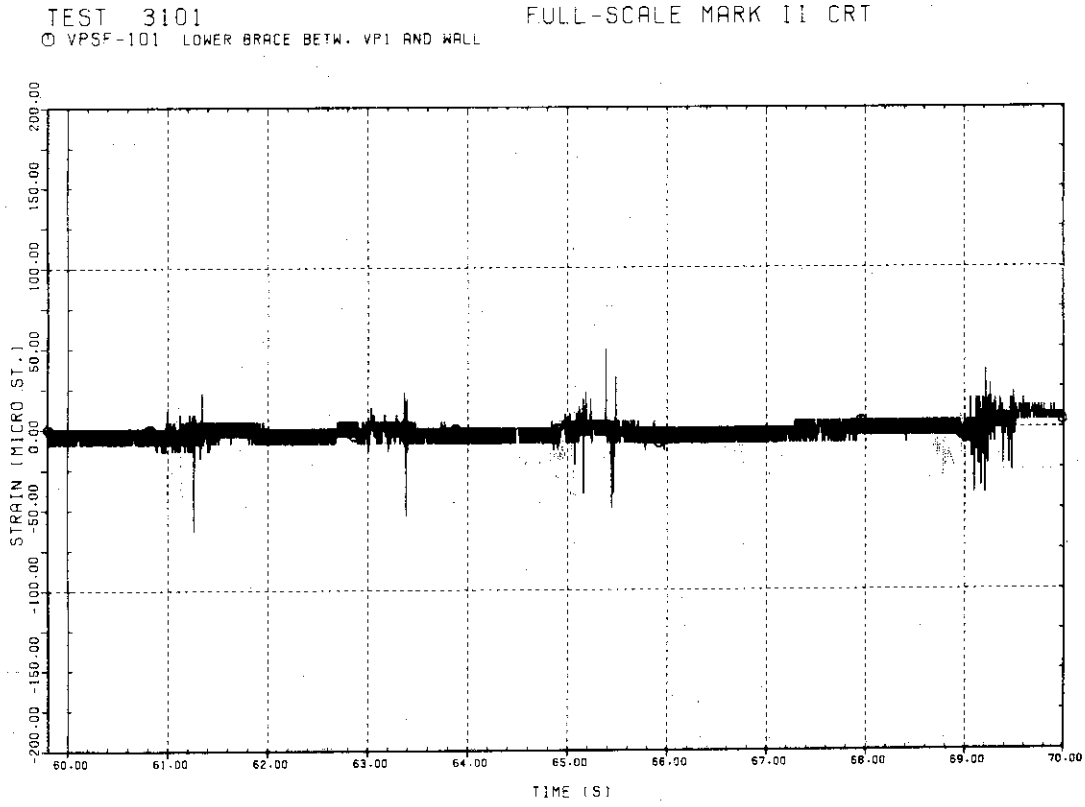
Plot S-1-27 Pressure in Wetwell



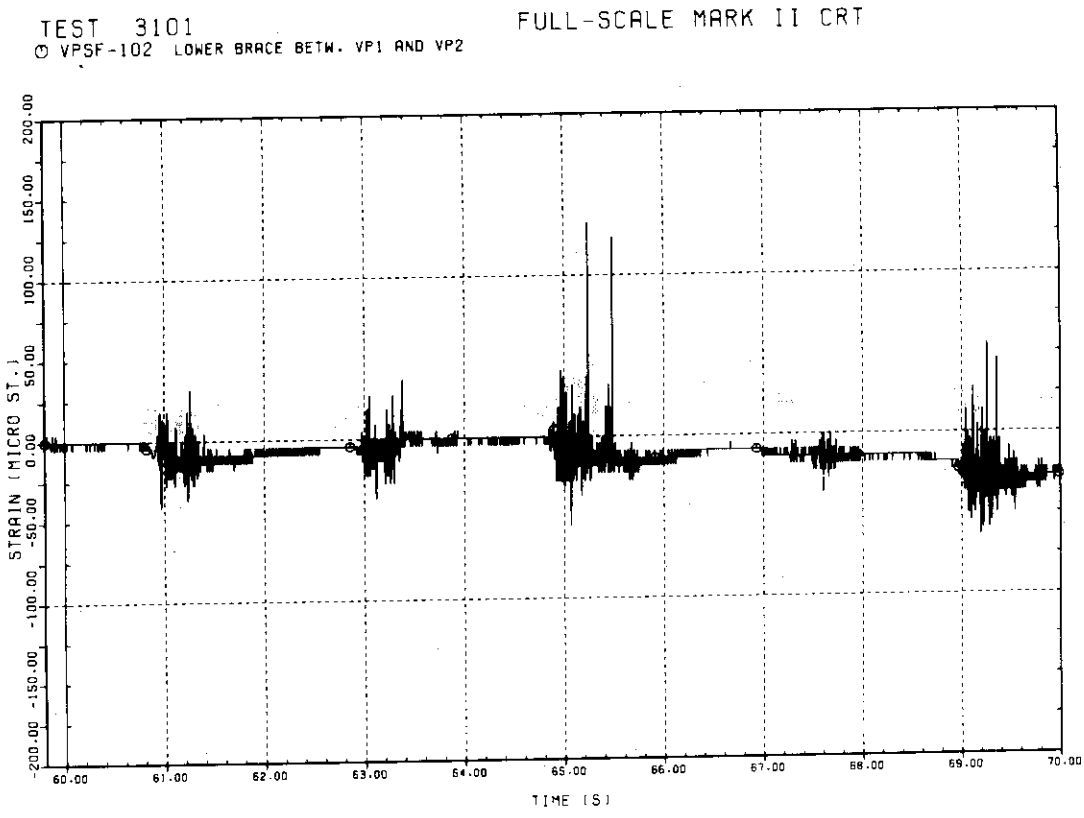
Plot S-1-28 Pressure in Wetwell



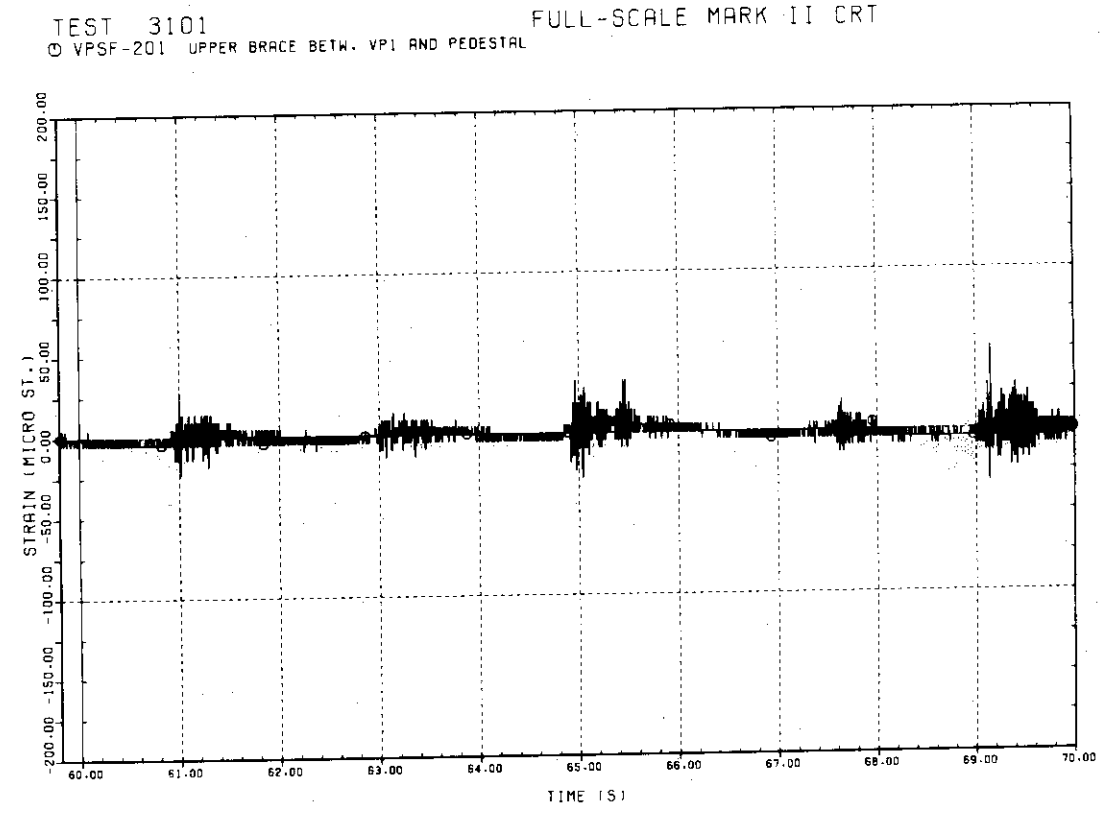
Plot S-1-29 Pressure in Wetwell



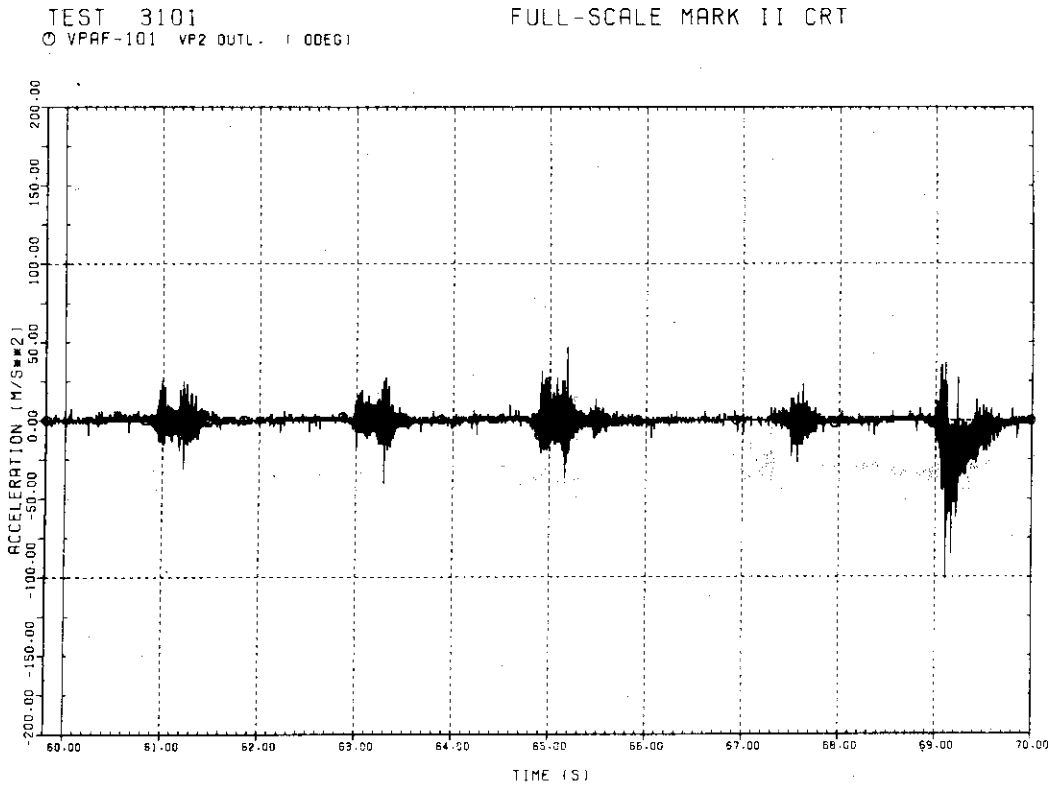
Plot S-1-30 Strain of Vent Pipe Brace



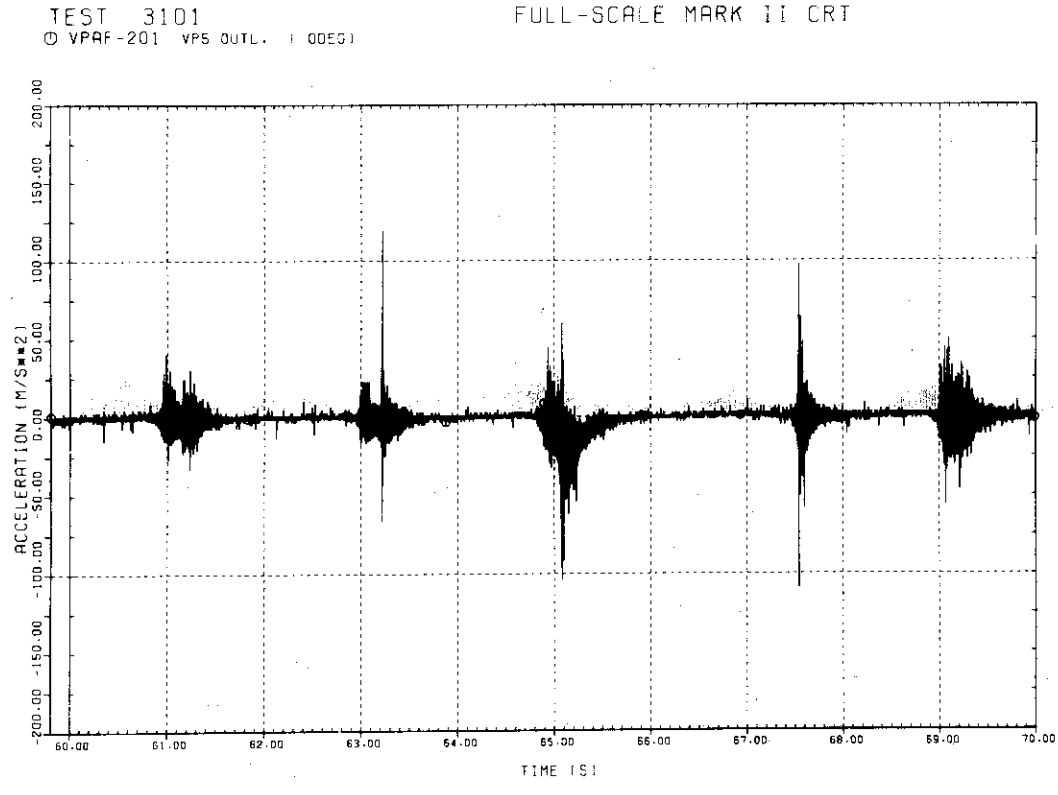
Plot S-1-31 Strain of Vent Pipe Brace



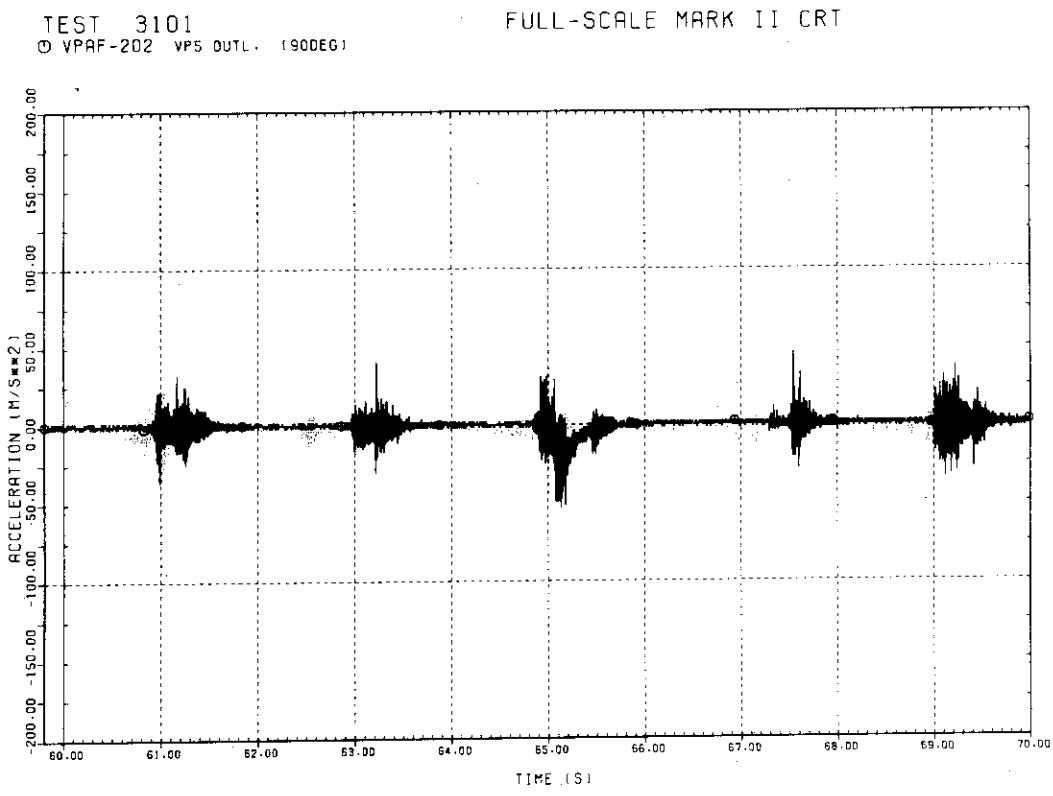
Plot S-1-32 Strain of Vent Pipe Brace



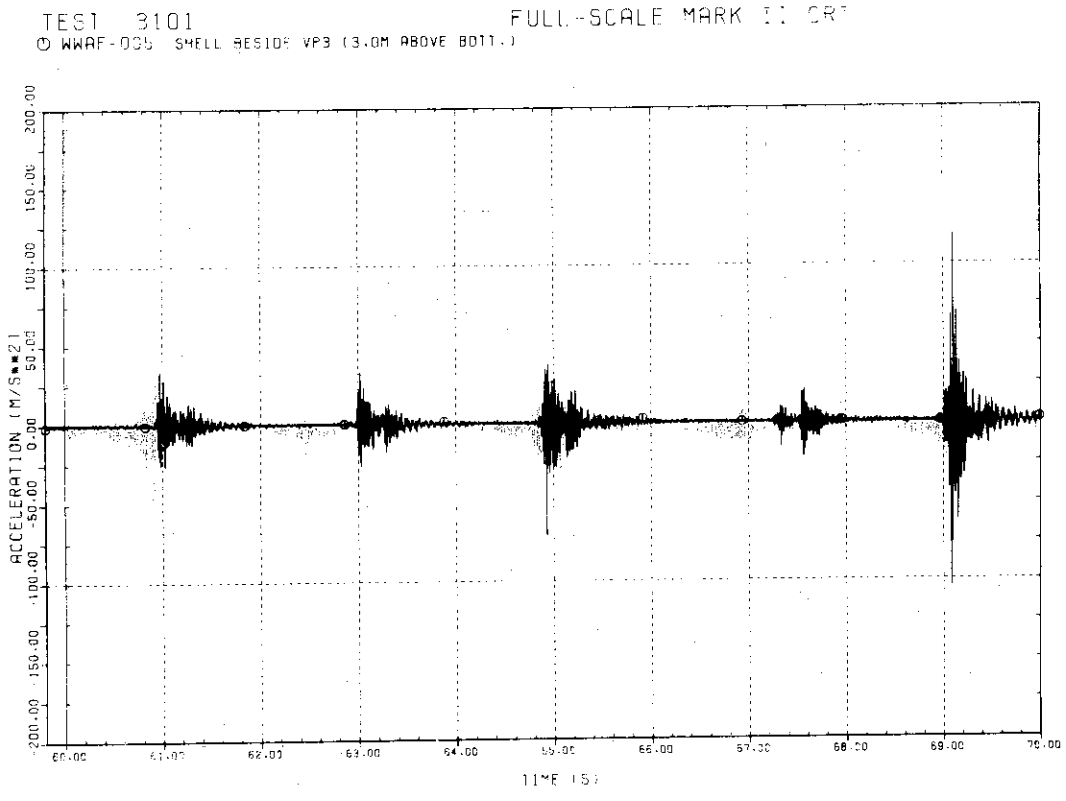
Plot S-2- 1 Acceleration of Vent Pipe Outlet



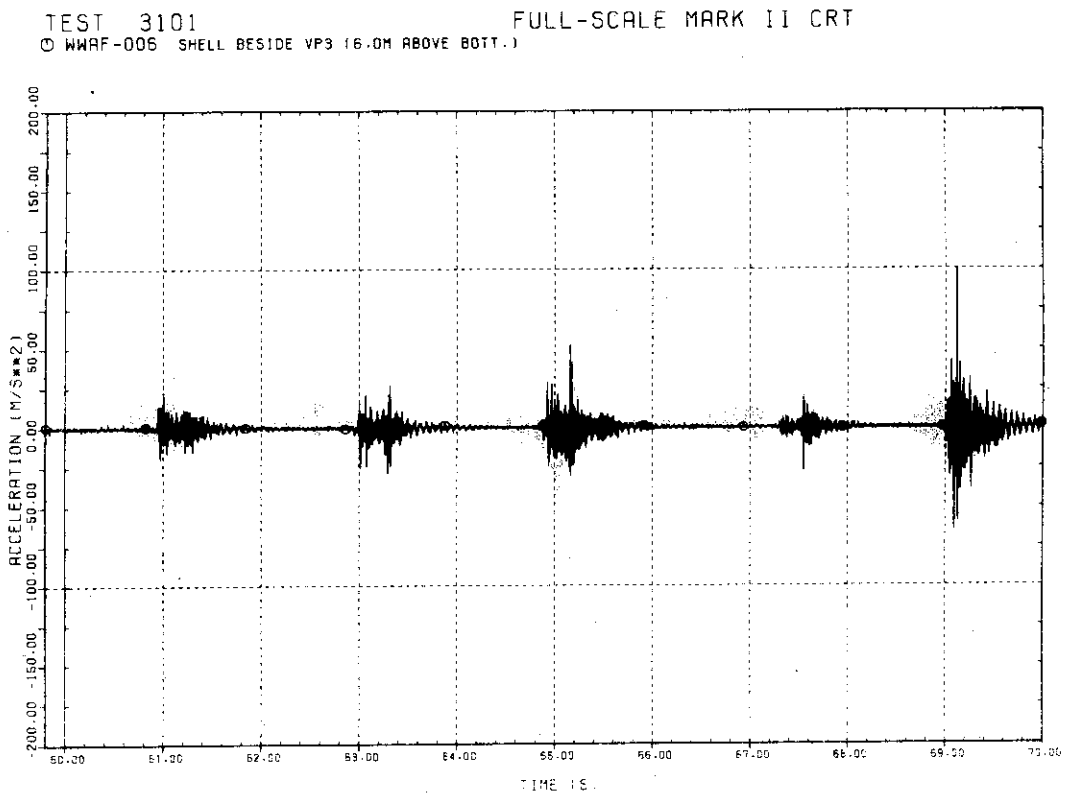
Plot S-2- 2 Acceleration of Vent Pipe Outlet



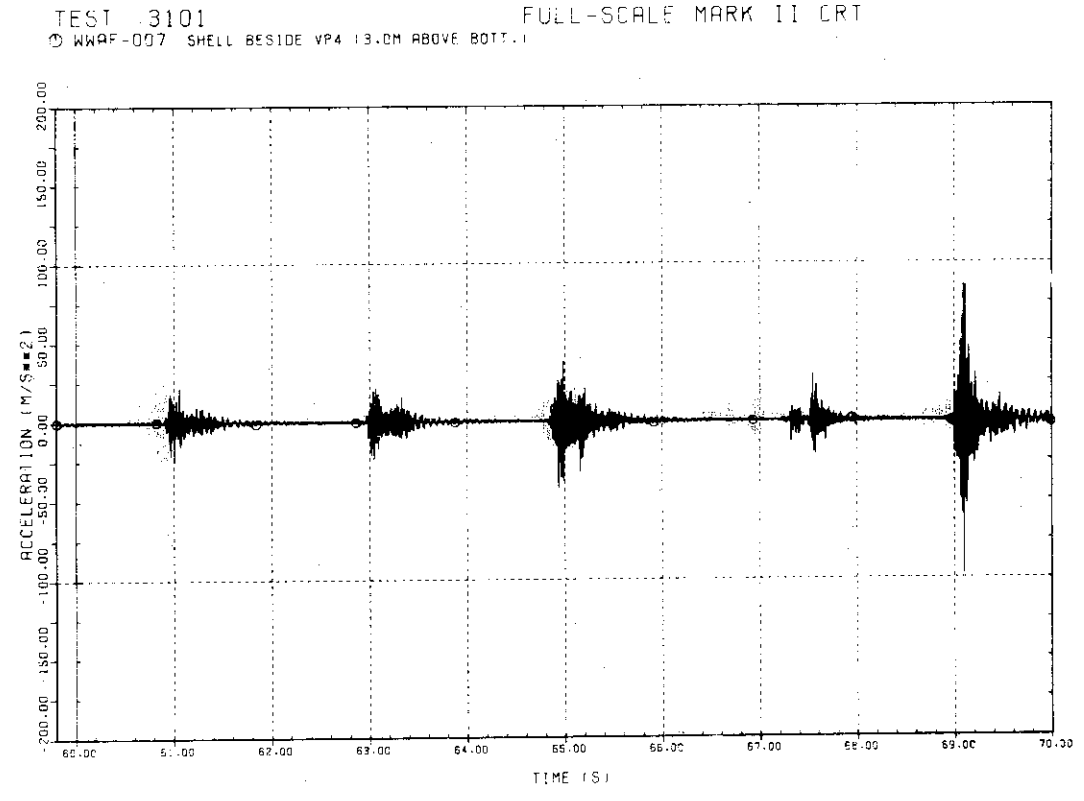
Plot S-2- 3 Acceleration of Vent Pipe Outlet



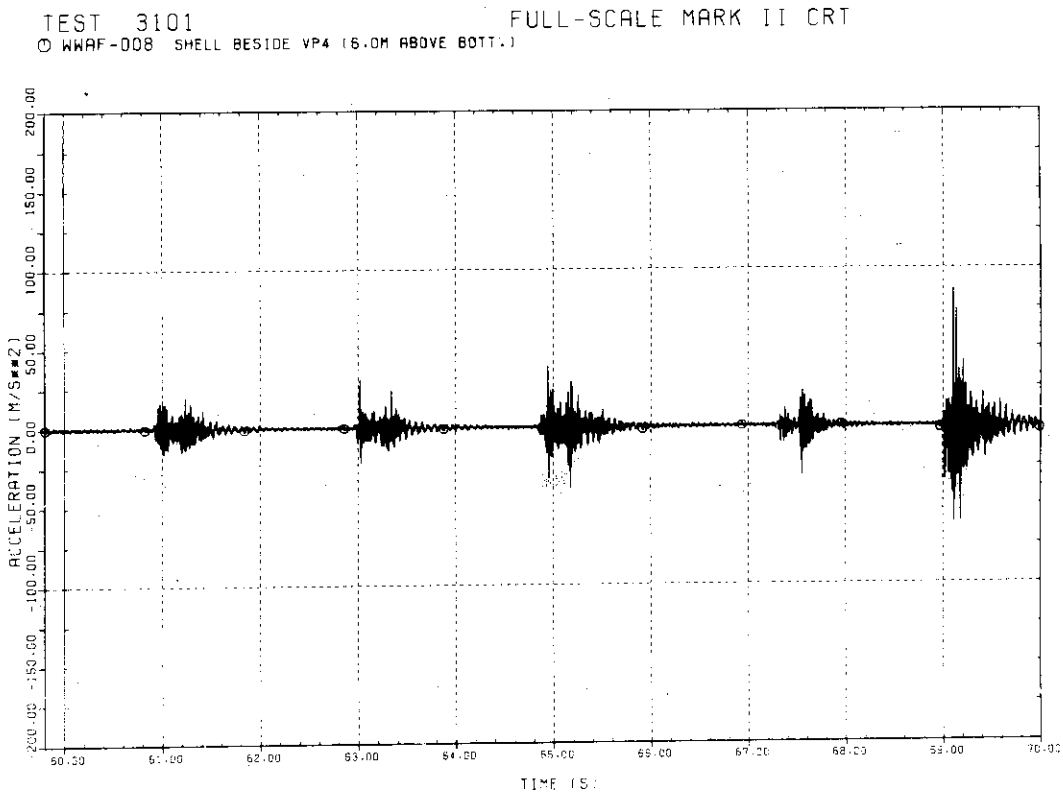
Plot S-2- 4 Acceleration of Containment Structure



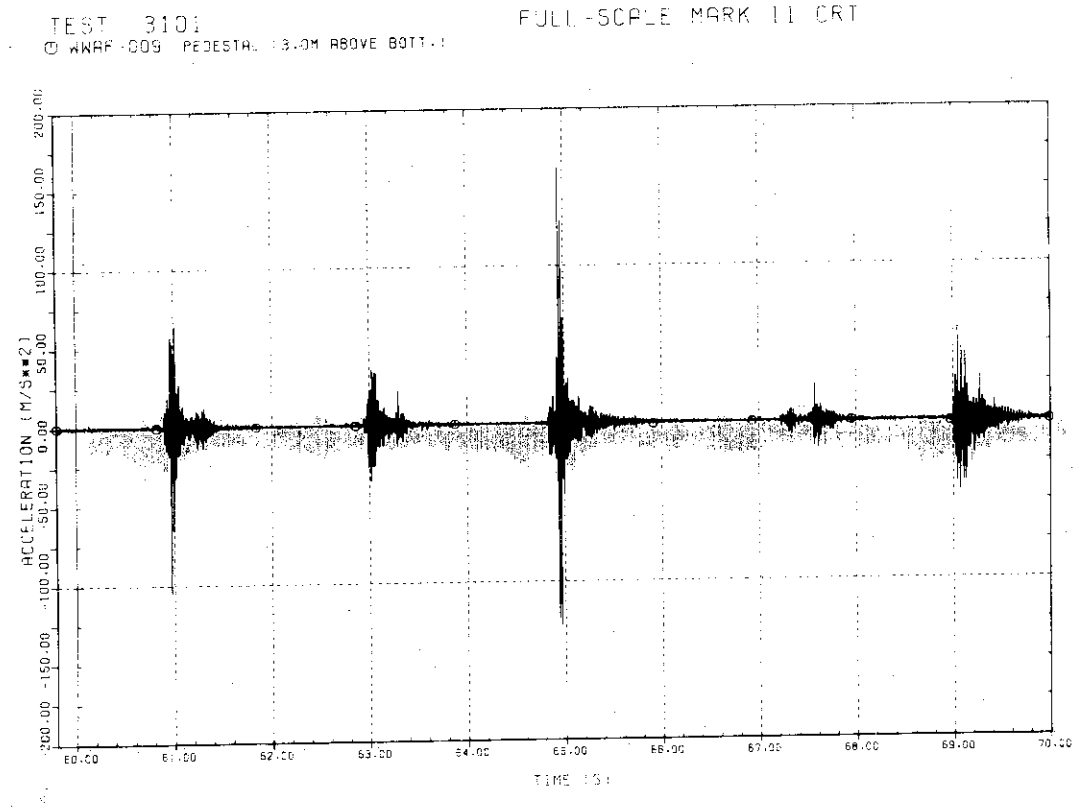
Plot S-2- 5 Acceleration of Containment Structure



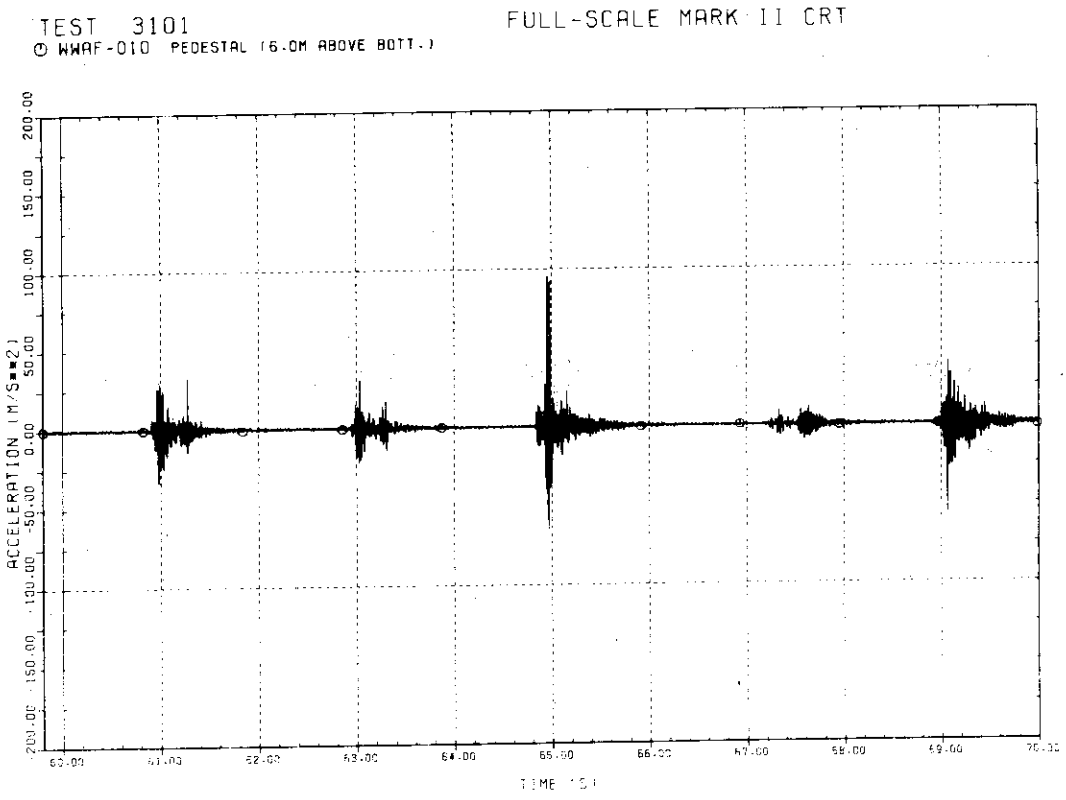
Plot S-2- 6 Acceleration of Containment Structure



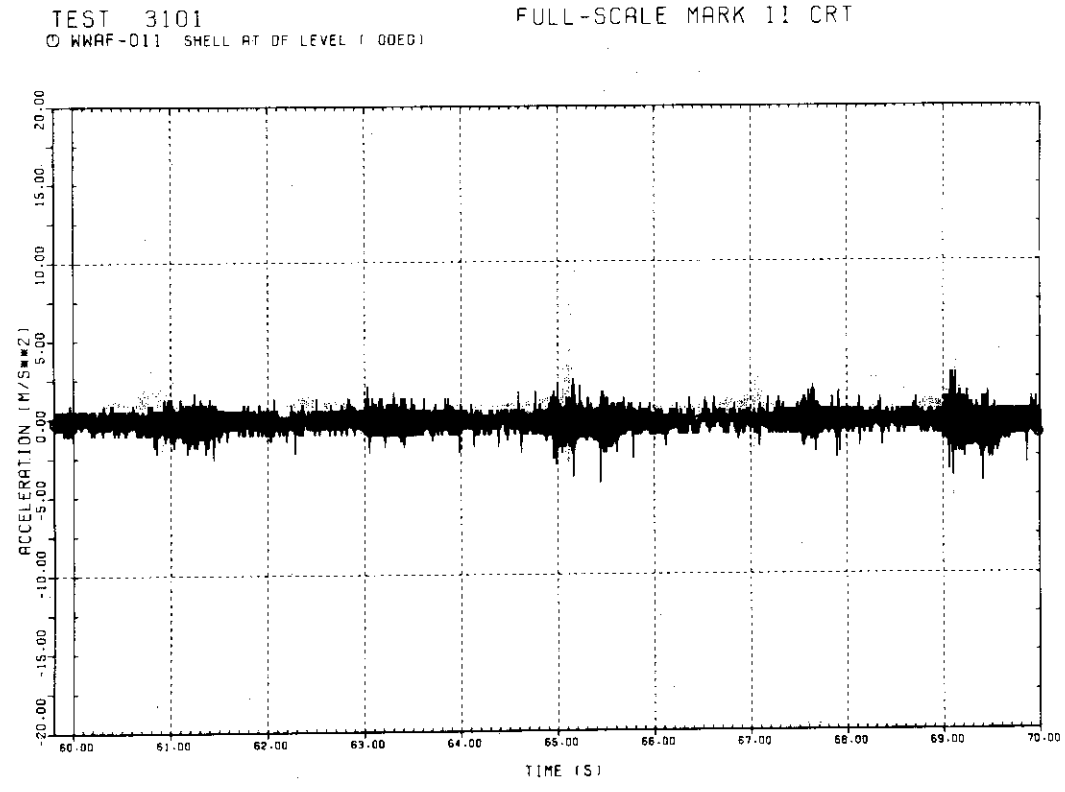
Plot S-2- 7 Acceleration of Containment Structure



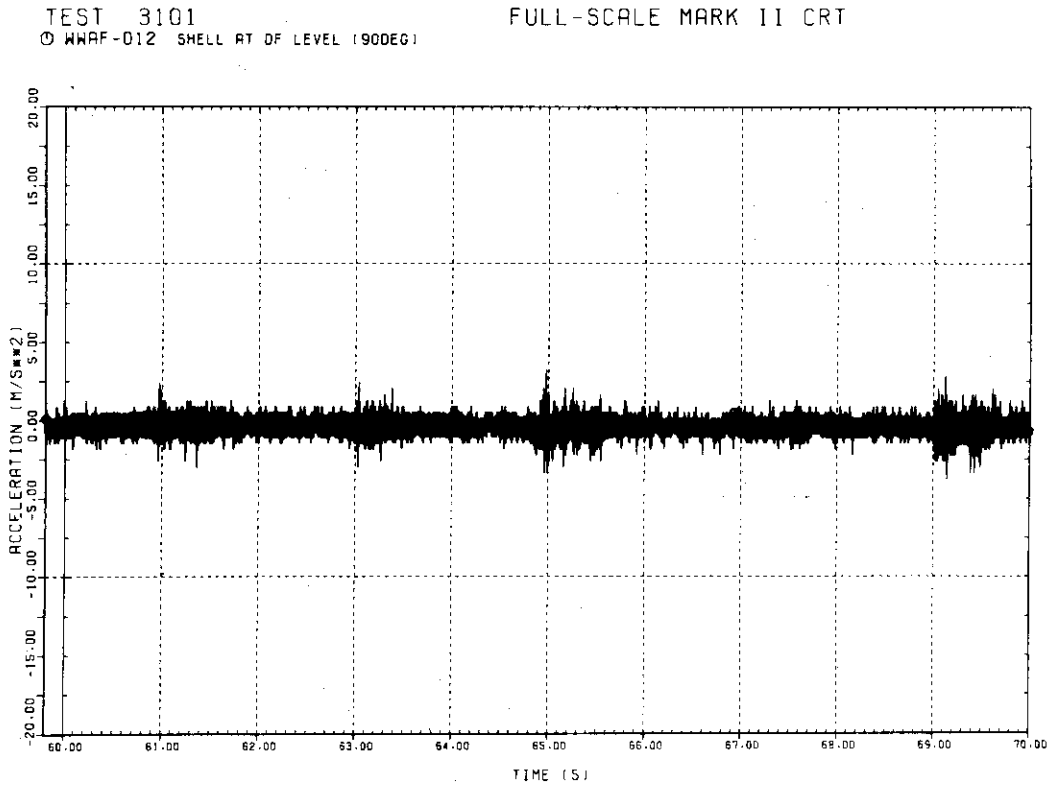
Plot S-2- 8 Acceleration of Containment Structure



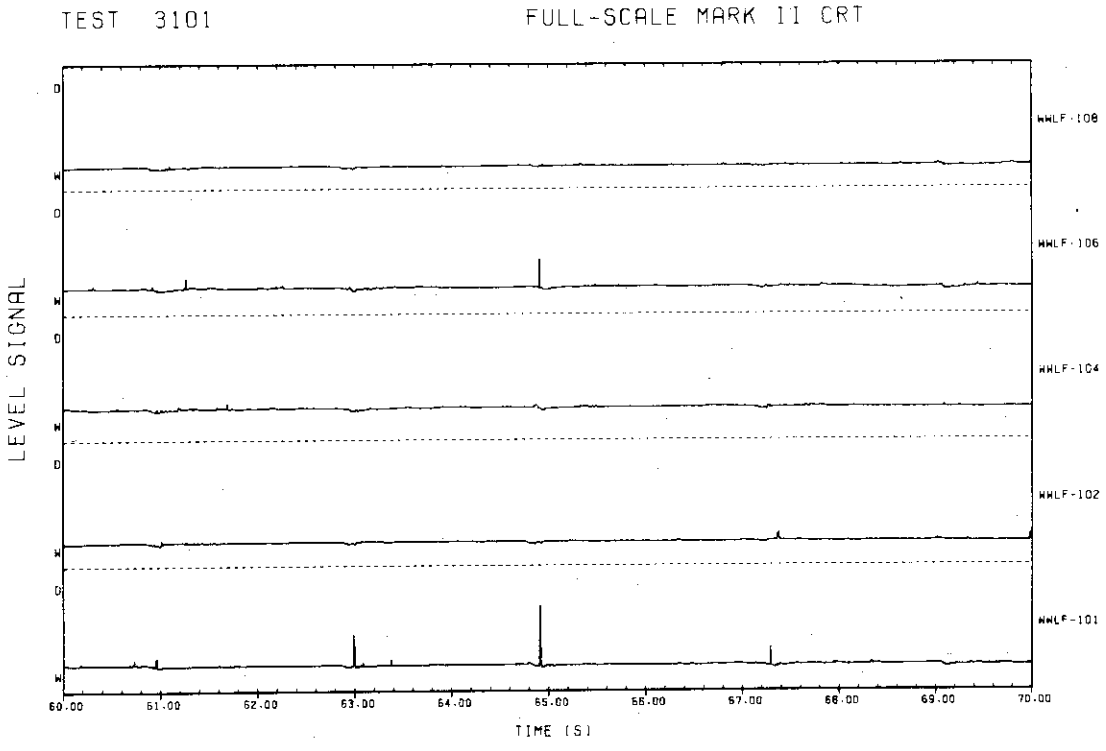
Plot S-2- 9　Acceleration of Containment Structure



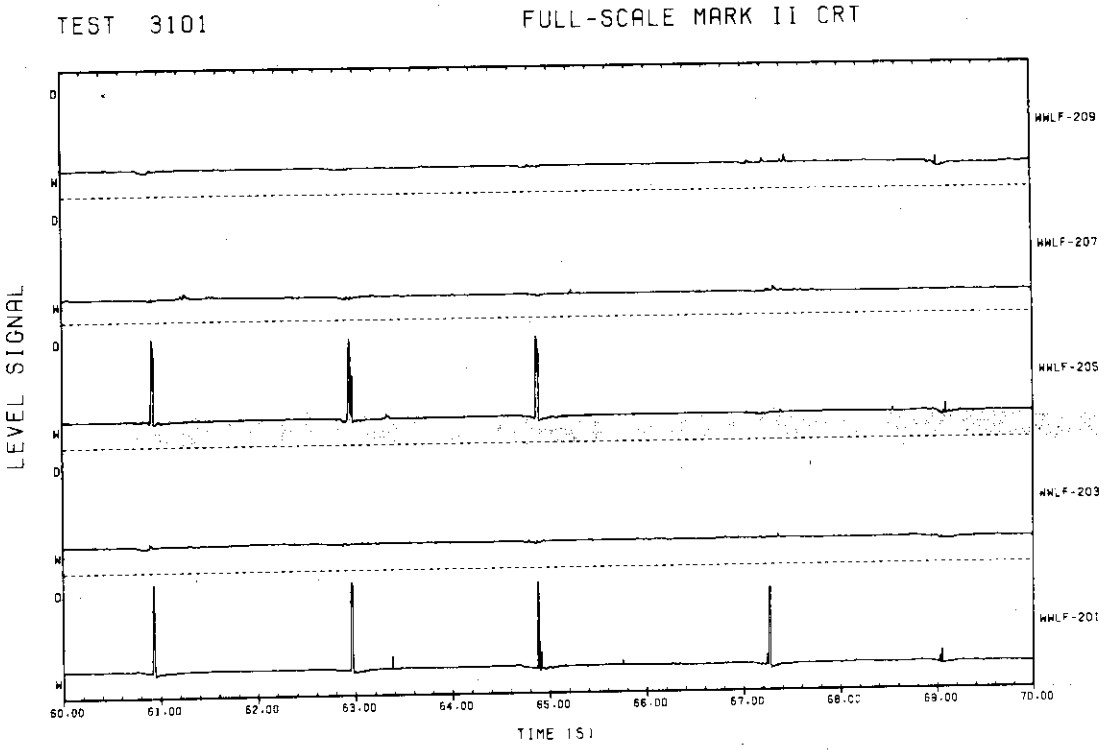
Plot S-2-10　Acceleration of Containment Structure



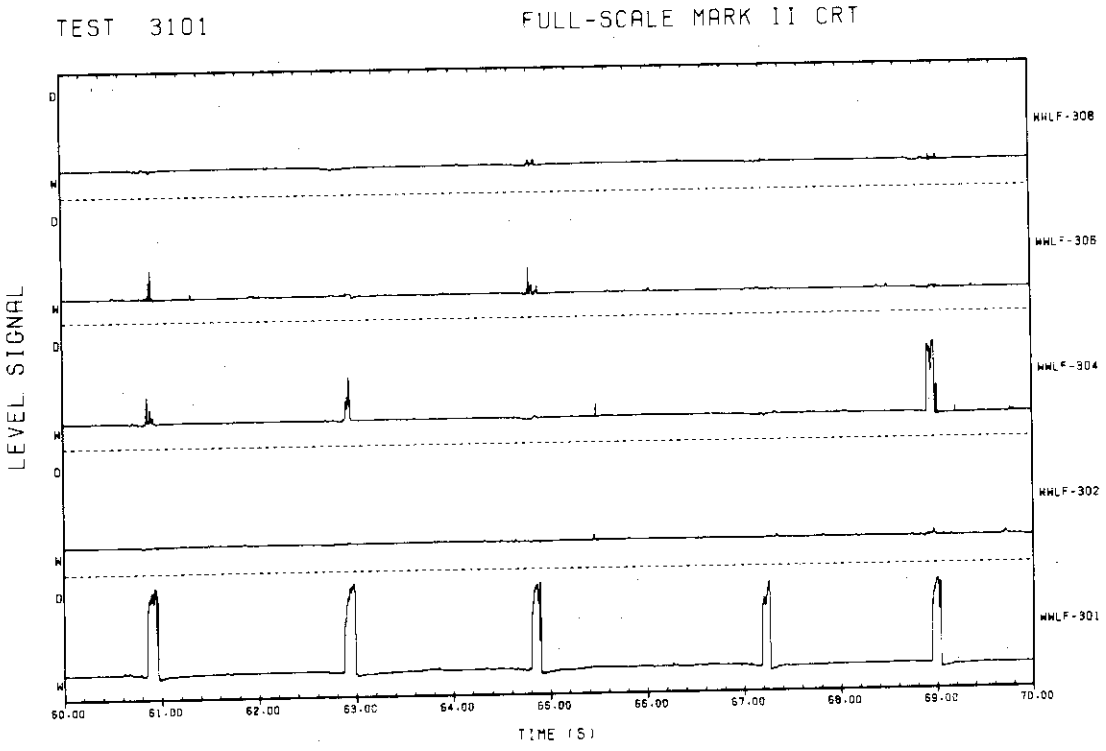
Plot S-2-11 Acceleration of Containment Strucutre



Plot S-2-12 Phase Boundary Signals



Plot S-2-13 Phase Boundary Signals



Plot S-2-14 Phase Boundary Signals