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MARK I CONTAINMENT PROGRAM PLANT UNIQUE LOAD DEFINITION ENRICO FERMI ATOMIC POWER PLANT: UNIT 2

GENERAL ELECTRIC

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MARK I CONTAINMENT PROGRAM

PLANT UNIQUE LOAD DEFINITION

ENRICO FERMI ATOMIC POWER PLANT: UNIT 2

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ILLUSTRATIONS (Continued)

ABSTRACT

This document provides unique definition of specific containment loading conditions that would result from a postulated loss-of-coolant accident in the Enrico Fermi Atomic Power Plant: Unit Number 2. Transient information is provided for containment pressures and temperatures, vent system thrust, torus vertical loads, vent system pool swell impact loads and vent header deflector loads. The document has been prepared under the Mark I Containment Program to aid Detroit Edison Company in the performance of a containment structural evaluation.

INTRODUCTION

This report provides specific transient loading information resulting from a postulated loss-of-coolant accident (LOCA) in the Enrico Fermi Atomic Power Plant: Unit Number 2. This report, in conjunction with the Mark I Containment Load Definition Report, was prepared for the Detroit Edison Company to use in the structural evaluation of the Mark I Containment system.

The following specific LOCA-related transient information is included:

- Pressure and temperature time histories for the drywell and wetwell (Operating and Zero ΔP)
- Vent system thrust loads
- Net vertical pool swell loads and average submerged pressures on the wetwell
- Pool swell impact and drag loads on the vent system
- Vent header deflector loads.

Transient information is presented via a series of figures for each of the above areas. An alpha-numeric identification scheme was developed for the figures such that the alpha designation denotes the plant of interest, while the first three digits of the numeric designation denote the applicable discussion section in the Mark I Containment Program Load Definition Report (NEDO-21888).

Transient conditions presented in this report are results of plant unique testing and/or analysis for specific plant conditions that have been provided or requested by the aforementioned utility. Changes to those specific

plant conditions could result in changes to the transient information reported herein. If, after further review of this document, the responsible utility considers that such changes would be appropriate, the document can be modified accordingly.

LOCA Pressure and Temperature Transients

LOCA Pressure and Temperature Transients

This section provides the LOCA-induced pressure and temperature transients for the drywell and wetwell. The initial conditions for which the pressure and temperature responses were evaluated are also presented. Transient conditions are included for the design basis accident (DBA), intermediate break accident (IBA), and small break accident (SBA). The list of applicable figures and tables for this section is given on the following page.

The peak drywell pressure and temperature and the wetwell pressure and temperature at 30 sec are identified on the DBA containment pressure and temperature plots (Operating and Zero ΔP) (Figures 4.1.1-1, 4.1.1-1a, 4.1.1-2, and 4.1.1-2a).

The peak containment pressures, the containment temperatures at the end of RPV blowdown, and the containment pressures and temperatures at the time of ADS initiation are identified on the IBA and SBA containment pressure and temperature plots (Figures 4.1.2-1, 4.1.2-2, 4.1.3-1, and 4.1.3-2).

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PLANT UNIQUE PRESSURE/TEMPERATURE RESPONSE FIGURES AND TABLES

Figure/Table Number	Title	Applicable Revision No.
Table EF 4.1.1-1	Plant Conditions at Instant of DBA Pipe Break (Operating ΔP)	Revision 3
Table EF 4.1.1-1a	Plant Conditions at Instant of DBA Pipe Break (Zero ΔP)	
Figure EF 4.1.1-1	DBA Containment Pressure Response (Operating ΔP)	
Figure EF 4.1.1-1a	DBA Containment Pressure Response (Zero ΔP)	
Figure EF 4.1.1-2	DBA Containment Temperature Response (Operating ΔP)	
Figure EF 4.1.1-2a	DBA Containment Temperature Response (Zero ΔP)	
Table EF 4.1.2-1	Plant Conditions at Instant of IBA Pipe Break (Operating and Zero ΔP)	
Figure EF 4.1.2-1	IBA Containment Pressure Response (Operating and Zero ΔP)	
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Table EF 4.1.3-1	Plant Conditions at Instant of SBA Pipe Break (Operating and Zero ΔP)	
Figure EF 4.1.3-1	SBA Containment Pressure Response	
Figure EF 4.1.3-2	SBA Containment Temperature Response	

Table EF 4.1.1-1

PLANT CONDITIONS AT INSTANT OF DBA PIPE BREAK

(Operating ΔP)

102% Licensed Power (MWt)	3358
Initial Suppression Pool Temperature (^{o}F)	70.0
Downcomer Submergence (ft)	3.33
Airspace Volume (ft^{3})	
Drywell	163,730
Wetwell	130,900
Airspace Pressure (psig)	
Drywell	0.75
Wetwell	0.575

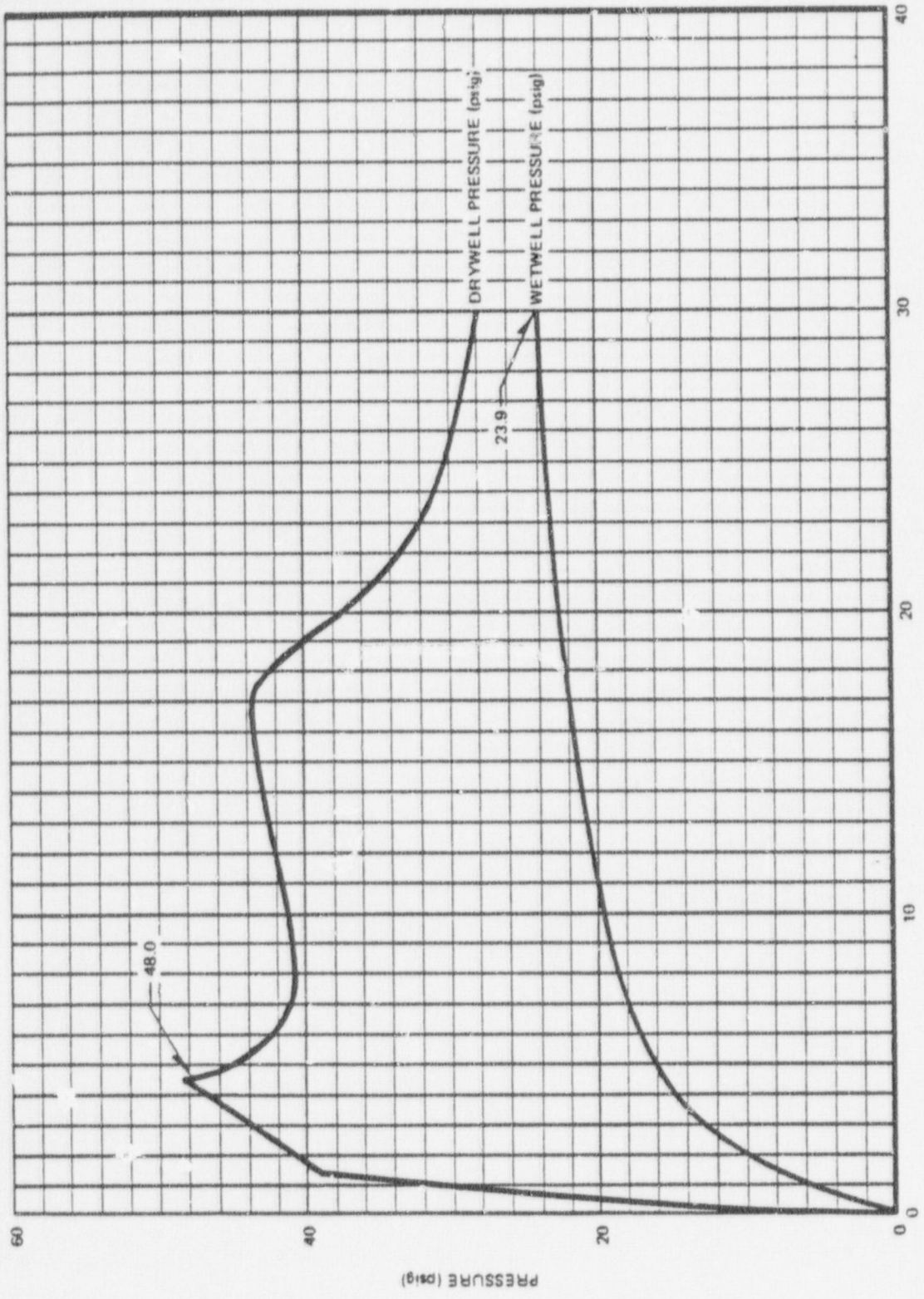

Figure EF 4.1.1-1. DBA Containment Pressure Response (Operating ΔP)

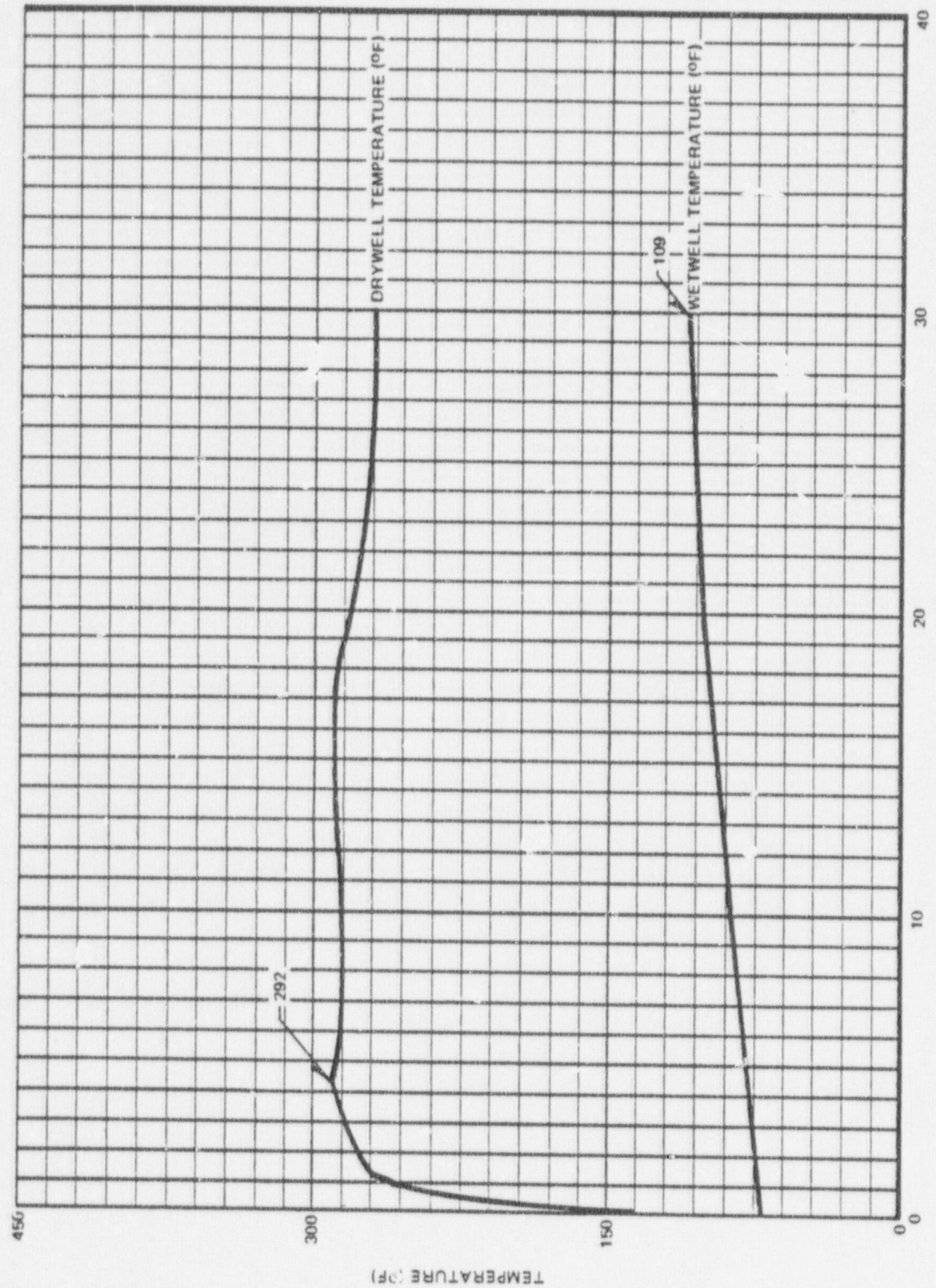

Figure 4.1.1-2. DBA Containment Temperature Response (Operating ΔP)

Table EF 4.1.1-1a

PLANT CONDITIONS AT INSTANT OF DBA PIPE BREAK

(Zero ΔP)

102% Licensed Power (MWt)	3358
Initial Suppression Pool Temperature (°F)	70.0
Downcomer Submergence (ft)	3.33
Airspace Volume (ft^3)	
Drywell	163,730
Wetwell	130,900
Airspace Pressure (psig)	
Drywell	0.75
Wetwell	0.75

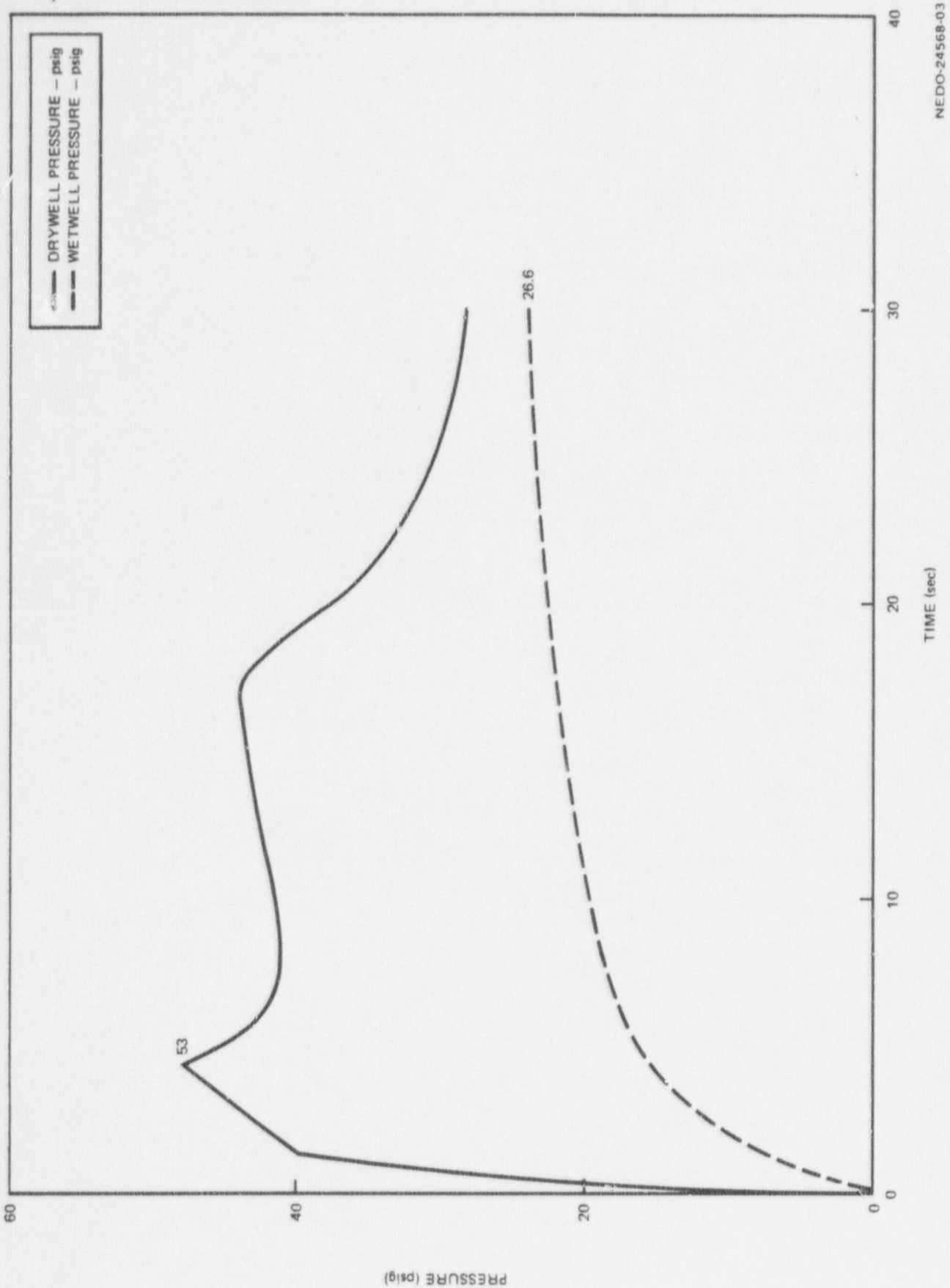

Figure EF 4.1.1-1a DBA Containment Pressure Response
(Zero ΔP)

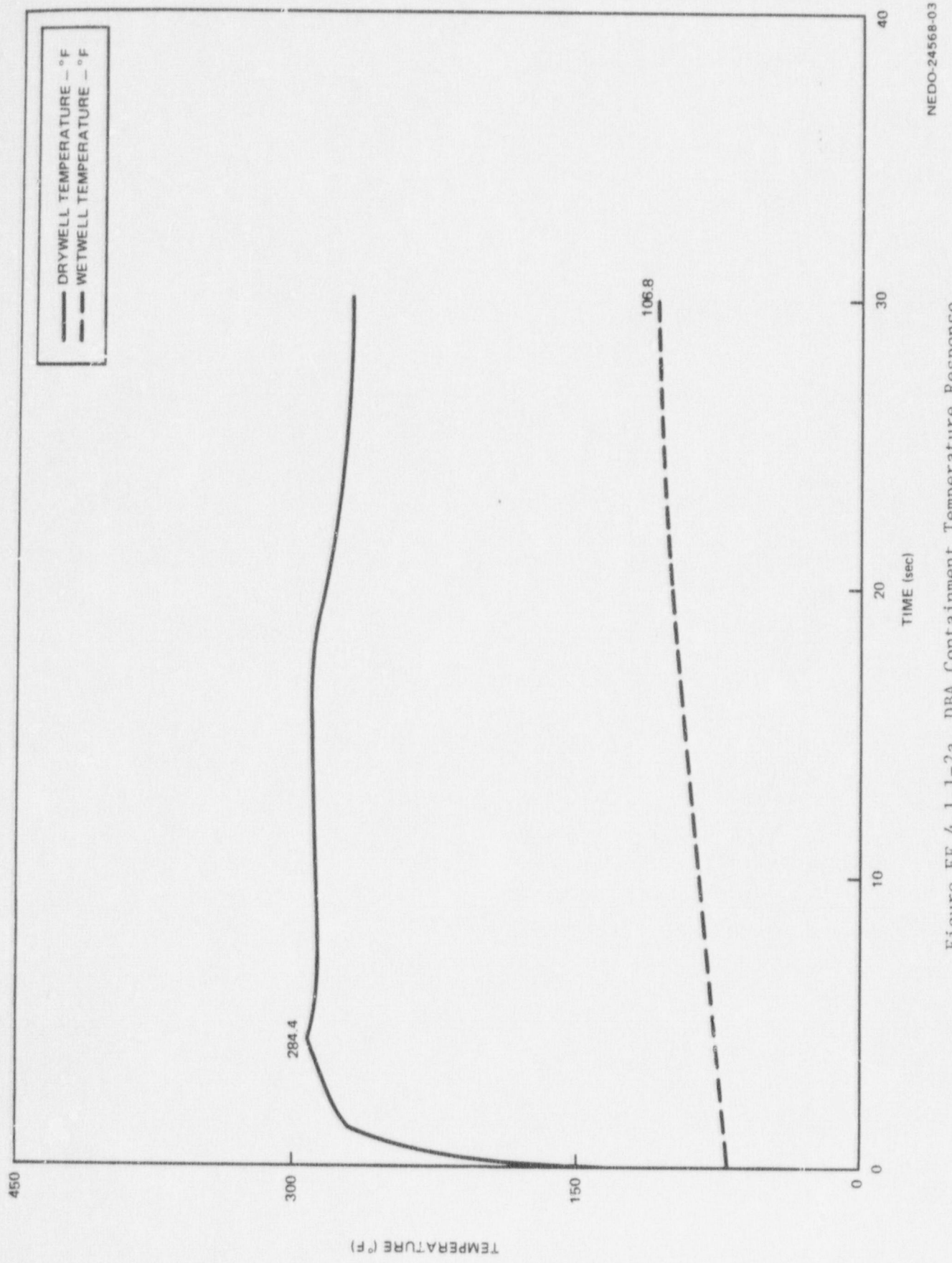

Figure EF 4.1.1-2a DBA Containment Temperature Response (Zero ΔP)

Table EF 4.1.2-1

PLANT CONDITIONS AT INSTANT OF IBA PIPE BREAK

102% Licensed Power (MWt)	3358
Initial Suppression Pool Temperature (^{o}F)	95
Downcomer Submergence (ft)	3.33
Airspace Volume (ft^{3})	
Drywell	163,730
Wetwell	130,900
Airspace Pressure (psig)	
Drywell	Bounds both
Wetwell	zero and operating
	ΔP conditions

Revision 3

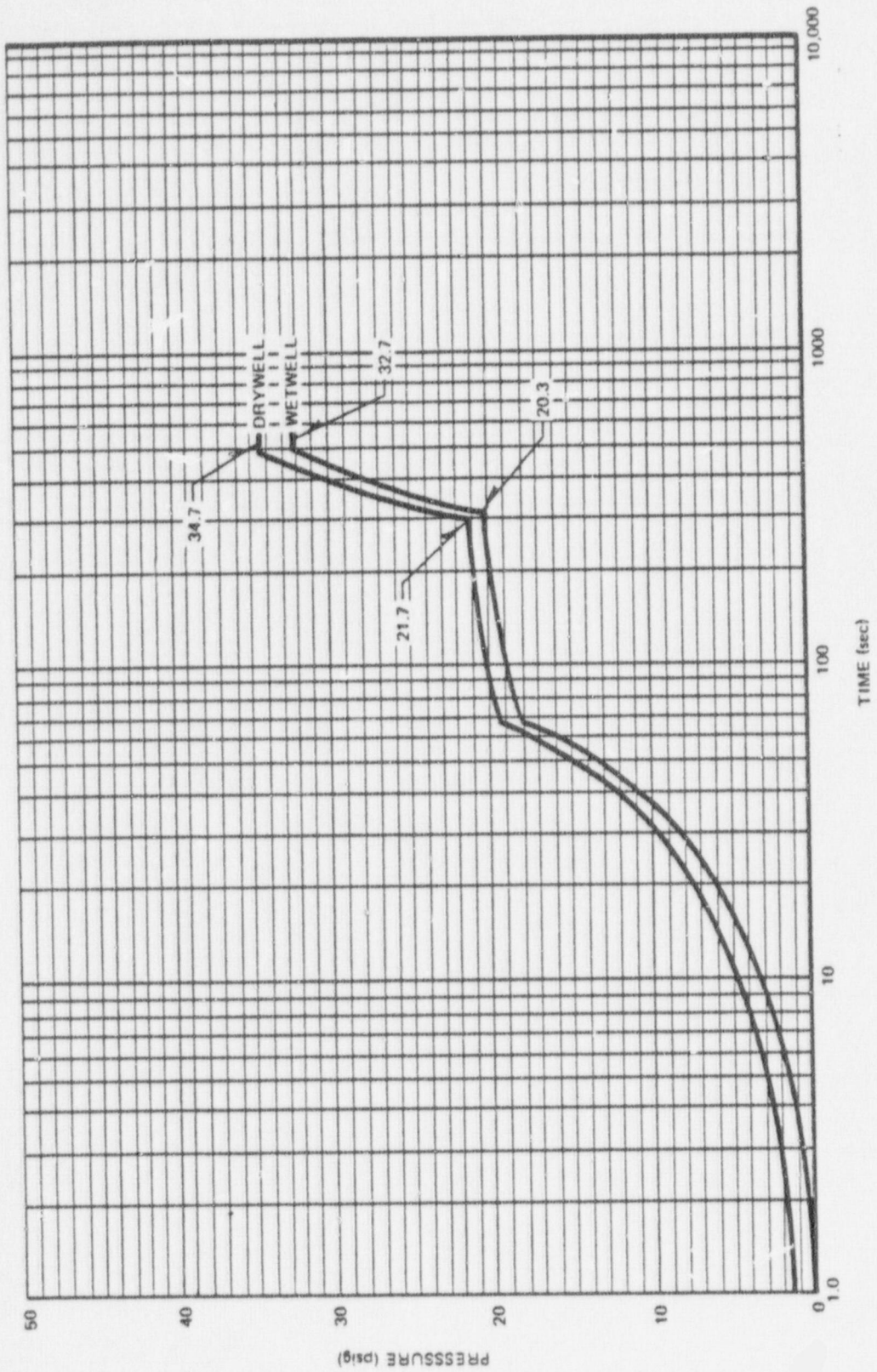

Figure EF 4.1.2-1. IBA Containment Pressure Response

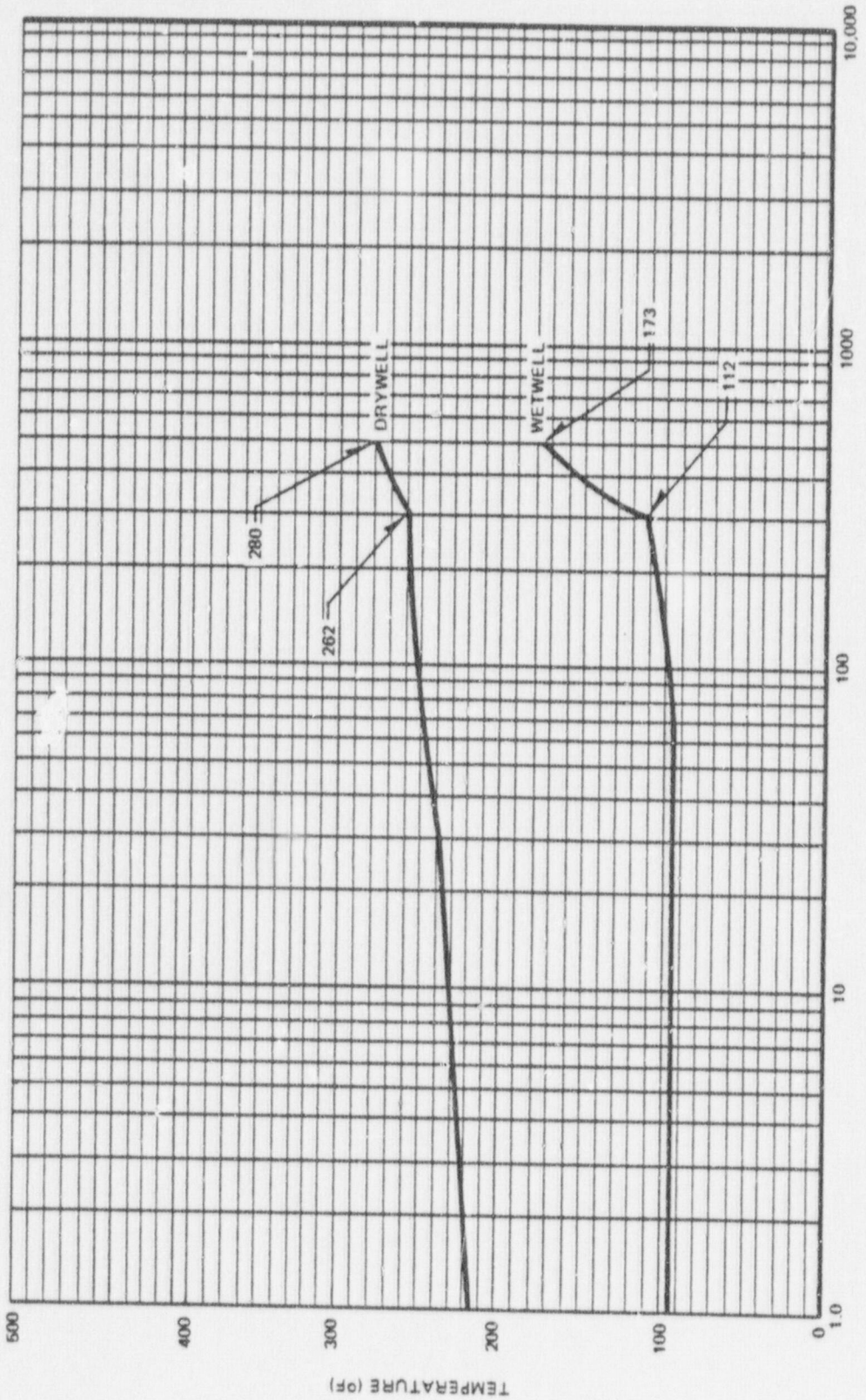

Figure EF 4.1.2-2. IBA Containment Temperature Response

Table EF 4.1.3-1

PLANT CONDITIONS AT INSTANT OF SBA PIPE BREAK

102% Licensed Power (MWt)	3358
Initial Suppression Pool Temperature (^{o}F)	95
Downcomer Submergence (ft)	3.33
Airspace Volume (ft^{3})	
Drywell	163,730
Wetwell	130,900
Airspace Pressure (psig)	
Drywell	Bounds both
Wetwell	zero and operating
	ΔP conditions

Revision 3

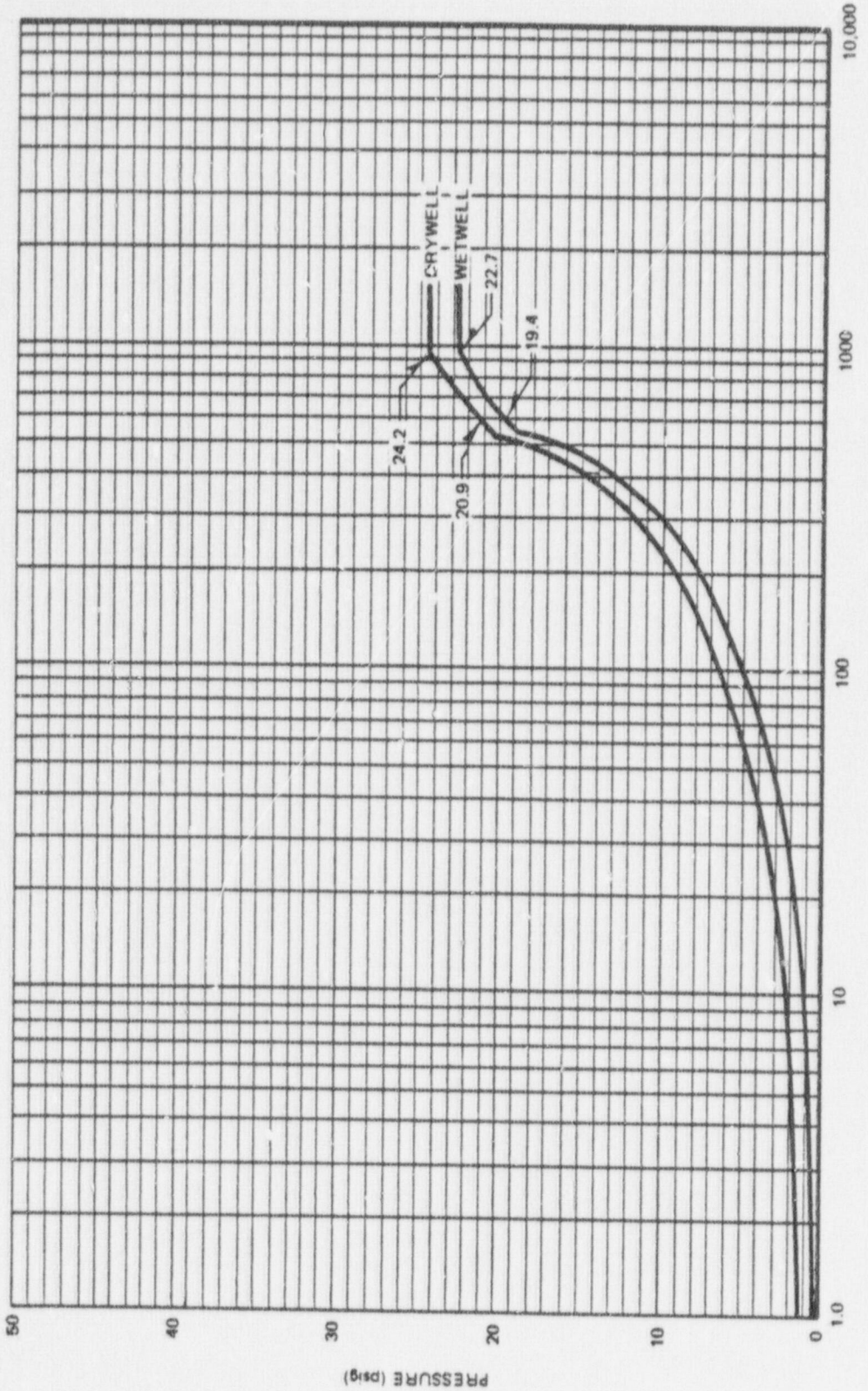

Figure EF 4.1.3-1. SBA Containment Pressure Response

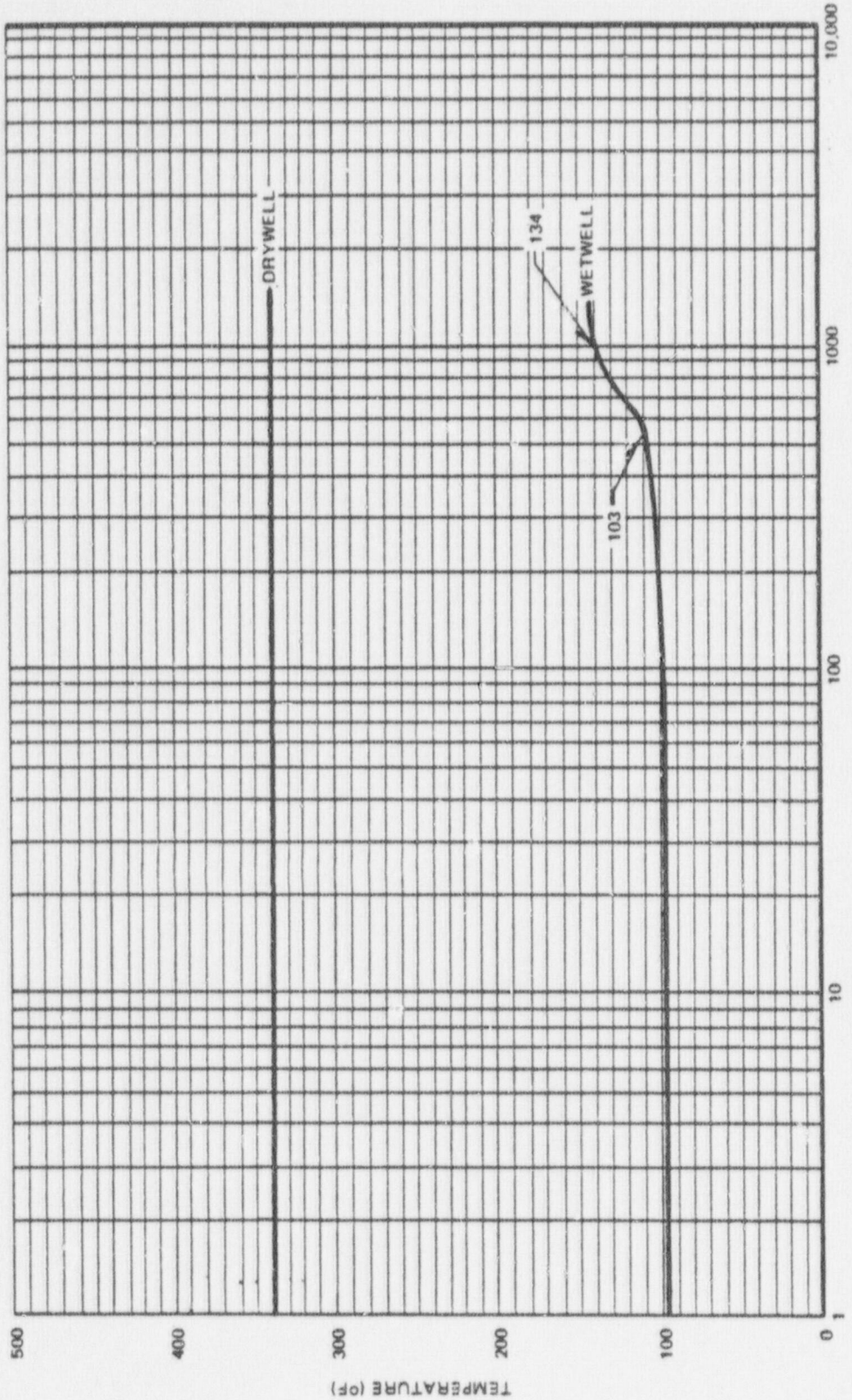

Figure EF 4.1.3-2. SBA Containment Temperature Response

DBA Vent System Thrust Loads - Zero ΔP, Operating ΔP

DBA Vent System Thrust Loads - Operating and Zero ΔP

This section provides thrust loads for the main vents, vent header, and downcomers resulting from the postulated DBA for plant operation at a positive and zero drywell-wetwell pressure differential. The list of applicable figures and tables for this section is given on the following page.

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PLANT UNIQUE DBA VENT SYSTEM THRUST LOAD FIGURES AND TABLES - ZERO AND OPERATING ΔP

Figure/Table Number	Title	Applicable Revision No.
Table EF 4.2-1	Nomenclature for DBA Vent System Thrust Load Section	Revision 3
Table EF 4.2-2	Plant Conditions at Instant of DBA Pipe Break for Thrust Load Calculations (Zero ΔP)	
Table EF 4.2-3	Plant Conditions at Instant of DBA Pipe Break for Thrust Load Calculations (Operating ΔP)	
Figure EF 4.2-1	Definition of Positive Thrust Loads	
Figure EF 4.2-2	Single Main Vent Forces (0-5 secs) (Zero ΔP)	
Figure EF 4.2-12	Single Main Vent Forces (0-5 secs) (Operating ΔP)	
Figure EF 4.2-3	Vent Header Forces per Mitre Bend (0-5 secs) (Zero ΔP)	
Figure EF 4.2-13	Vent Header Forces per Mitre Bend (0-5 secs) (Operating ΔP)	
Figure EF 4.2-4	Single Downcomer Forces (0-5 secs) (Zero ΔP)	
Figure EF 4.2-14	Single Downcomer Forces (0-5 secs) (Operating ΔP)	
Figure EF 4.2-5	Total Vertical Forces, Net Vertical Force (0-5 secs) (Zero ΔP)	
Figure EF 4.2-15	Total Vertical Forces, Net Vertical Force (0-5 secs) (Operating ΔP)	
Figure EF 4.2-6	Single Main Vent Forces (0-30 secs) (Zero ΔP)	
Figure EF 4.2-16	Single Main Vent Forces (0-30 secs) (Operating ΔP)	
Figure EF 4.2-7	Vent Header Forces per Mitre Bend (0-30 secs) (Zero ΔP)	
Figure EF 4.2-17	Vent Header Forces per Mitre Bend (0-30 secs) (Operating ΔP)	
Figure 4.2-8	Single Downcomer Forces (0-30 secs) (Zero ΔP)	
Figure 4.2-18	Single Downcomer Forces (0-30 secs) (Operating ΔP)	

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PLANT UNIQUE DBA VENT SYSTEM THRUST LOAD FIGURES AND TABLES - ZERO AND OPERATING ΔP (Continued)

Figure/Table Number	Title	Applicable Revision No.
Figure EF 4.2-9	Total Vertical Forces, Net Vertical Force (0-30 secs) (Zero ΔP)	Revision 3
Figure EF 4.2-19	Total Vertical Forces, Net Vertical Force (0-30 secs) (Operating ΔP)	
Figure EF 4.2-10	Pressure Time Histories (0-5 secs) (Zero ΔP)	
Figure EF 4.2-20	Pressure Time Histories (0-5 secs) (Operating ΔP)	
Figure EF 4.2-11	Pressure Time Histories (0-30 secs) (Zero ΔP)	
Figure EF 4.2-21	Pressure Time Histories (0-30 secs) (Operating ΔP)	

Table EF 4.2-1

NOMENCLATURE FOR DBA VENT SYSTEM THRUST LOAD SECTION

PDW	Drywell pressure
PWW	Wetwell airspace pressure
P1	Main vent pressure
P2	Vent header pressure
P3	Downcomer pressure
F1V1	Vertical force on a single main vent end cap
F1H1	Horizontal force on a single main vent end cap
F1V2	Vertical force on a single main vent mitre bend (applicable to Browns Ferry and Oyster Creek only)
F1H2	Horizontal force on a single main vent mitre bend (applicable to Browns Ferry and Oyster Creek only)
F2V	Vertical force on vent header (per mitre bend)
F2H	Horizontal force on vent header (per mitre bend)
F3V	Vertical force on a single downcomer mitre bend
F3H	Horizontal force on a single downcomer mitre bend

F4V	Vertical force on second mitre bend of a single downcomer (if applicable)
F4H	Horizontal force on second mitre bend of a single downcomer (if applicable)
F1V1T	Total main vent end cap vertical force - F1V1 x number of main vents
F1V2T	Total main vent mitre bend vertical force = F1V2 x number of main vents
F2VT	Total vent header vertical force = F2V x number of vent header mitre bends
F3VT	Total vertical force (first downcomer mitre bend) = F3V x number of downcomers
F4VT	Total vertical force (second downcomer mitre bend) = F4V x number of downcomers
FNETV	FNETV = F1V1T + F1V2T + F2VT + F3VT + F4VT
A_{VH}	Vent header flow area
A_{VP}	Total main vent flow area

Table EF 4.2-1 (Continued)

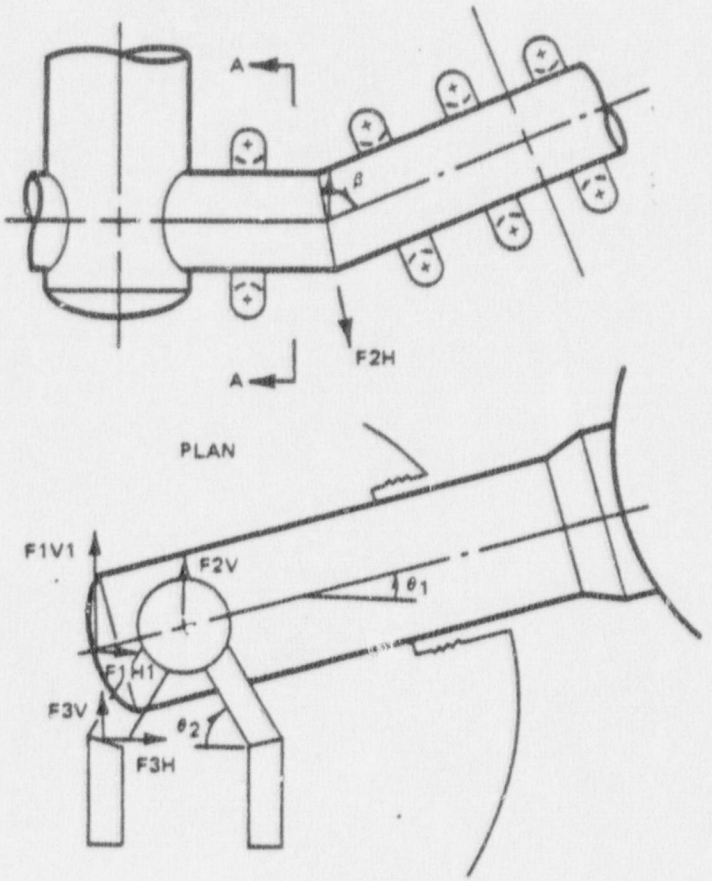
NOMENCLATURE FOR DBA VENT SYSTEM THRUST LOAD SECTION

A_{DC}	Total downcomer flow area
n_1	Number of main vents
n_2	Number of downcomers
n_3	Number of vent header mitre bends
$\dot{m}_T$	Total mass flow rate
V_1	Fluid velocity in main vent
V_2	Fluid velocity in vent header
V_3	Fluid velocity in downcomer
Θ_1	Angle of main vent with horizontal
Θ_2	Angle of first downcomer mitre bend with horizontal
Θ_3	Angle of second downcomer mitre bend with horizontal
α	Angle of main vent mitre bend with horizontal
β	90° - (vent header mitre bend angle)

Table EF 4.2-2

PLANT CONDITIONS AT INSTANT OF DBA PIPE BREAK FOR THRUST LOAD CALCULATIONS - ZERO ΔP

Thermal Power (102% of licensed) (MWt)	3358
Initial Suppression Pool Temperature (°F)	70
Downcomer Submergence (ft)	3.33
Airspace Volume (ft^3)	
Drywell	163,730
Wetwell	130,900
Airspace Pressure (psig)	
Operating (ΔP) DW-Ww	
Drywell	0.75
Wetwell	0.75



F1V1 = VERTICAL FORCE ON MAIN VENT END CAP
F1H1 = HORIZONTAL FORCE ON MAIN VENT END CAP
F2V = VERTICAL FORCE ON VENT HEADER (PER MITRE BEND)
F2H = HORIZONTAL FORCE ON VENT HEADER (PER MITRE BEND)
F3V = VERTICAL FORCE ON DOWNCOMER MITRE BEND
F3H = HORIZONTAL FORCE ON DOWNCOMER MITRE BEND

FORCES ARE SHOWN IN THEIR ASSUMED POSITIVE DIRECTION

Figure EF 4.2-1. Definition of Positive Thrust Loads

VENT SYSTEM THRUST LOADS FIGURES AND TABLES - ZERO ΔP

Figure/Table Number	Title	Applicable Revision No.
Table EF 4.2-2	Plant Conditions at Instant of DBA Pipe Break for Thrust Load Calculations	Revision 3
Figure EF 4.2-2	Single Main Vent Forces (0-5 sec)	
Figure EF 4.2-3	Vent Header Forces per Mitre Bend (0-5 sec)	
Figure EF 4.2-4	Single Downcomer Forces (0-5 sec)	
Figure EF 4.2-5	Total Vertical Forces, Net Vertical Force (0-5 sec)	
Figure EF 4.2-6	Single Main Vent Forces (0-30 sec)	
Figure EF 4.2-7	Vent Header Forces per Mitre Bend (0-30 sec)	
Figure EF 4.2-8	Single Downcomer Forces (0-30 sec)	
Figure EF 4.2-9	Total Vertical Forces, Net Vertical Force (0-30 sec)	
Figure EF 4.2-10	Pressure Time Histories (0-5 sec)	
Figure EF 4.2-11	Pressure Time Histories (0-30 sec)	

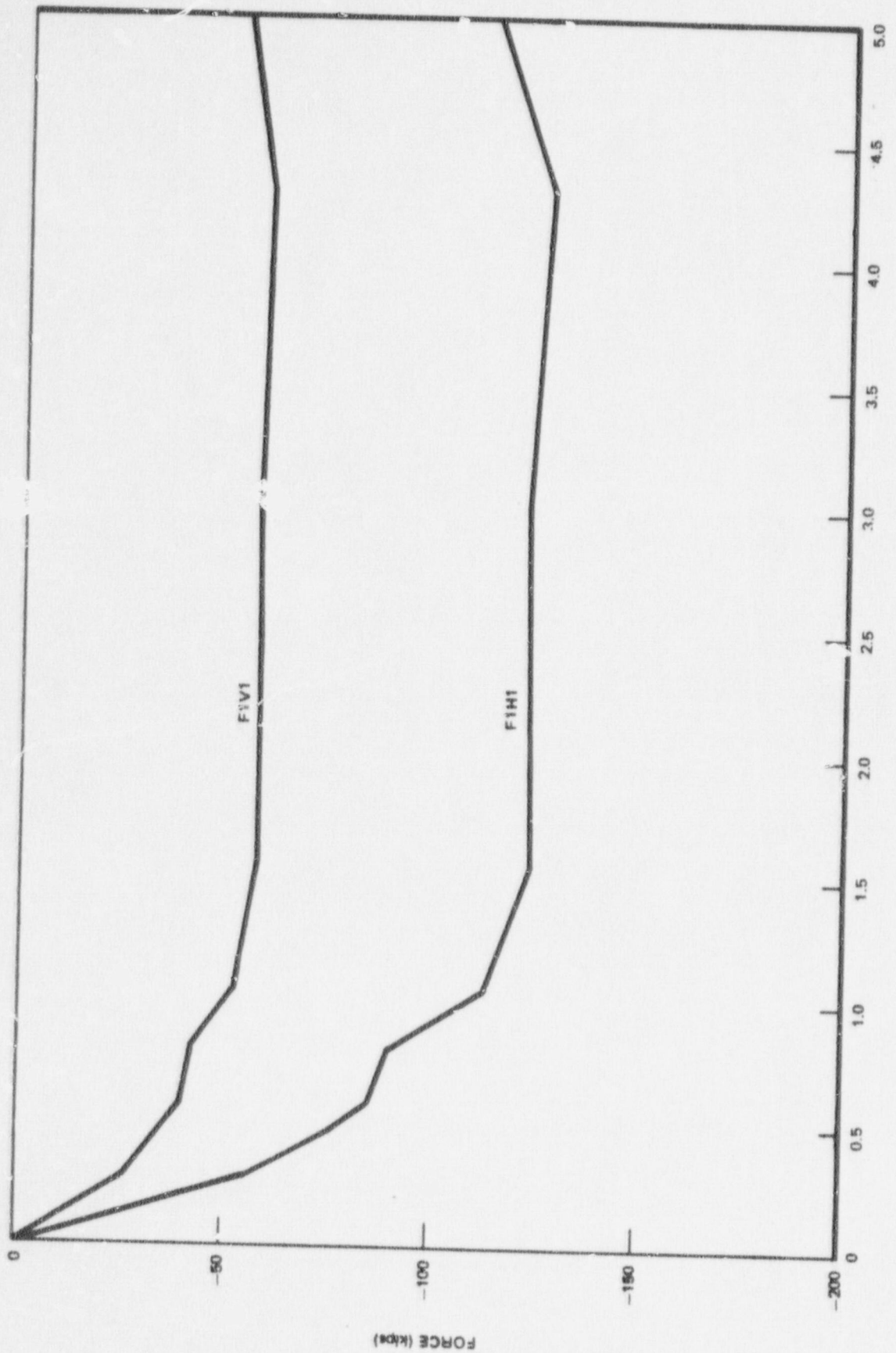


Figure EF 4.2-2. Single Main Vent Forces (Zero ΔP)

Figure EF 4.2-3. Vent Header Forces Per Mitre Bend (Zero ΔP)

Figure EF 4.2-4. Single Downcomer Forces (Zero ΔP)

Figure EF 4.2-5. Total and Net Vertical Forces (Zero ΔP)

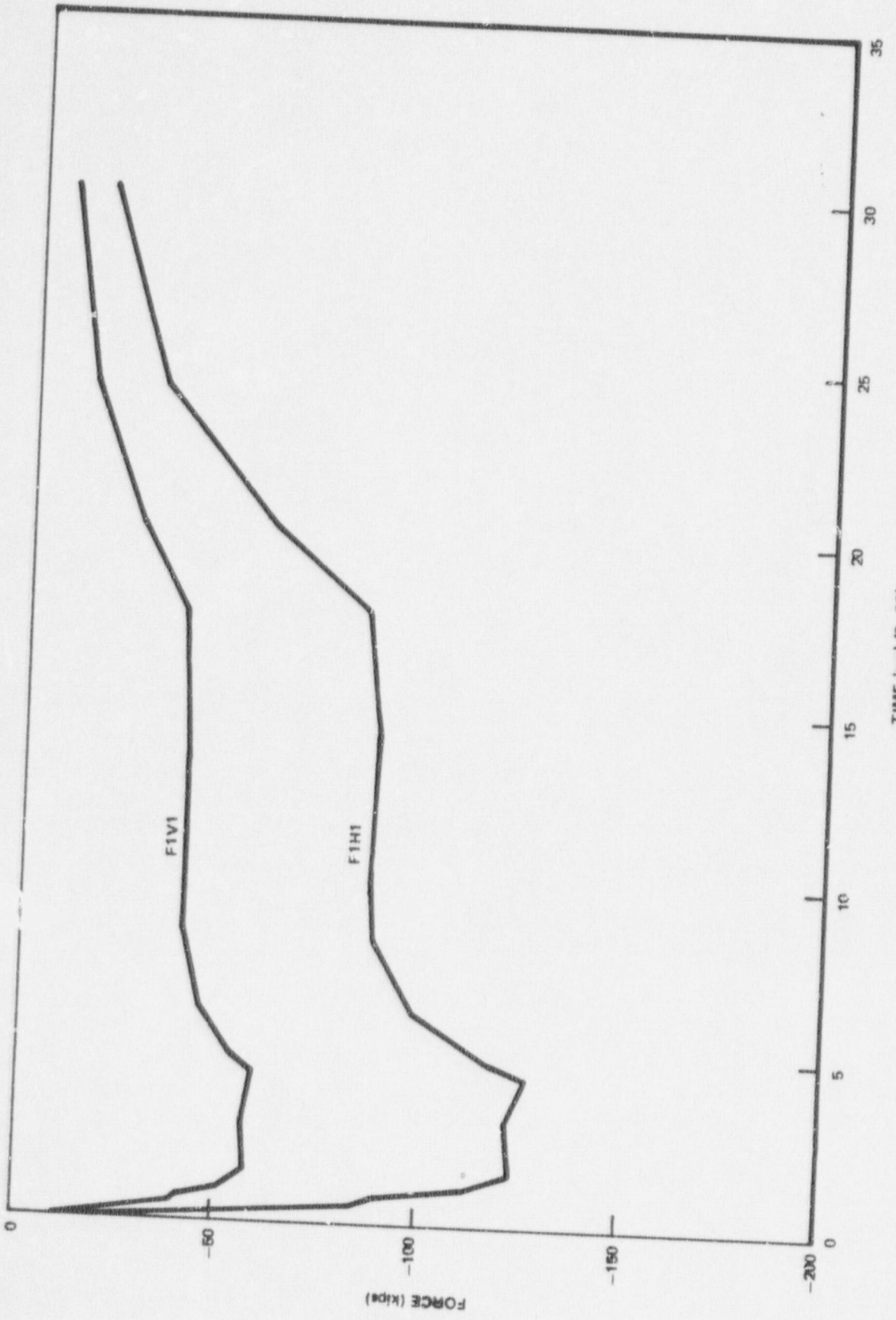


Figure EF 4.2-6. Single Main Vent Forces (Zero ΔP)

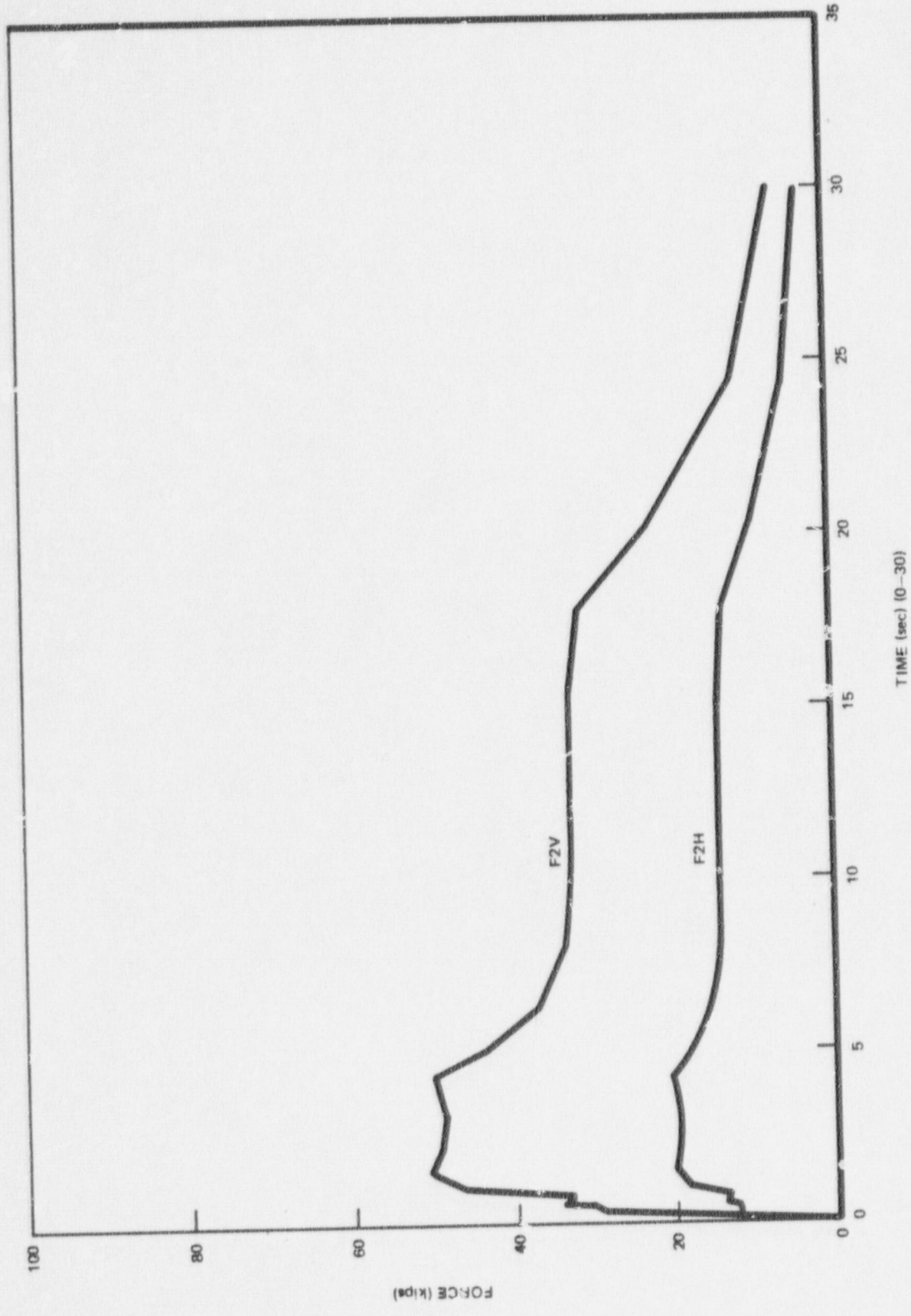


Figure 4.2-7. Vent Header Forces Per Mitre Bend (Zero ΔP)

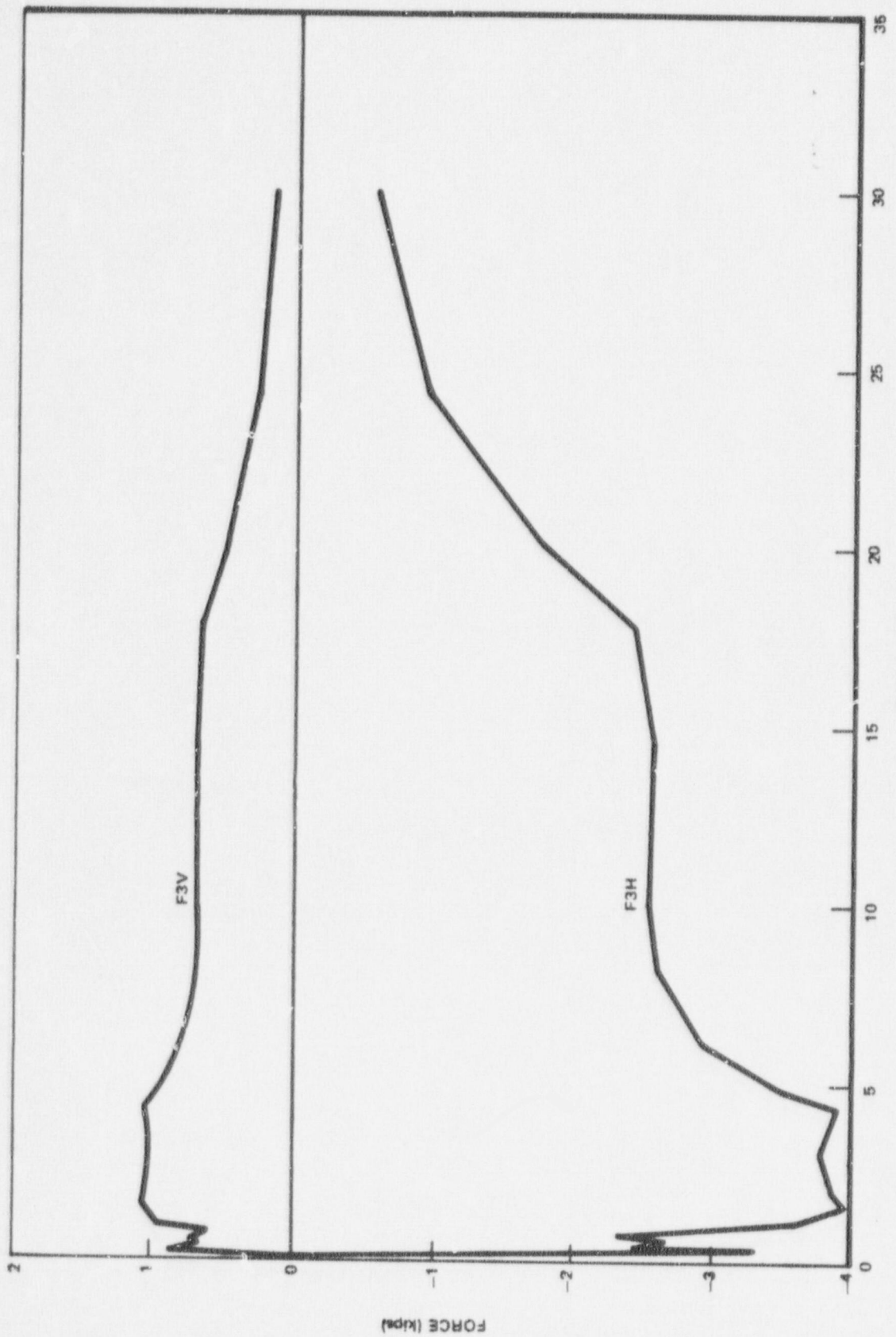


Figure EF 4.2-8. Single Downcomer Forces (Zero ΔP)

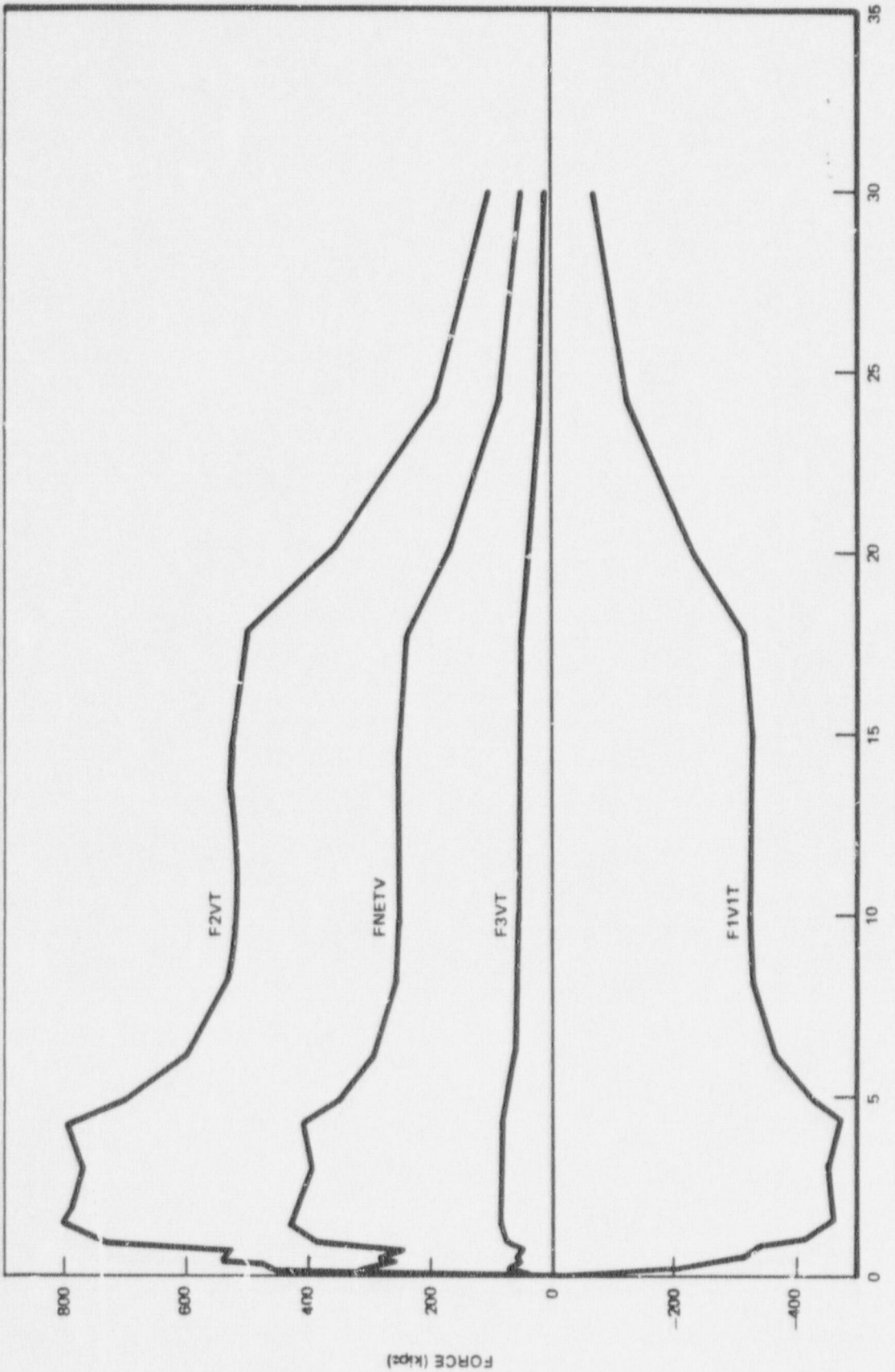


Figure EF 4.2-9. Total and Net Vertical Forces (Zero ΔP)

Figure EF 4.2-10. Pressure Time Histories (Zero ΔP)

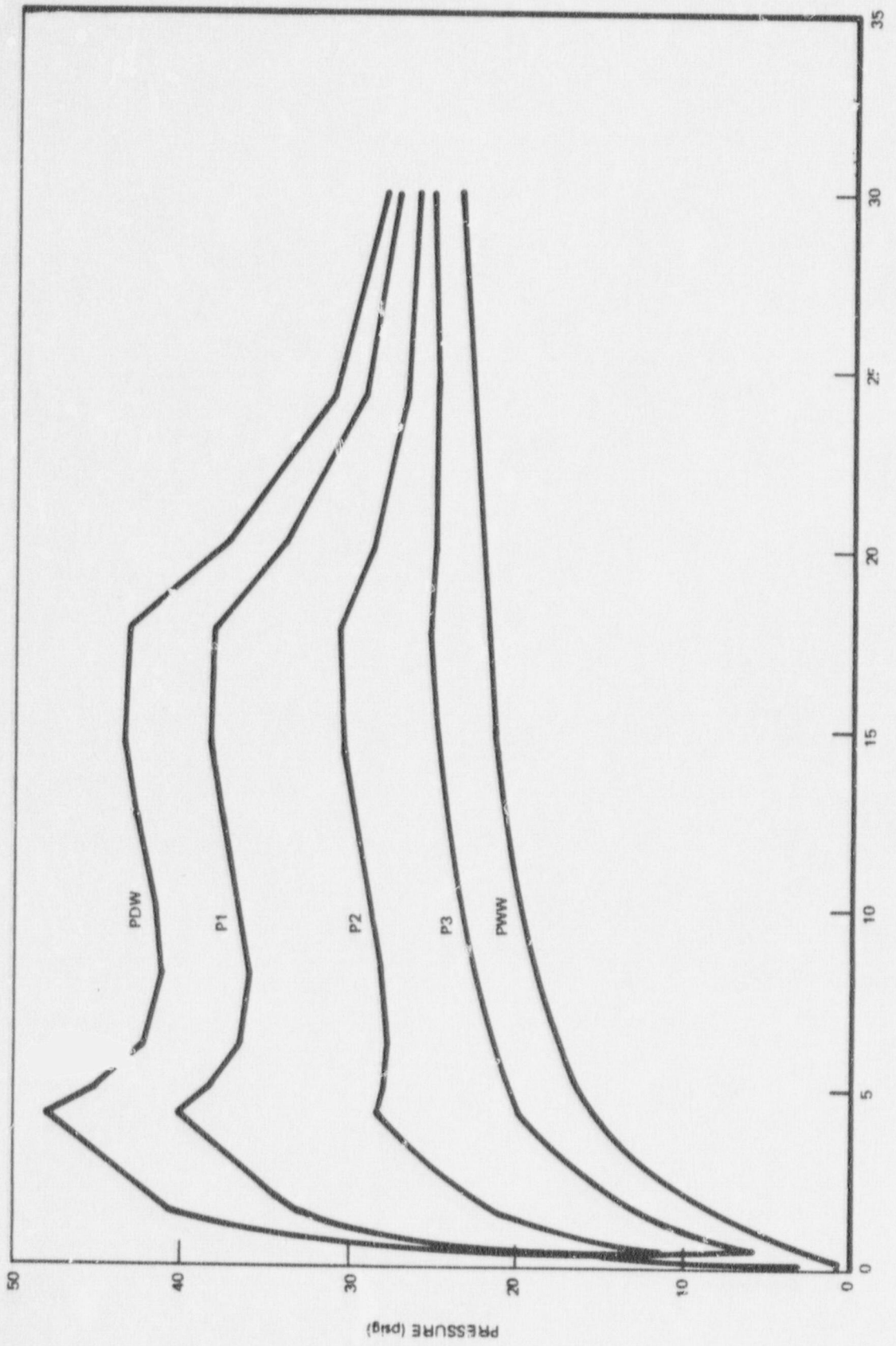


Figure EF 4.2-11. Pressure Time Histories (Zero ΔP)

(Zero ΔP)

Table EF 4.2-3

PLANT CONDITIONS AT INSTANT OF DBA PIPE BREAK FOR THRUST LOAD CALCULATIONS - OPERATING ΔP

Thermal Power (102% of licensed) (MWt)	3358
Initial Suppression Pool Temperature (°F)	70
Downcomer Submergence (ft)	3.33
Airspace Volume (ft^3)	
Drywell	163,730
Wetwell	130,900
Airspace Pressure (psig)	
Drywell	0.75
Wetwell	0.575

Figure EF 4.2-12. Single Main Vent Forces (Operating ΔP)

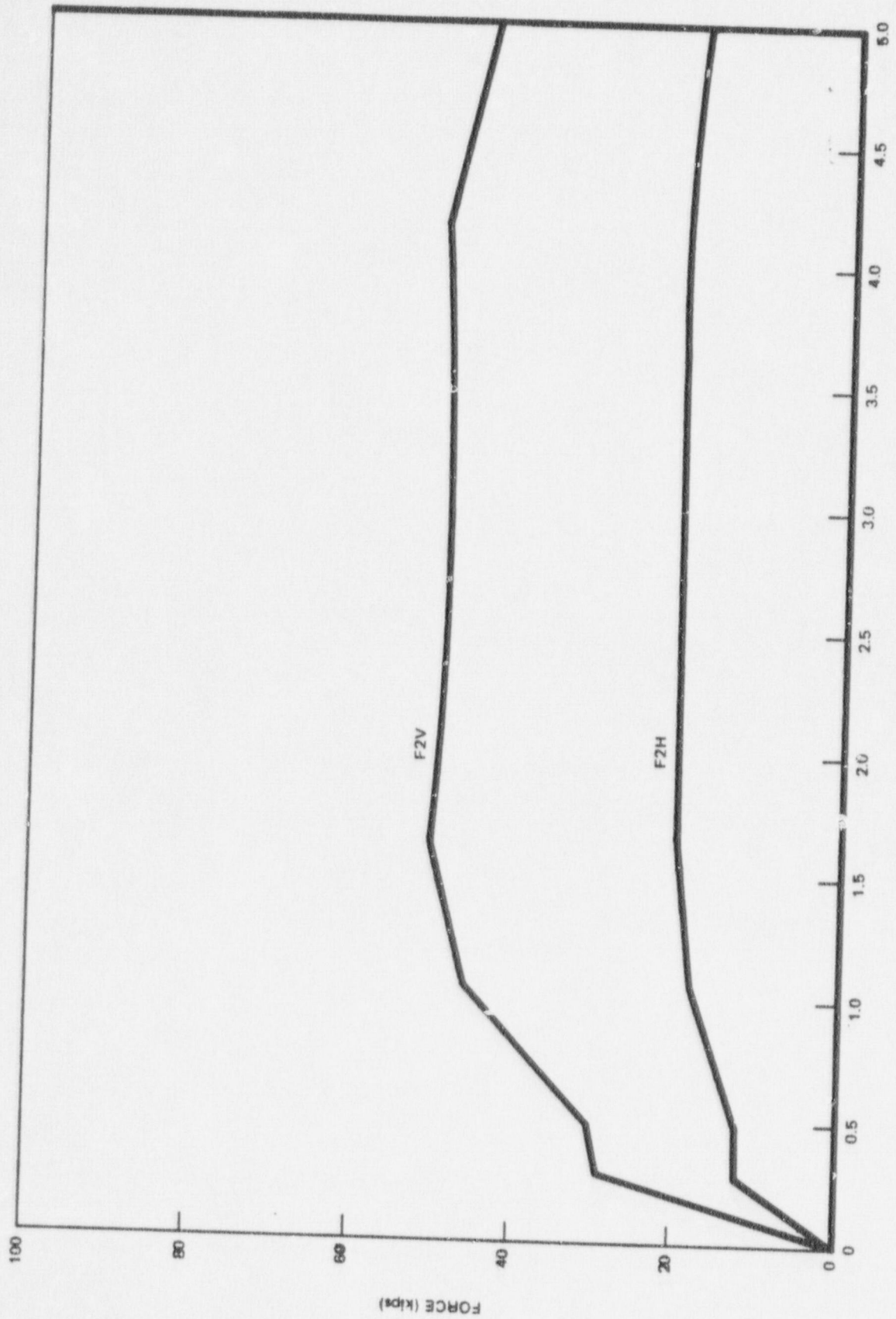


Figure EF 4.2-13. Vent Header Forces Per Mitre Bend (Operating ΔP)

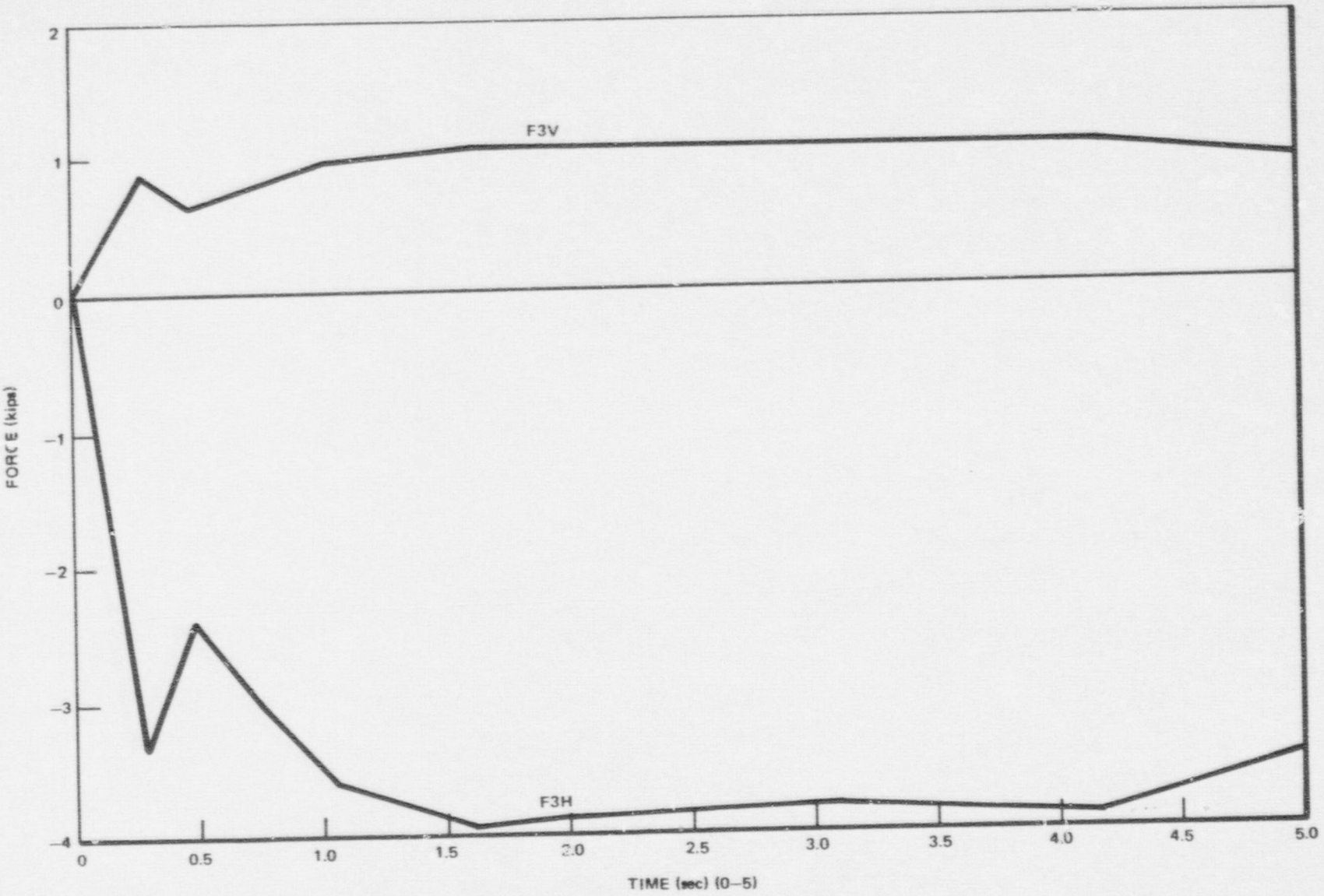


Figure EF 4.2-14. Single Downcomer Forces
(Operating ΔP)

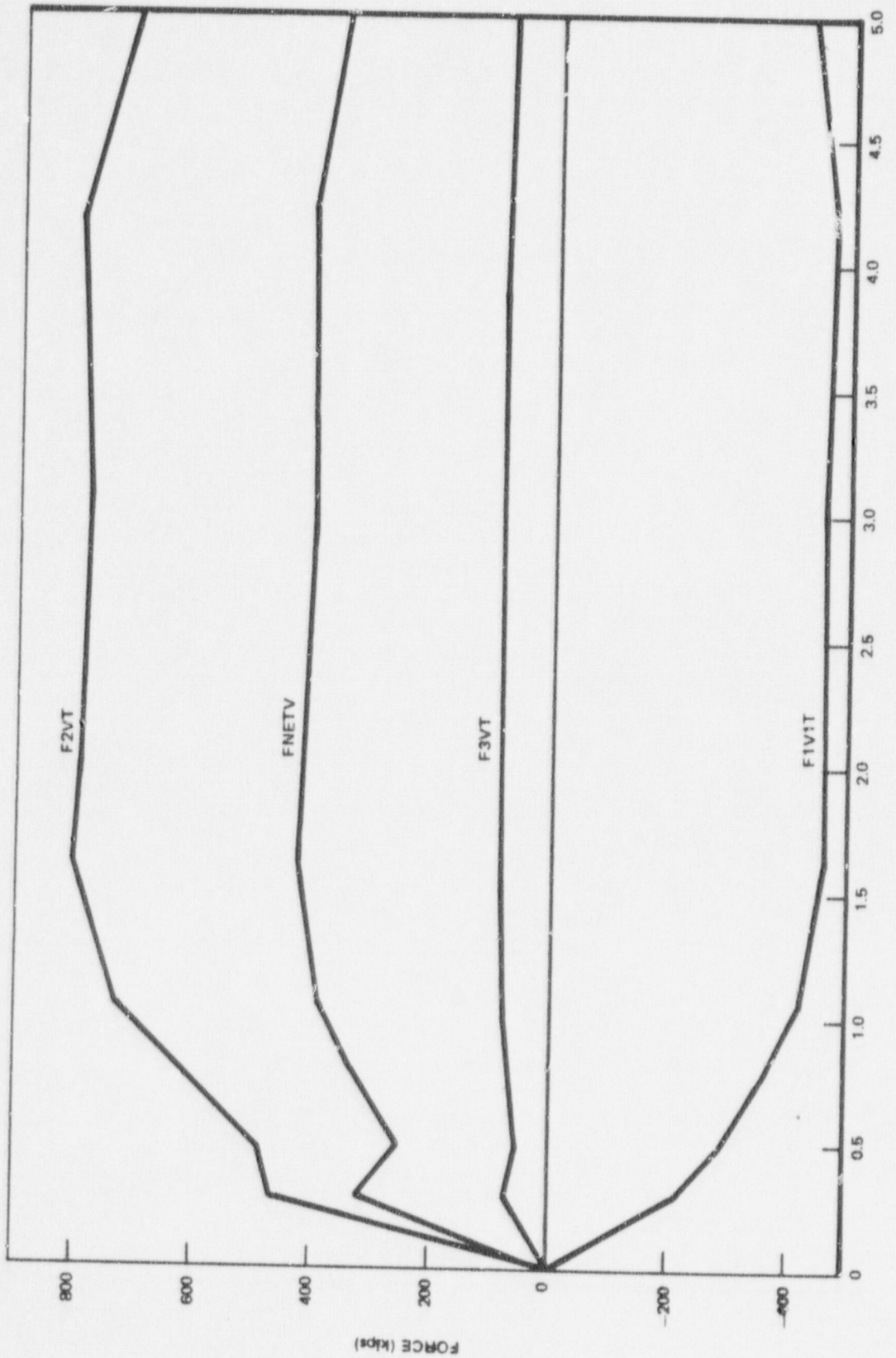


Figure EF 4.2-15. Total and Net Vertical Forces (Operating ΔP)

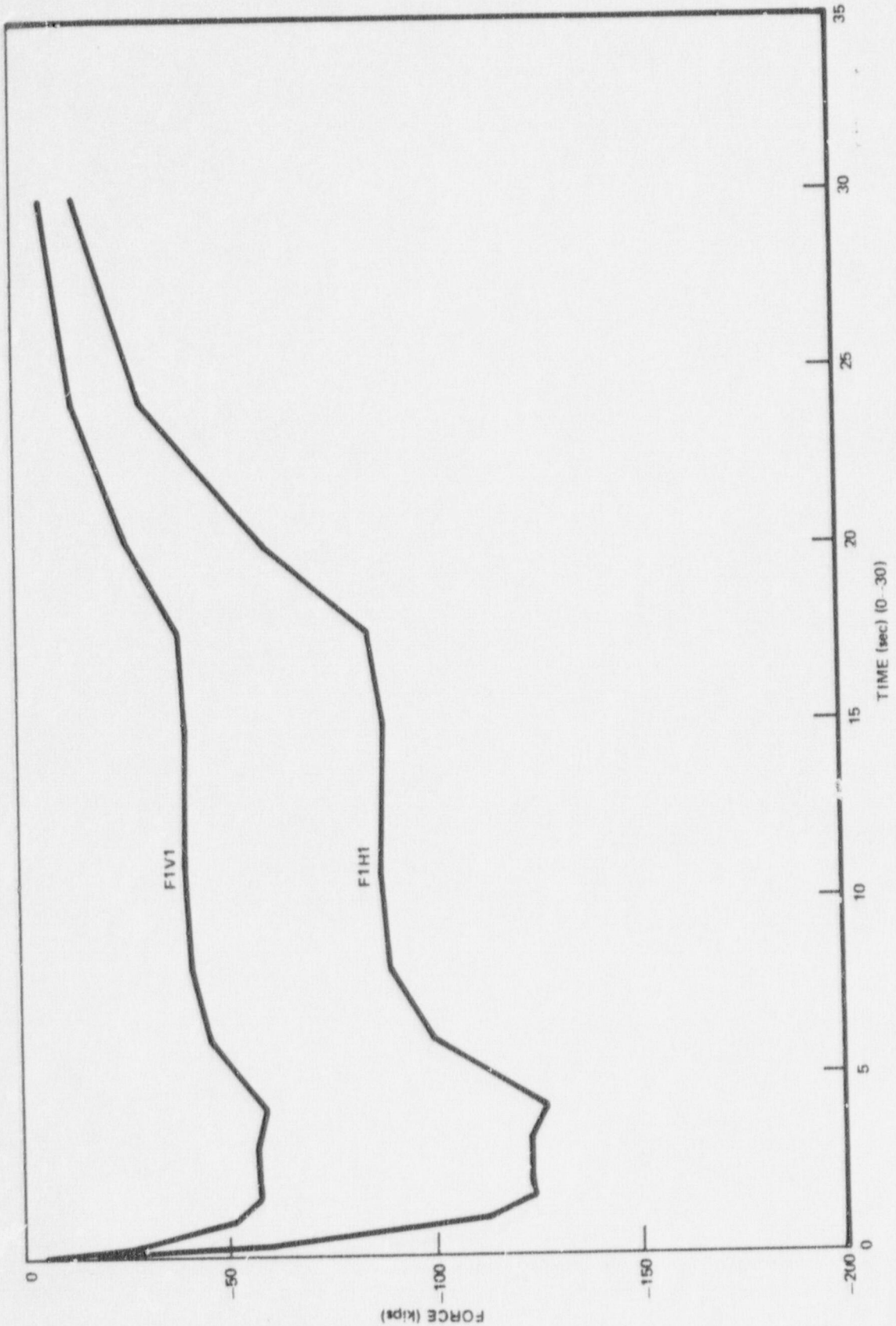


Figure EF 4.2-16. Single Main Vent Forces (Operating ΔP)

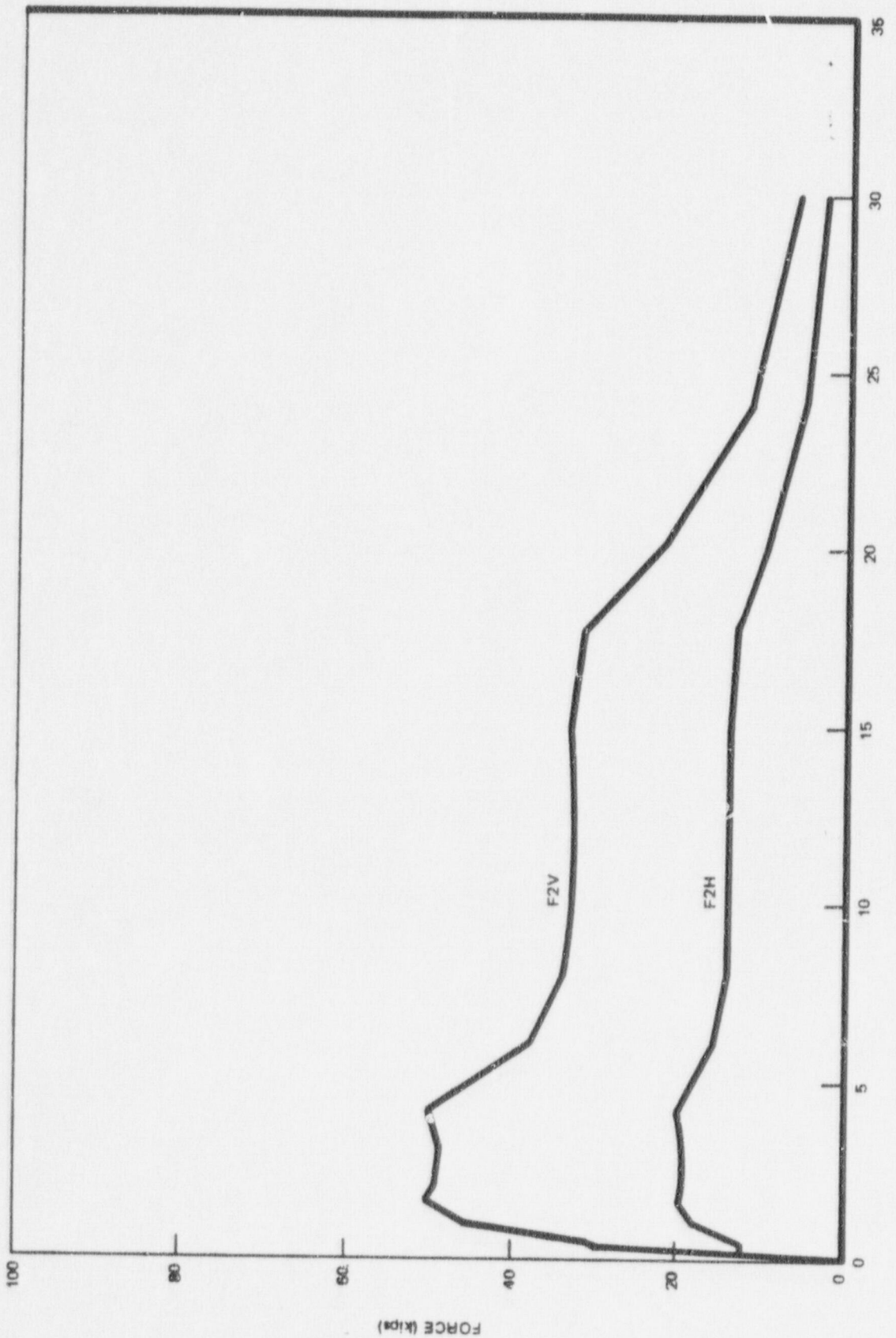


Figure EF 4.2-17. Vent Header Forces Per Mitre Bend (Operating ΔP)

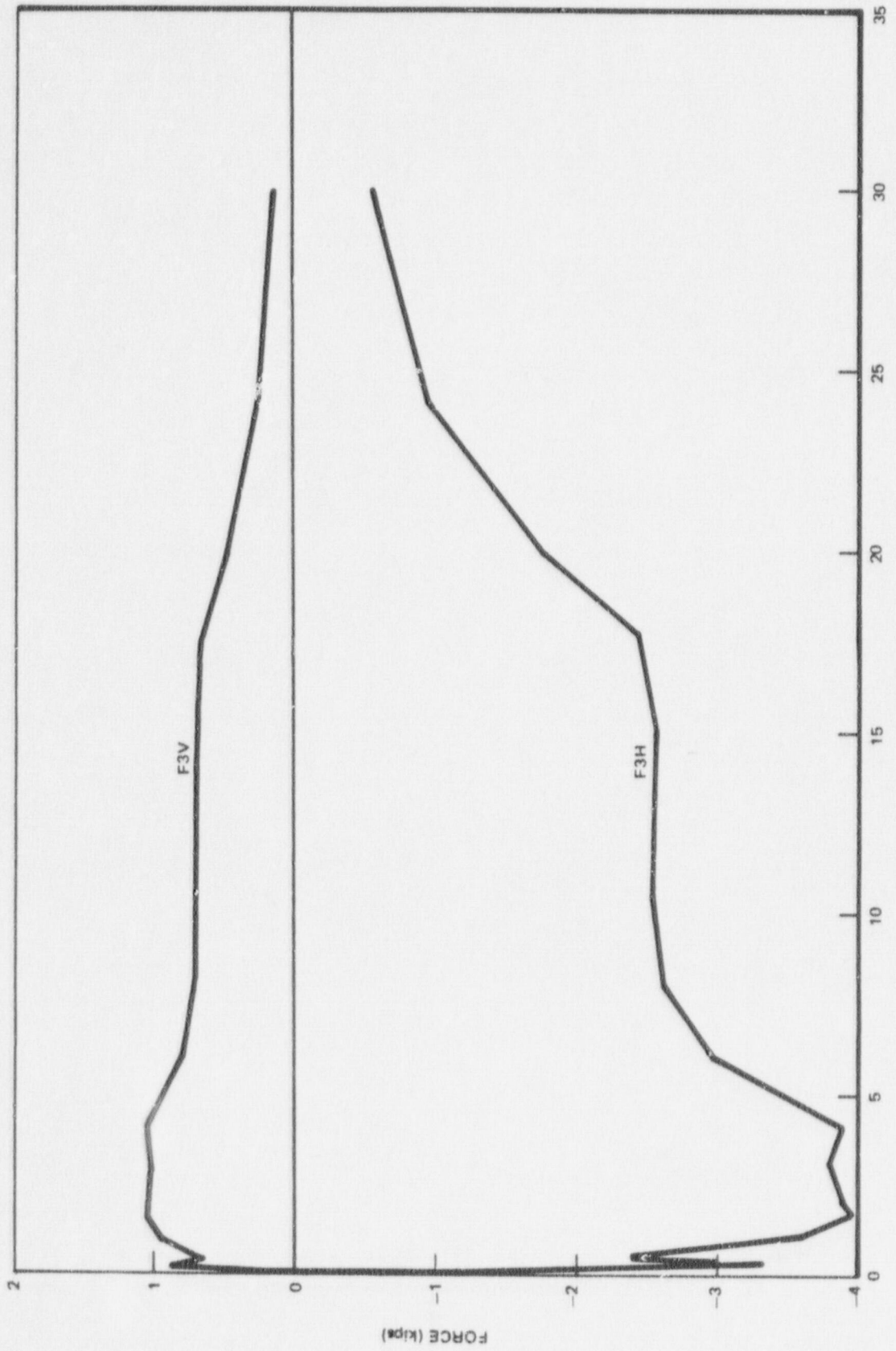


Figure EF 4.2-18. Single Downcomer Forces (Operating ΔP)

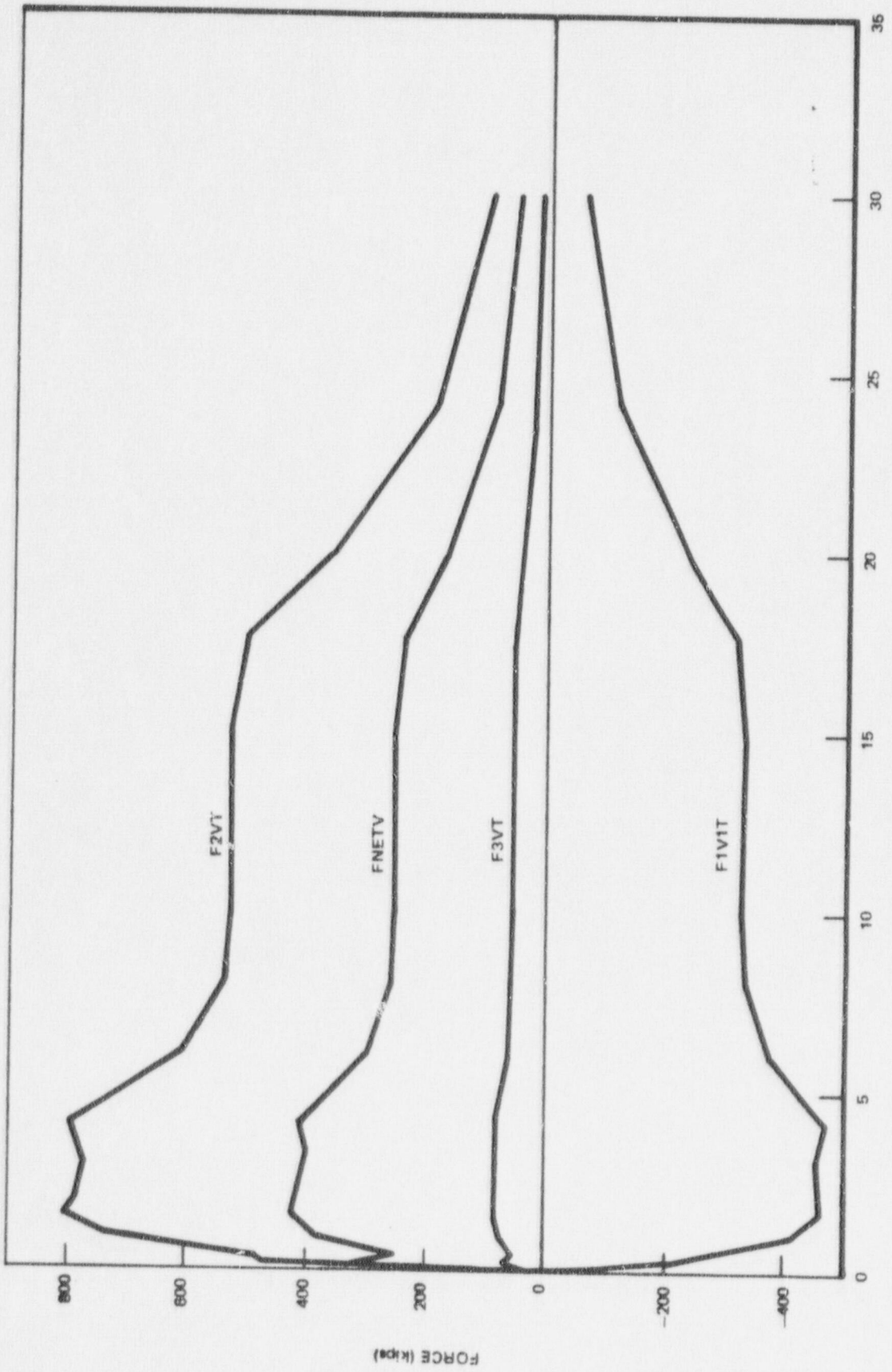


Figure EF 4.2-19. Total and Net Vertical Forces (Operating ΔP)

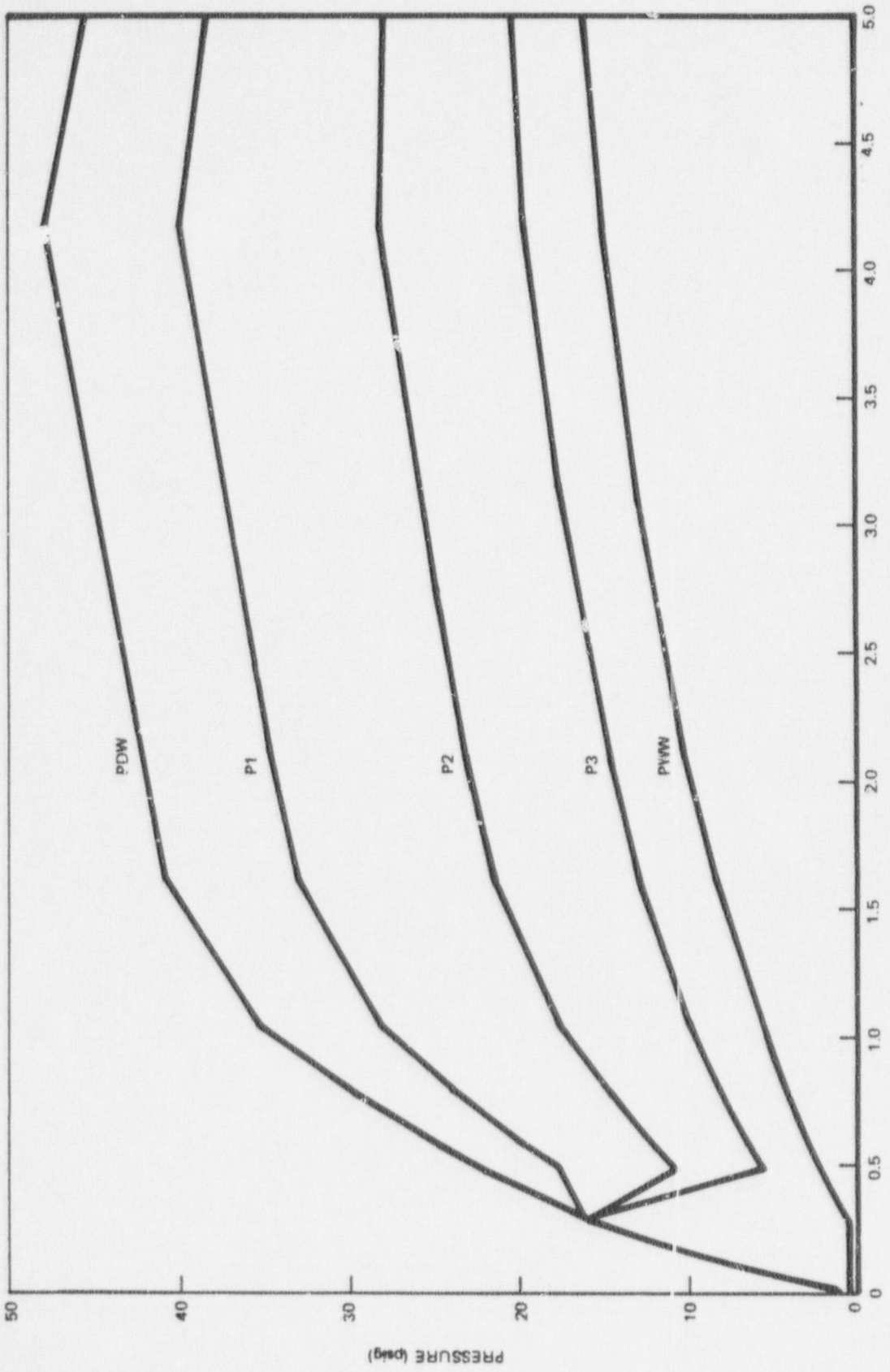


Figure EF 4.2-20. Pressure Time Histories (Operating ΔP)

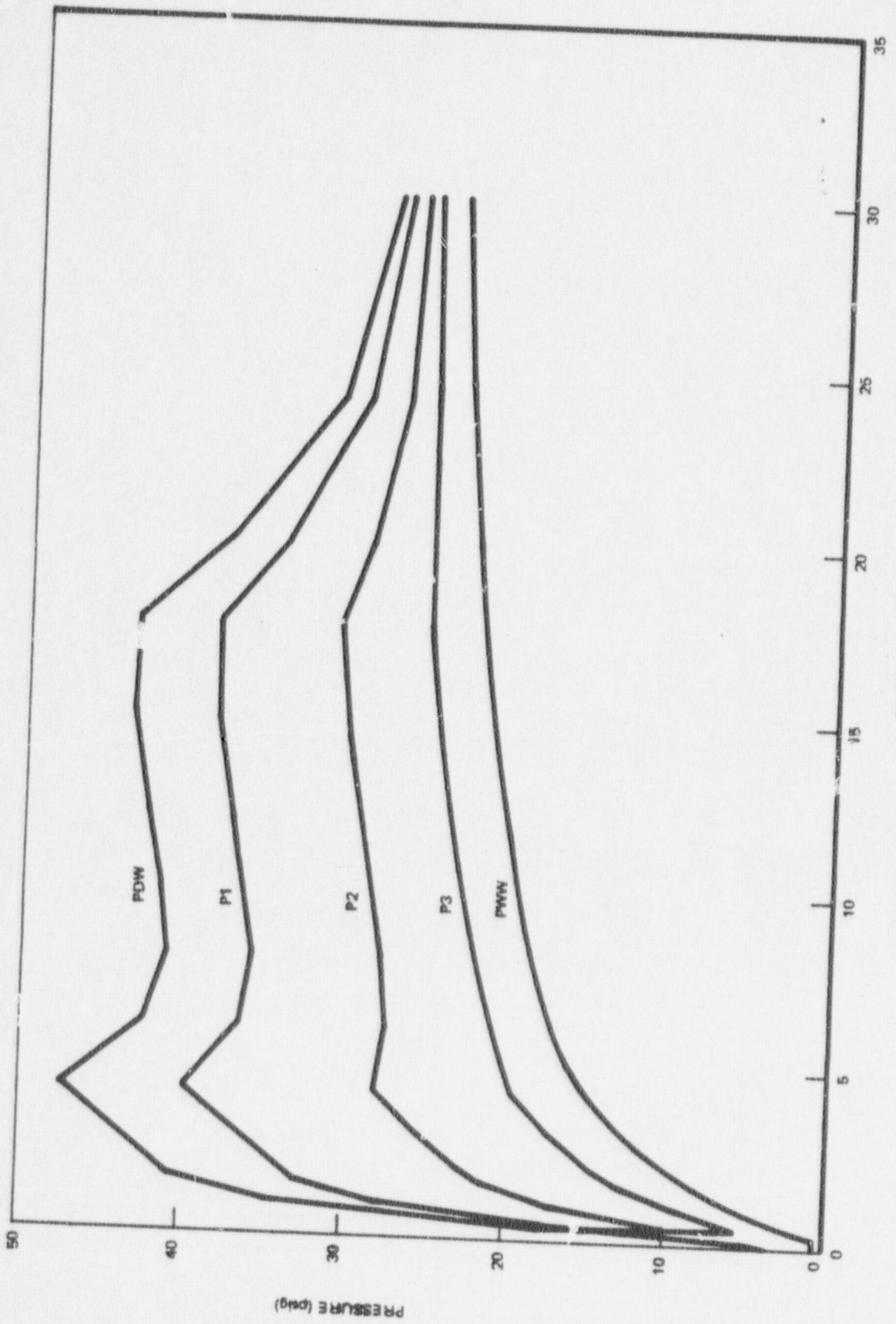


Figure EF 4.2-21. Pressure Time Histories (Operating ΔP)

Pool Swell Torus Vertical Loads

Pool Swell Torus Vertical Loads

This section provides the net torus vertical load and shell pressure histories resulting from the drywell air purge to the wetwell during the postulated DBA. The list of applicable figures for this section is given on the following page.

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POOL SWELL TORUS VERTICAL LOADS FIGURES

Figure Number	Title	Applicable Revision No.
Figure EF 4.3.1-1	Net Torus Vertical Load (Operating ΔP)	Revision 3
Figure EF 4.3.1-2	Net Torus Vertical Load (Zero ΔP)	
Figure EF 4.3.2-1	Average Submerged Pressure (Operating ΔP)	
Figure EF 4.3.2.2	Average Submerged Pressure (Zero ΔP)	
Figure EF 4.3.2.3	Torus Air Pressure (Operating ΔP)	
Figure EF 4.3.2.4	Torus Air Pressure (Zero ΔP)	

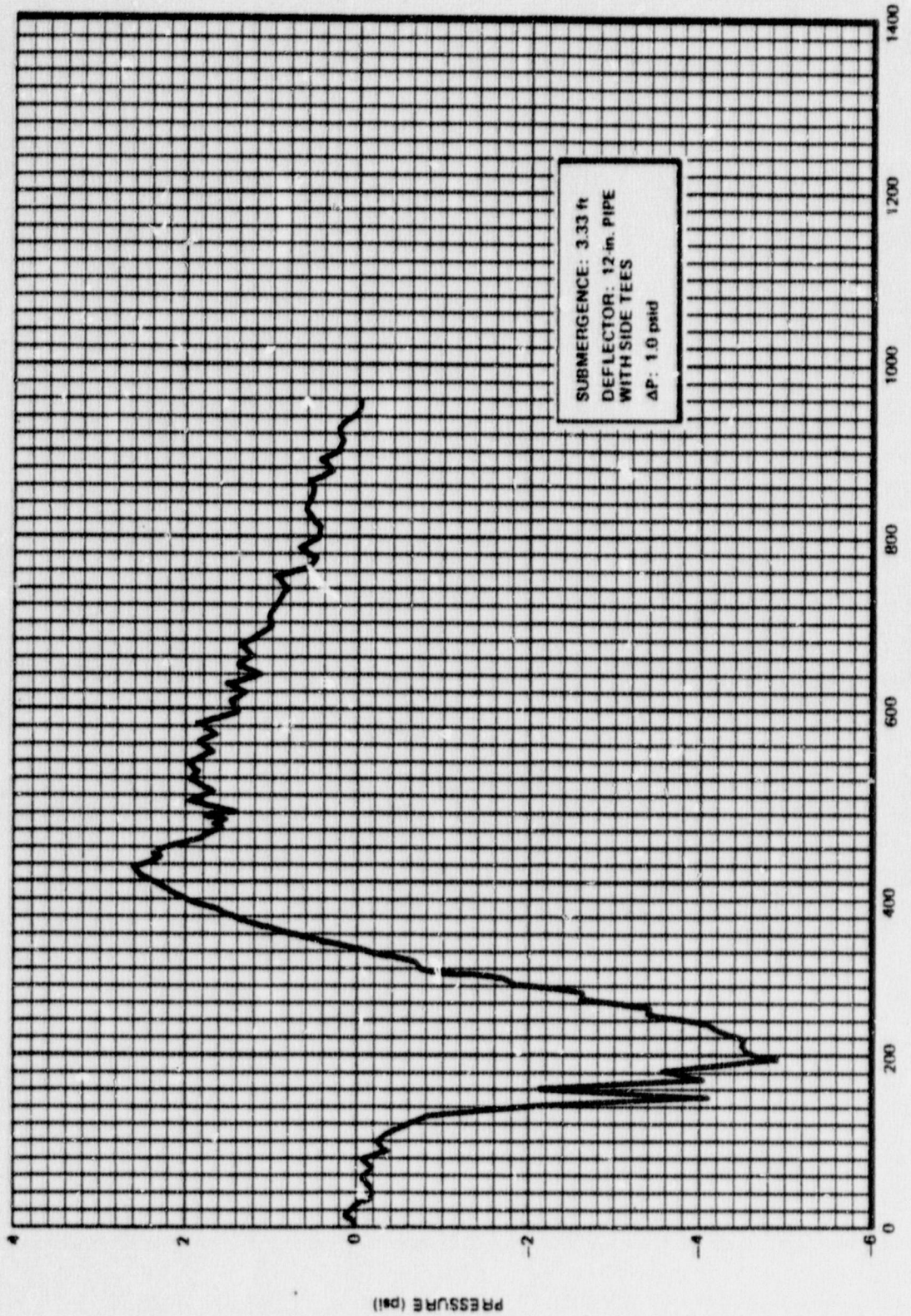

Figure EF 4.3.1-1. Net Torus Vertical Load (Operating ΔP)

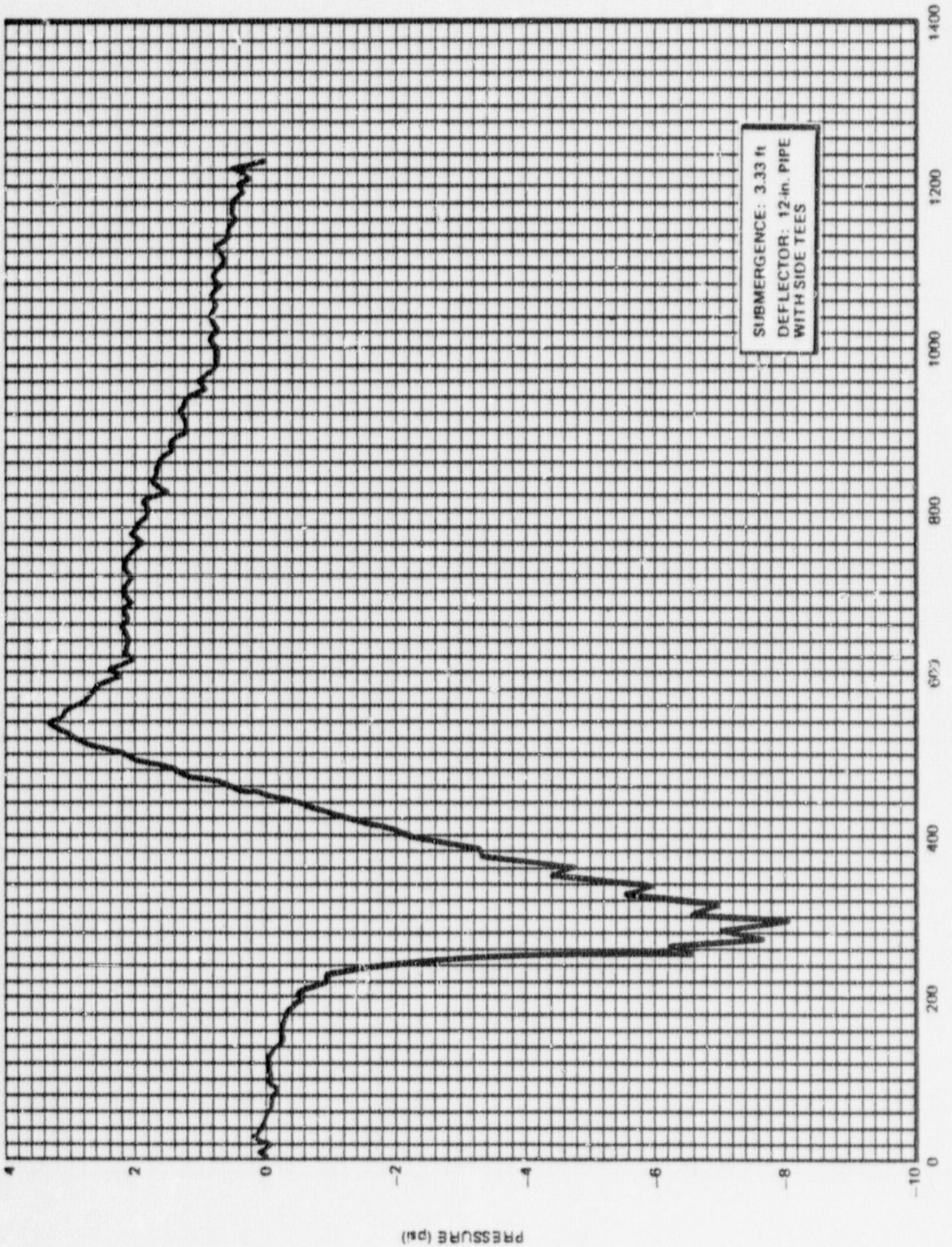

Figure EF 4.3.1-2. Net Torus Vertical Load (Zero ΔP)

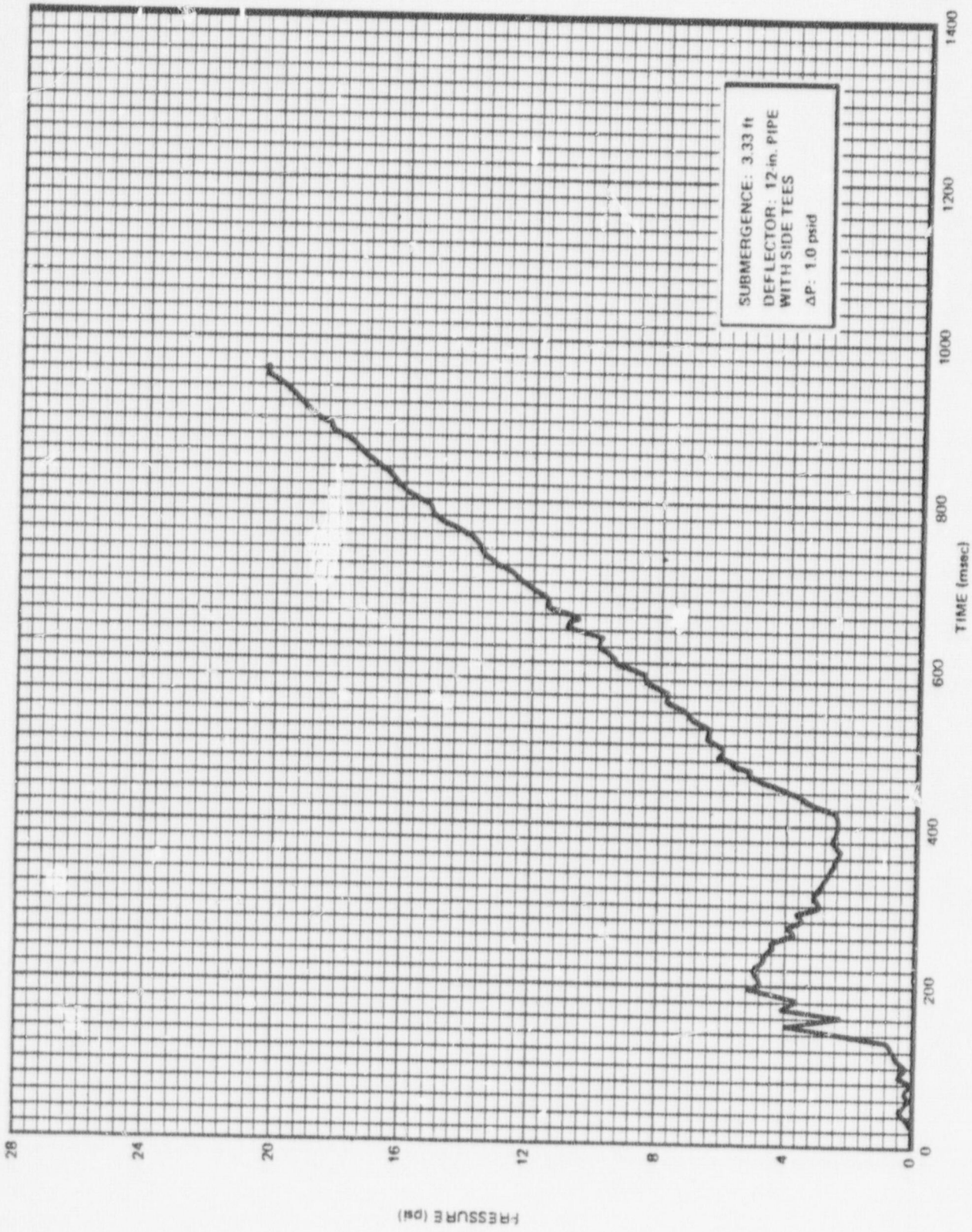

Figure EF 4.3.2-1. Average Submerged Pressure (Operating ΔP)

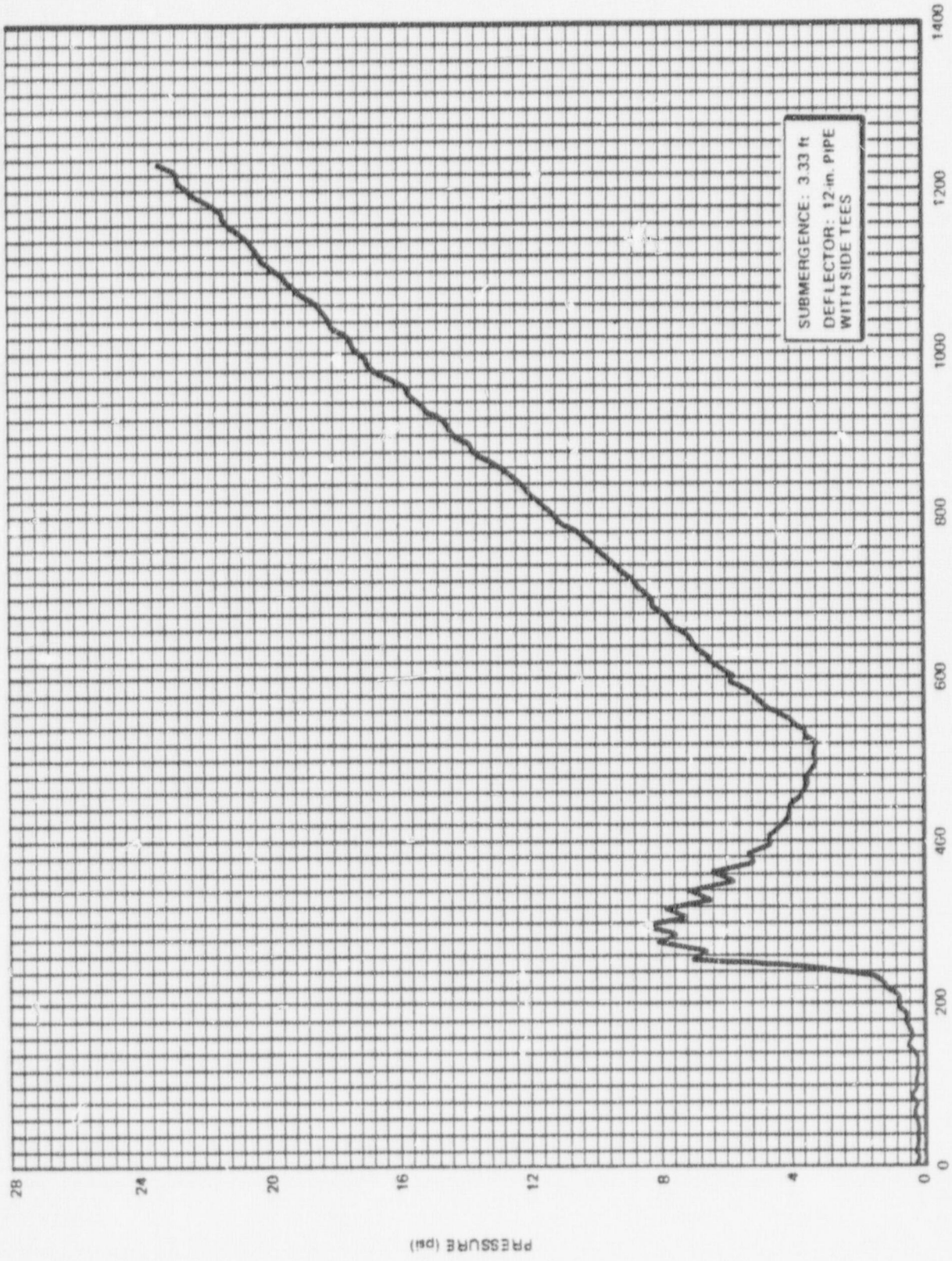

Figure EF 4.3.2-2. Average Submerged Pressure (Zero ΔP)

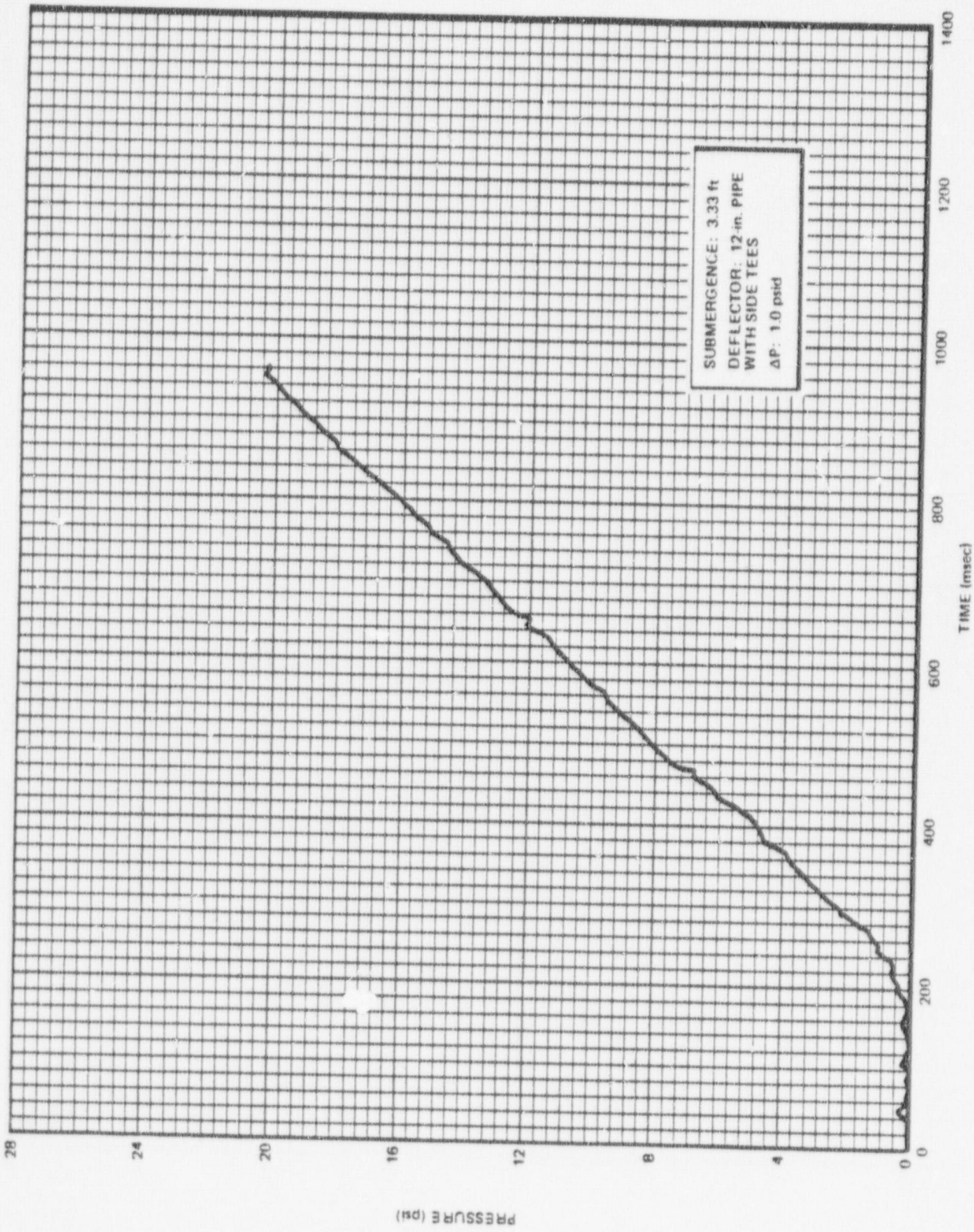

Figure EF 4.3.2-3. Torus Air Pressure (Operating ΔP)

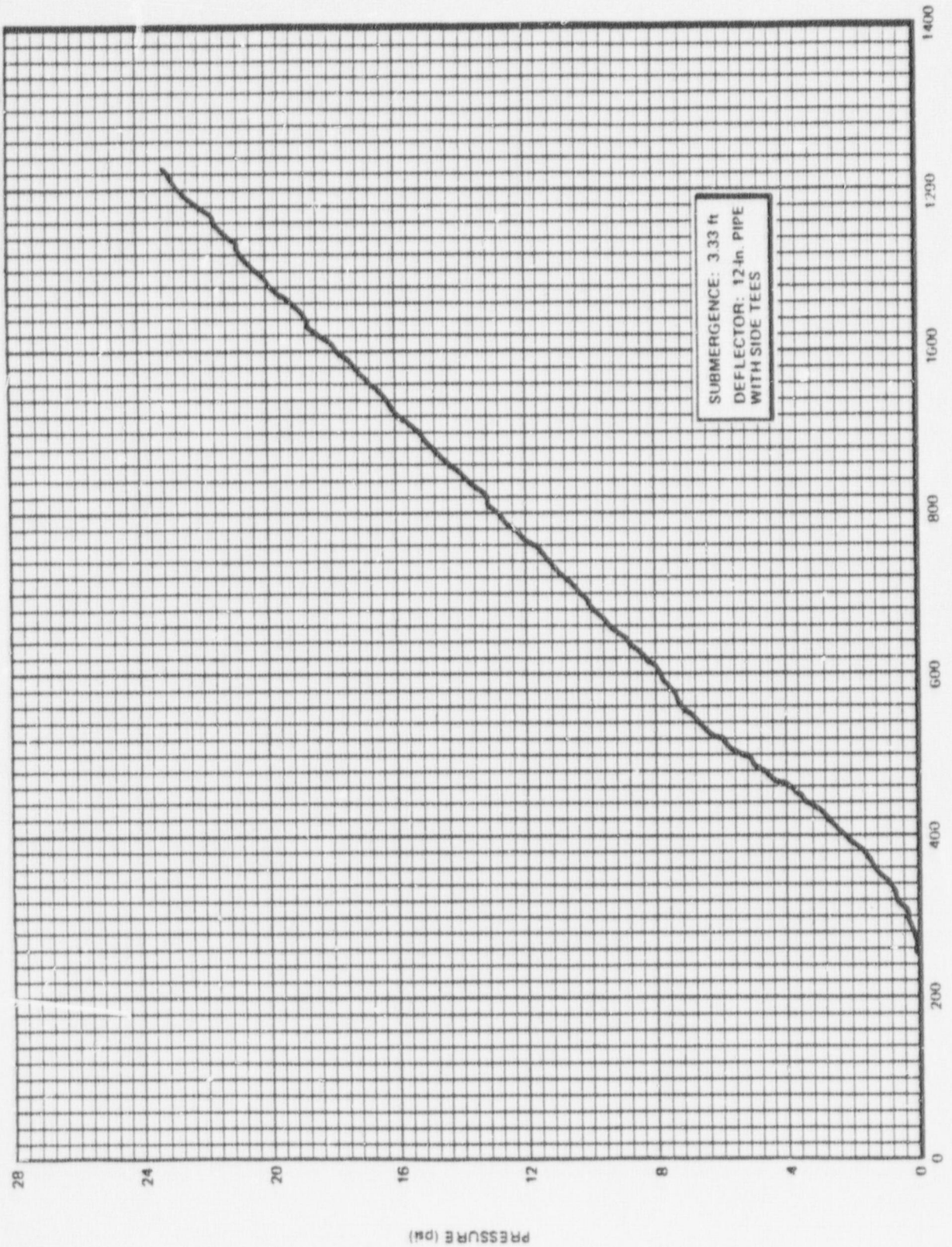

Figure EF 4.3.2-4. Torus Air Pressure (Zero ΔP)

Pool Swell Impact and Drag Loads

Pool Swell Impact and Drag Loads

This section provides the pool swell displacement and velocity distributions for evaluation of impact and drag loads on structures located above the pool. For the conditions specified and noted herein, the pool swell event does not produce impact or drag loading on the vent header. The list of applicable figures for this section is given on the following page.

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PLANT UNIQUE POOL SWELL IMPACT AND DRAG LOAD FIGURES

Figure No.	Title	Applicable Revision No.
Figure 4.3.3-1	Pool Swell Displacement Distribution (Zero ΔP)	Revision 3
Figure 4.3.3-2	Pool Swell Displacement Distribution (Operating ΔP)	
Figure 4.3.3-3	Pool Swell Velocity Distribution (Zero ΔP)	
Figure 4.3.3-4	Pool Swell Velocity Distribution (Operating ΔP)	
Figure 4.3.4-1	Longitudinal Vent Header Impact Velocity Distribution Based on EPRI Main Vent Orifice Test	
Figure 4.3.4-2	Longitudinal Time Delay Distribution Based on EPRI Main Vent Orifice Test	

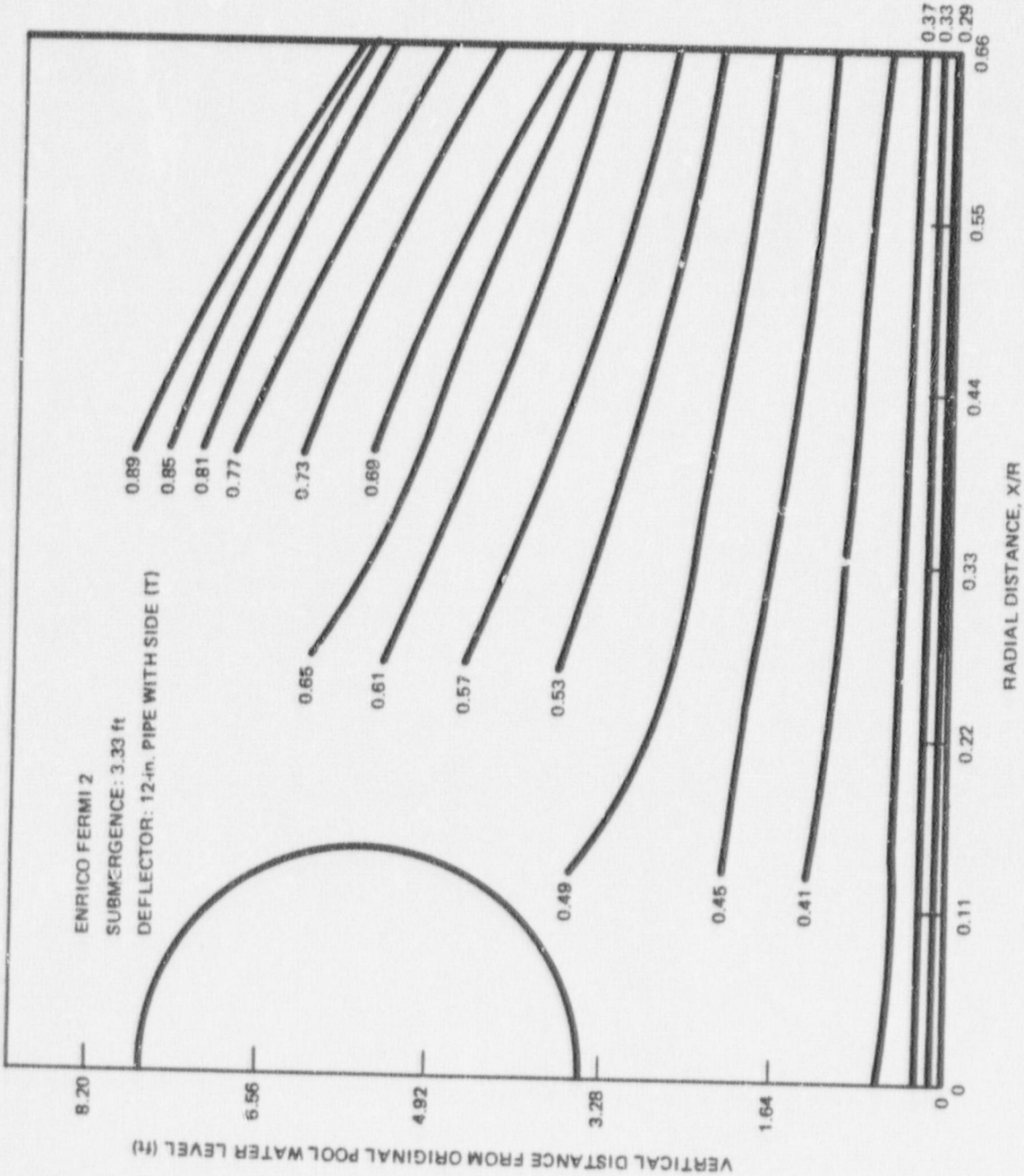

Figure EF 4.3.3-1. Pool Swell Displacement Distribution (Zero ΔP)
Radial Distance, X/R

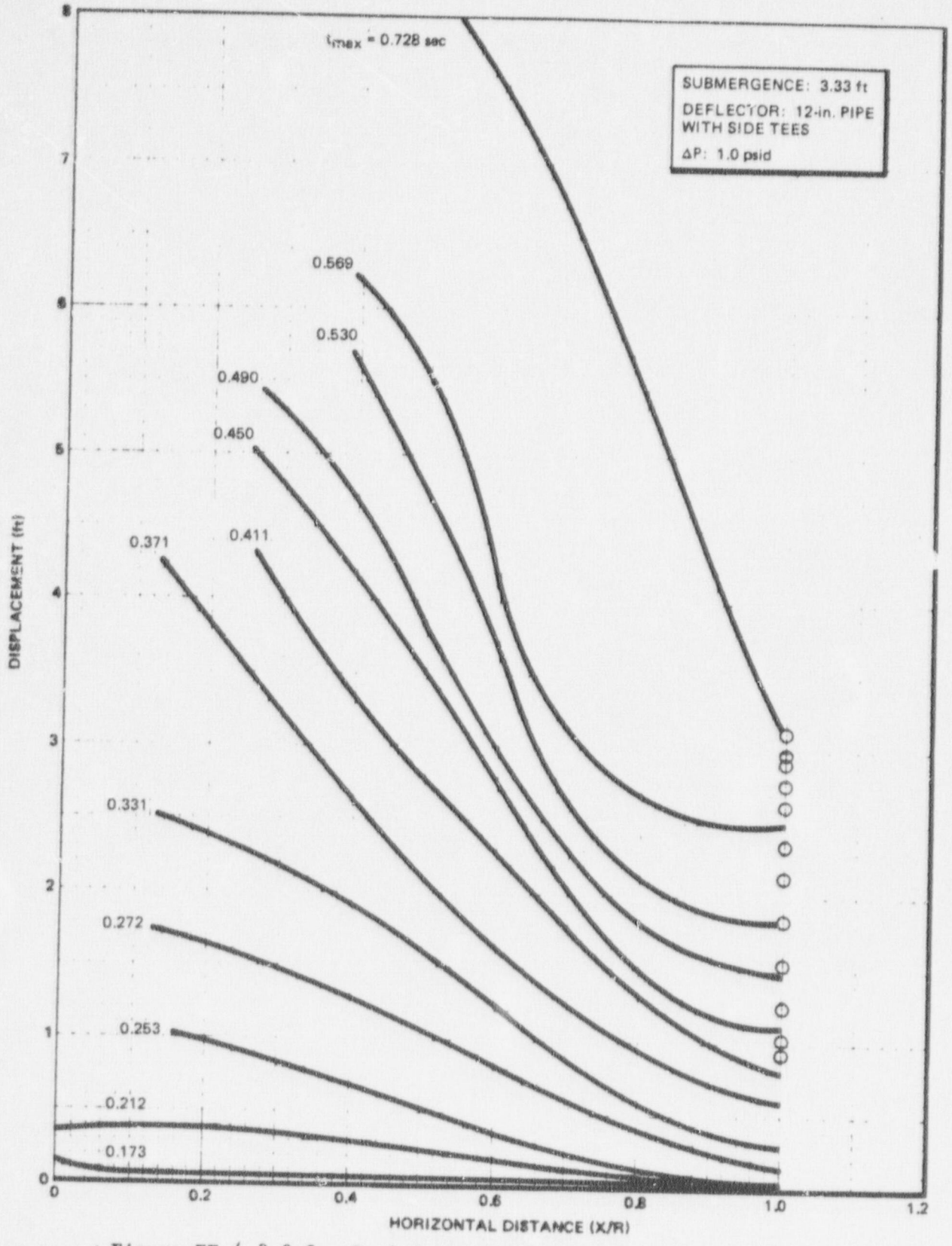

Figure EF 4.3.3-2. Pool Swell Displacement Distribution (Operating ΔP)

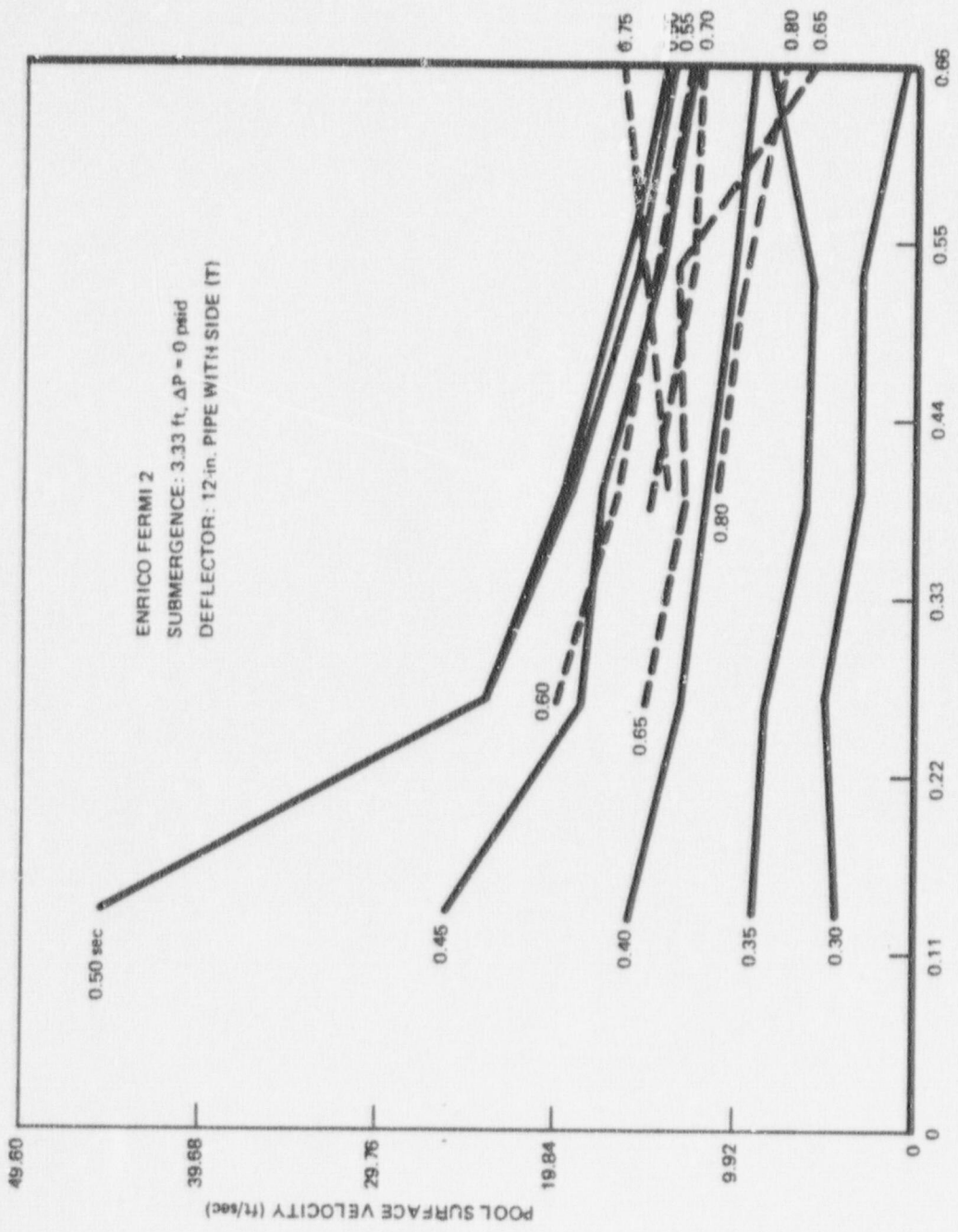

Figure EF 4.3.3-3. Pool Swell Velocity Distribution (Zero ΔP)
Radial Distance, X/R

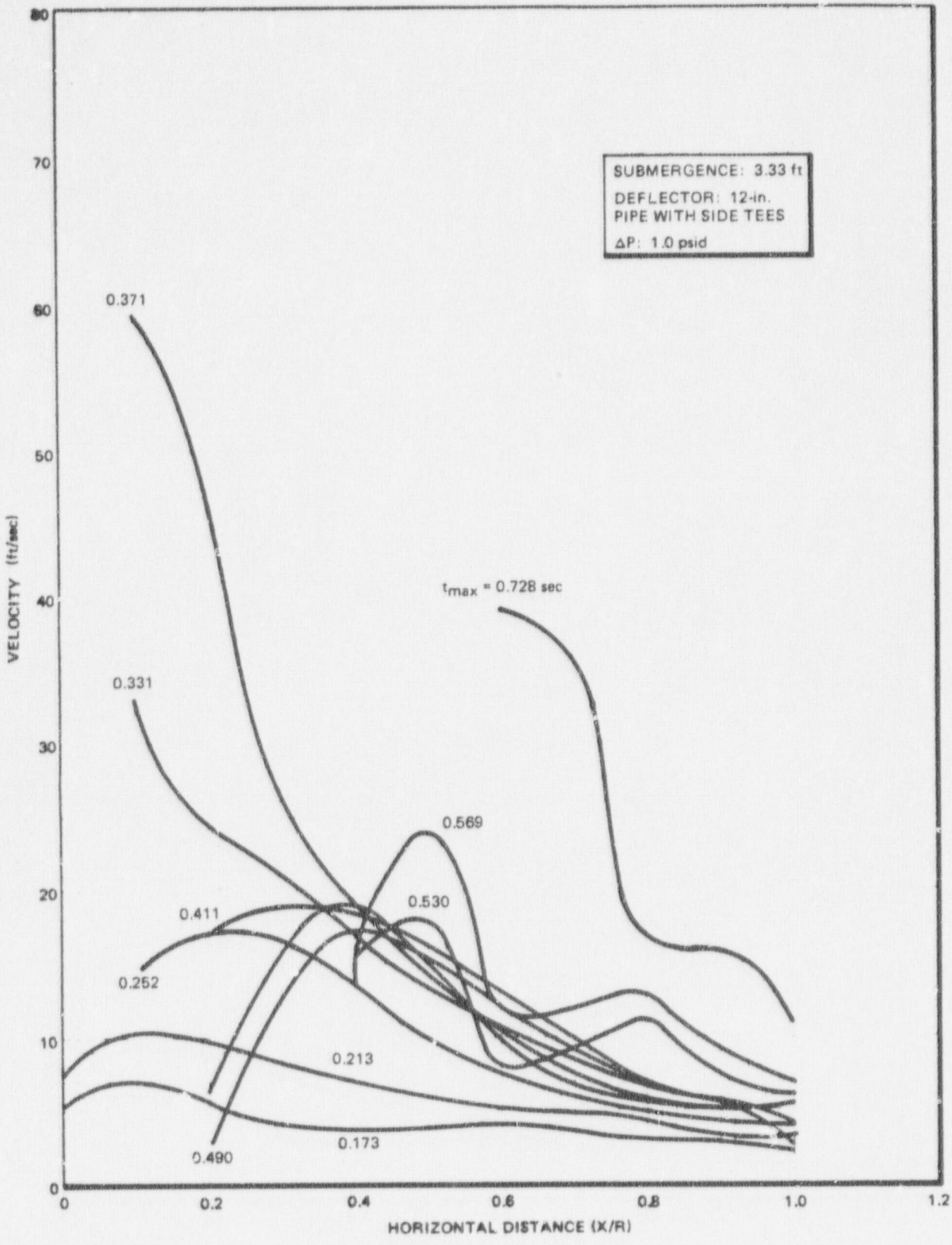

Figure EF 4.3.3-4. Pool Swell Velocity Distribution (Operating ΔP)

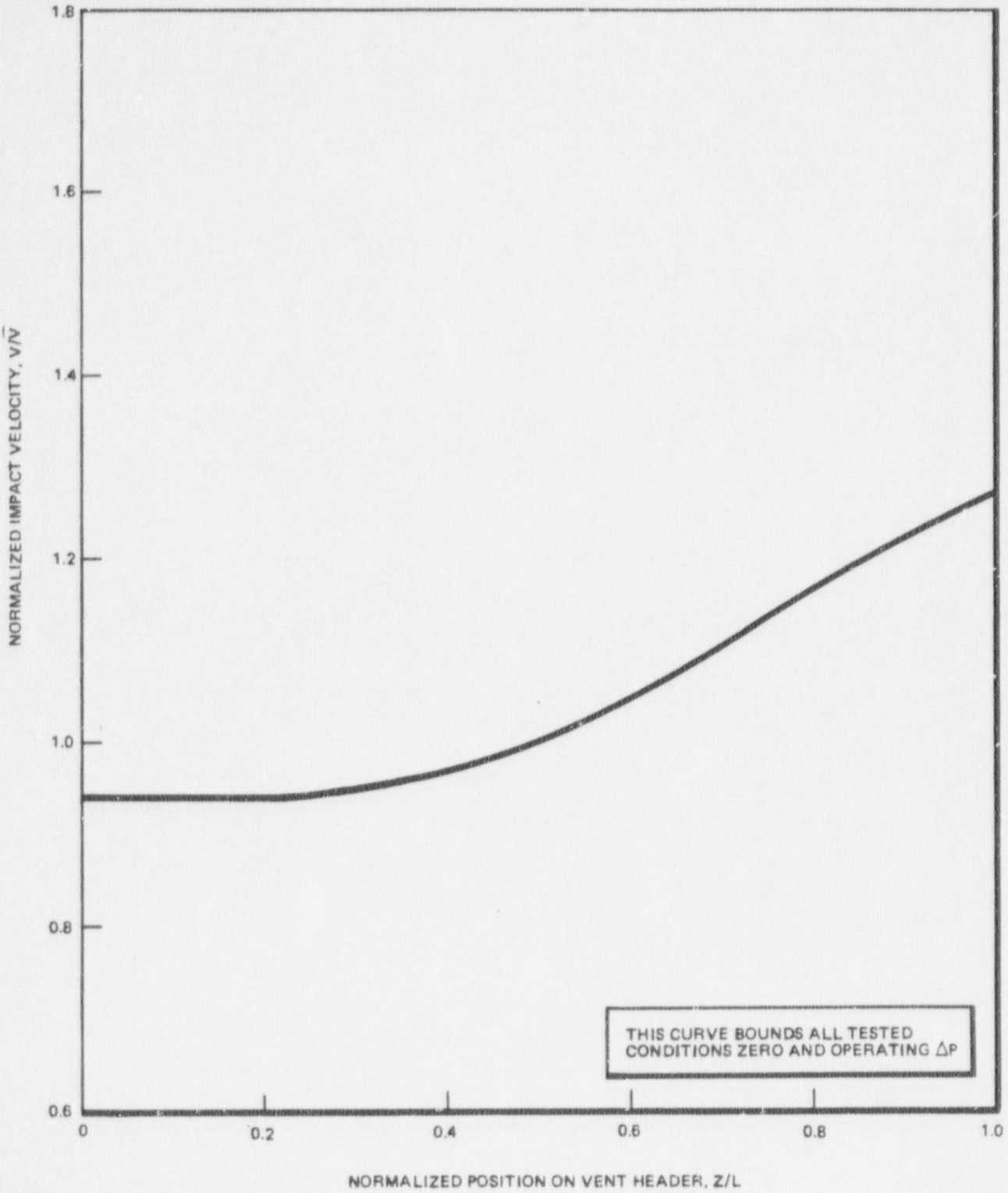

Figure EF 4.3.4-1. Longitudinal Vent Header Impact Velocity Distribution Based on EPRI Main Vent Orifice Test

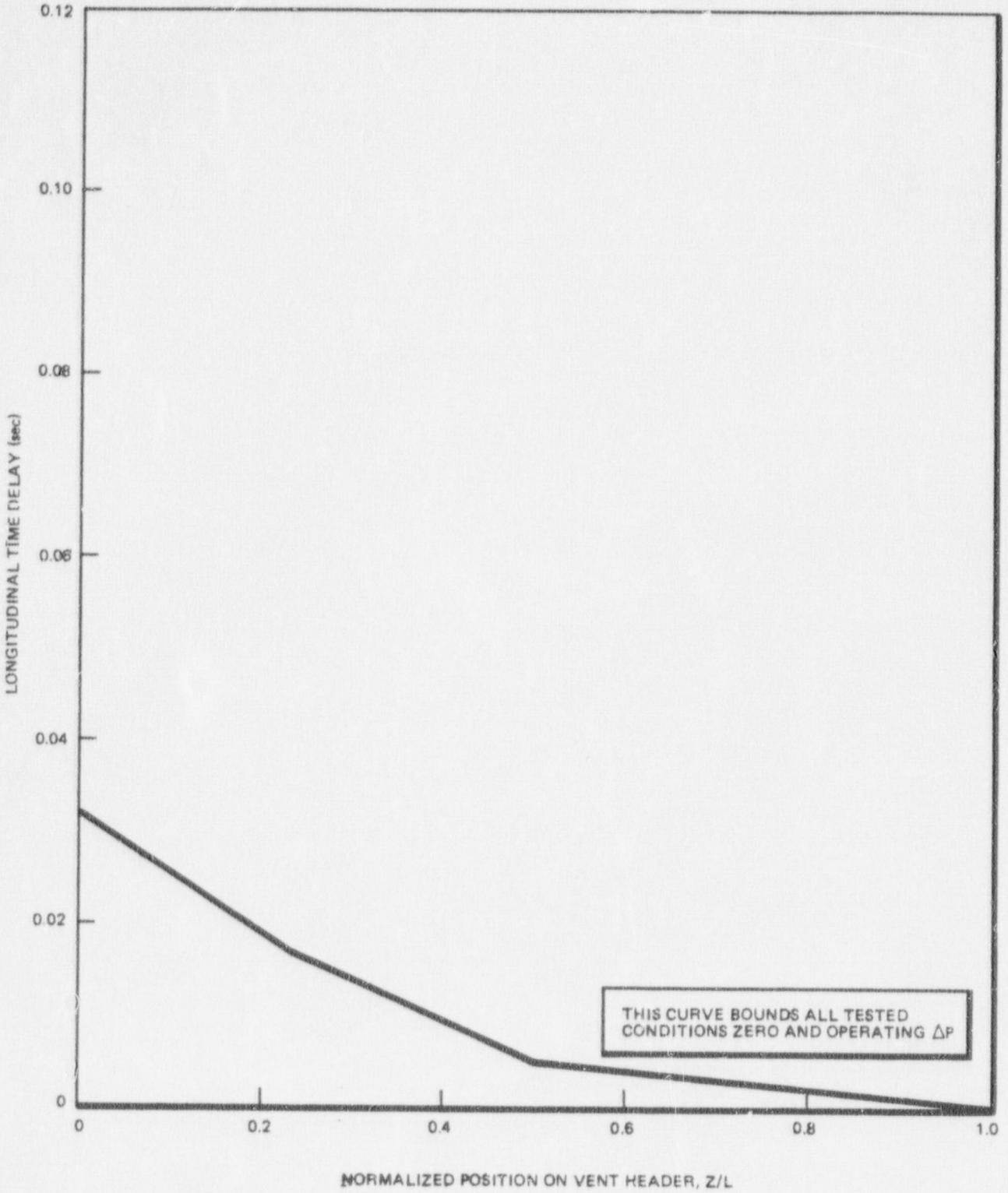

Figure EF 4.3.4-2. Longitudinal Time Delay Distribution Based on EPRI Main Vent Orifice Test

Vent Header Deflector Loads

Pool Swell Vent Header Deflector Loads

This section provides the vent header deflector loads from the pool swell resulting from the drywell air purge to the wetwell during the postulated DBA.

The loads presented are full scale running load as a function of time from LOCA break, for three values of Z/L (distance along the deflector). Z/L = 0 corresponds to the middle of the vent bay and Z/L = 1.0 corresponds to the middle of the non-vent bay.

These loads were derived from the method discussed in the Mark I Containment Program Vent Header Deflector Load Definition (NEDO-24612).

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PLANT UNIQUE POOL SWELL VENT HEADER DEFLECTOR LOADS

Figure/Table Number	Title	Applicable Revision No.
Figure EF 4.3.9-1	Vent Header Deflector Load	Revision 3
Table EF 4.3.9-1	Vent Header Deflector Load	Revision 3

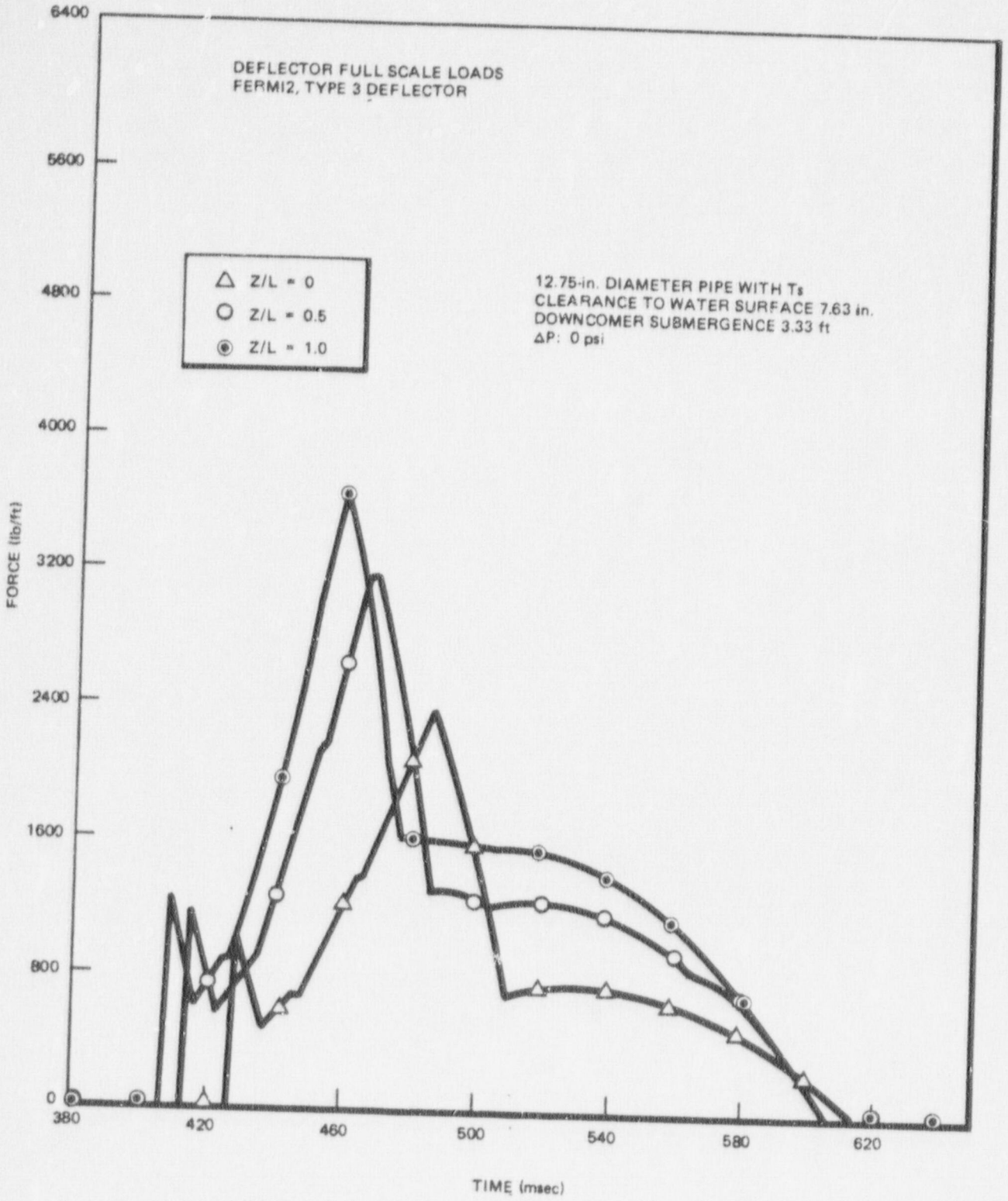

Figure EF 4.3.9-1. Vent Header Load (Zero ΔP)

Table EF 4.3.9-1

VENT HEADER DEFLECTOR LOAD
****DEFLECTOR FULL SCALE LOADS****

Fermi 2, Type 3 Deflector

Z/L=1.0		Z/L=0.5		Z/L=0.0	
Time (msec)	Load (lb/ft)	Time (msec)	Load (lb/ft)	Time (msec)	Load (lb/ft)
380.89	.00	380.89	.00	380.89	.00
382.87	.00	382.87	.00	382.87	.00
384.86	.00	384.86	.00	384.86	.00
386.84	.00	386.84	.00	386.84	.00
388.83	.00	388.83	.00	388.83	.00
390.81	.00	390.81	.00	390.81	.00
392.79	.00	392.79	.00	392.79	.00
394.78	.00	394.78	.00	394.78	.00
396.76	.00	396.76	.00	396.76	.00
398.74	.00	398.74	.00	398.74	.00
400.73	.00	400.73	.00	400.73	.00
402.71	.00	402.71	.00	402.71	.00
404.70	.00	404.70	.00	404.70	.00
406.68	.00	406.68	.00	406.68	.00
408.66	1261.05	408.66	.00	408.66	.00
410.65	1122.33	410.65	.00	410.65	.00
412.63	951.00	412.63	.00	412.63	.00
414.62	751.16	414.62	1172.77	414.62	.00
416.60	615.05	416.60	1053.58	416.60	.00
418.58	674.44	418.58	909.58	418.58	.00
420.57	739.39	420.57	735.07	420.57	.00
422.55	811.22	422.55	571.19	422.55	.00
424.53	888.91	424.53	620.62	424.53	.00
426.52	896.69	426.52	671.97	426.52	.00
428.50	1012.00	428.50	728.09	428.50	1006.34
430.49	1135.91	430.49	789.77	430.49	905.65
432.47	1279.00	432.47	865.07	432.47	790.21
434.45	1436.56	434.45	894.76	434.45	654.78
436.44	1600.71	436.44	1008.12	436.44	495.53
438.42	1775.79	438.42	1129.52	438.42	509.99
440.40	1960.38	440.40	1262.11	440.40	550.98
442.35	2044.28	442.39	1398.44	442.39	592.20
444.37	2232.57	444.37	1537.72	444.37	636.98
446.36	2425.61	446.36	1681.50	446.36	683.98
448.34	2625.95	448.34	1831.57	448.34	678.66
450.32	2840.45	450.32	1956.66	450.32	753.68
452.31	3069.76	452.31	2127.55	452.31	835.17
454.29	3169.51	454.29	2172.83	454.29	922.05
456.28	3394.30	456.28	2338.04	456.28	1012.93
458.26	3619.44	458.26	2505.21	458.26	1108.01
460.24	3641.13	460.24	2672.29	460.24	1200.38
462.23	3487.18	462.23	2839.12	462.23	1294.70

Table EF 4.3.9-1

VENT HEADER DEFLECTOR LOAD (Continued)
****DEFLECTOR FULL SCALE LOADS****

Fermi 2, Type 3 Deflector

Z/L=1.0		Z/L=0.5		Z/L=0.0	
Time (msec)	Load (lb/ft)	Time (msec)	Load (lb/ft)	Time (msec)	Load (lb/ft)
464.21	3300.61	464.21	3005.27	464.21	1389.82
466.19	3082.68	466.19	3169.55	466.19	1395.04
468.18	2840.85	468.18	3186.34	468.18	1483.21
470.16	2593.34	470.16	3047.60	470.16	1576.73
472.15	2340.02	472.15	2900.13	472.15	1675.66
474.13	2062.27	474.13	2732.86	474.13	1775.82
476.11	1757.78	476.11	2542.31	476.11	1875.02
478.10	1610.17	478.10	2331.82	478.10	1973.97
480.08	1611.02	480.08	2103.82	480.08	2071.83
482.06	1594.48	482.06	1850.44	482.06	2166.30
484.05	1585.19	484.05	1589.74	484.05	2261.39
486.03	1595.18	486.03	1333.23	486.03	2361.26
488.02	1603.78	488.02	1312.74	488.02	2307.45
490.00	1598.48	490.00	1309.72	490.00	2196.56
491.98	1589.90	491.98	1304.87	491.98	2076.73
493.97	1608.40	493.97	1319.34	493.97	1956.17
495.95	1611.56	495.95	1322.76	495.95	1824.83
497.94	1589.45	497.94	1306.43	497.94	1676.43
499.92	1561.66	499.92	1284.88	499.92	1517.49
501.90	1568.21	501.90	1256.03	501.90	1347.85
503.89	1563.17	503.89	1226.45	503.89	1166.11
505.87	1573.16	505.87	1239.41	505.87	985.94
507.85	1574.07	507.85	1245.76	507.85	798.88
509.84	1553.93	509.84	1237.02	509.84	706.30
511.82	1558.21	511.82	1244.75	511.82	717.56
513.81	1563.74	513.81	1253.09	513.81	728.59
515.79	1557.60	515.79	1252.90	515.79	735.84
517.77	1559.13	517.77	1257.86	517.77	744.63
519.76	1571.85	519.76	1270.63	519.76	756.31
521.74	1557.17	521.74	1263.55	521.74	759.41
523.72	1544.74	523.72	1257.77	523.72	762.52
525.71	1565.56	525.71	1275.88	525.71	775.69
527.69	1555.20	527.69	1271.24	527.69	778.71
529.68	1530.46	529.68	1255.81	529.68	776.45
531.66	1531.12	531.66	1258.76	531.66	782.13
533.64	1515.38	533.64	1249.47	533.64	781.93
535.63	1478.51	535.63	1224.31	535.63	773.89
537.61	1462.81	537.61	1214.54	537.61	772.65
539.60	1456.84	539.60	1211.83	539.60	774.50
541.58	1401.21	541.58	1171.89	541.58	758.08
543.56	1361.85	543.56	1143.75	543.56	746.83
545.55	1352.35	545.55	1137.76	545.55	746.10

Table EF 4.3.9-1

VENT HEADER DEFLECTOR LOAD (Continued)
****DEFLECTOR FULL SCALE LOADS****

Fermi 2, Type 3 Deflector

Z/L=1.0		Z/L=0.5		Z/L=0.0	
Time (msec)	Load (lb/ft)	Time (msec)	Load (lb/ft)	Time (msec)	Load (lb/ft)
547.53	1330.35	547.53	1122.25	547.53	740.47
549.51	1296.07	549.51	1097.32	549.51	729.84
551.50	1257.44	551.50	1068.86	551.50	717.10
553.48	1238.75	553.48	1055.31	553.48	711.62
555.47	1218.75	555.47	1040.65	555.47	705.38
557.45	1168.52	557.45	1002.84	557.45	687.00
559.43	1114.44	559.43	961.86	559.43	666.61
561.42	1066.82	561.42	925.57	561.42	648.29
563.40	1014.04	563.40	885.13	563.40	627.49
565.38	983.77	565.38	861.75	565.38	615.36
567.37	968.78	567.37	853.51	567.37	611.08
569.35	942.15	569.35	838.16	569.35	602.95
571.34	910.01	571.34	818.05	571.34	592.14
573.32	878.83	573.32	798.19	573.32	581.33
575.30	838.40	575.30	770.23	575.30	566.00
577.29	773.32	577.29	721.04	577.29	538.98
579.27	696.09	579.27	660.33	579.27	505.38
581.26	662.54	581.26	635.50	581.26	491.08
583.24	609.21	583.24	593.04	583.24	466.99
585.22	552.84	585.22	547.01	585.22	440.77
587.21	498.77	587.21	502.06	587.21	414.96
589.19	450.56	589.19	460.41	589.19	391.40
591.17	398.71	591.17	414.19	591.17	365.43
593.16	347.22	593.16	368.24	593.16	339.04
595.14	296.97	595.14	323.33	595.14	312.70
597.13	247.66	597.13	279.22	597.13	286.30
599.11	198.09	599.11	234.82	599.11	259.21
601.05	149.09	601.09	190.89	601.09	231.89
603.08	100.70	603.08	147.46	603.08	204.40
605.06	52.78	605.06	104.41	605.06	176.67
607.04	5.20	607.04	61.62	607.04	148.66
609.03	.00	609.03	19.24	609.03	120.46
611.01	.00	611.01	.00	611.01	92.09
613.00	.00	613.00	.00	613.00	63.55
614.98	.00	614.98	.00	614.98	34.84
616.96	.00	616.96	.00	616.96	6.00
618.95	.00	618.95	.00	618.95	.00
620.93	.00	620.93	.00	620.93	.00
622.92	.00	622.92	.00	622.92	.00
624.90	.00	624.90	.00	624.90	.00
626.88	.00	626.88	.00	626.88	.00
628.87	.00	628.87	.00	628.87	.00

Table EF 4.3.9-1

VENT HEADER DEFLECTOR LOAD (Continued)
****DEFLECTOR FULL SCALE LOADS****

Fermi 2, Type 3 Deflector

Z/L=1.0		Z/L=0.5		Z/L=0.0	
Time (msec)	Load (lb/ft)	Time (msec)	Load (lb/ft)	Time (msec)	Load (lb/ft)
630.85	.00	630.85	.00	630.85	.00
632.83	.00	632.83	.00	632.83	.00
634.82	.00	634.82	.00	634.82	.00
636.80	.00	636.80	.00	636.80	.00
638.75	.00	638.79	.00	638.79	.00
640.77	.00	640.77	.00	640.77	.00
642.75	.00	642.75	.00	642.75	.00
644.74	.00	644.74	.00	644.74	.00
646.72	.00	646.72	.00	646.72	.00
648.70	.00	648.70	.00	648.70	.00
650.69	.00	650.69	.00	650.69	.00
652.67	.00	652.67	.00	652.67	.00
654.66	.00	654.66	.00	654.66	.00
656.64	.00	656.64	.00	656.64	.00
658.62	.00	658.62	.00	658.62	.00

NUCLEAR ENERGY DIVISIONS • GENERAL ELECTRIC COMPANY
SAN JOSE, CALIFORNIA 95125

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TECHNICAL INFORMATION EXCHANGE

TITLE PAGE

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SUMMARY

This document provides unique definition of specific containment loading conditions that would result from a postulated loss-of-coolant accident in the Enrico Fermi Atomic Power Plant: Unit 2. Transient information is provided for containment pressures and temperatures, vent system thrust, torus vertical loads, vent system pool swell impact loads and vent header deflector loads. The document has been prepared under the Mark I Containment Program to aid Detroit Edison Company in the performance of a containment structural evaluation.

By cutting out this rectangle and folding in half, the above information can be fitted into a standard card file.

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