

Appendix 6B. Figures

Figure 6-1. Minimum Containment Sump pH Following a Design Basis LOCA

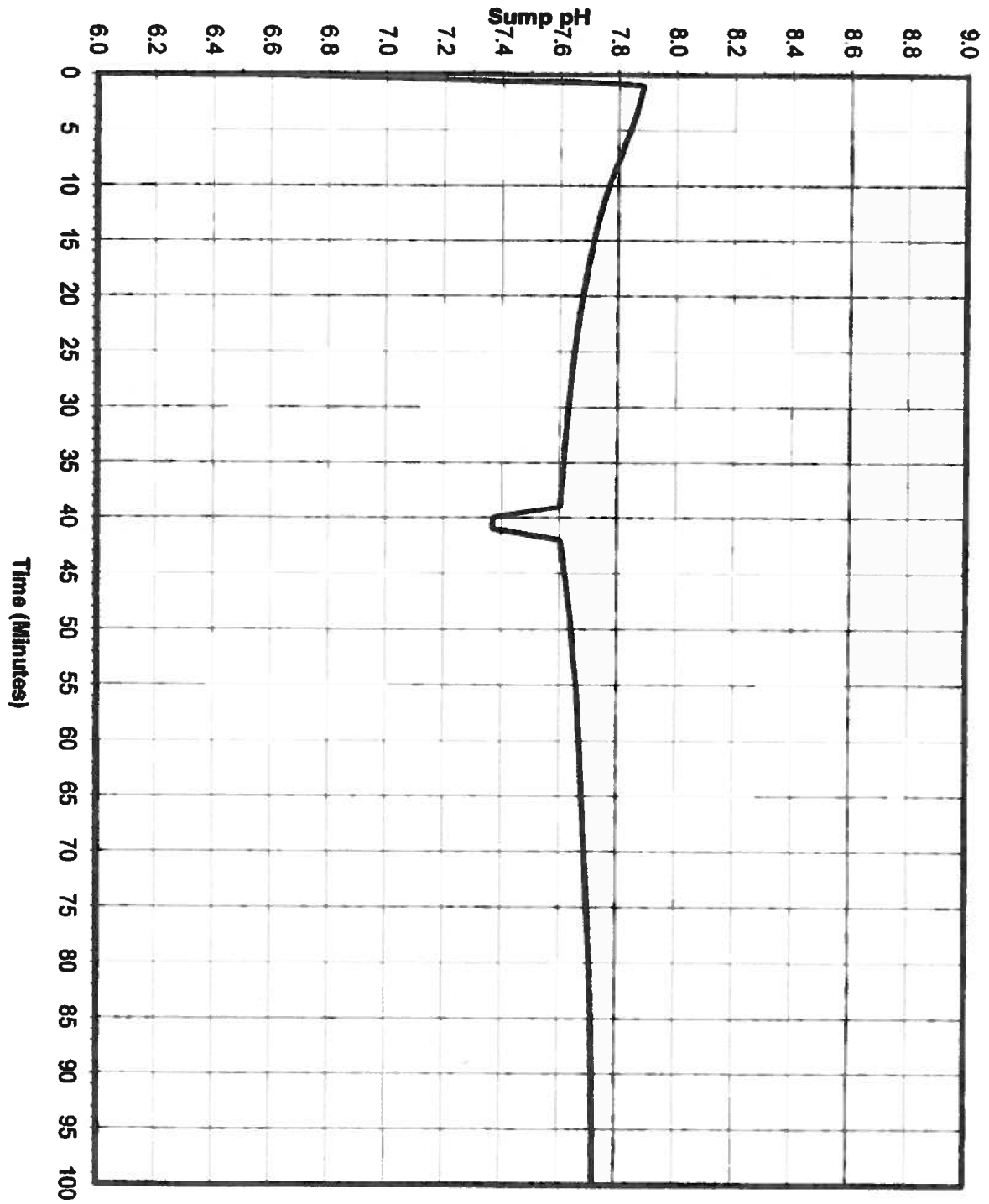


Figure 6-2. Sensitivity of Peak Pressure to Air Compression Ratio

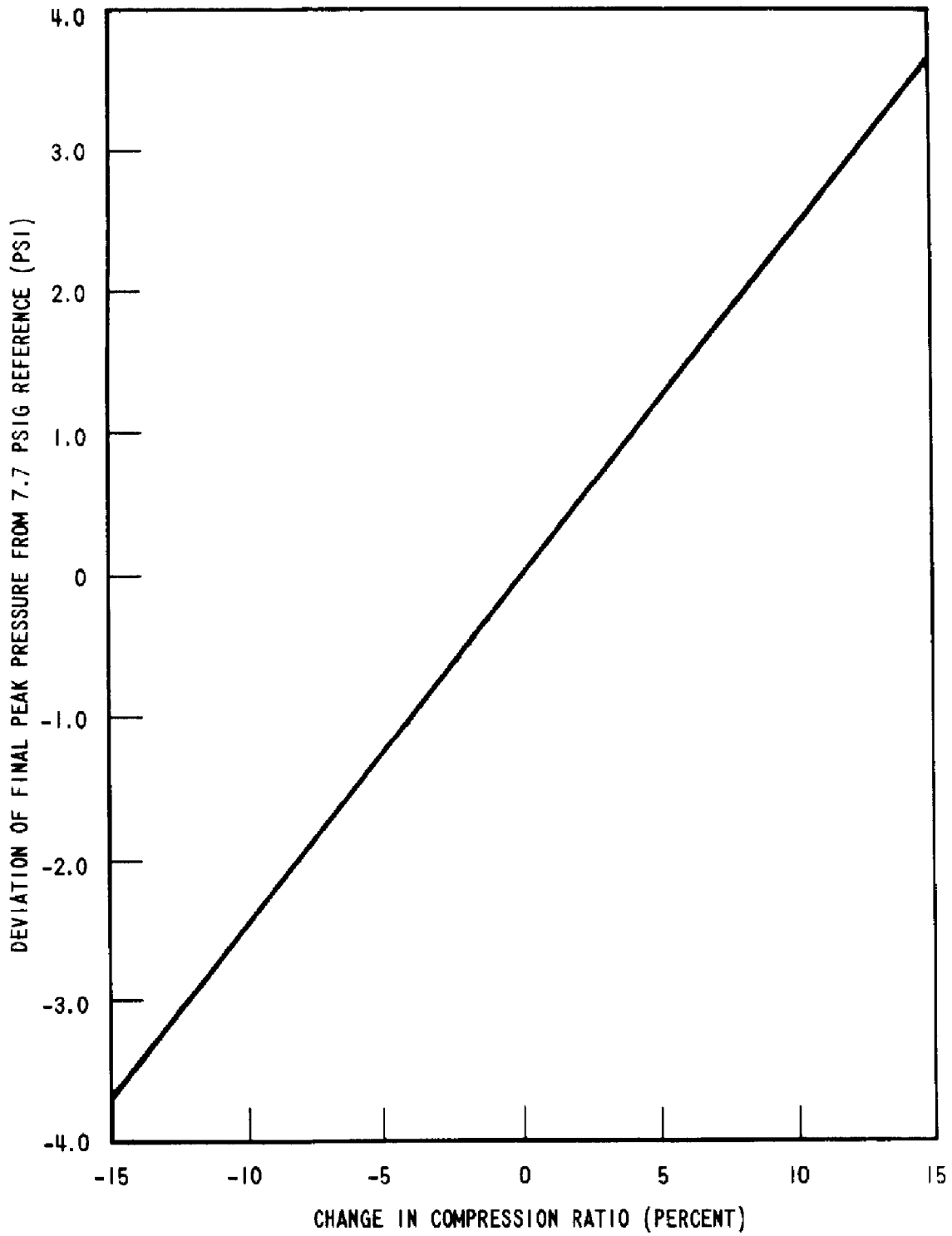


Figure 6-3. Steam Concentration in a Vertical Distribution Channel

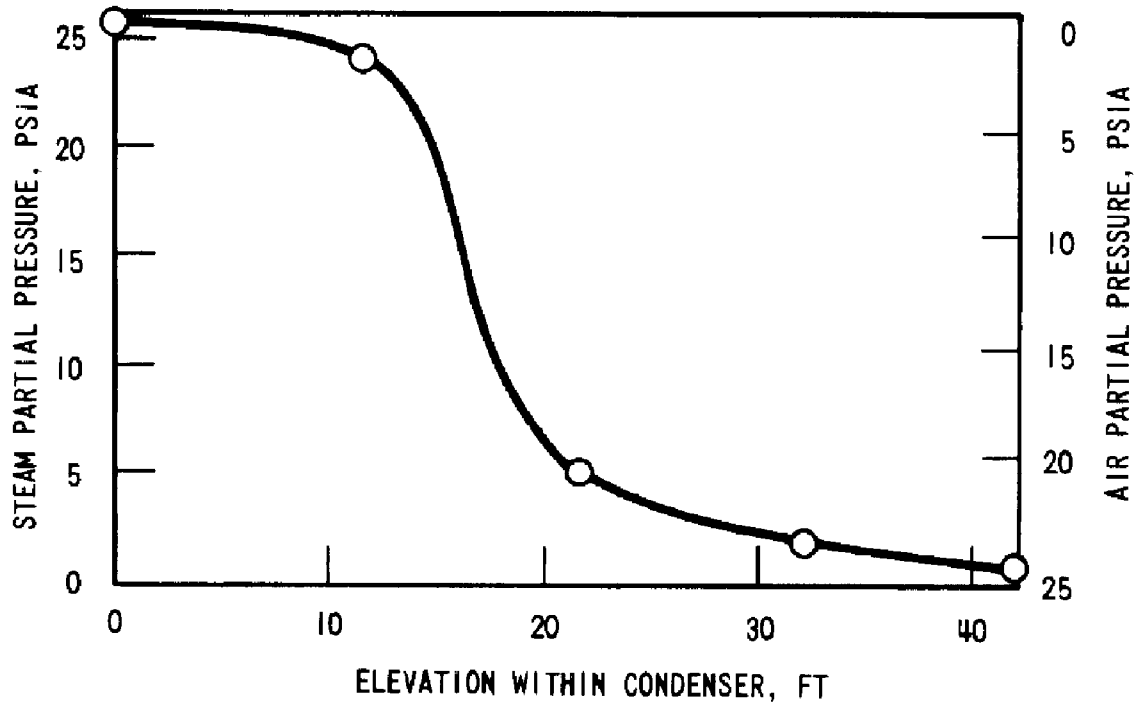


Figure 6-4. Peak Compression Pressure Versus Compression Ratio

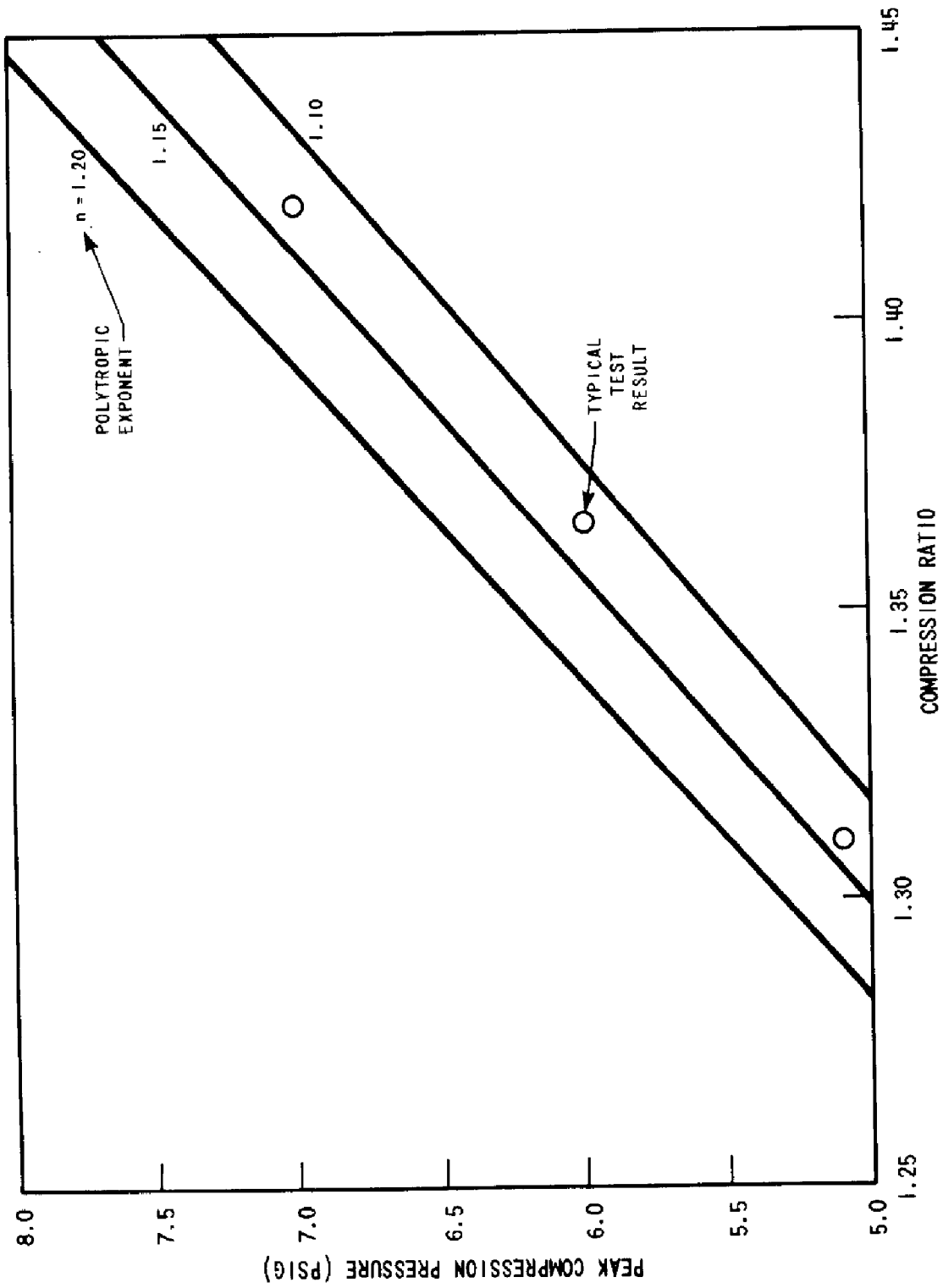


Figure 6-5. Upper Compartment Compression Pressure Versus Energy Release for Tests at 110% and 200% of Initial DBA Blowdown Rate

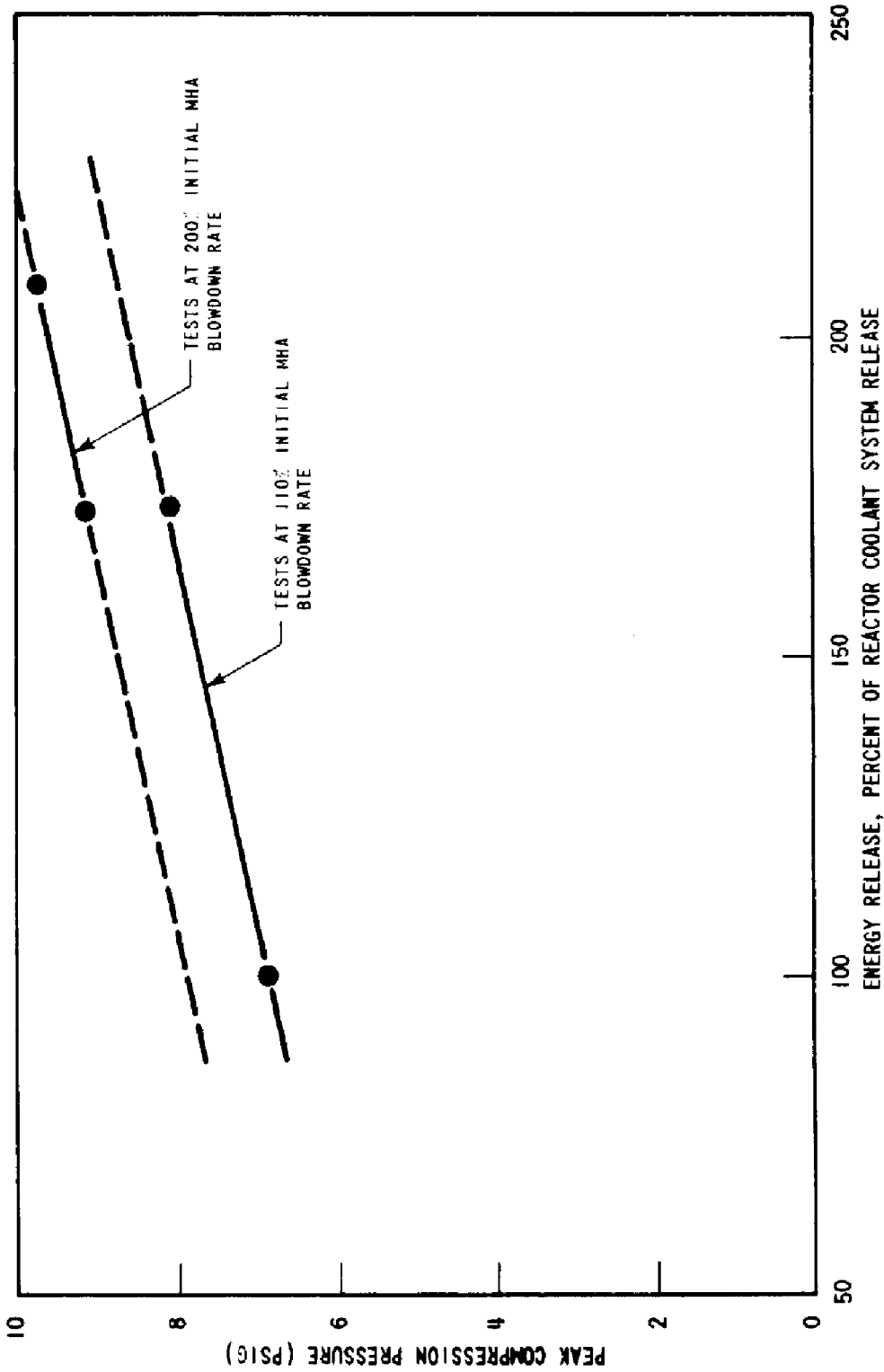


Figure 6-6. Peak Containment Pressure Transient – Pressure

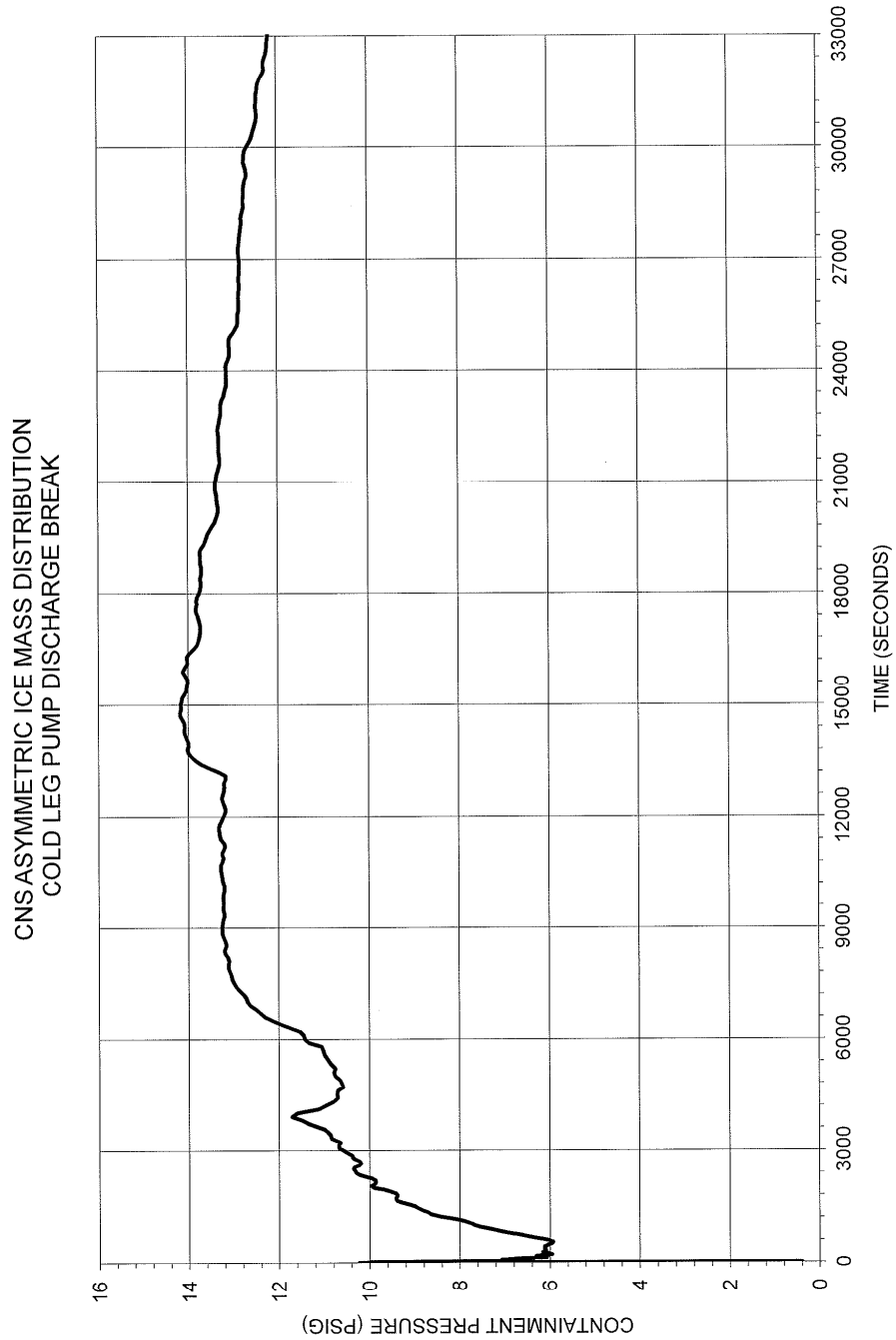


Figure 6-7. Peak Containment Pressure Transient - Upper Containment Temperature

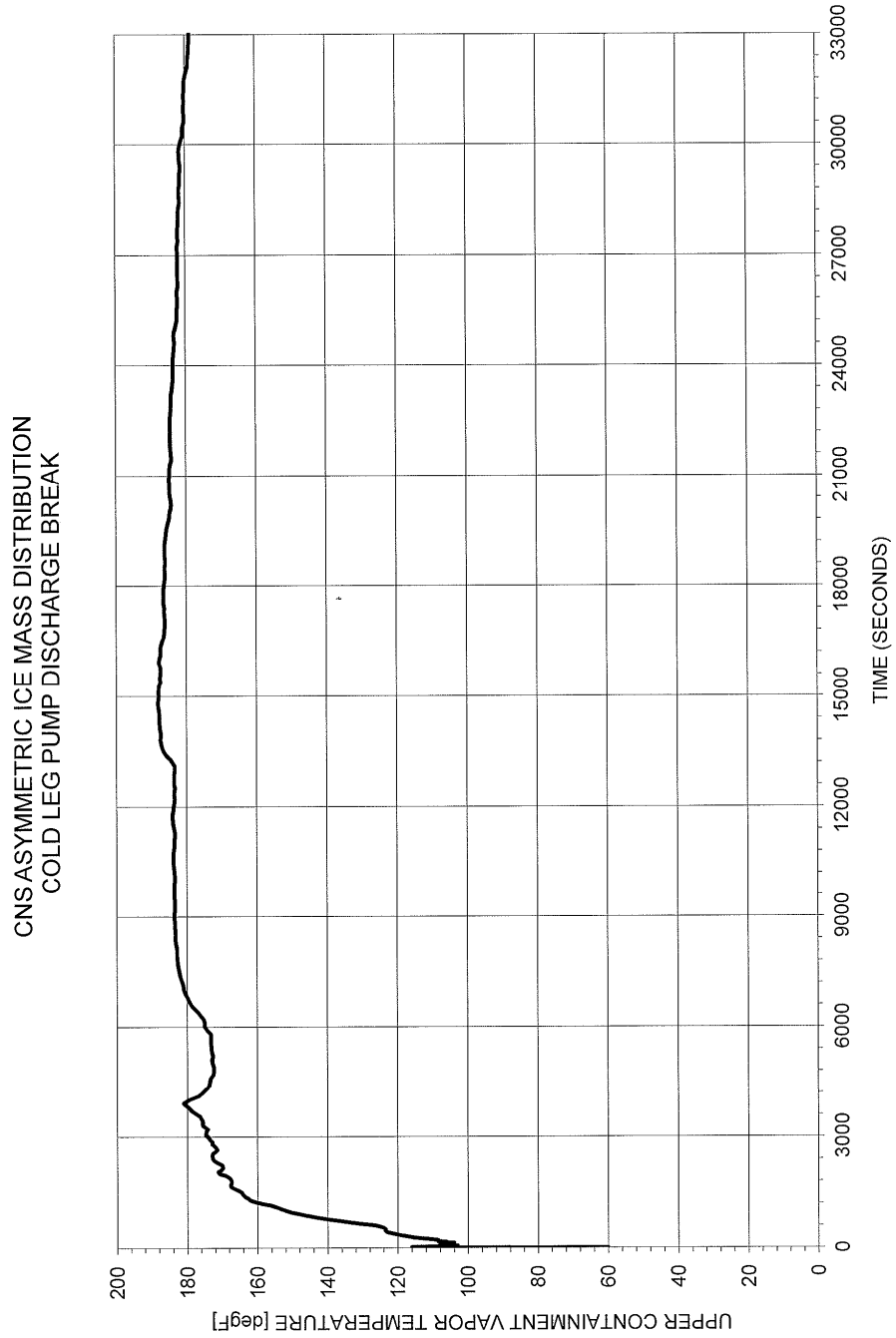


Figure 6-8. Peak Containment Pressure Transient - Lower Containment Temperature

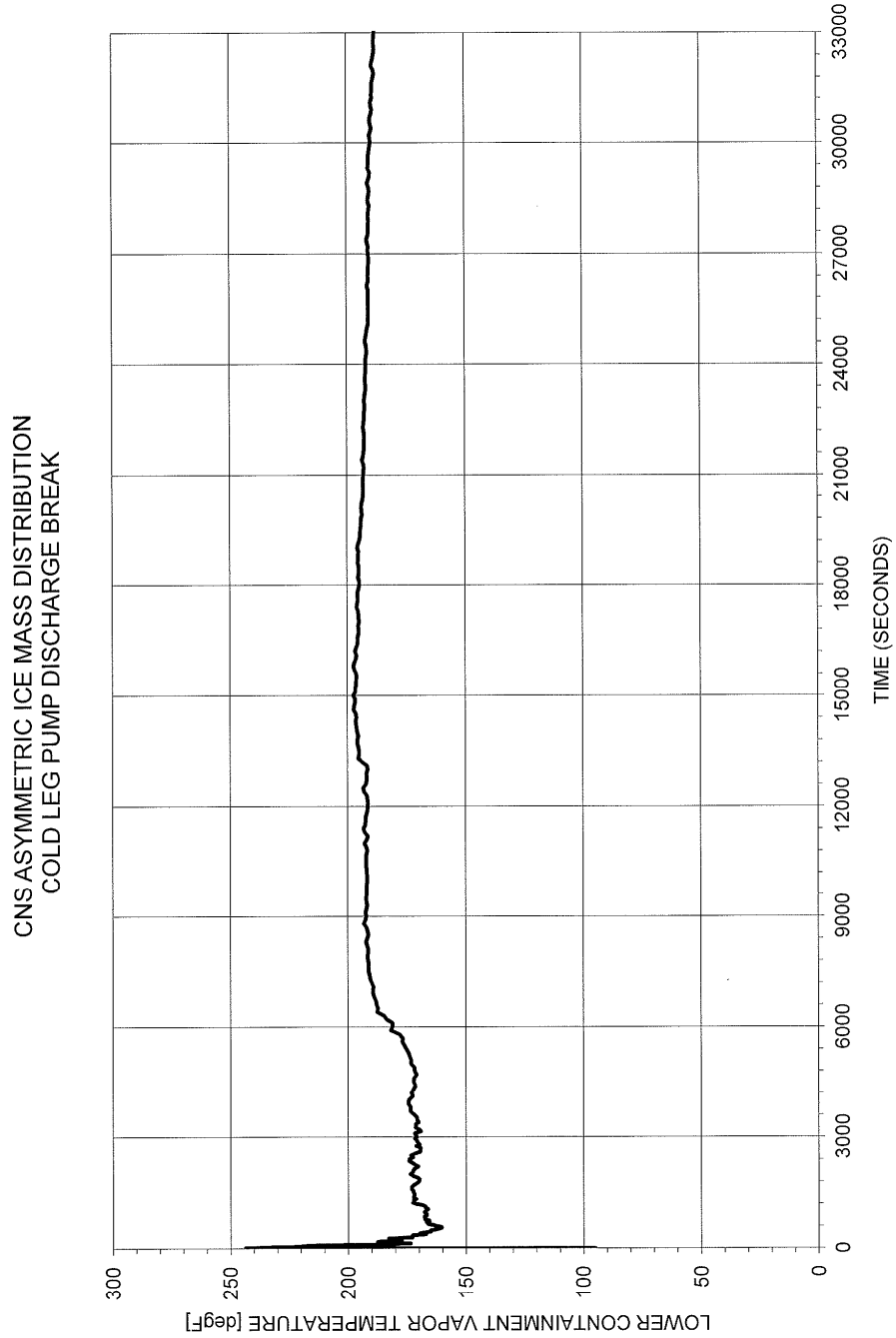


Figure 6-9. Peak Containment Pressure Transient - Sump Temperature

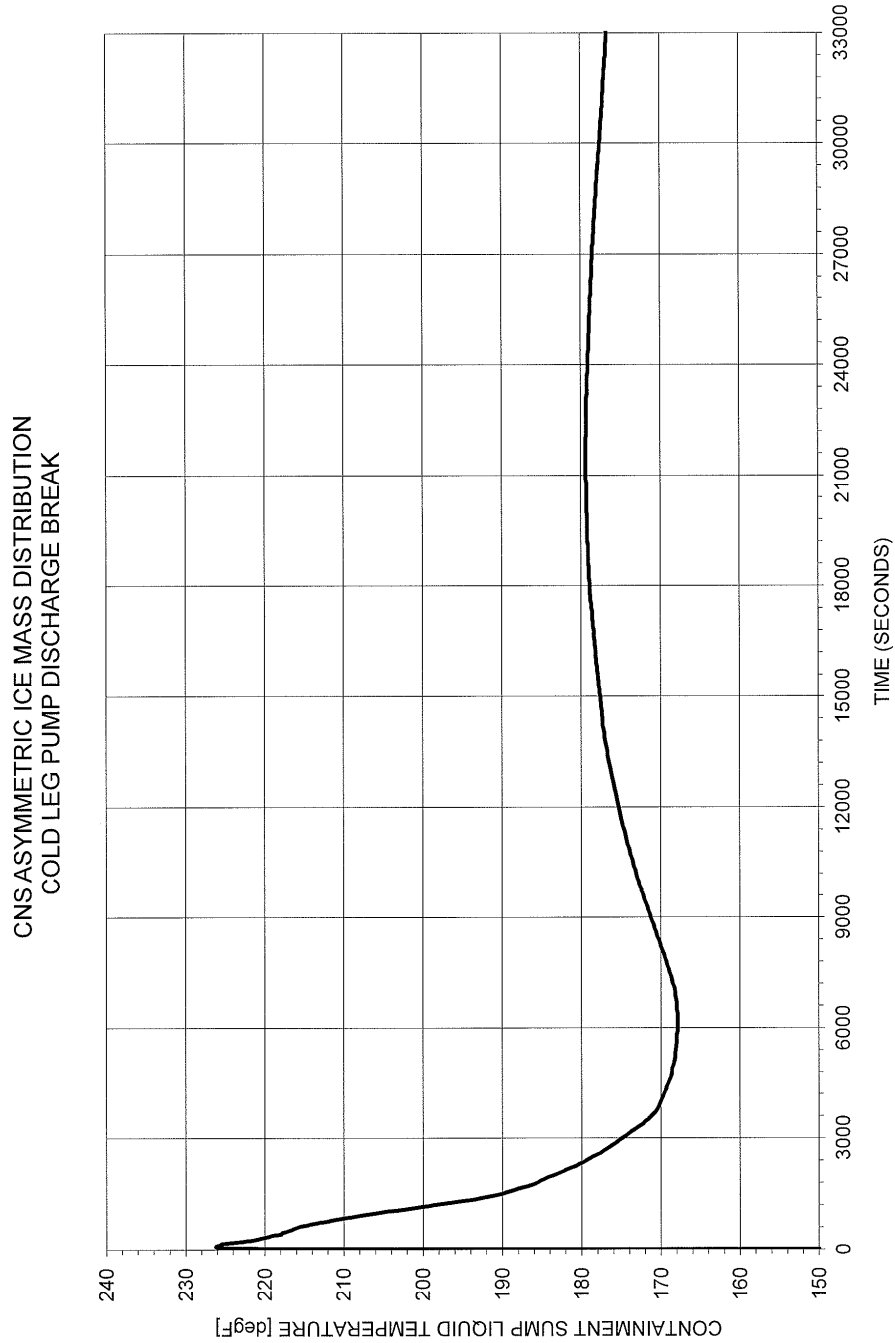


Figure 6-10. Peak Containment Pressure Transient - Ice Melted

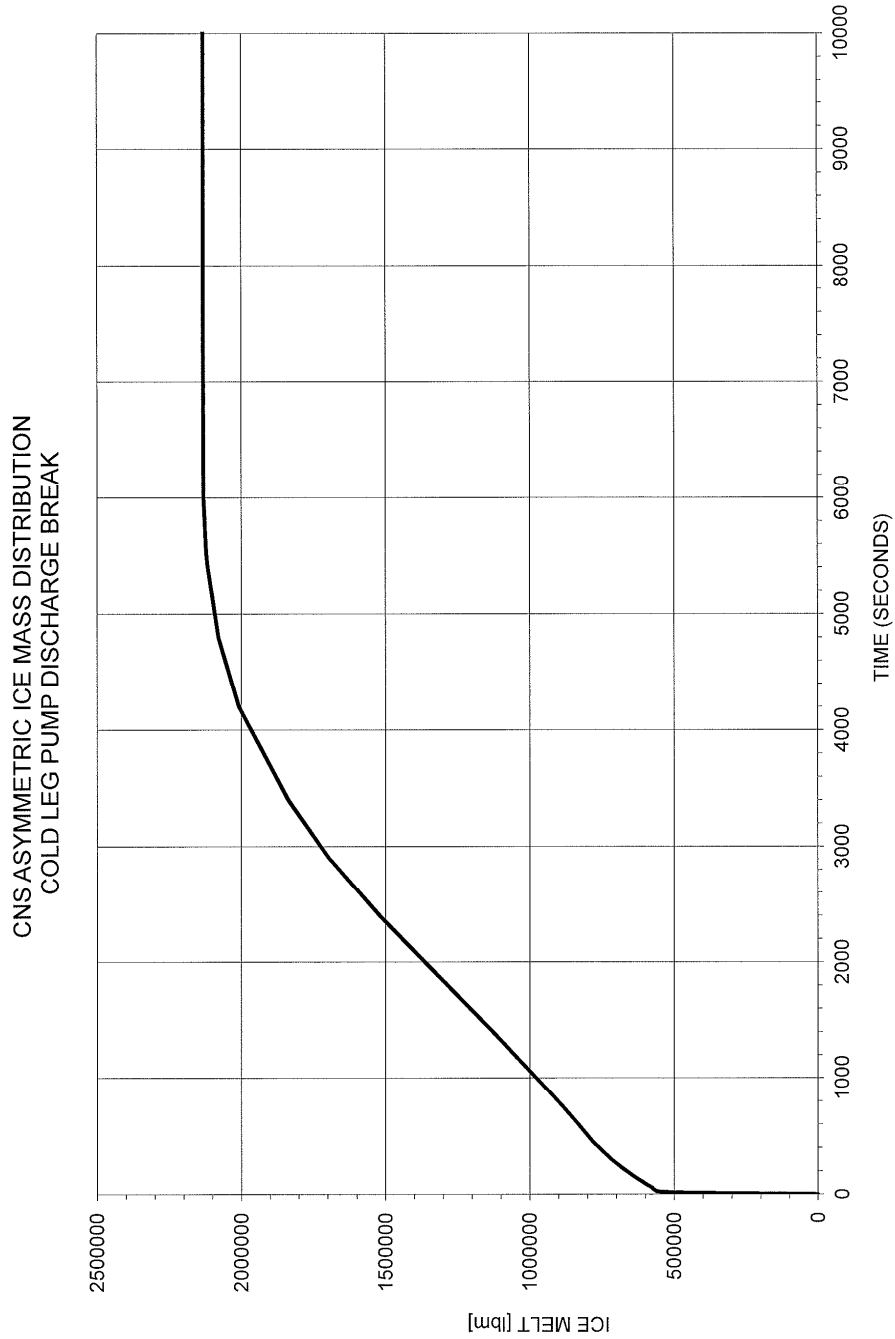


Figure 6-12. Containment Spray Return Drains from Air Return Pit Fans

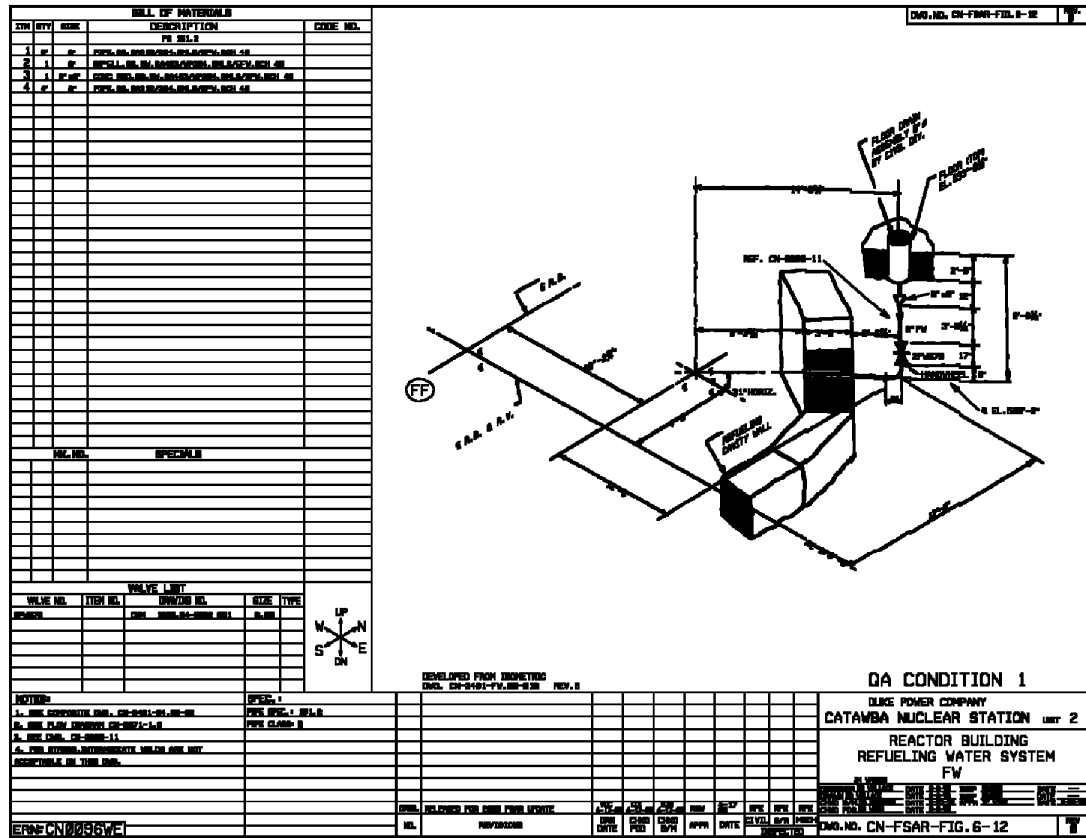


Figure 6-13. Drain Piping Arrangement Refueling Canal

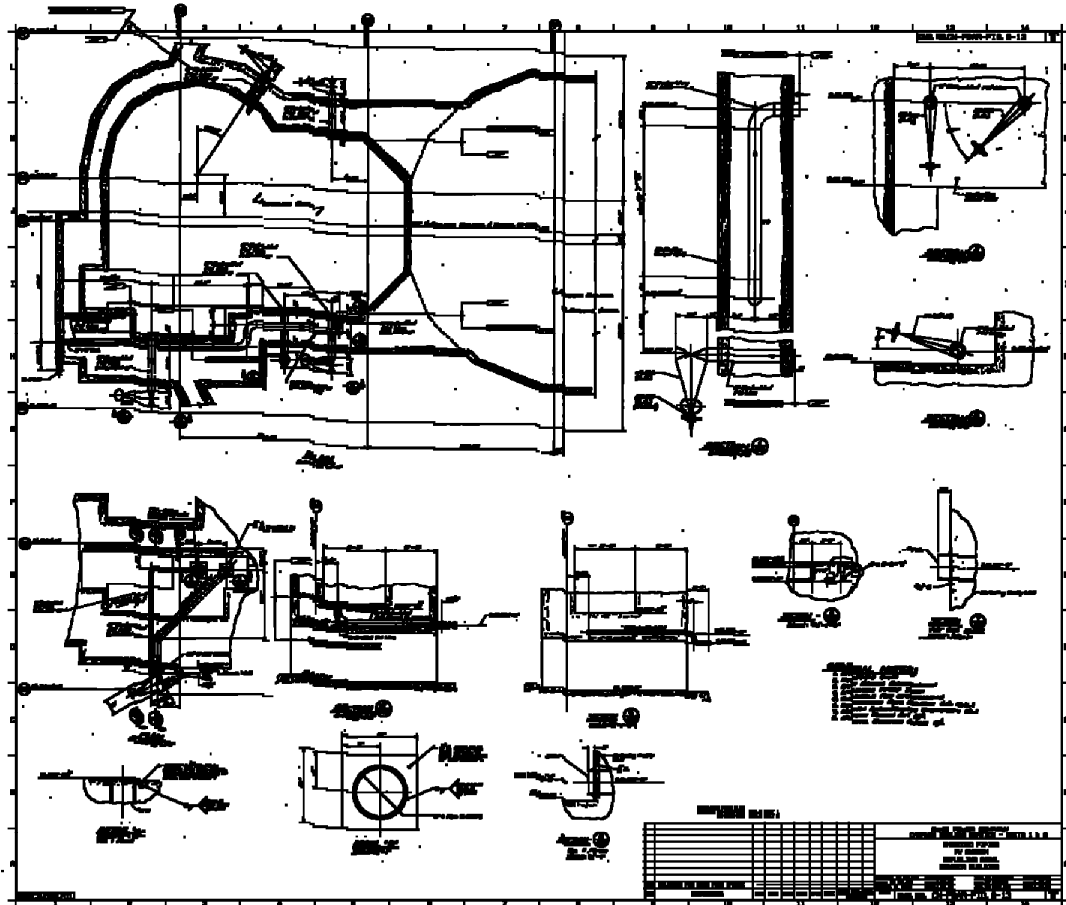


Figure 6-14. Ice Melted Versus Energy Release for Tests at Different Blowdown Rates

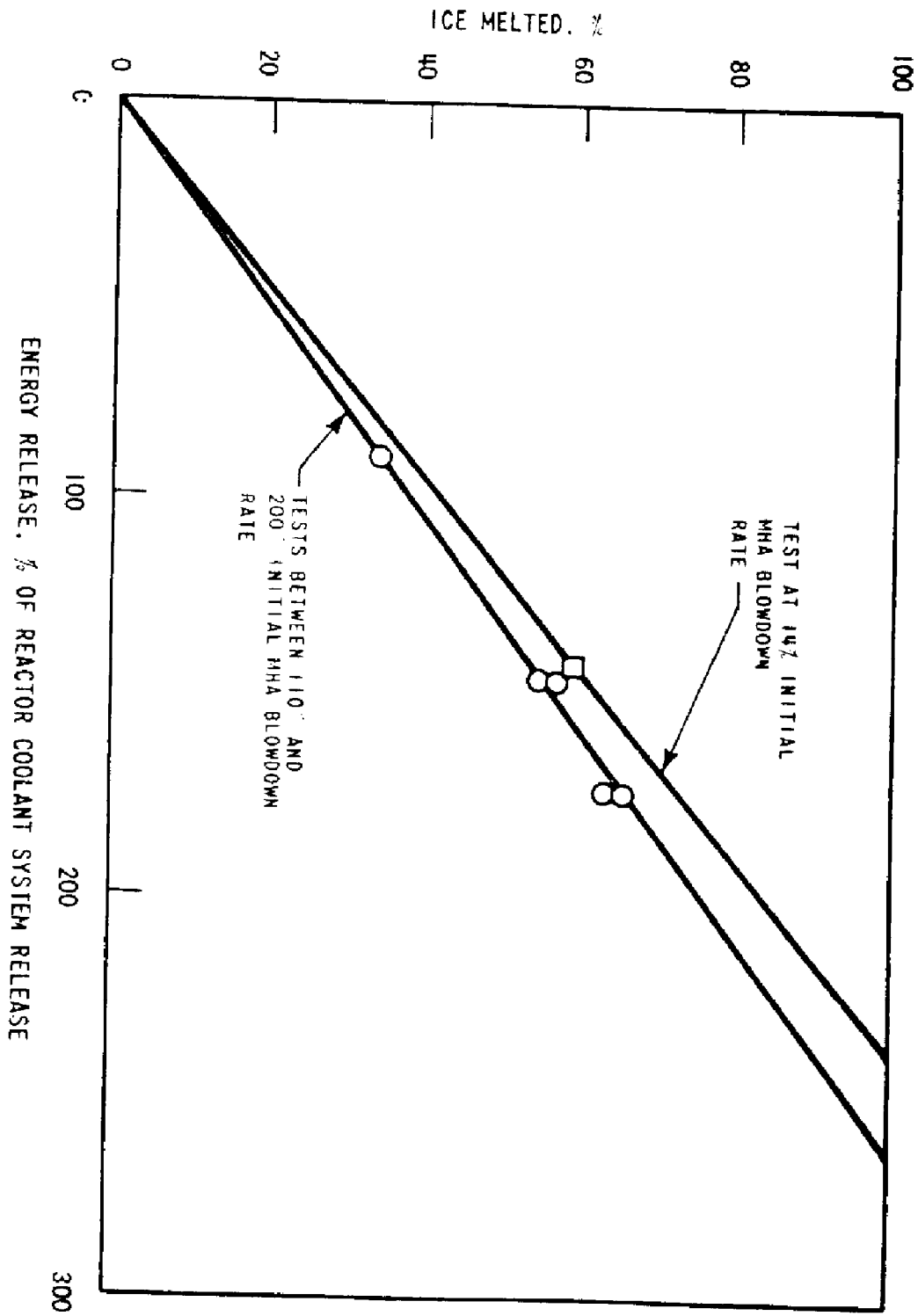


Figure 6-15. Upper Compartment Peak Compression Pressure Versus Blowdown Rate for Tests with 175% Energy Release

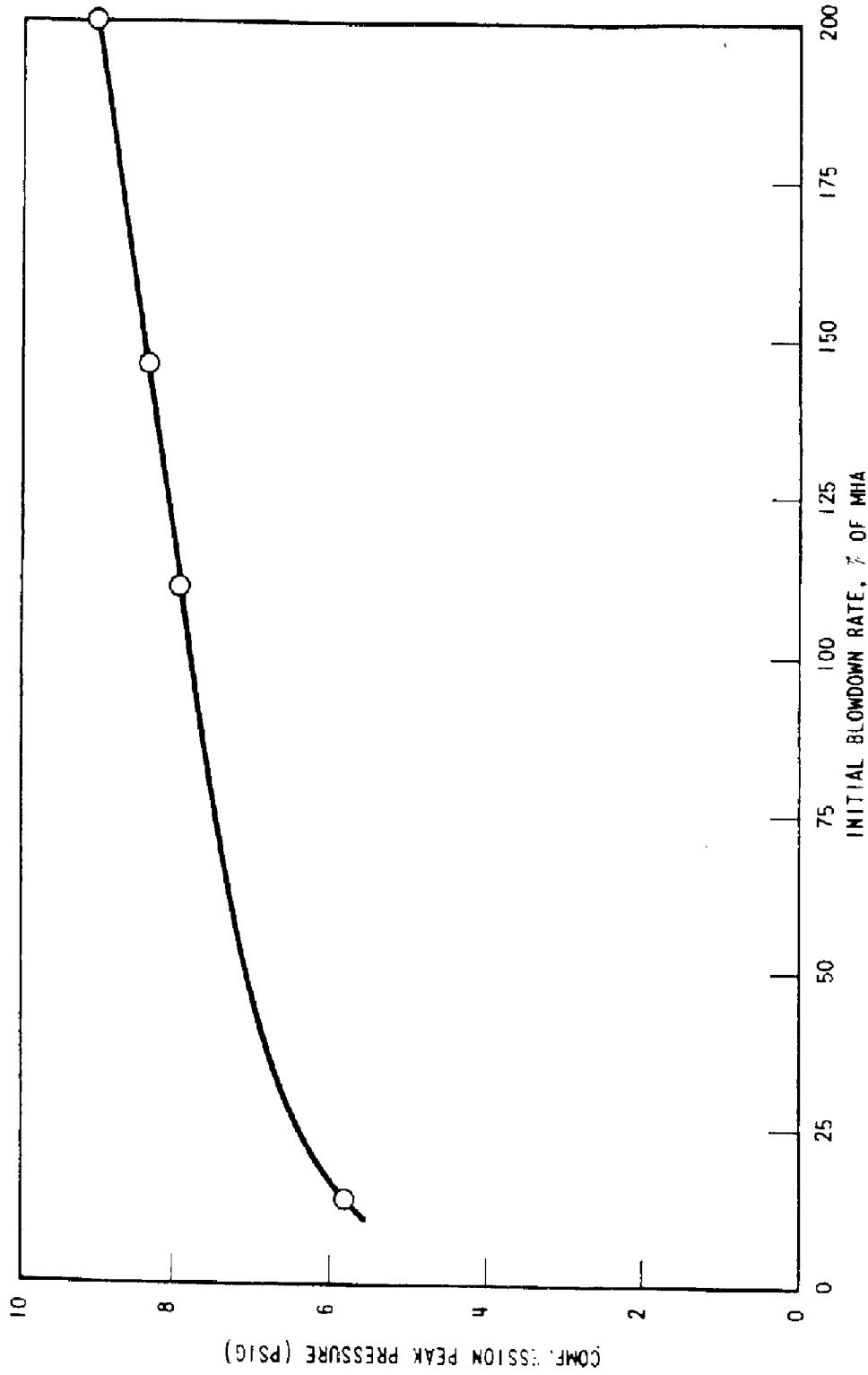


Figure 6-16. Peak Reverse Differential Pressure Transient

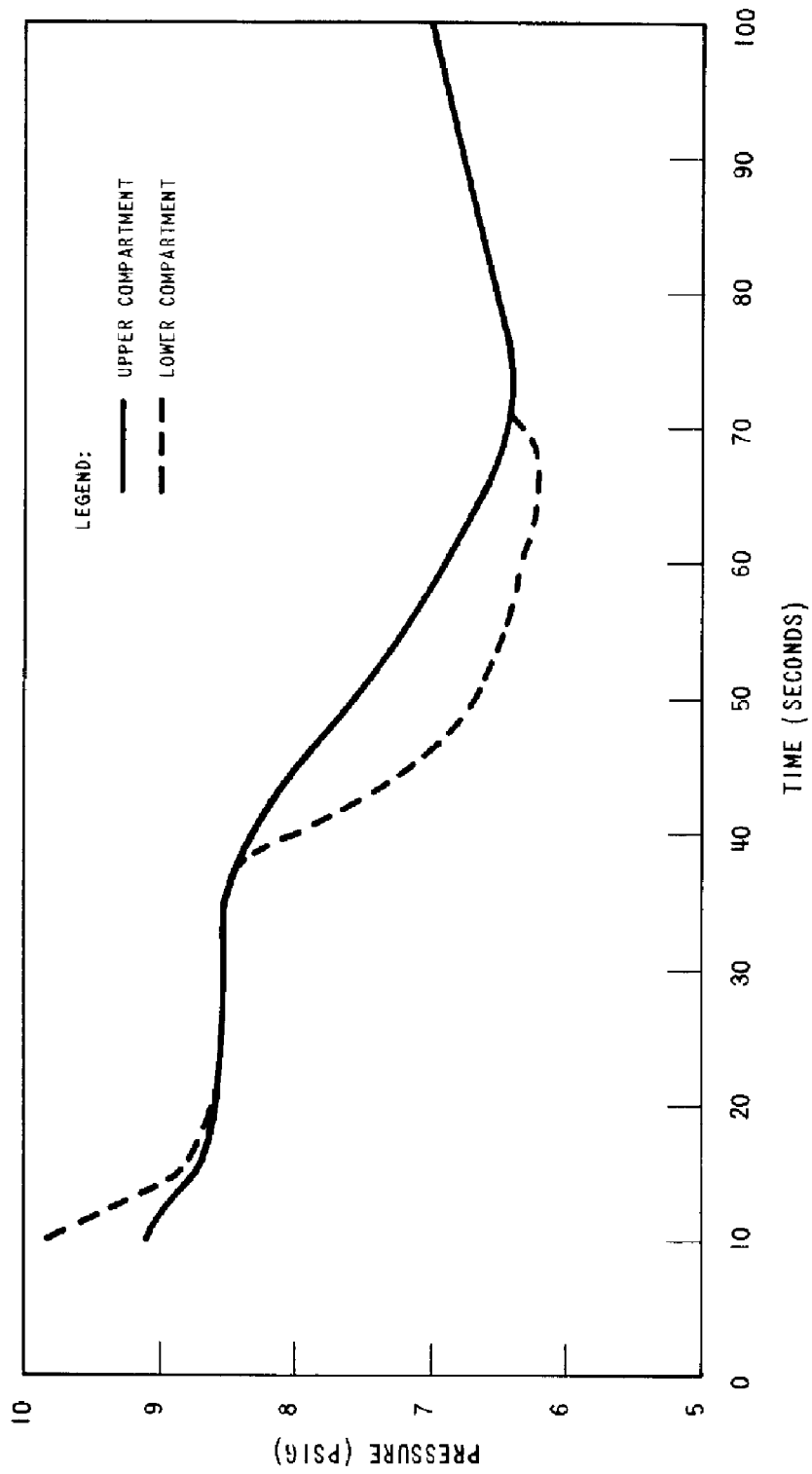


Figure 6-17. Peak Reverse Differential Pressure Transient

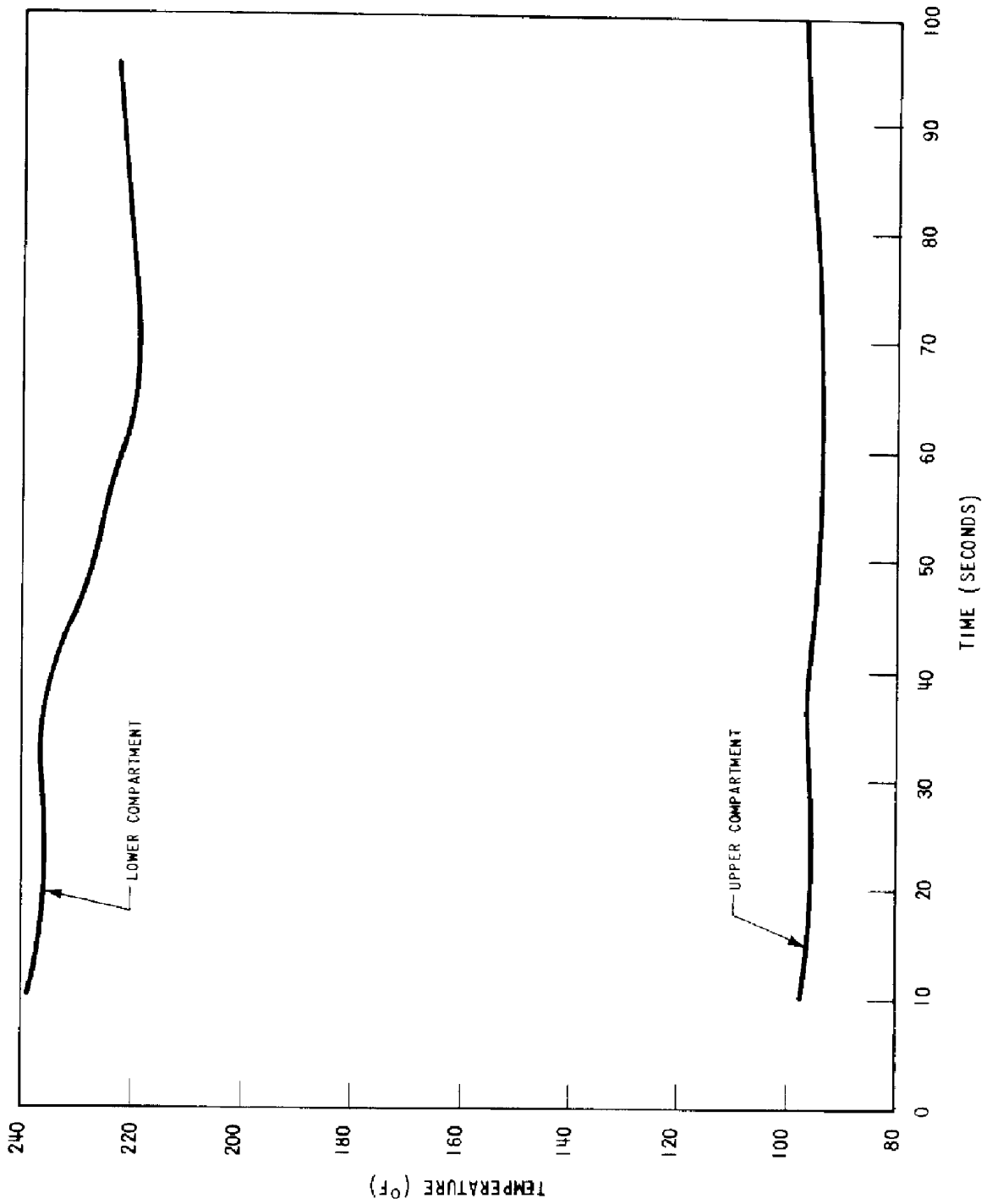


Figure 6-18. Pressure Increase Versus Deck Area from Deck Leakage Tests

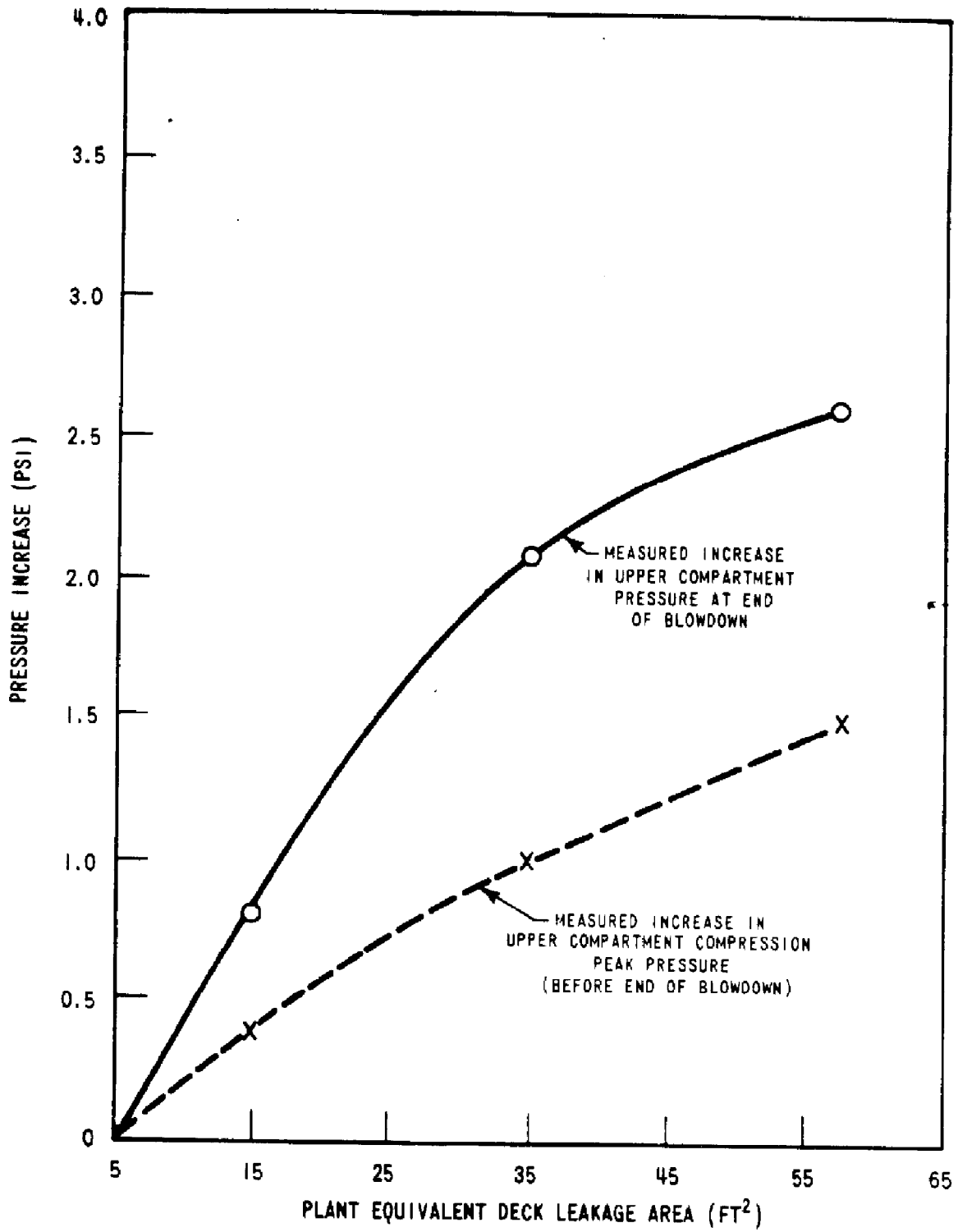


Figure 6-19. Energy Release at Time of Compression Peak Pressure from Full-Scale Section Test with 1-Foot Diameter Baskets

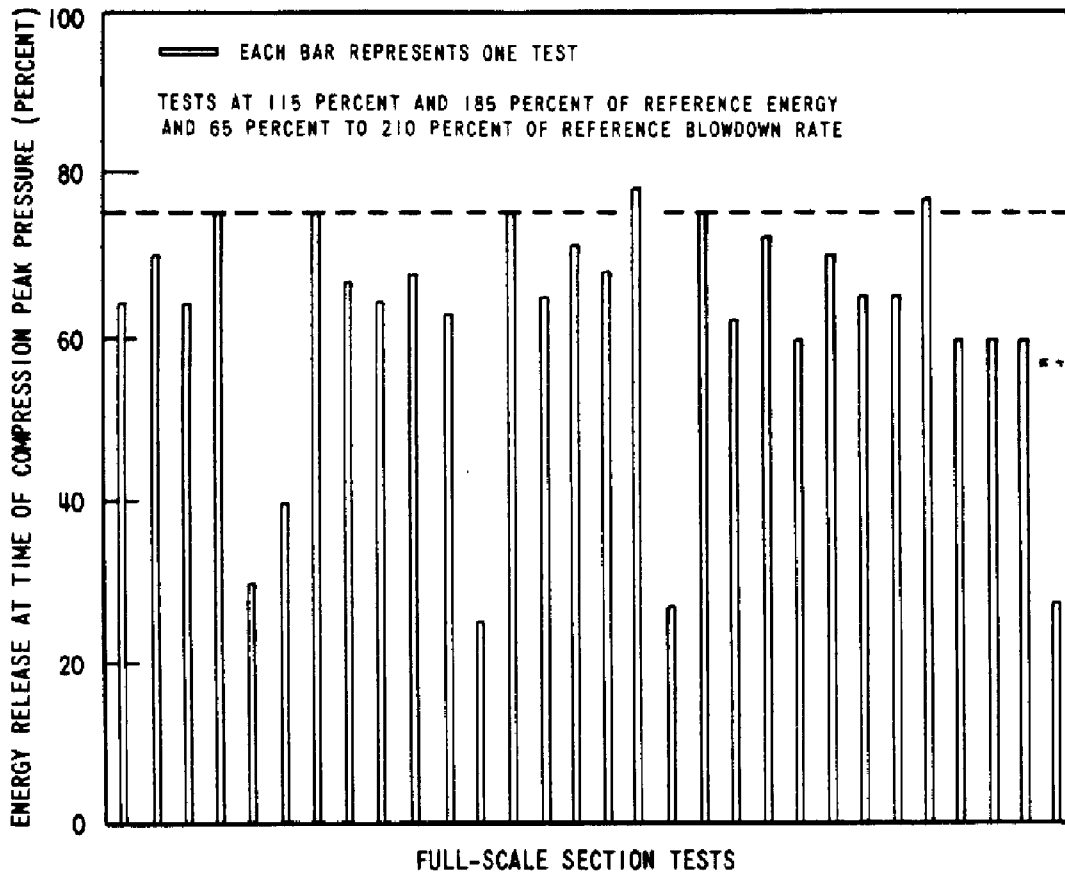


Figure 6-20. Peak Containment Temperature Transient - Lower Containment Temperature

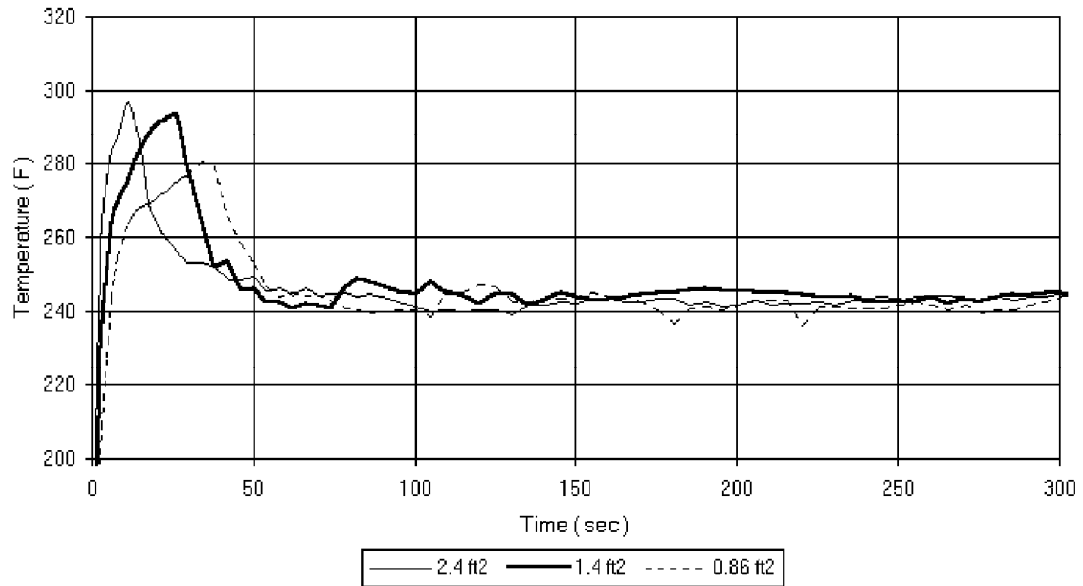


Figure 6-21. Peak Containment Temperature Transient - Break Compartment Temperature

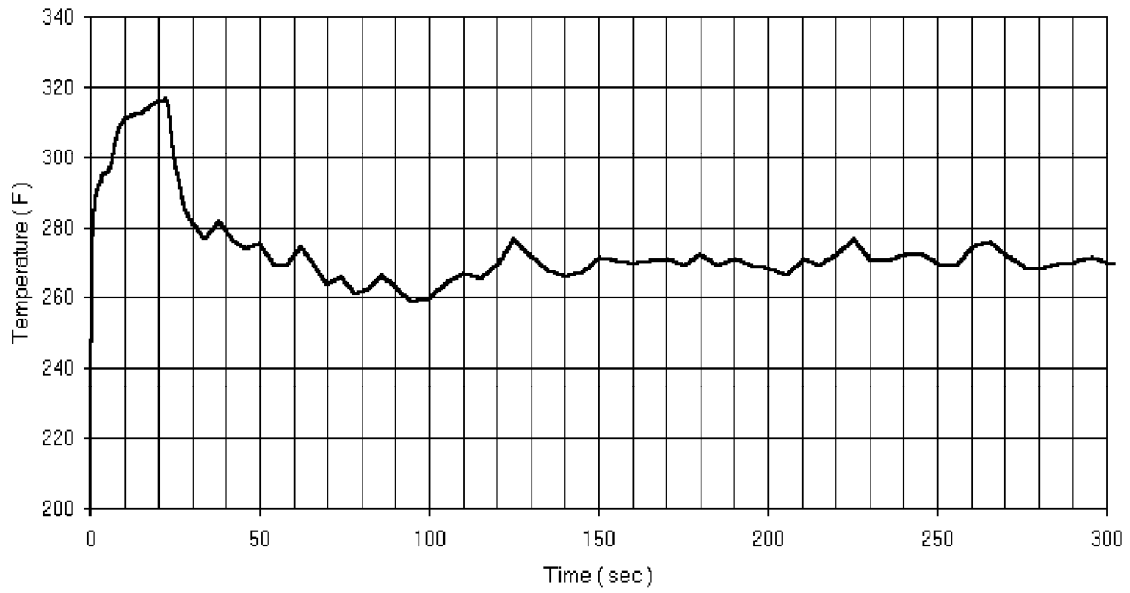


Figure 6-22. Deleted Per 1997 Update

Figure 6-23. Typical Upper and Lower Compartment Pressure Transient for Break Compartment Having a DEHL Break

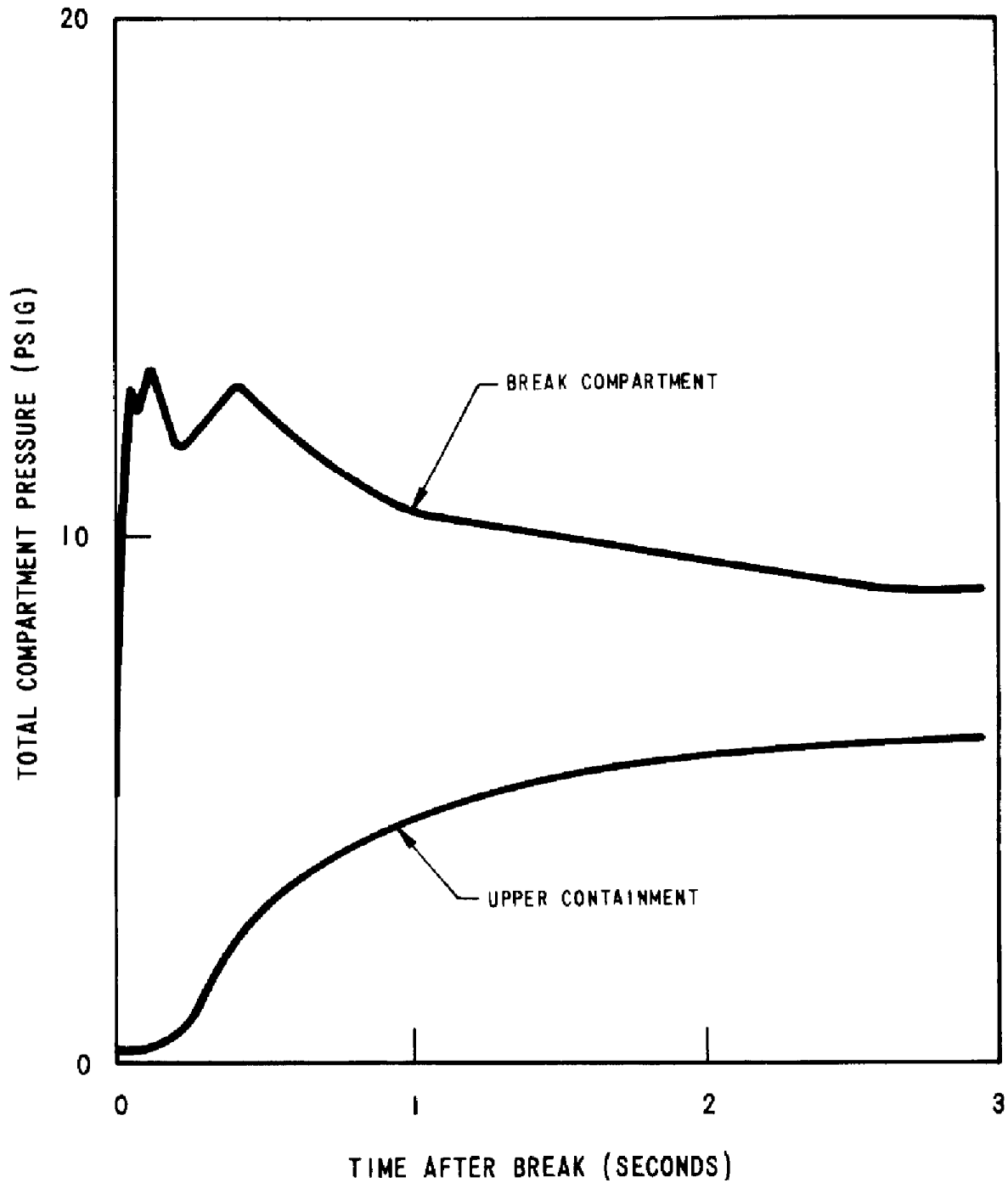


Figure 6-24. Typical Upper and Lower Compartment Pressure Transient for Break Compartment Having a DECL Break

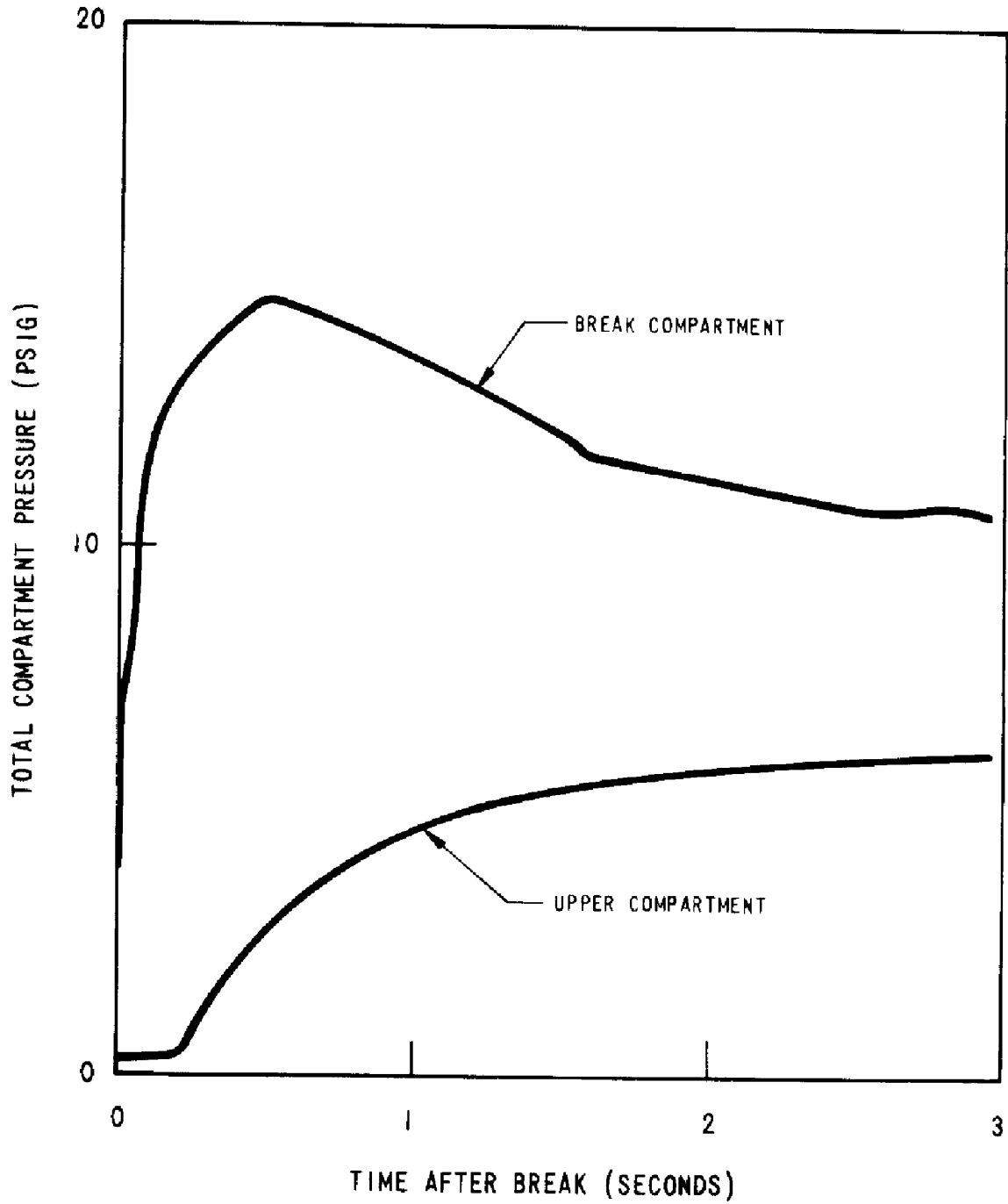


Figure 6-25. Plan at Equipment Rooms Elevation

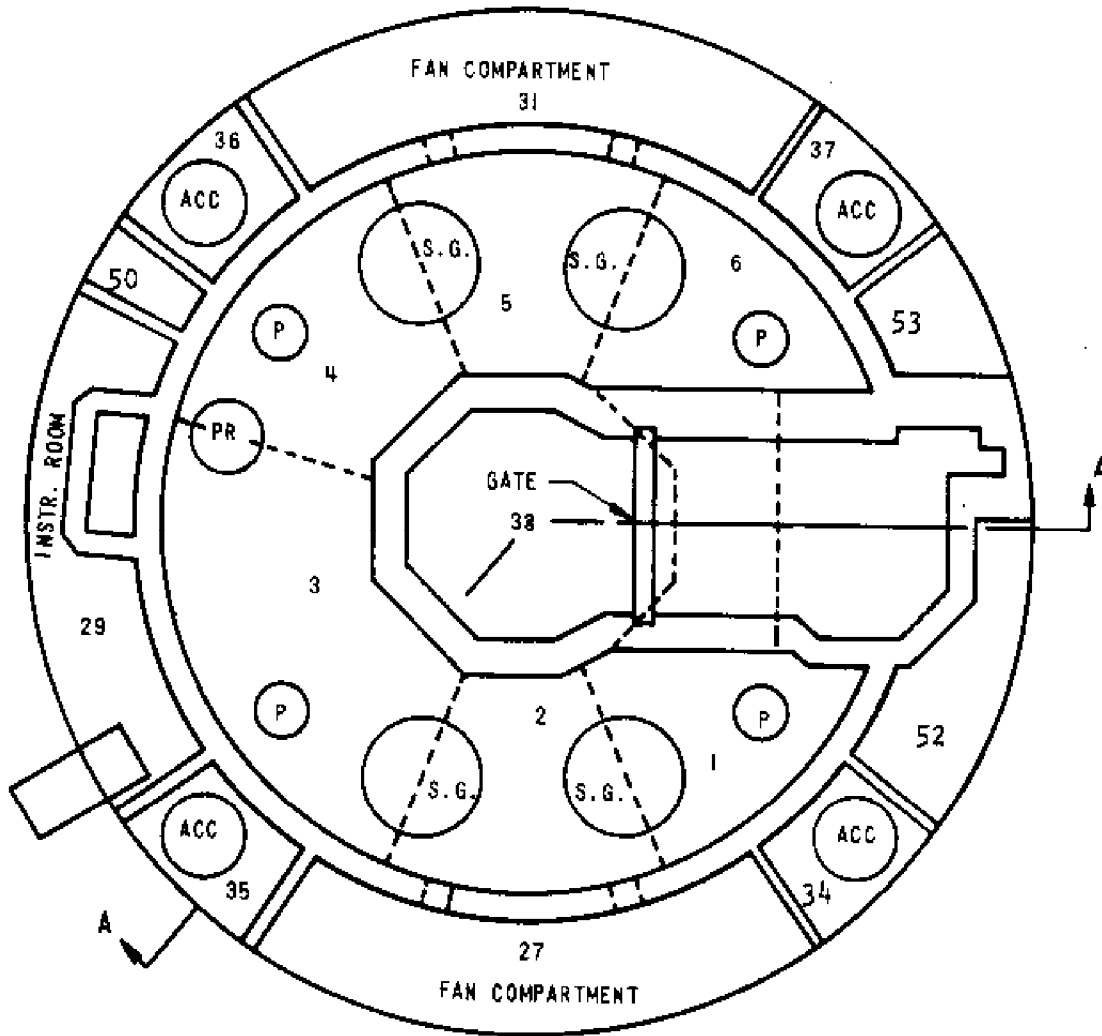


Figure 6-26. Compartment Section View

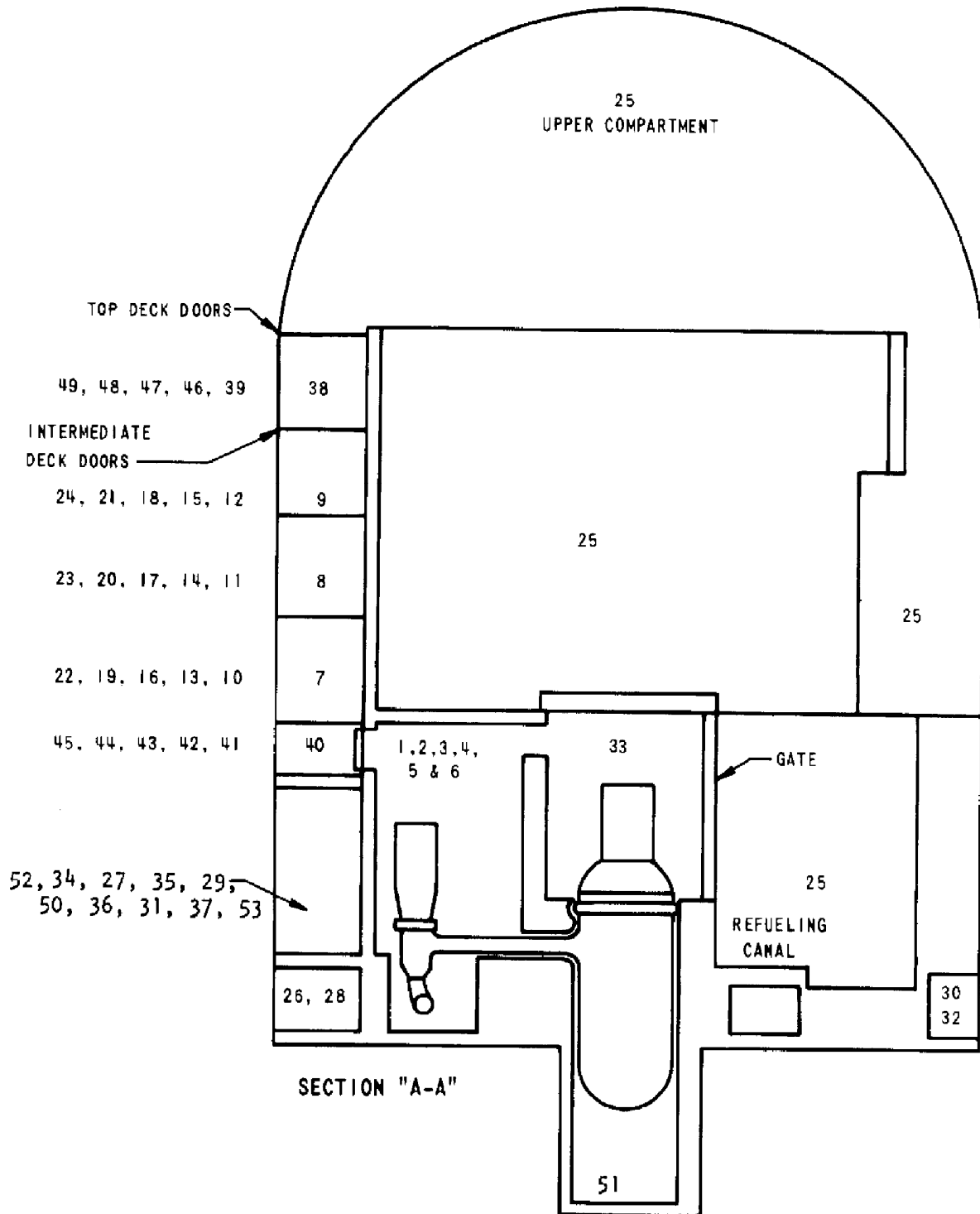


Figure 6-27. Plan View at Ice Condenser Elevation - Ice Condenser Compartments

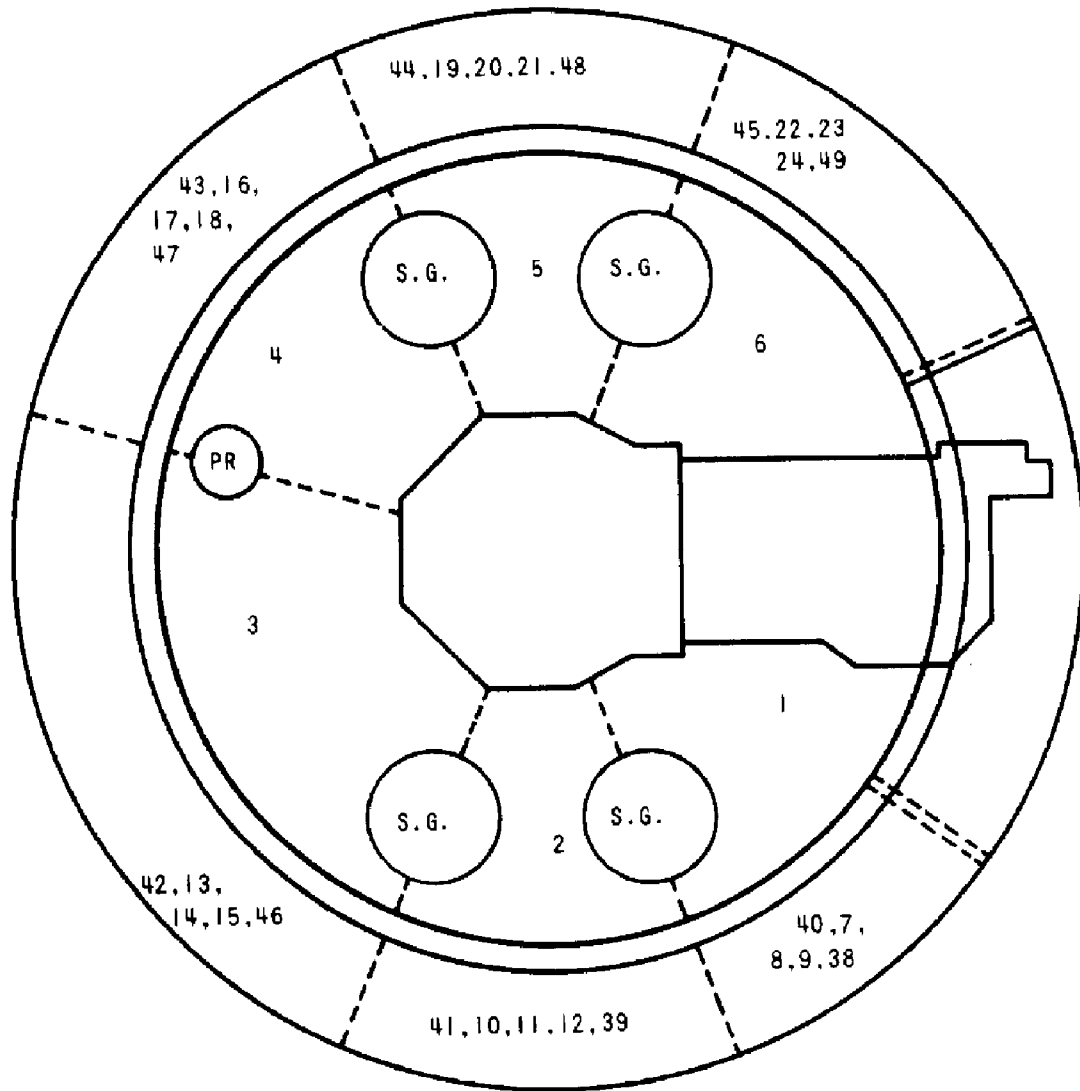


Figure 6-28. Layout of Containment Shell

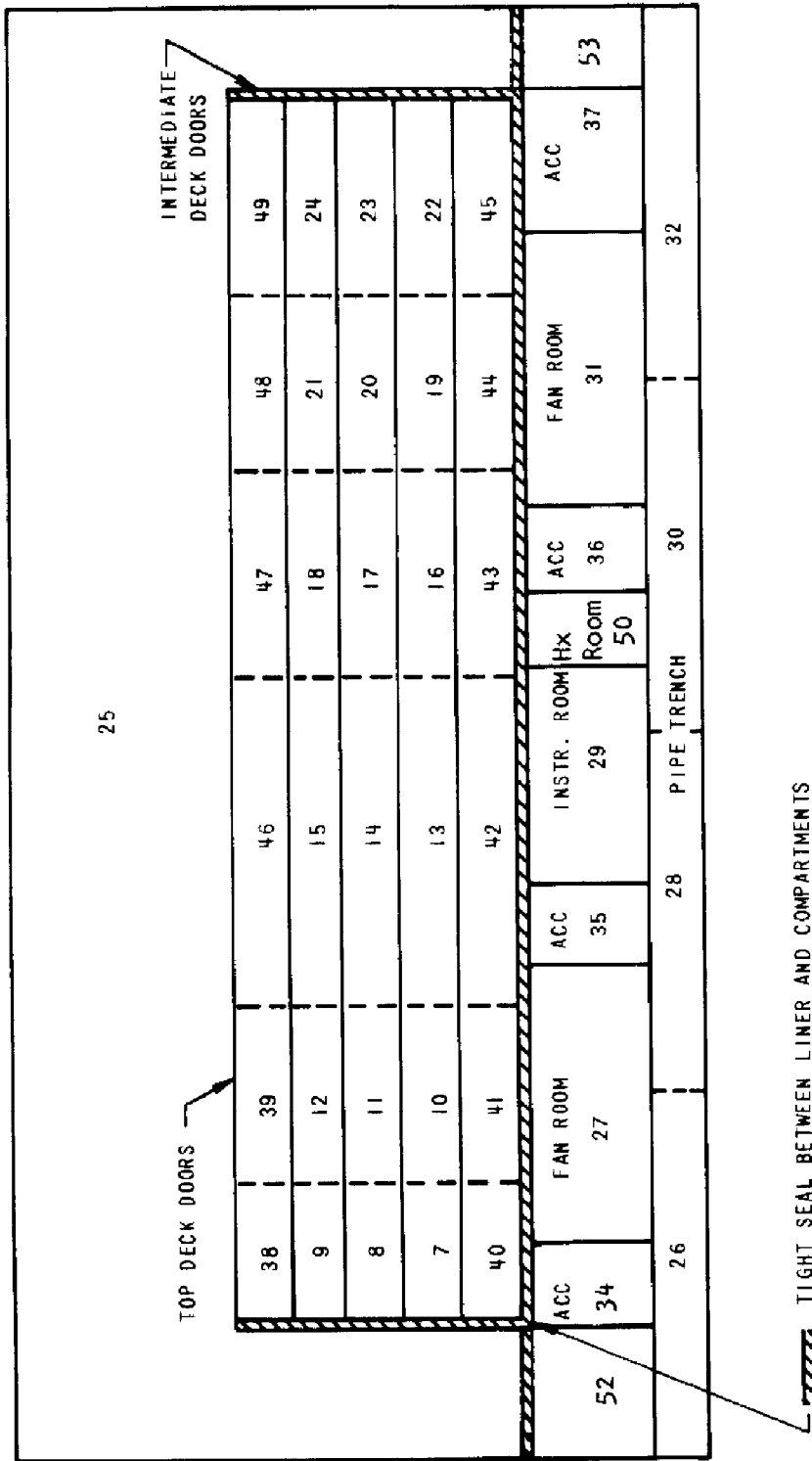


Figure 6-29. TMD Code Network

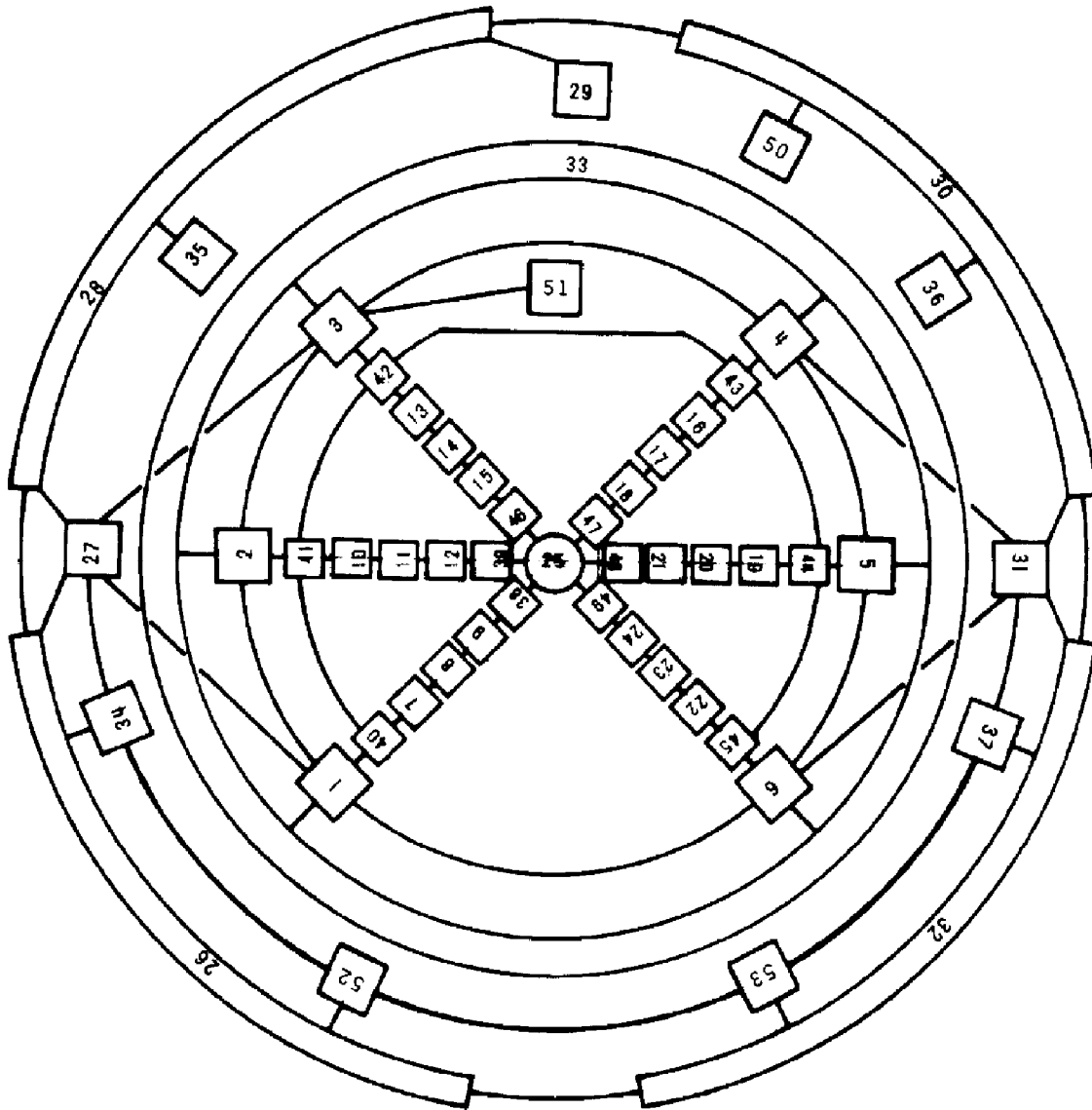


Figure 6-30. Nine Volume Nodalization of the Steam Generator Enclosure

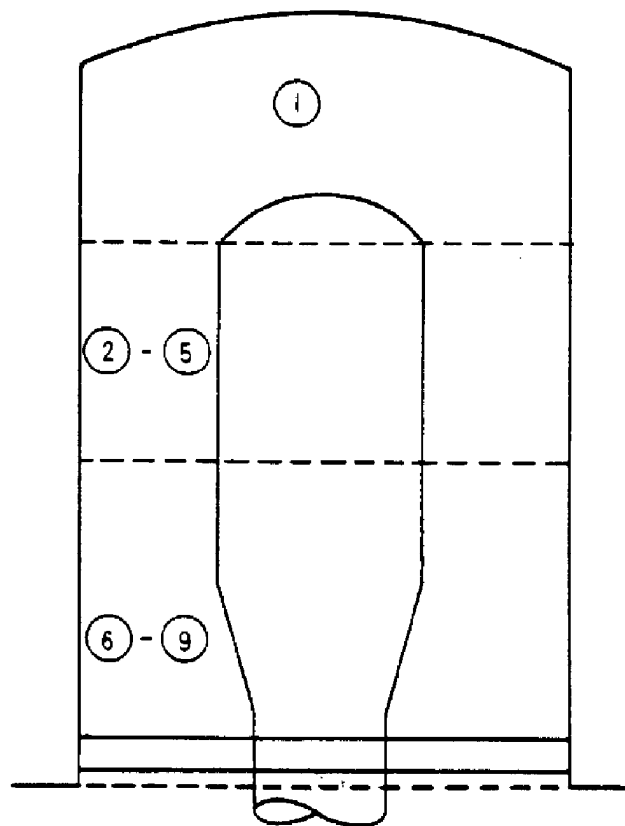
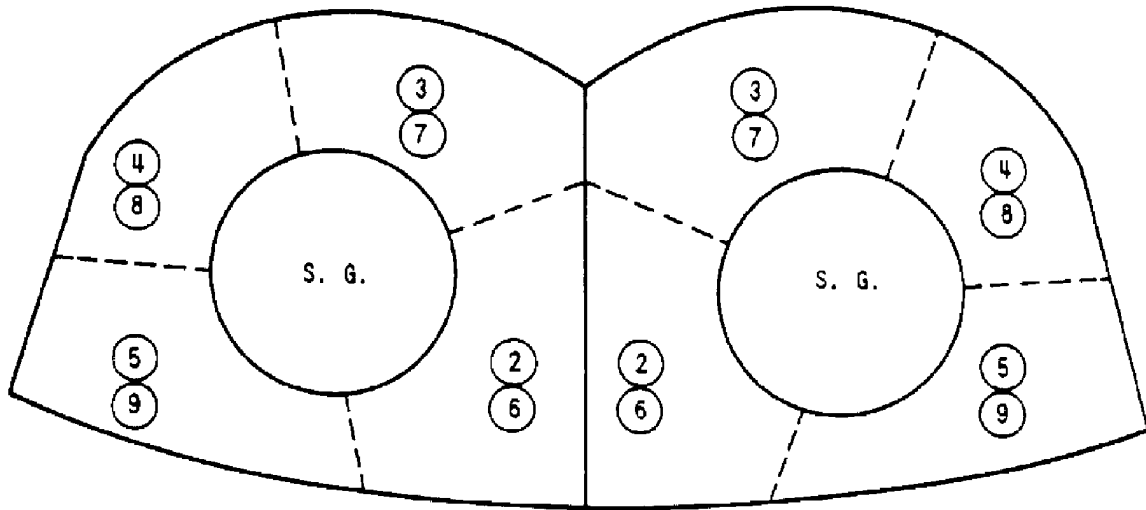


Figure 6-31. Double Ended Steam Line Break in Steam Generator Enclosure

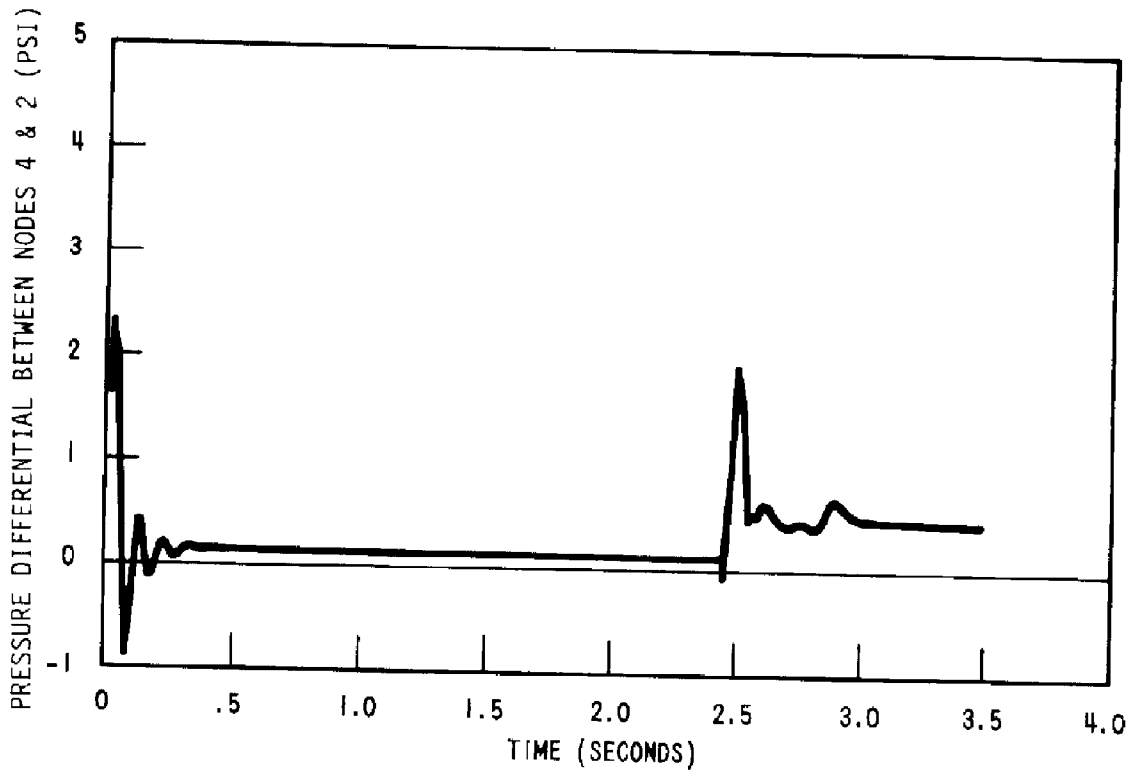


Figure 6-32. Double Ended Steam Line Break in Steam Generator Enclosure

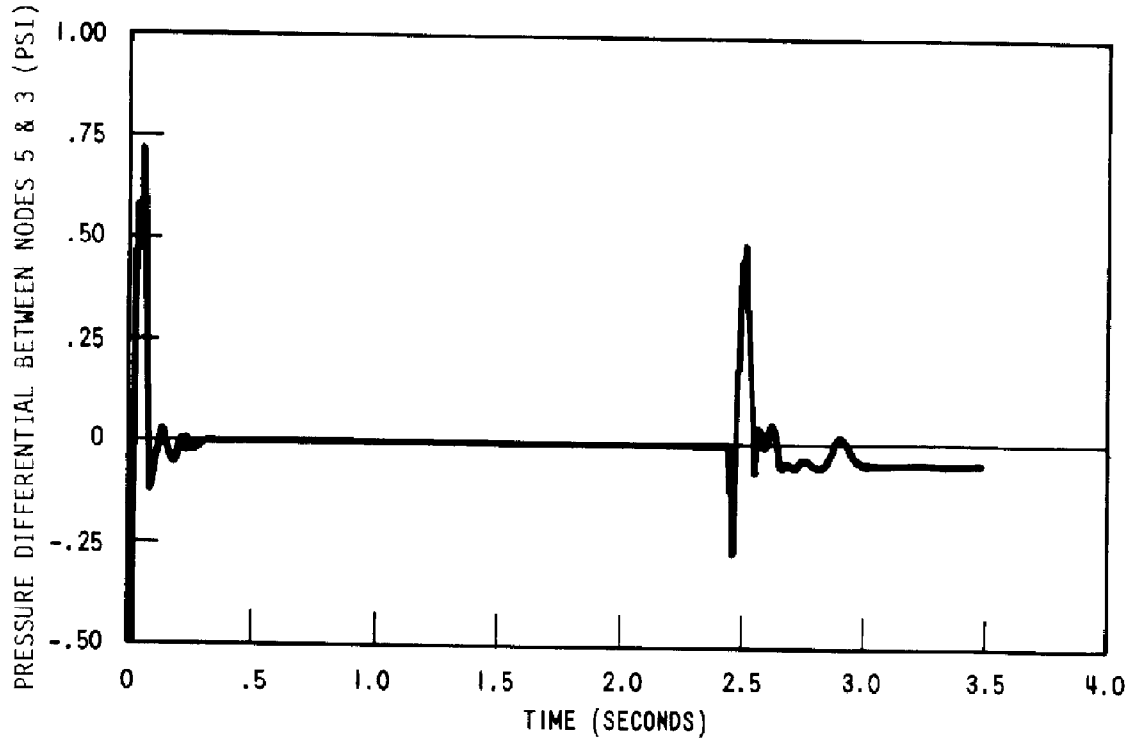


Figure 6-33. Double Ended Steam Line Break in Steam Generator Enclosure

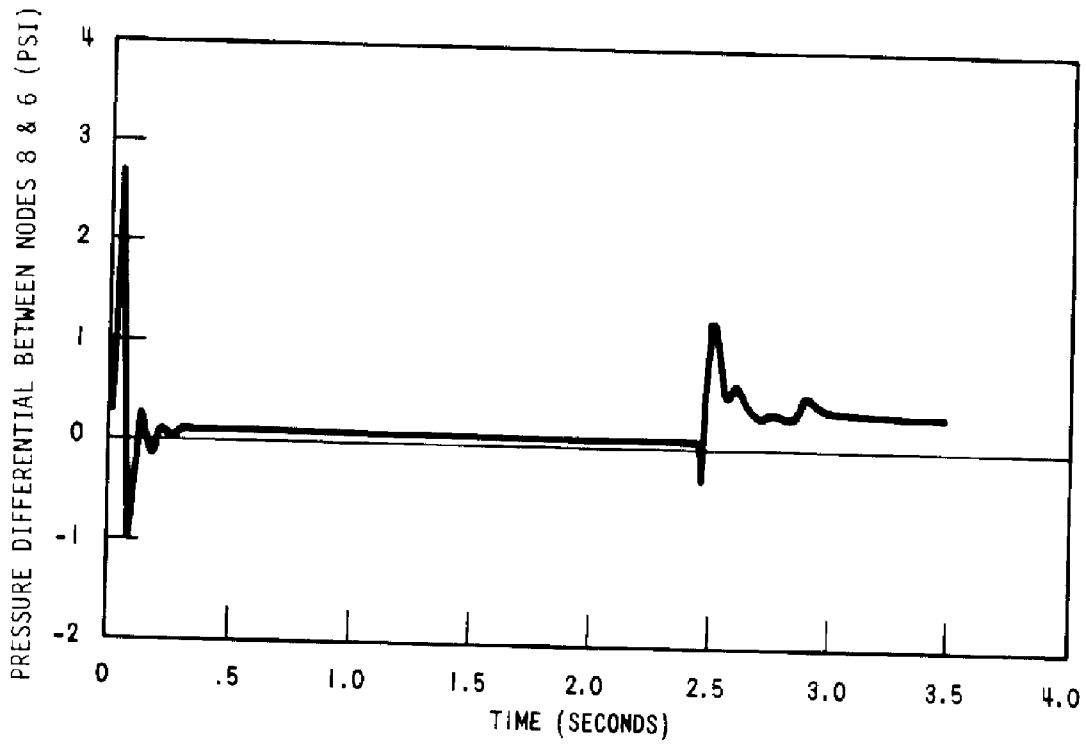


Figure 6-34. Double Ended Steam Line Break in Steam Generator Enclosure

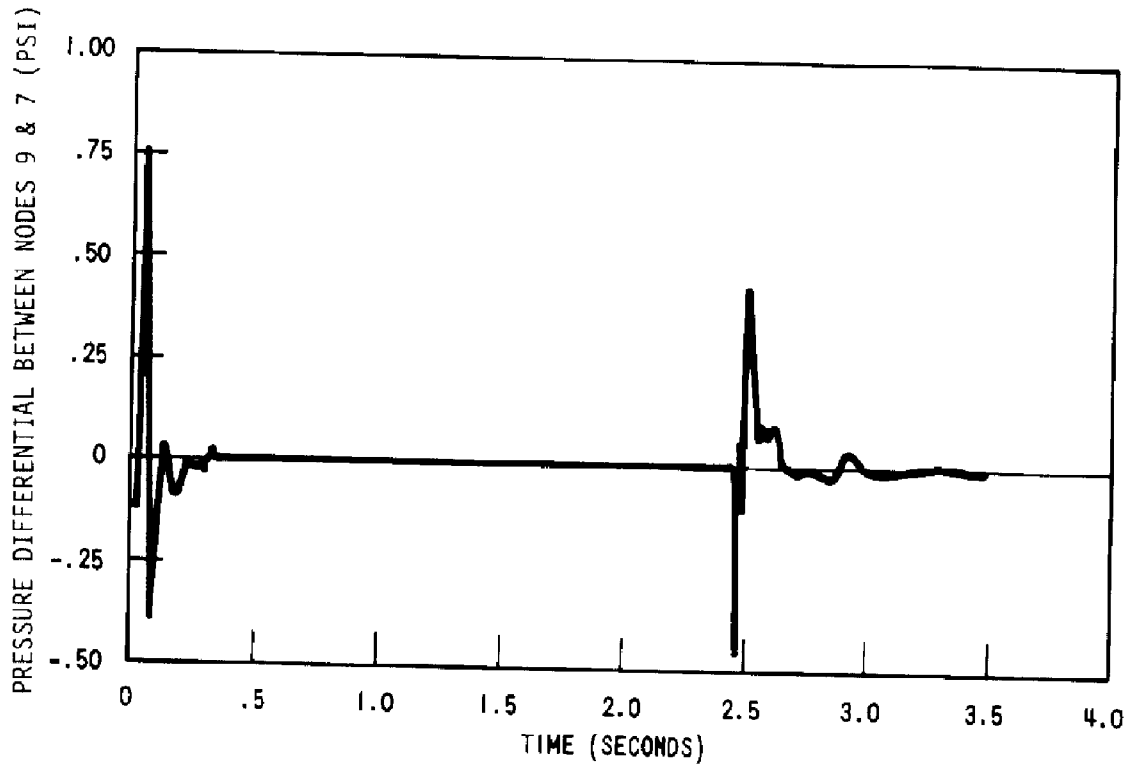


Figure 6-35. Double Ended Steam Line Break in Steam Generator Enclosure

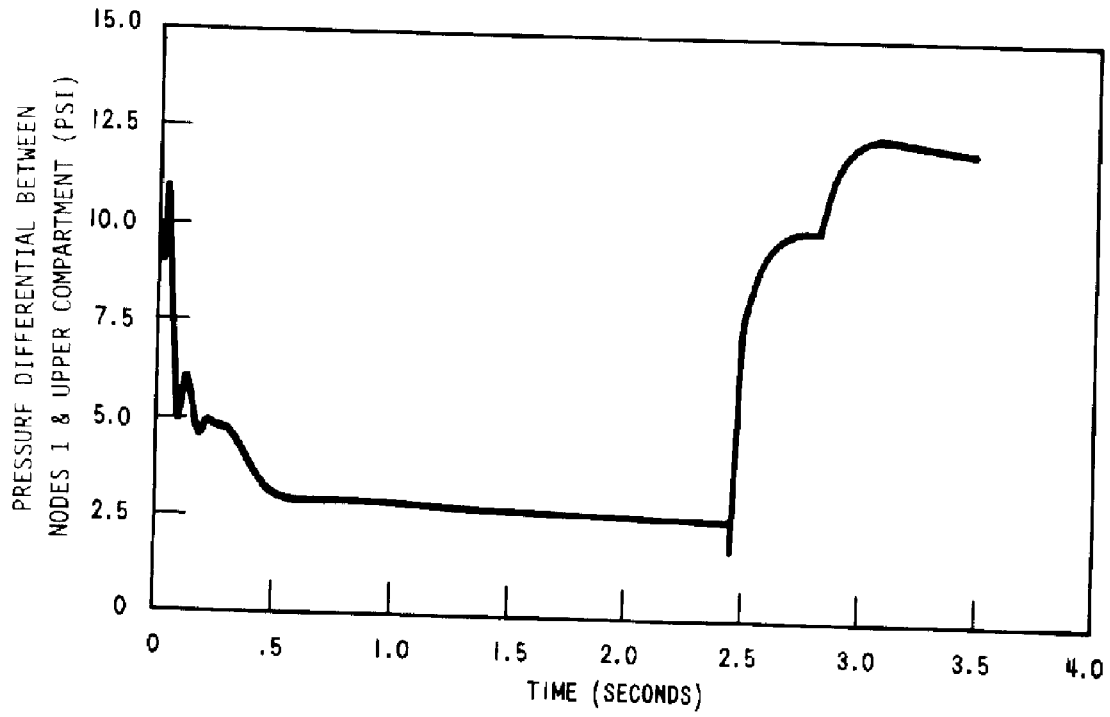


Figure 6-36. Two Volume Nodalization of the Steam Generator Enclosure

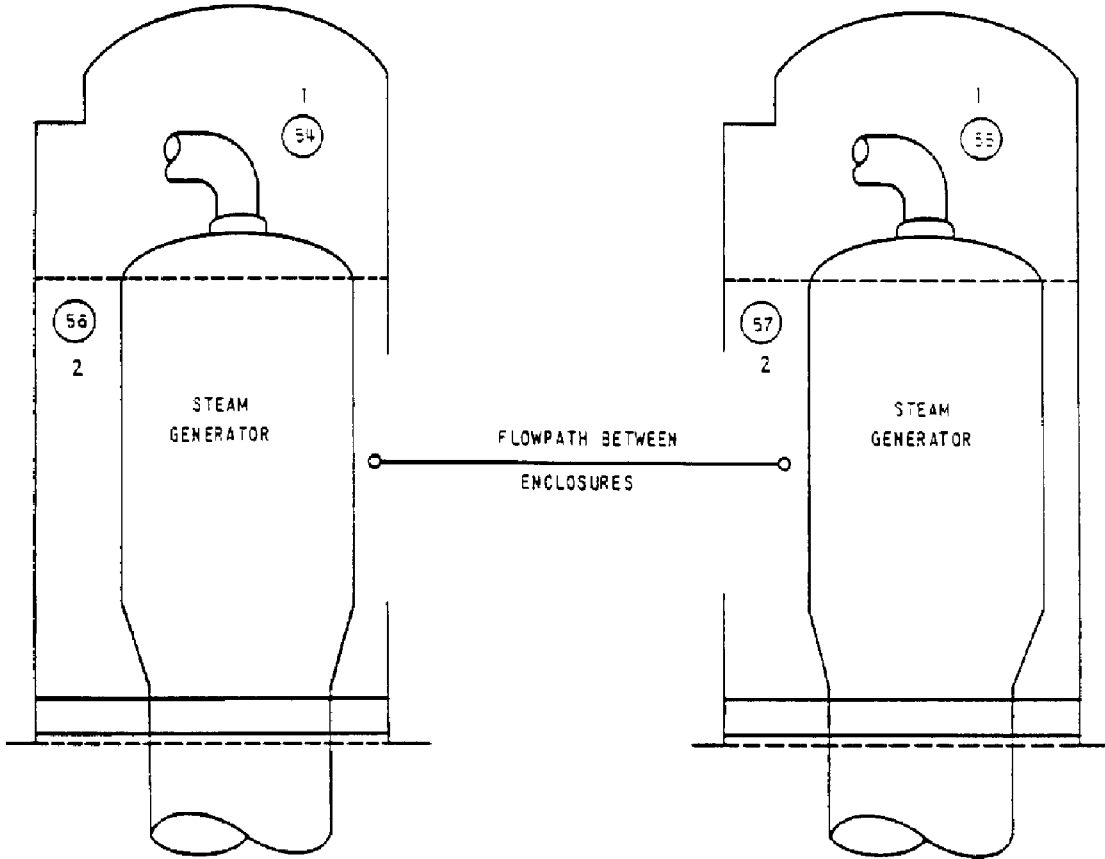


Figure 6-37. Two Volume Nodalization of the Pressurizer Enclosure

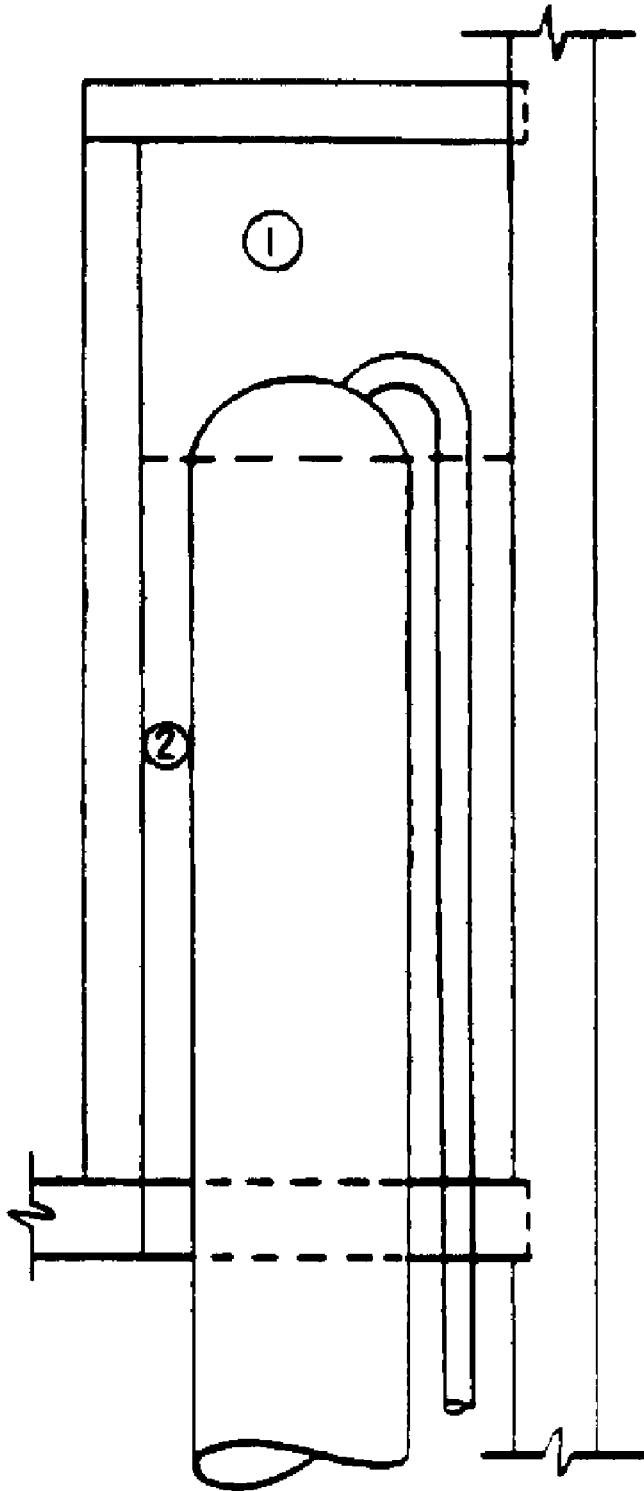


Figure 6-38. Four Volume Nodalization of the Pressurizer Enclosure

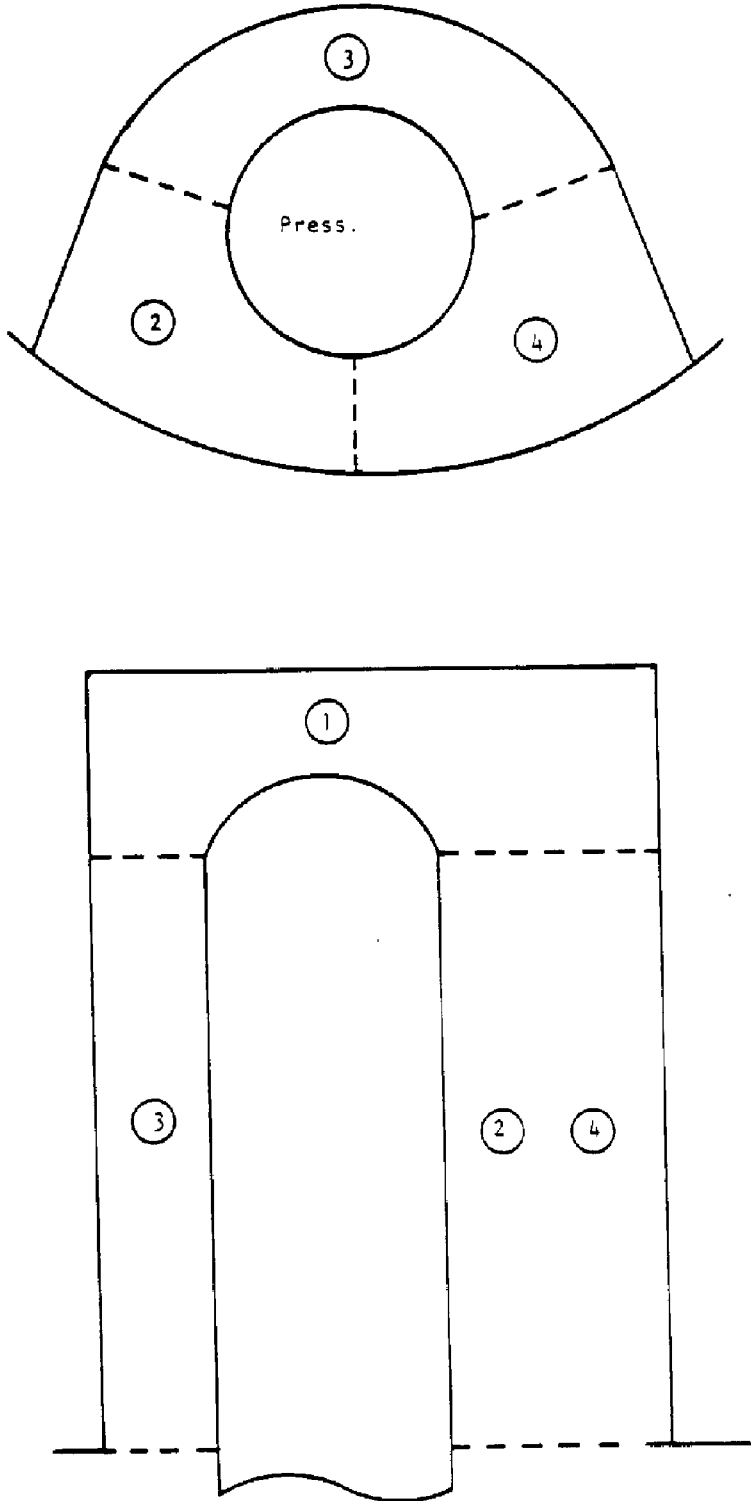


Figure 6-39. Developed View of the TMD Code Network for the Reactor Cavity Analysis

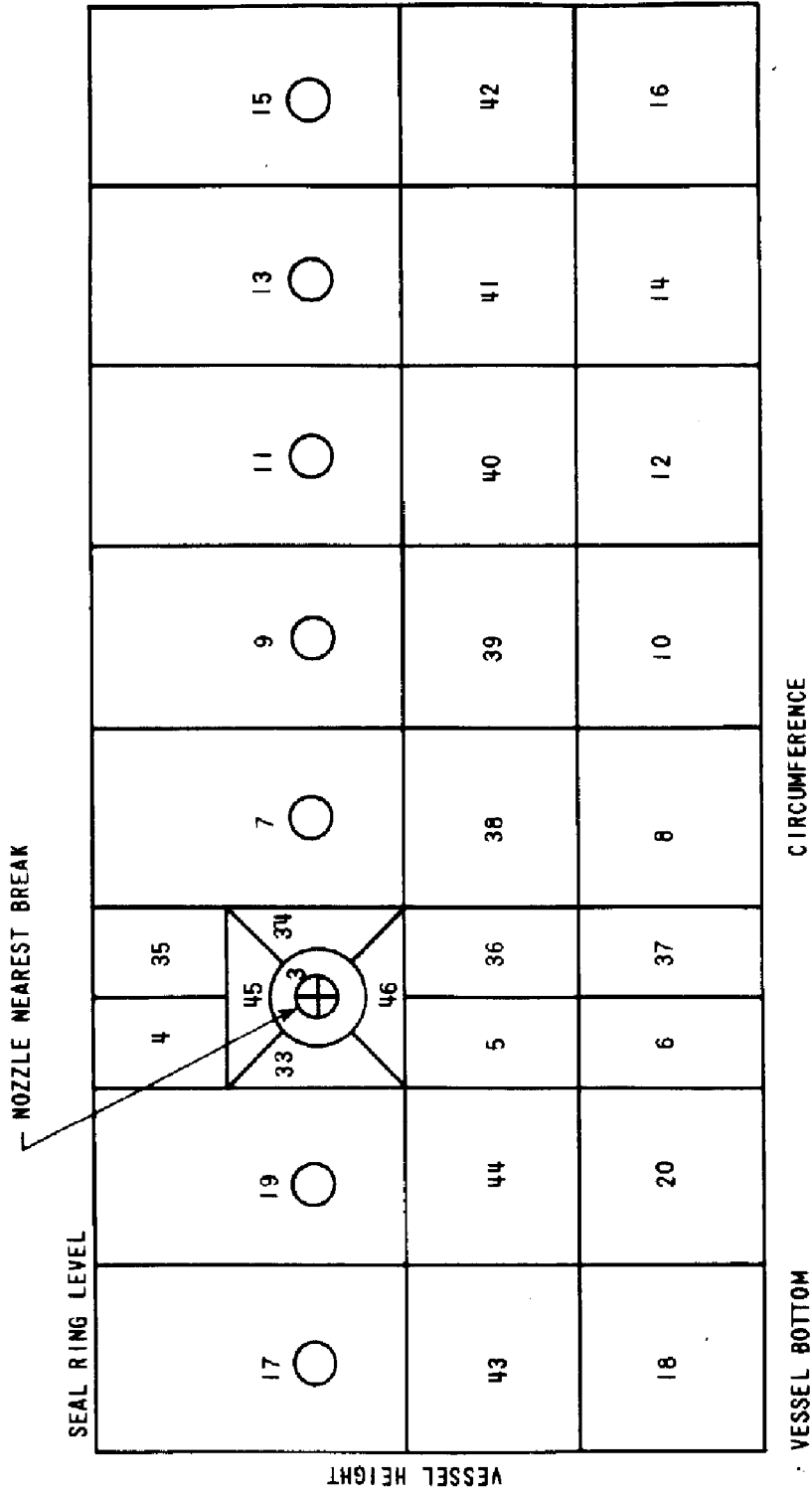


Figure 6-40. Flowpath Connections for the Reactor Cavity Analysis

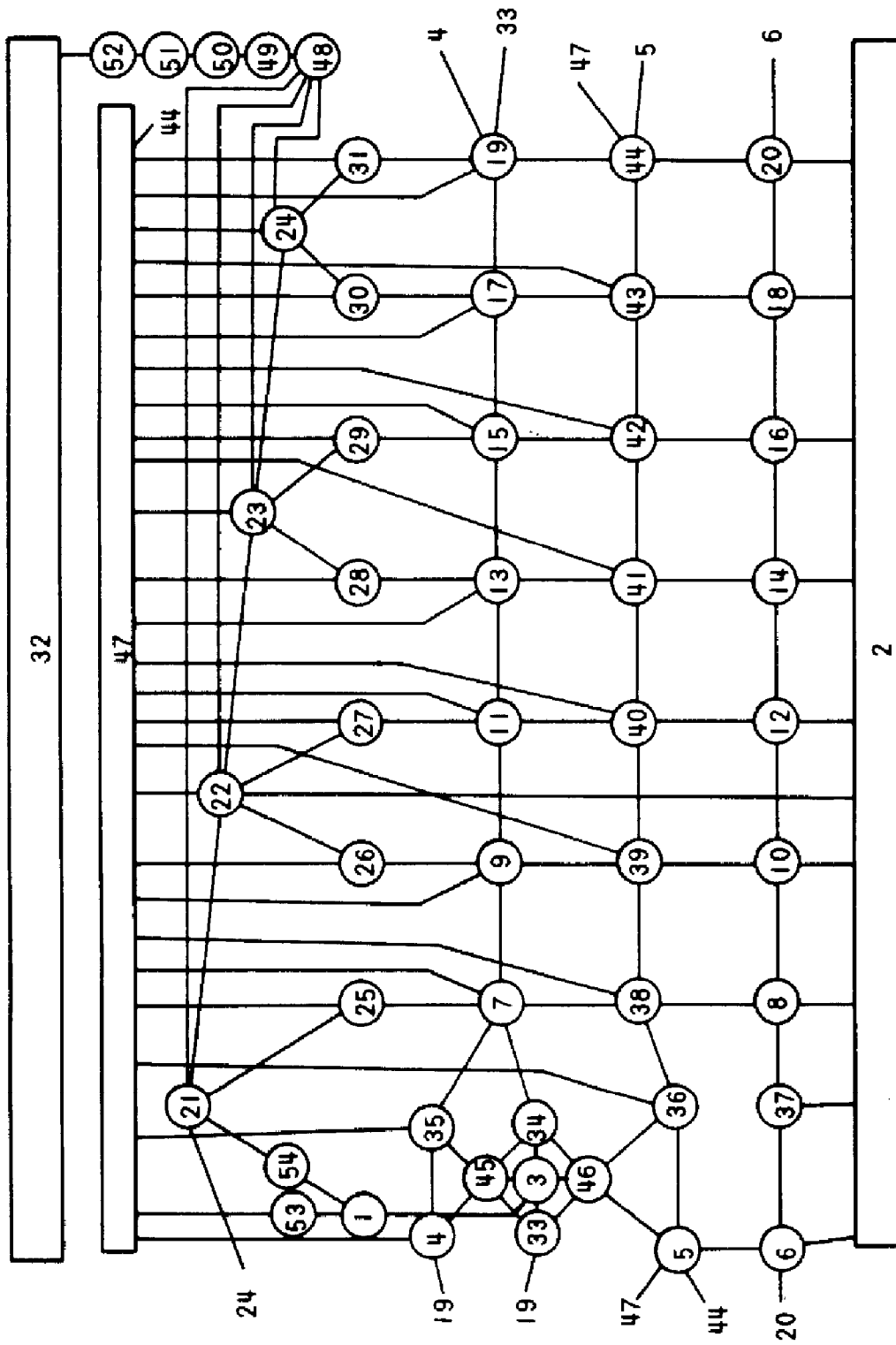


Figure 6-41. Containment Model for the Reactor Cavity Analysis

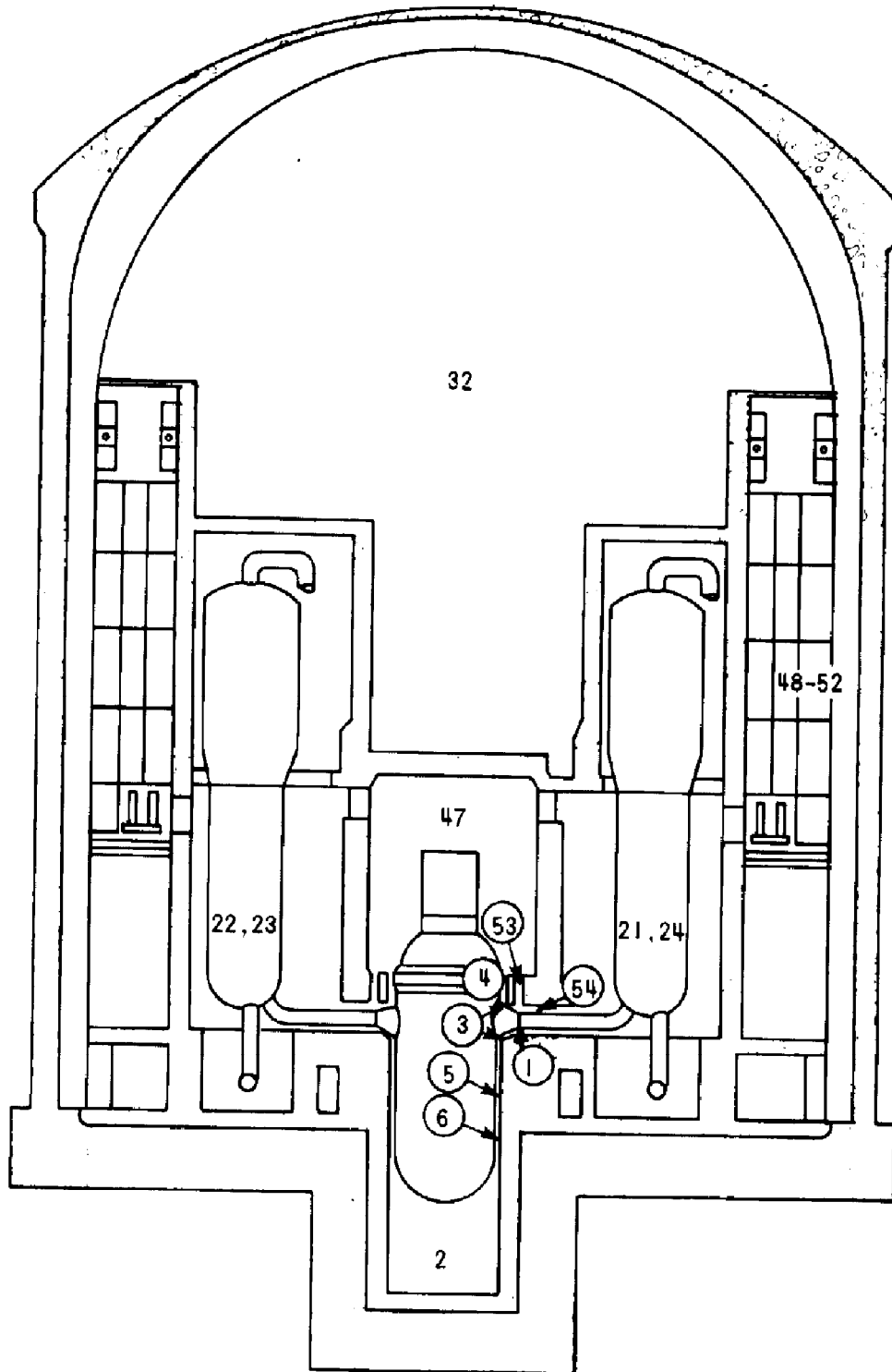
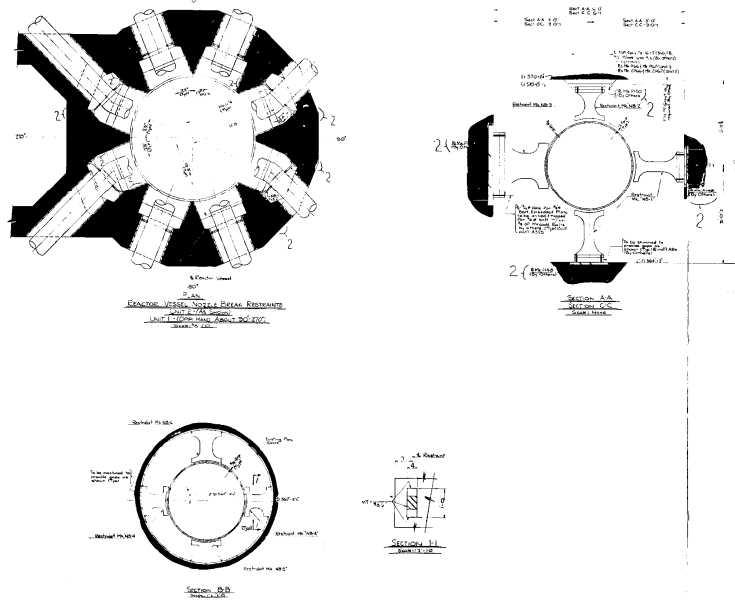


Figure 6-42. Reactor Vessel Nozzle Break Restraints



REACTOR VESSEL NOZZLE
BREAK SUPPORTS
CATAWBA NUCLEAR STATION
Figure 6.2.1-37

Figure 6-43. Reactor Cavity Analysis, Element 1

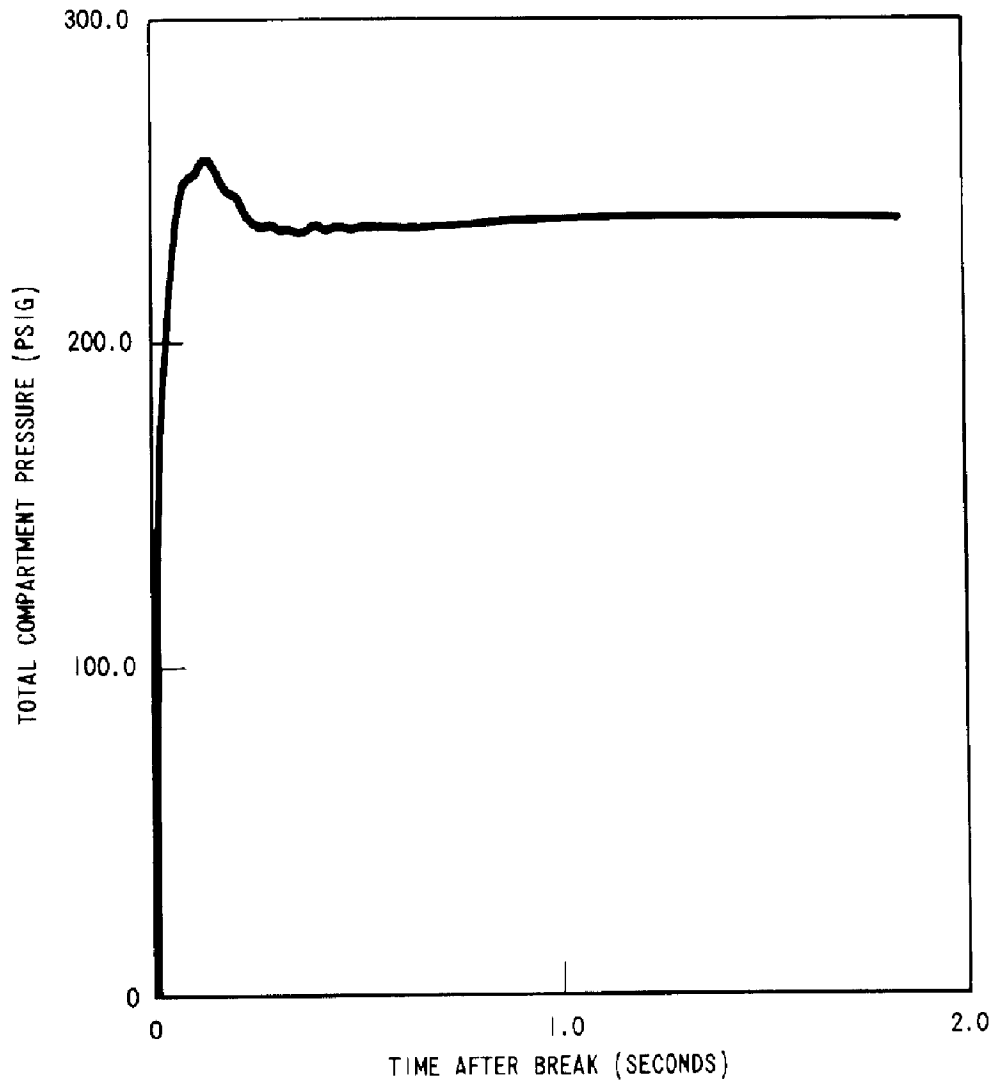


Figure 6-44. Reactor Cavity Analysis, Element 2

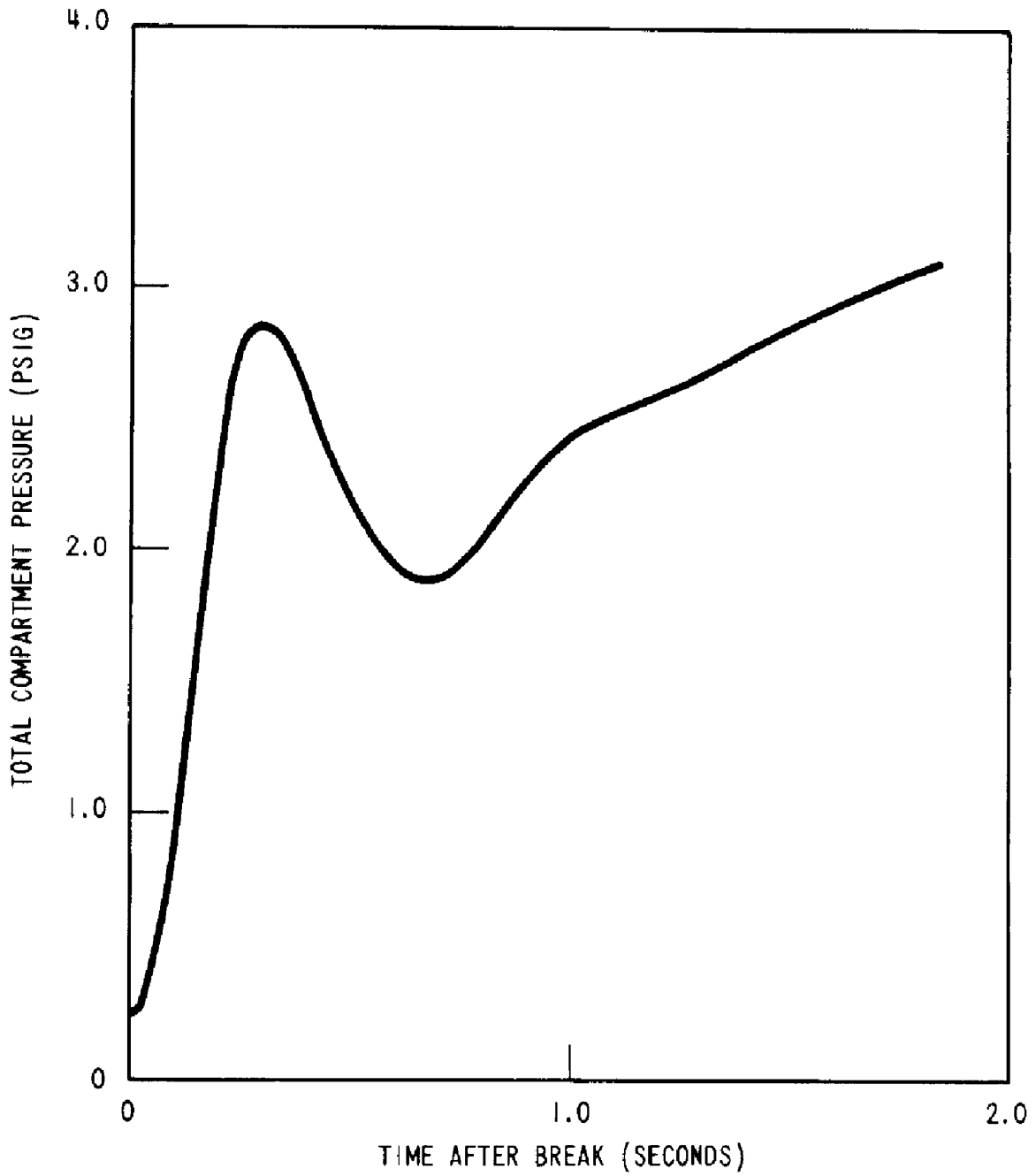


Figure 6-45. Reactor Cavity Analysis, Element 3

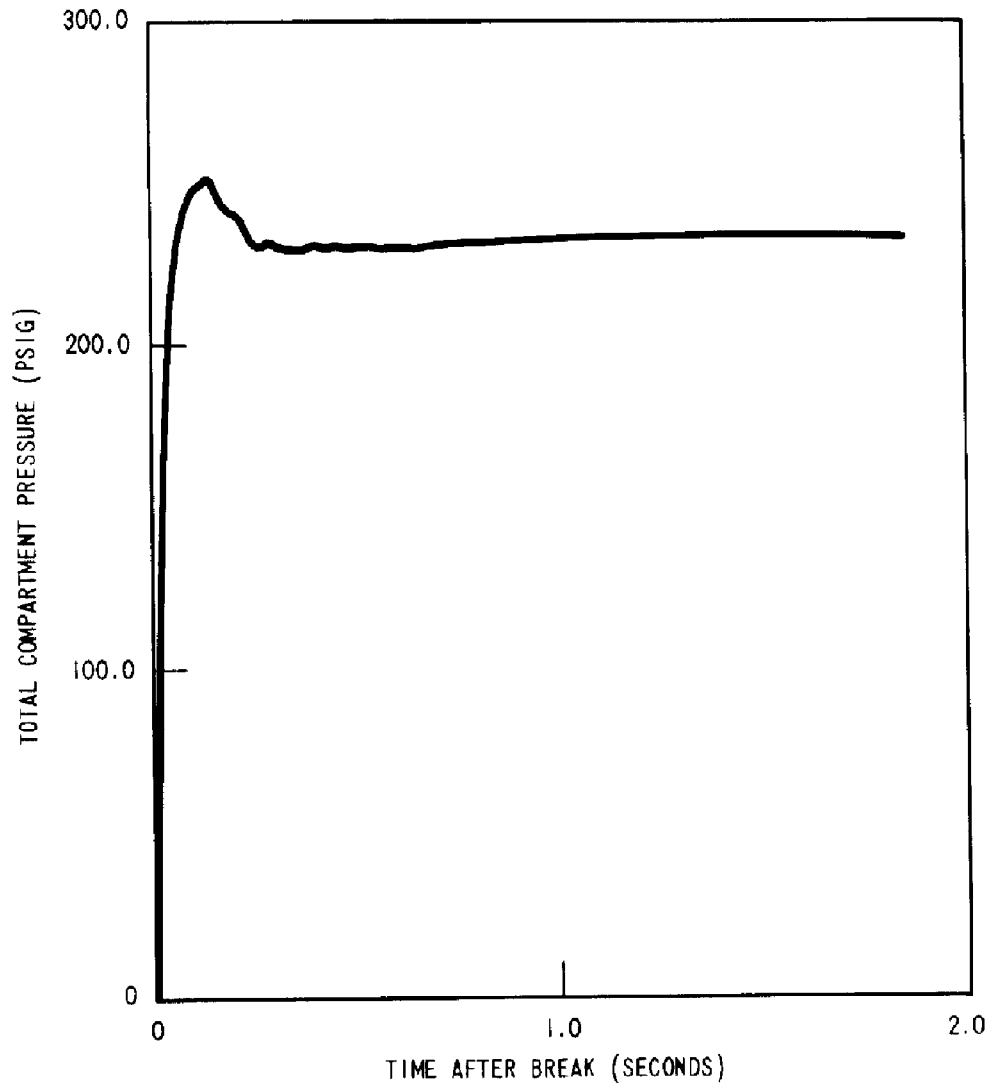


Figure 6-46. Reactor Cavity Analysis, Element 4

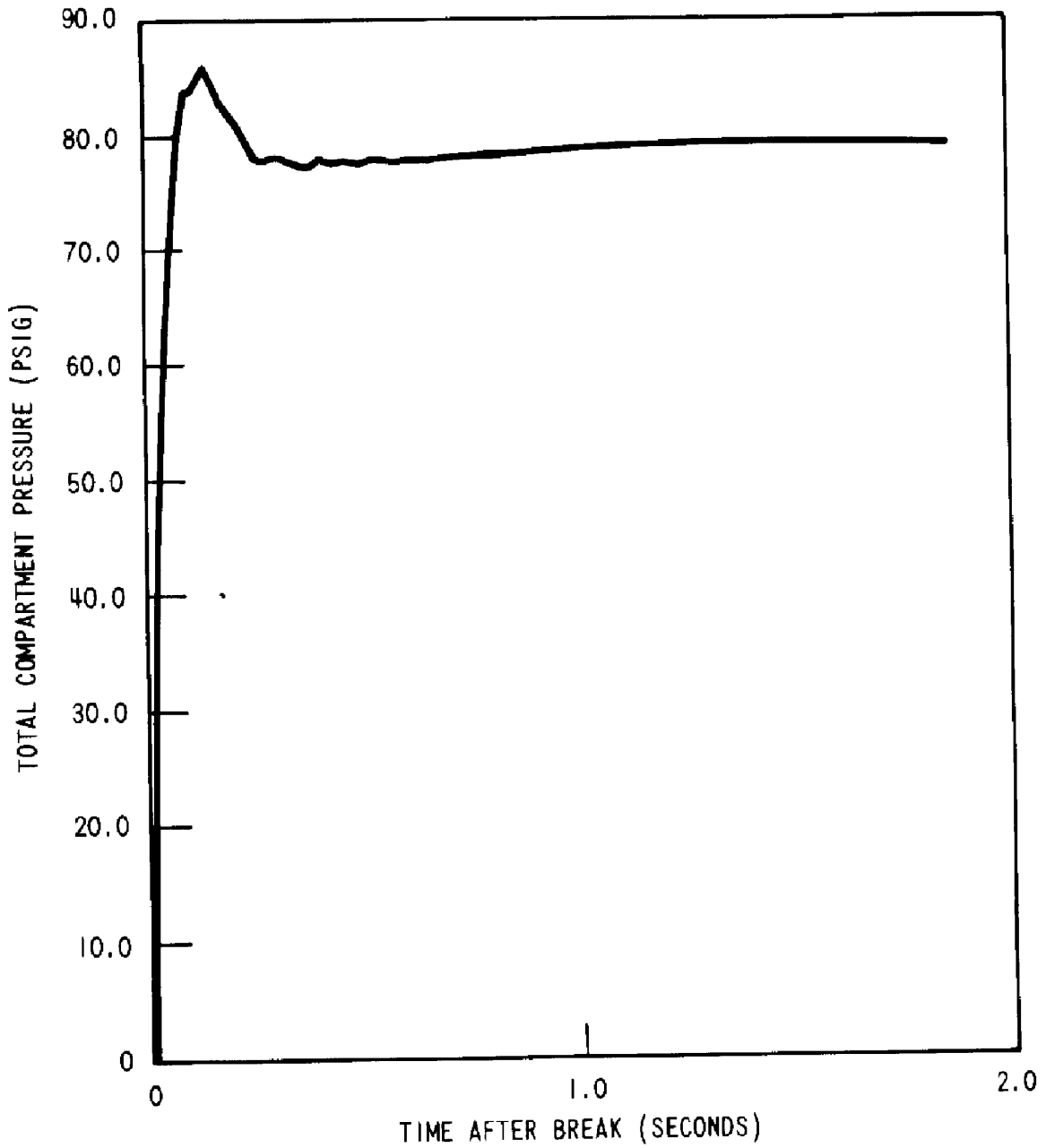


Figure 6-47. Reactor Cavity Analysis, Element 5

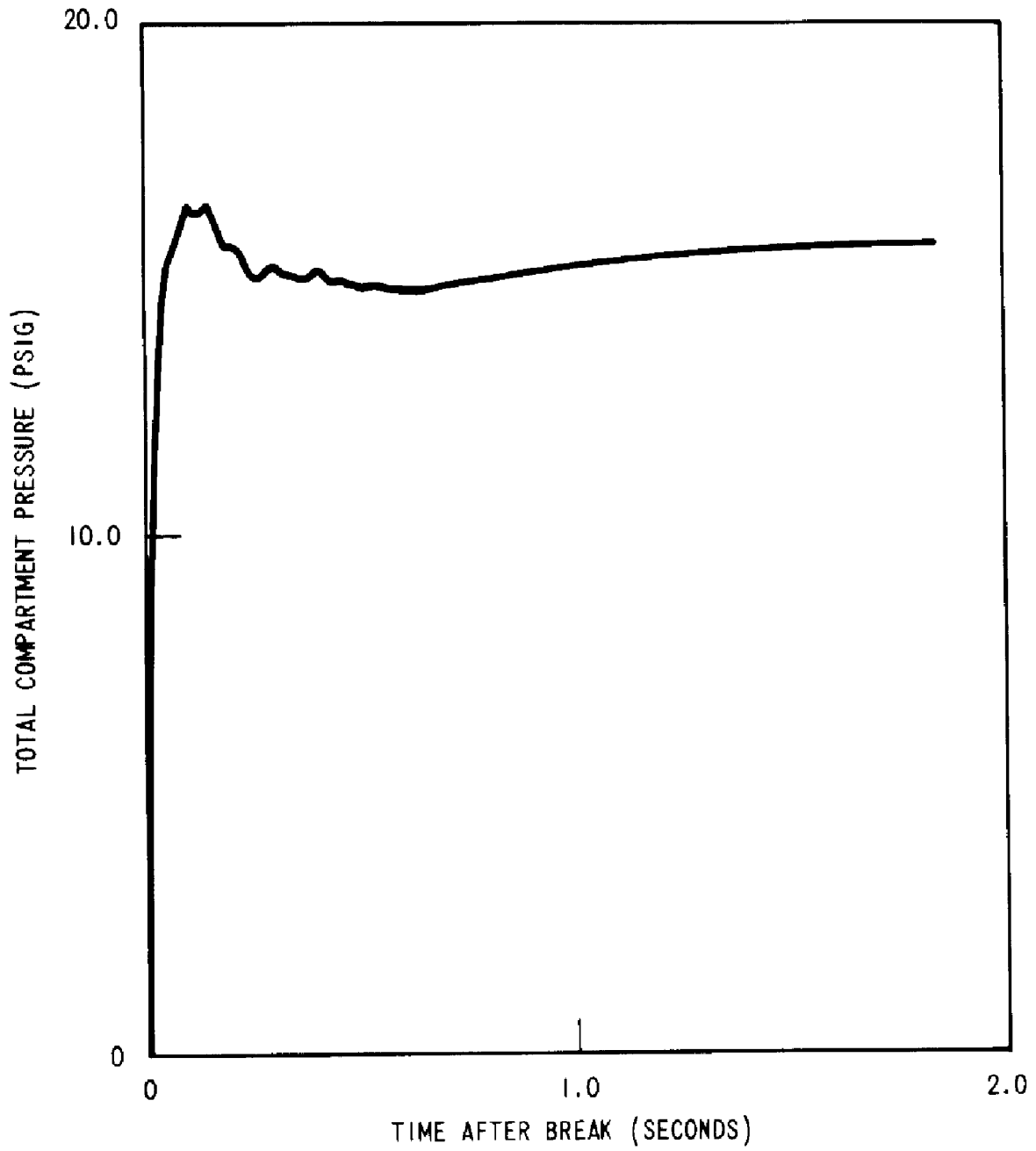


Figure 6-48. Reactor Cavity Analysis, Element 6

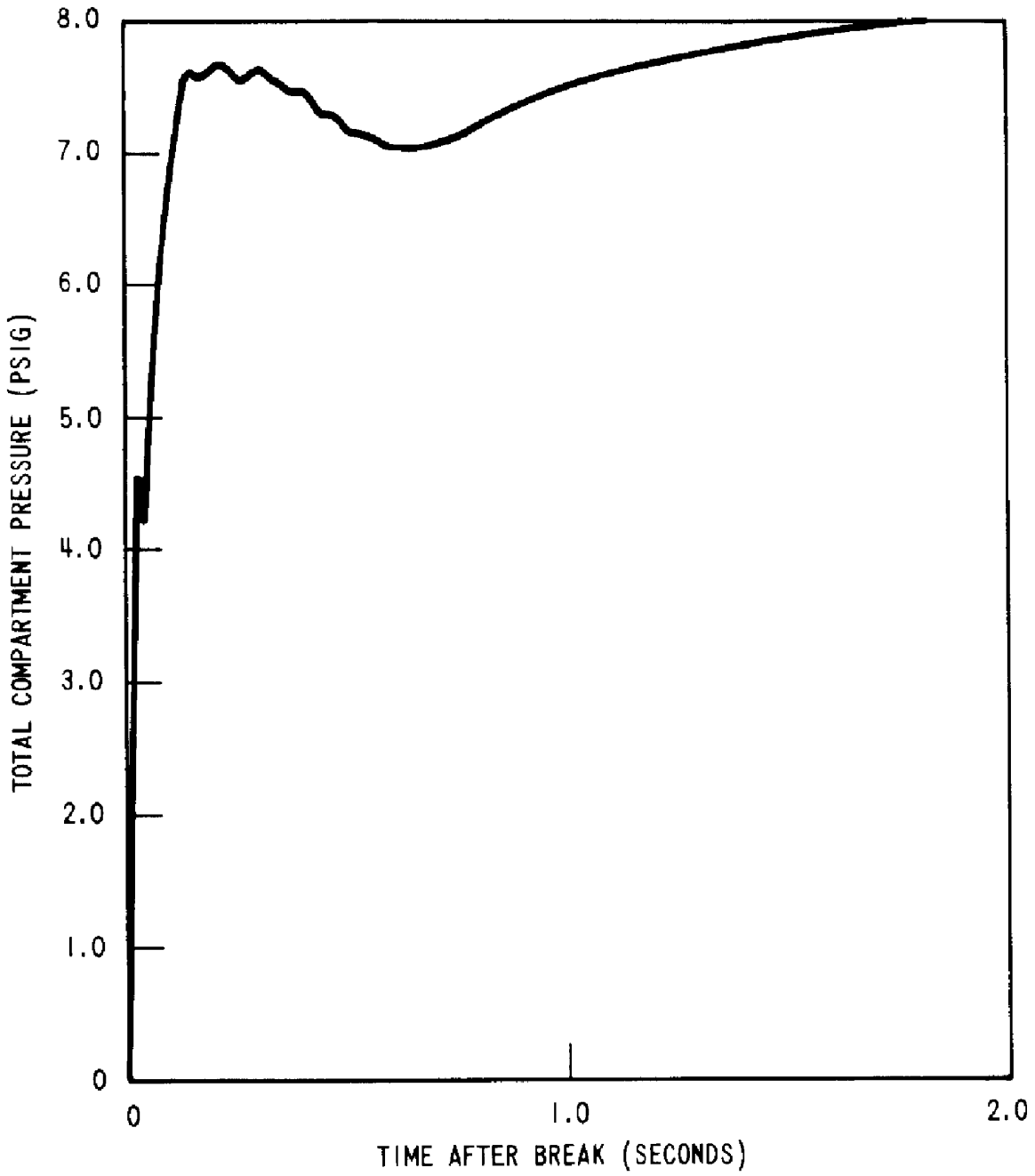


Figure 6-49. Reactor Cavity Analysis, Element 7

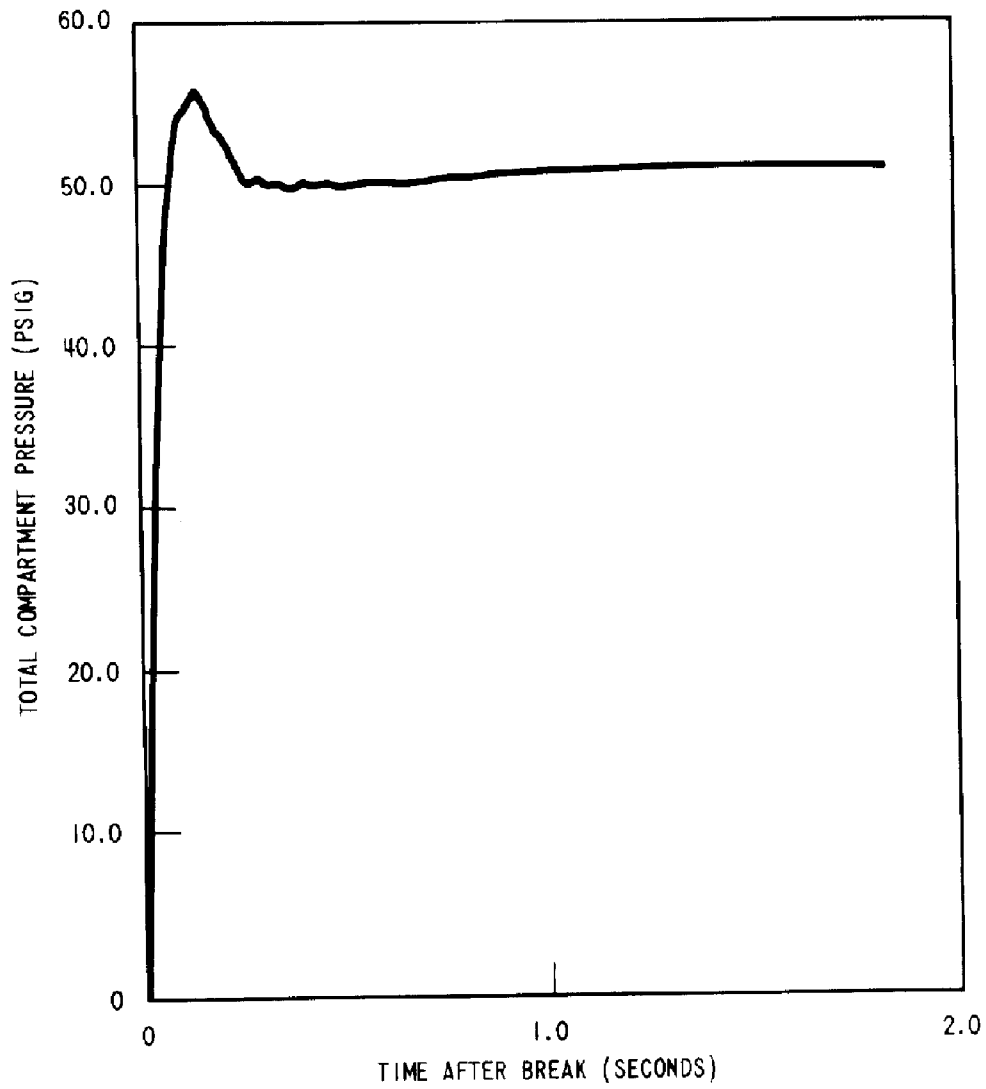


Figure 6-50. Reactor Cavity Analysis, Element 8

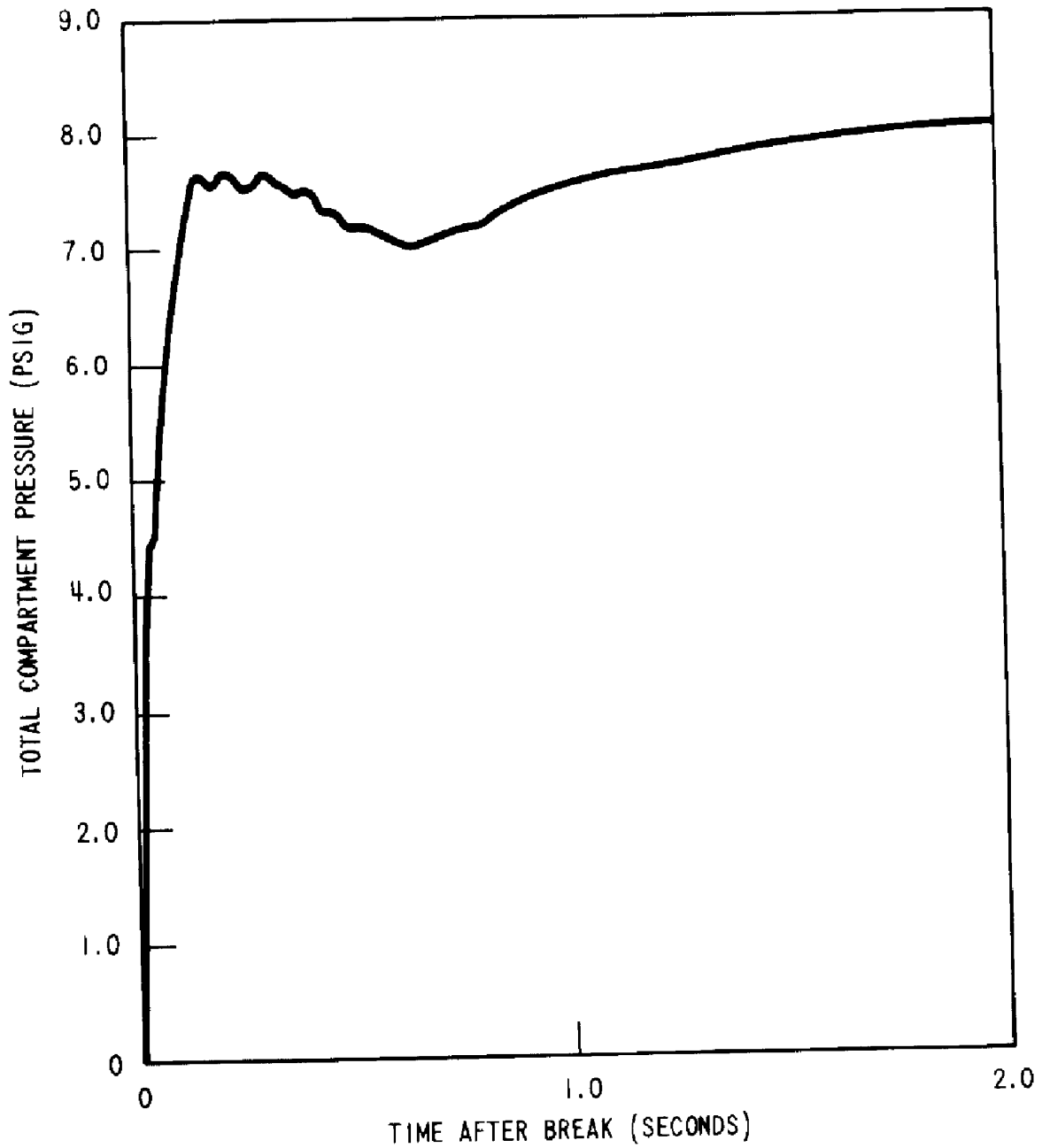


Figure 6-51. Reactor Cavity Analysis, Element 9

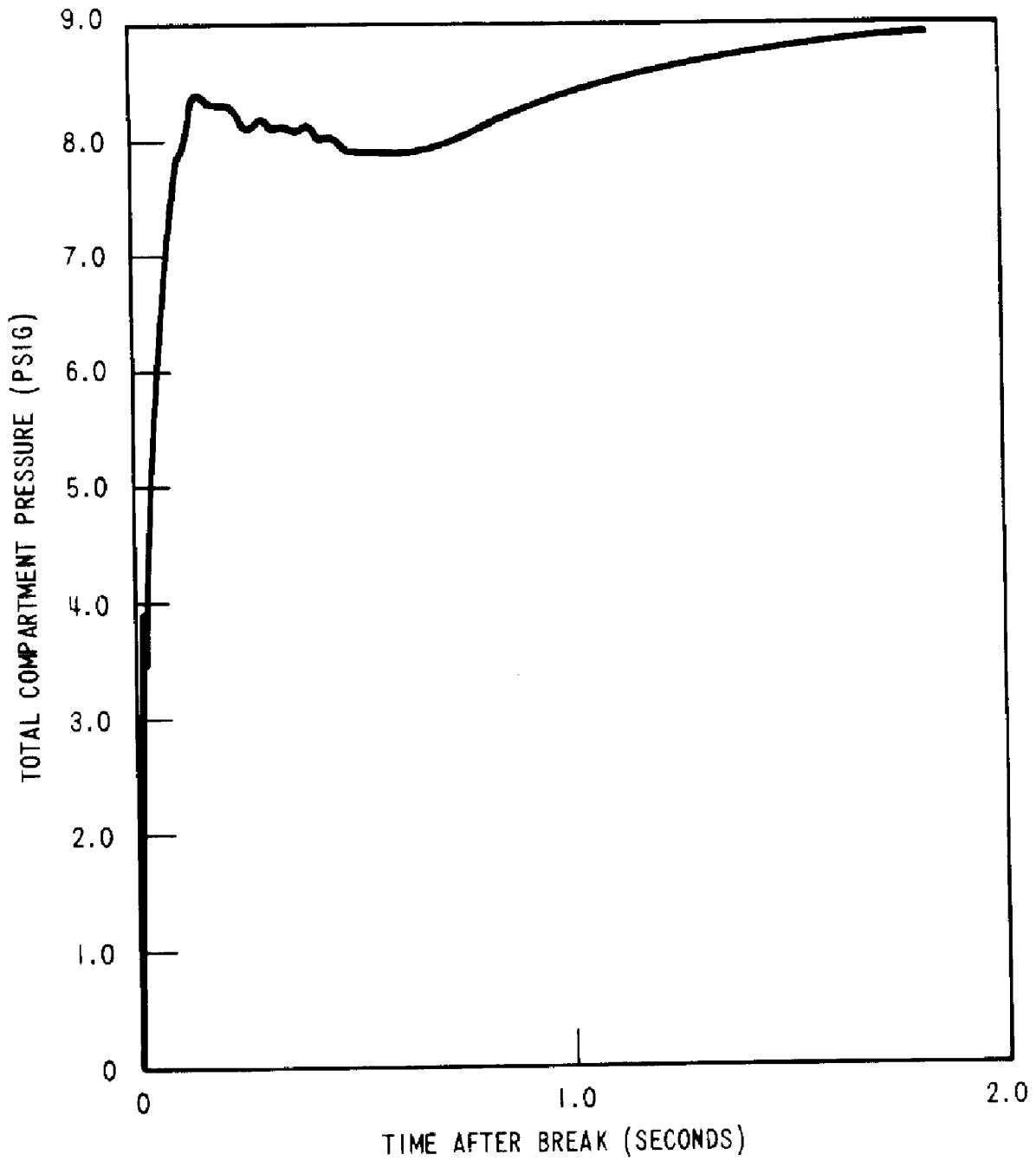


Figure 6-52. Reactor Cavity Analysis, Element 10

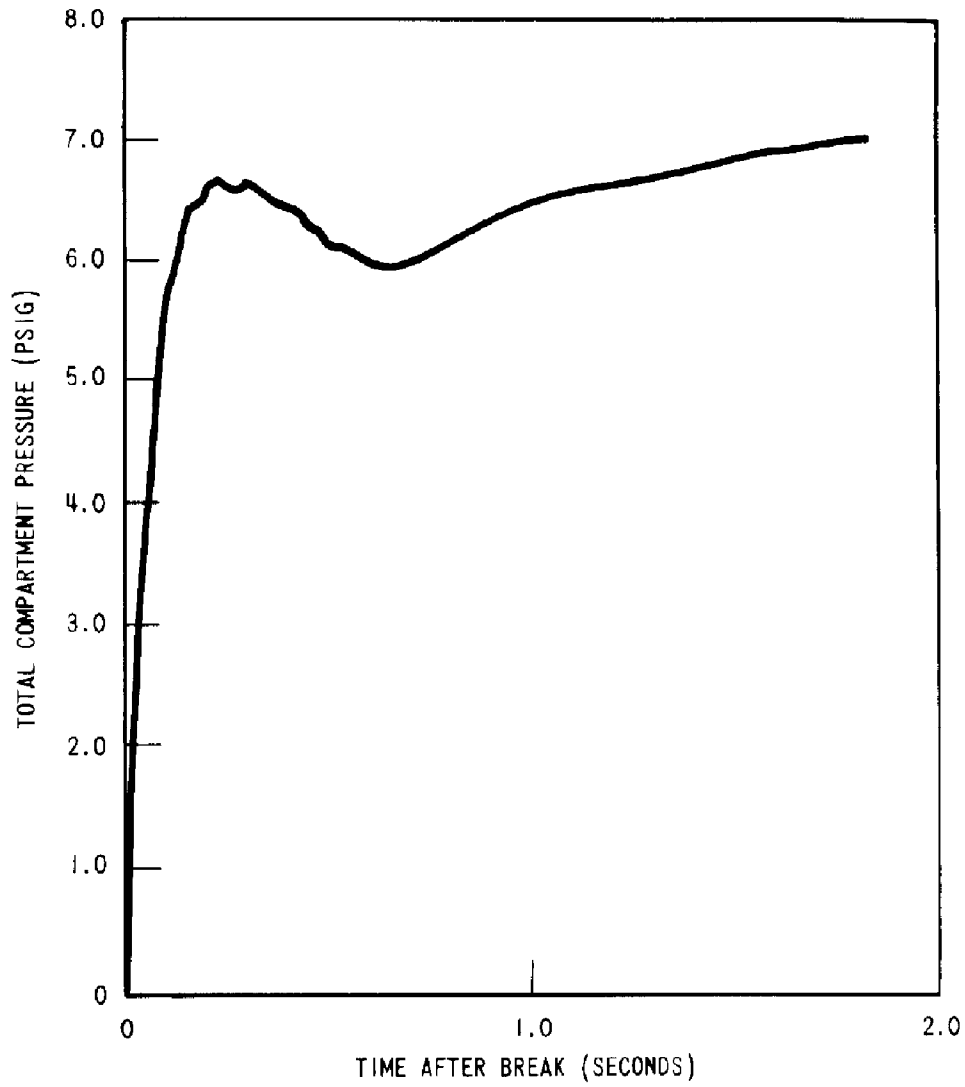


Figure 6-53. Reactor Cavity Analysis, Element 11

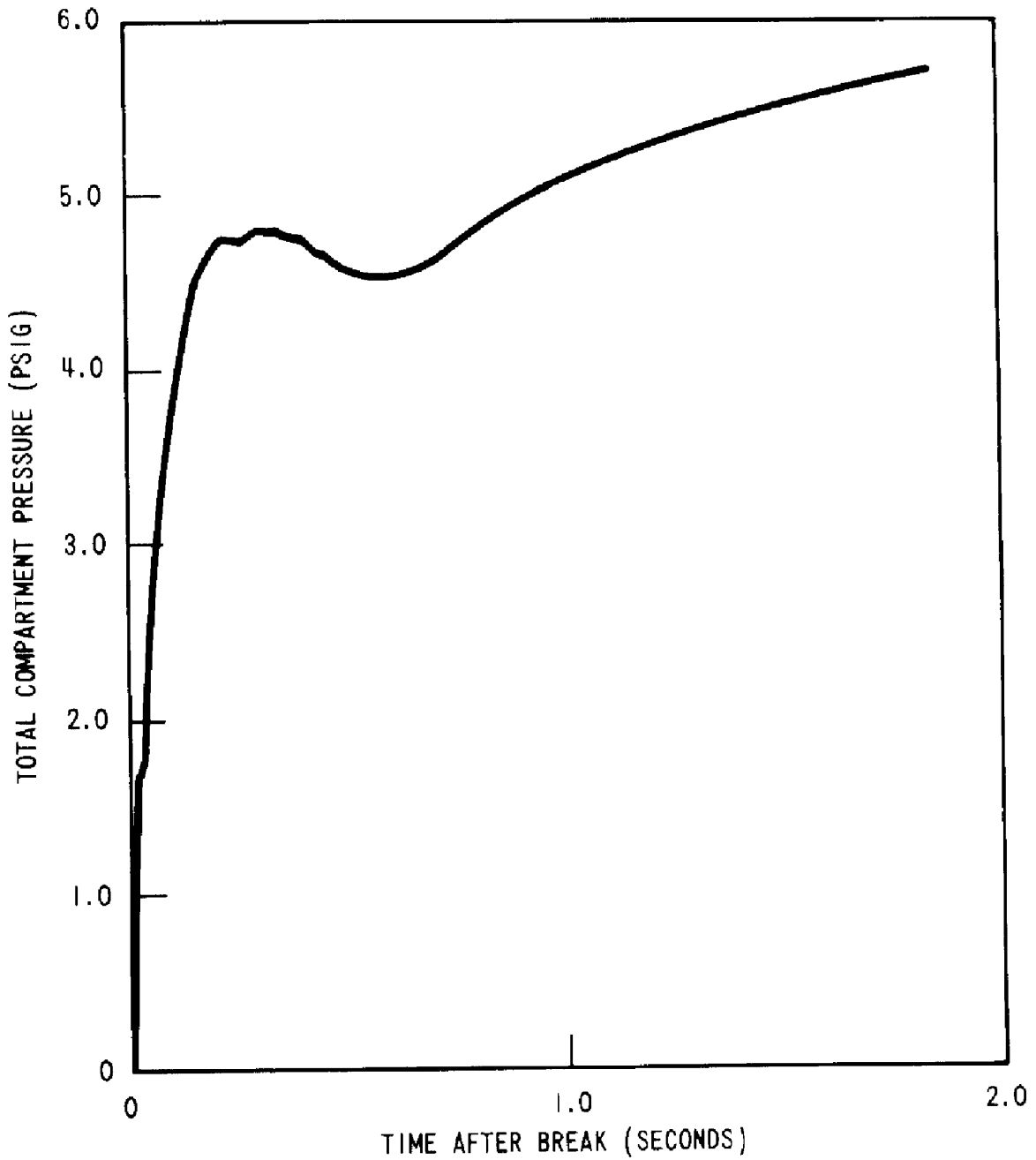


Figure 6-54. Reactor Cavity Analysis, Element 12

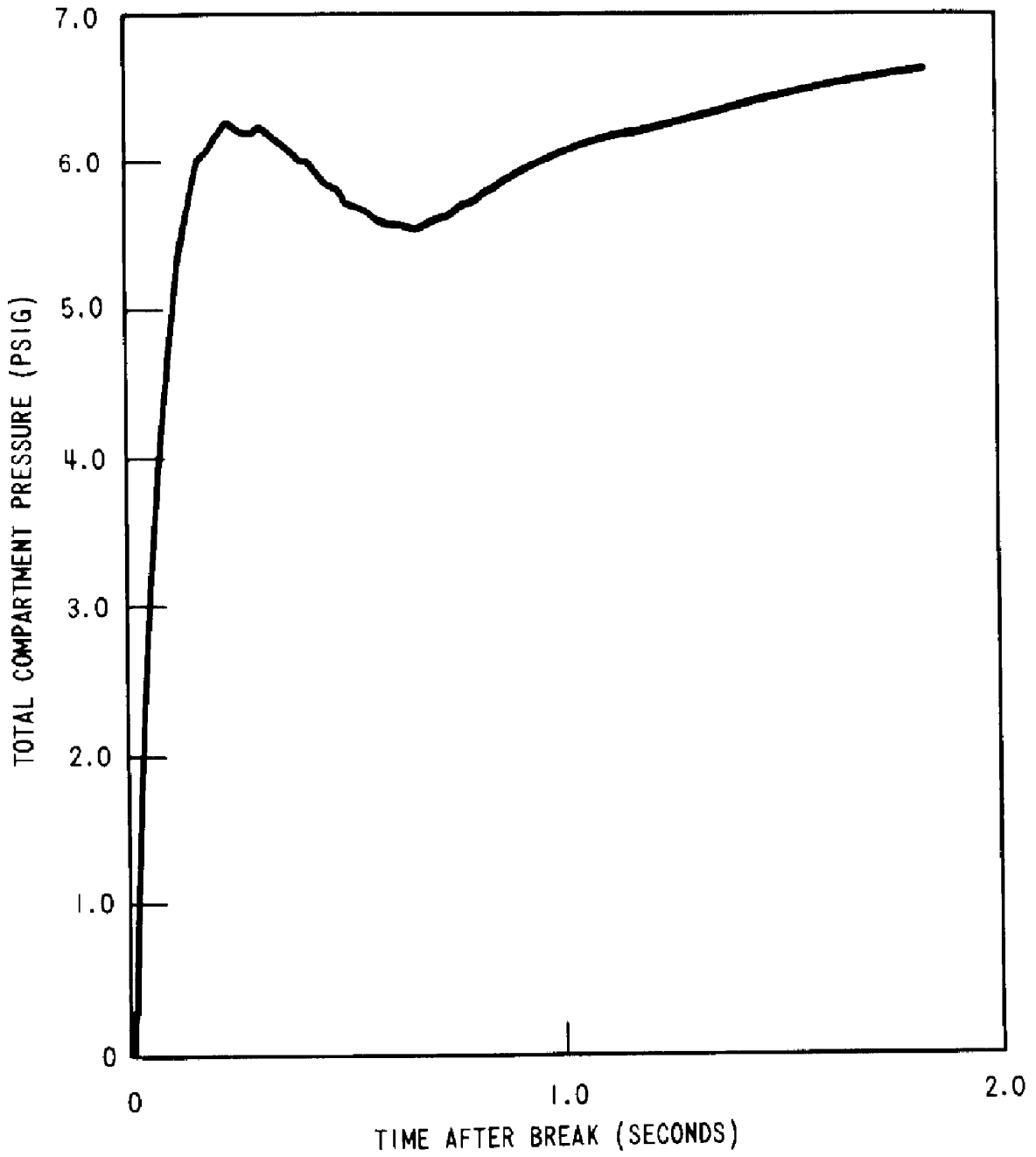


Figure 6-55. Reactor Cavity Analysis, Element 13

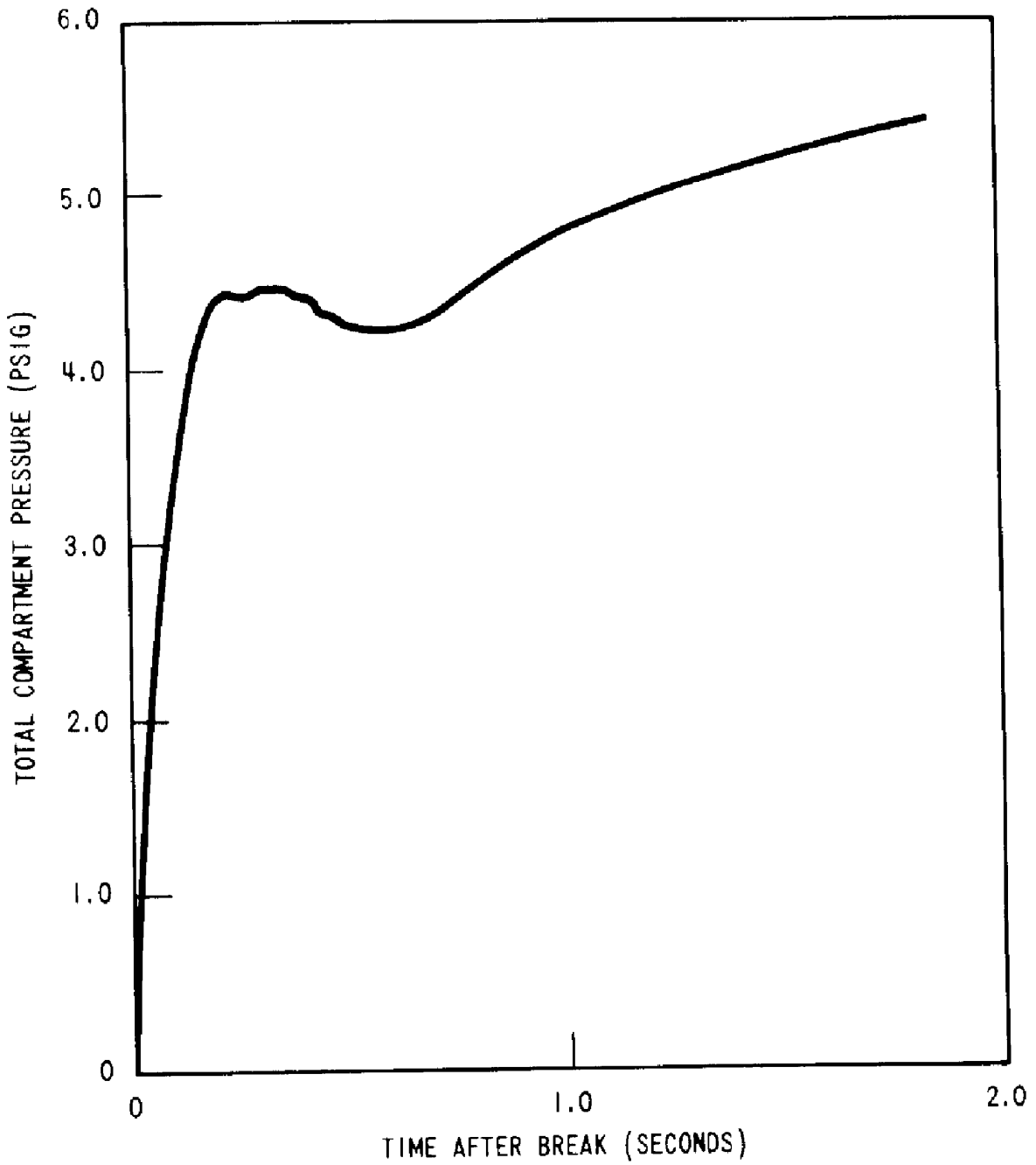


Figure 6-56. Reactor Cavity Analysis, Element 14

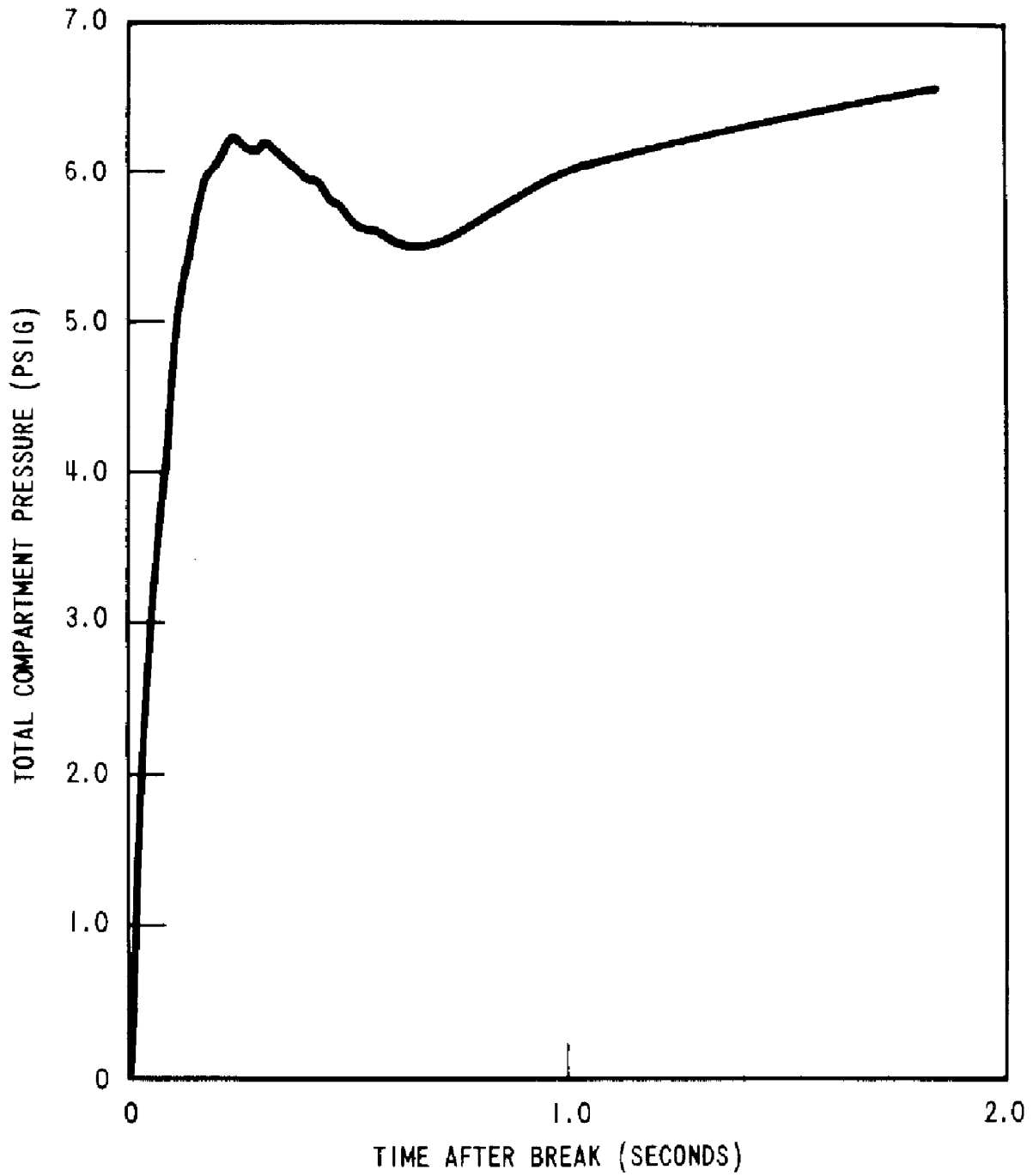


Figure 6-57. Reactor Cavity Analysis, Element 15

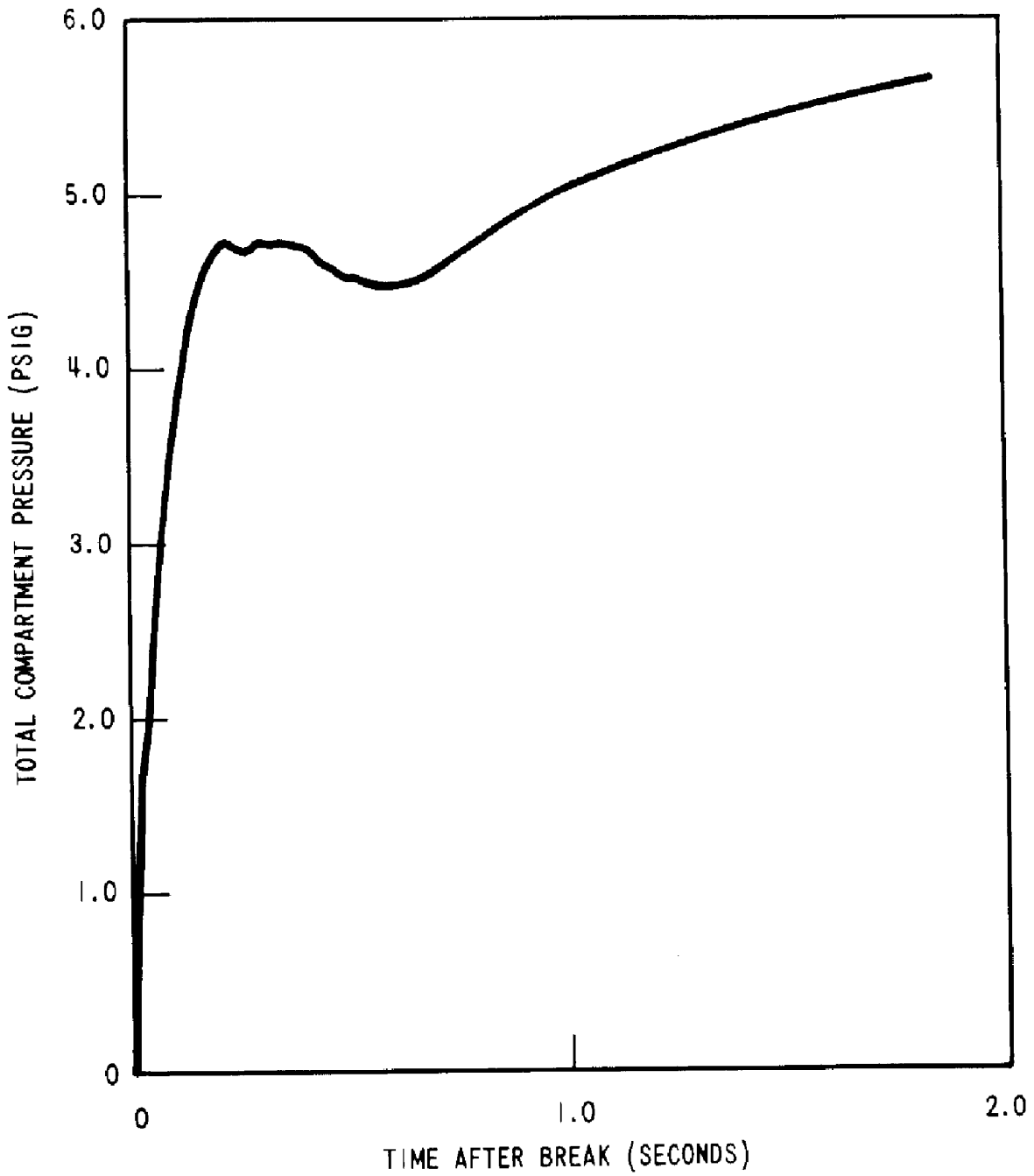


Figure 6-58. Reactor Cavity Analysis, Element 16

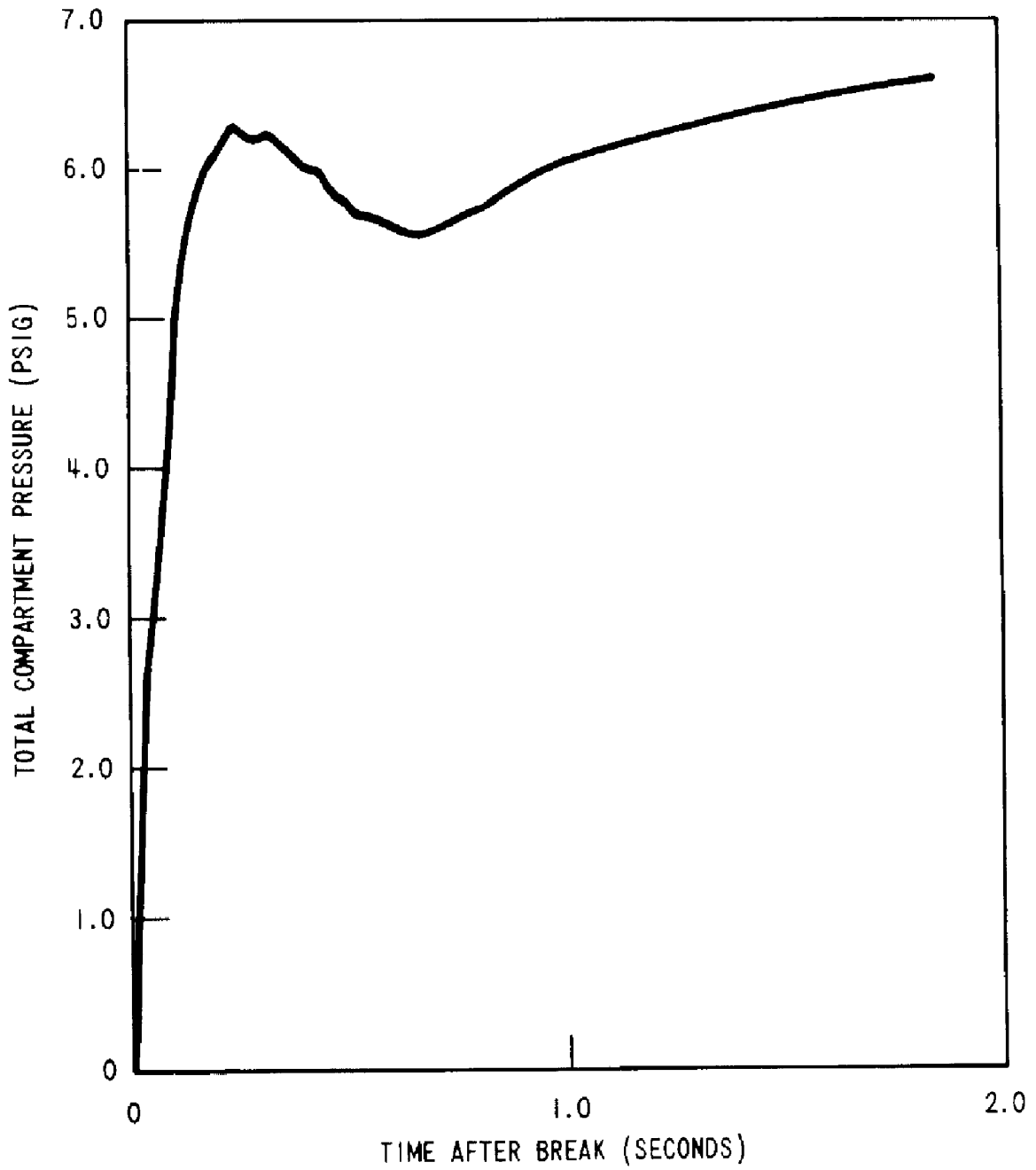


Figure 6-59. Reactor Cavity Analysis, Element 17

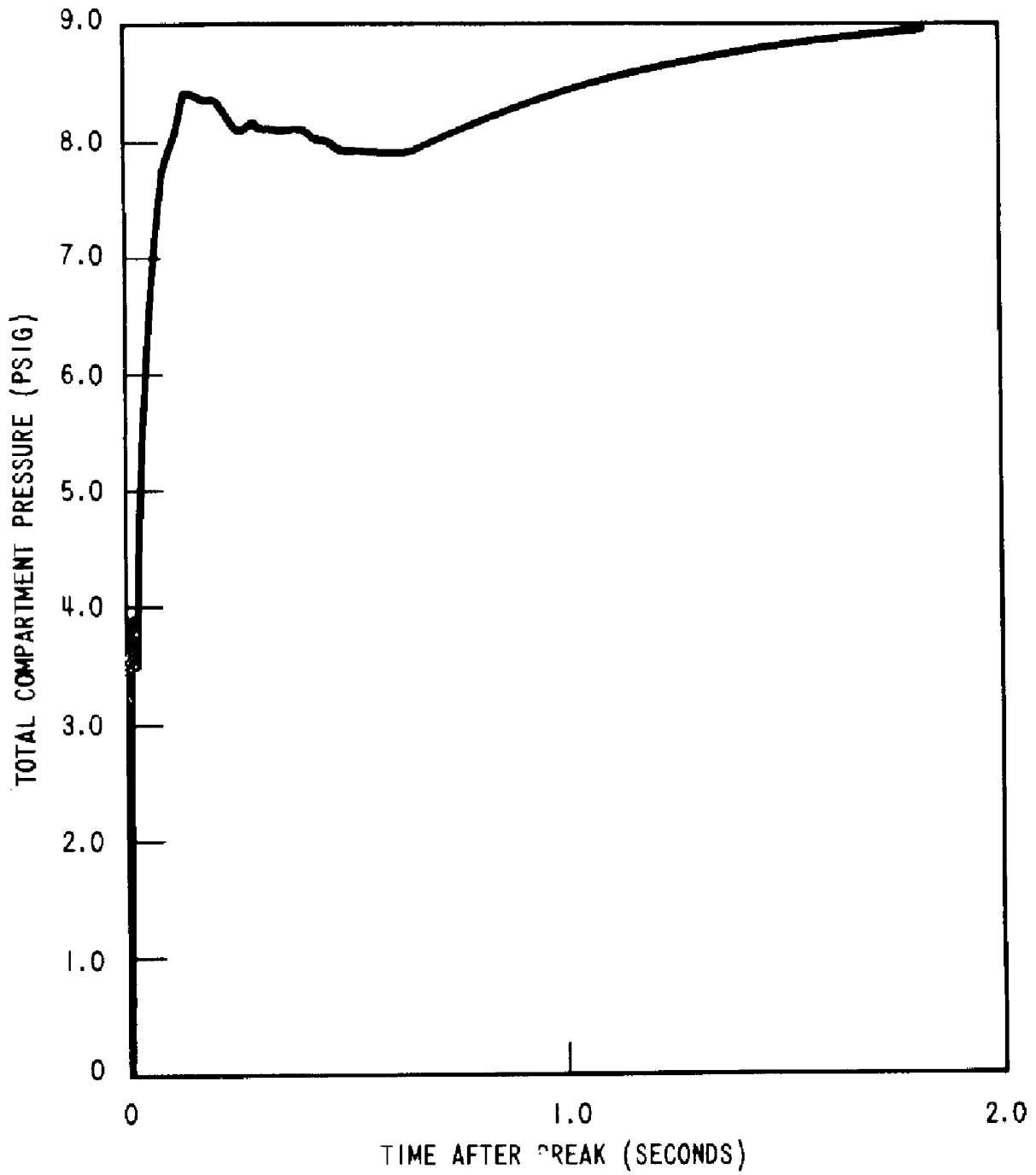


Figure 6-60. Reactor Cavity Analysis, Element 18

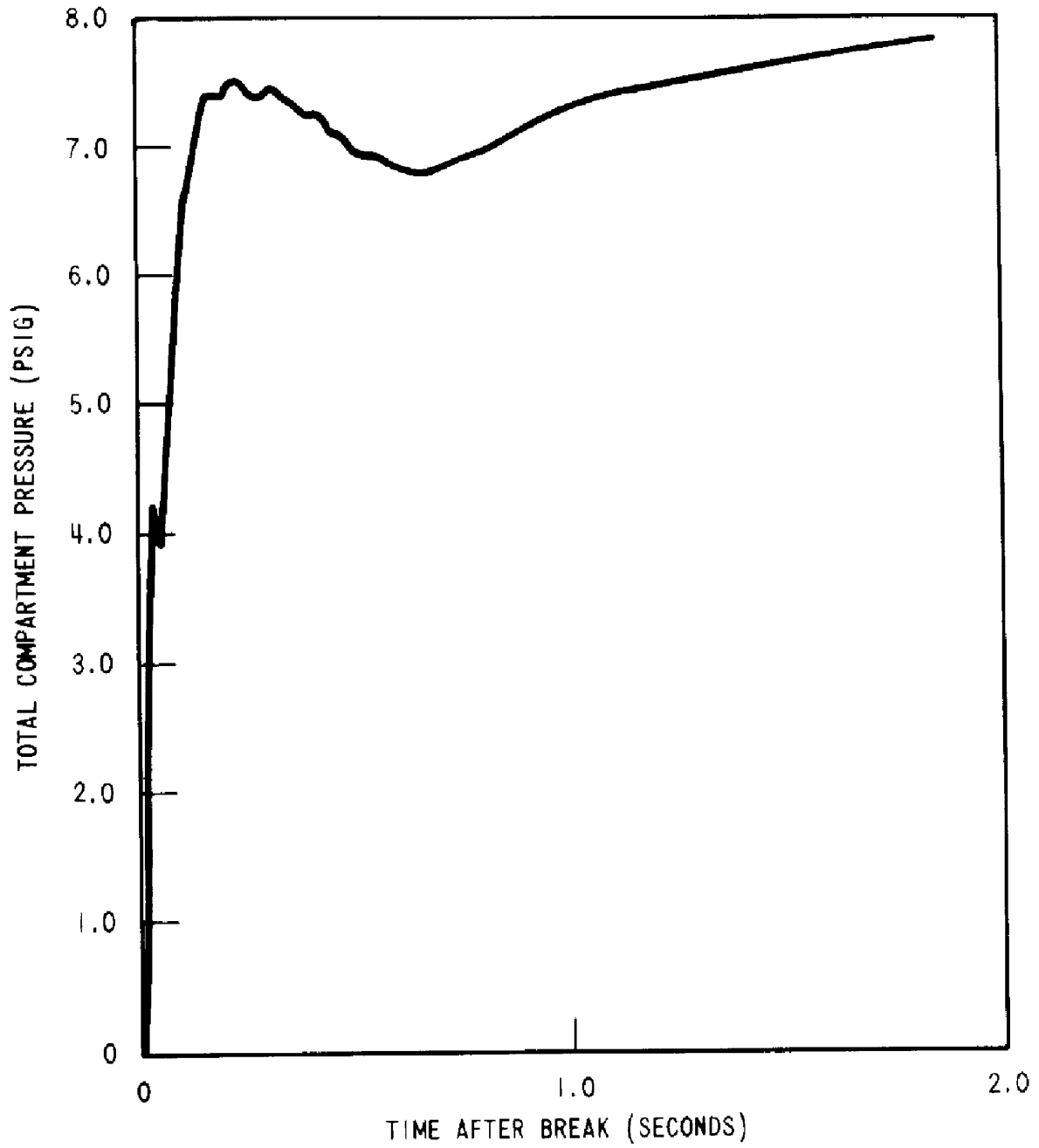


Figure 6-61. Reactor Cavity Analysis, Element 19

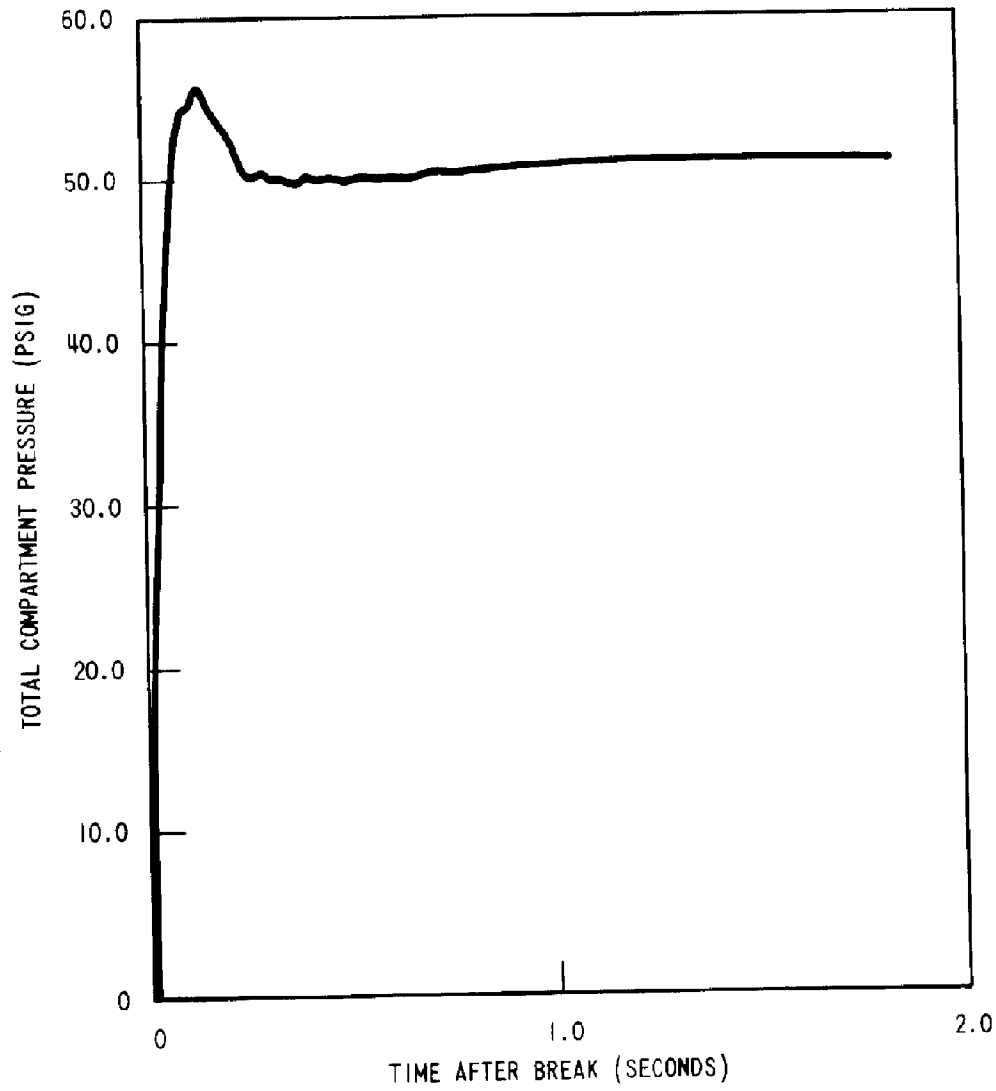


Figure 6-62. Reactor Cavity Analysis, Element 20

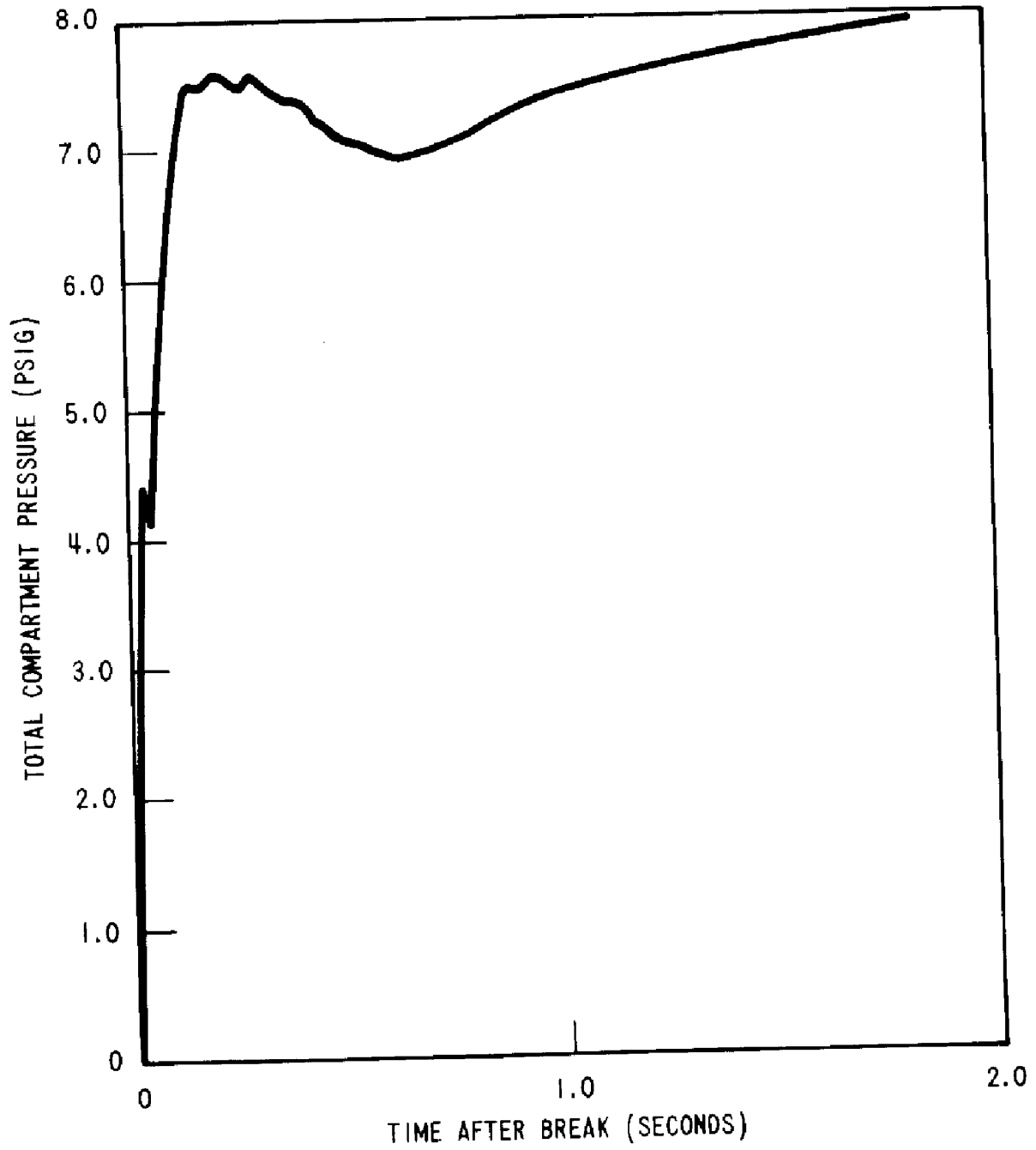


Figure 6-63. Reactor Cavity Analysis, Element 32

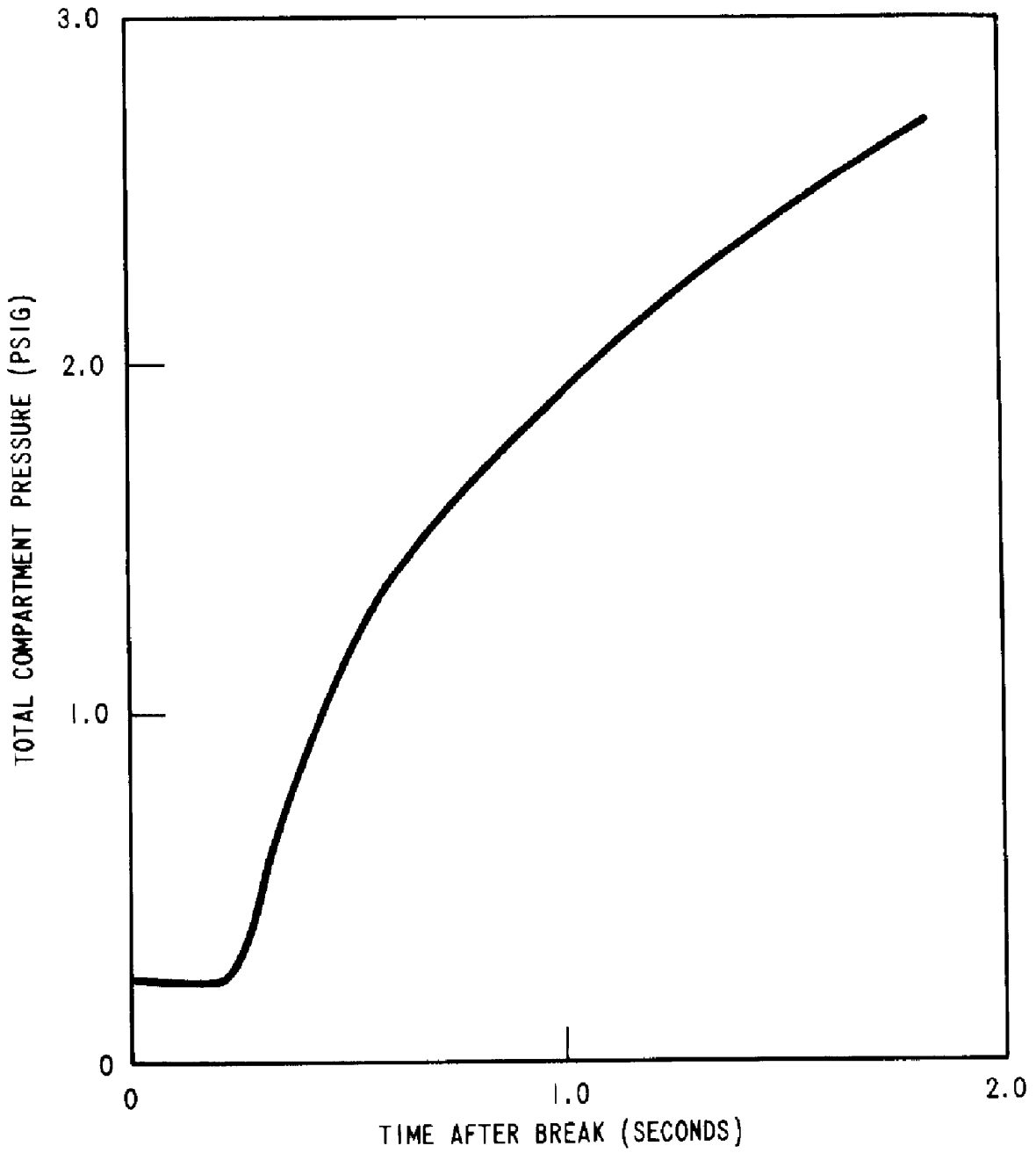


Figure 6-64. Reactor Cavity Analysis, Element 33

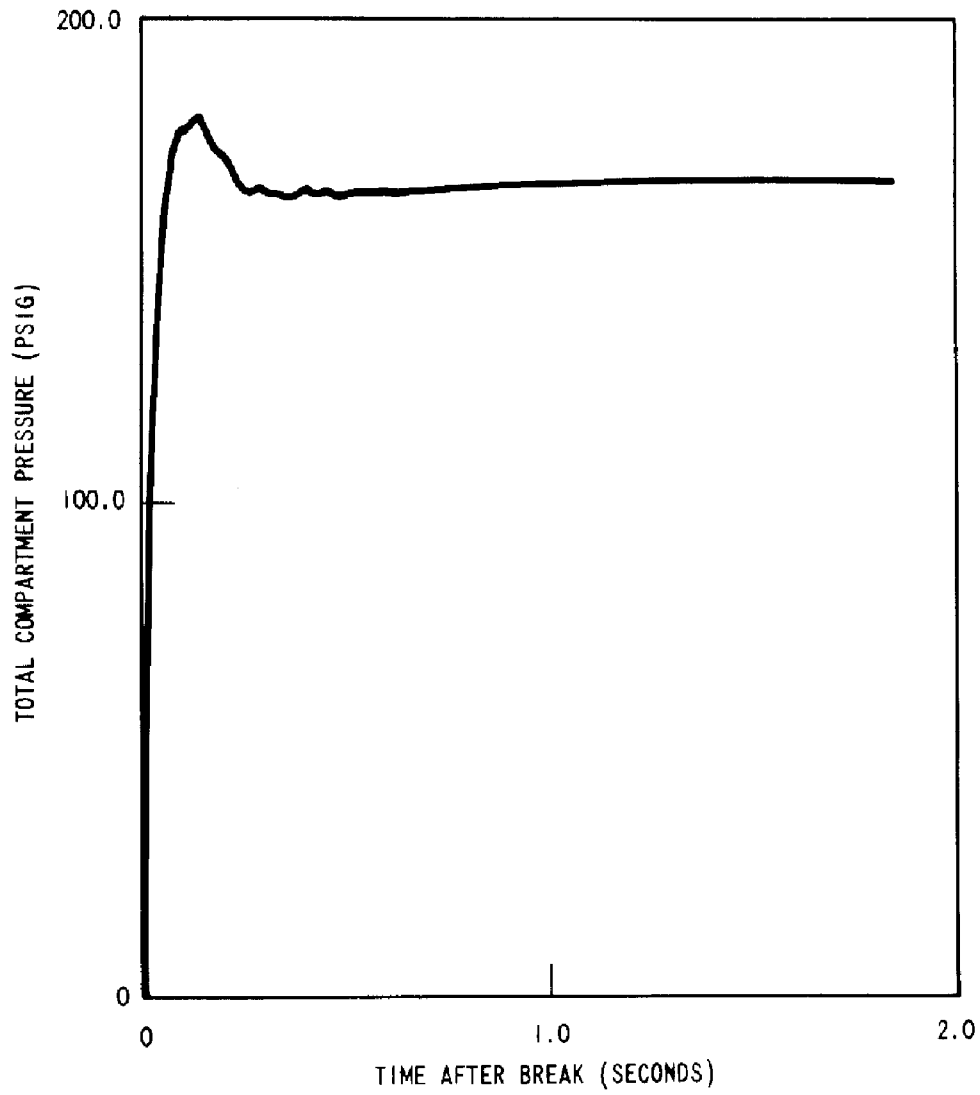


Figure 6-65. Reactor Cavity Analysis, Element 34

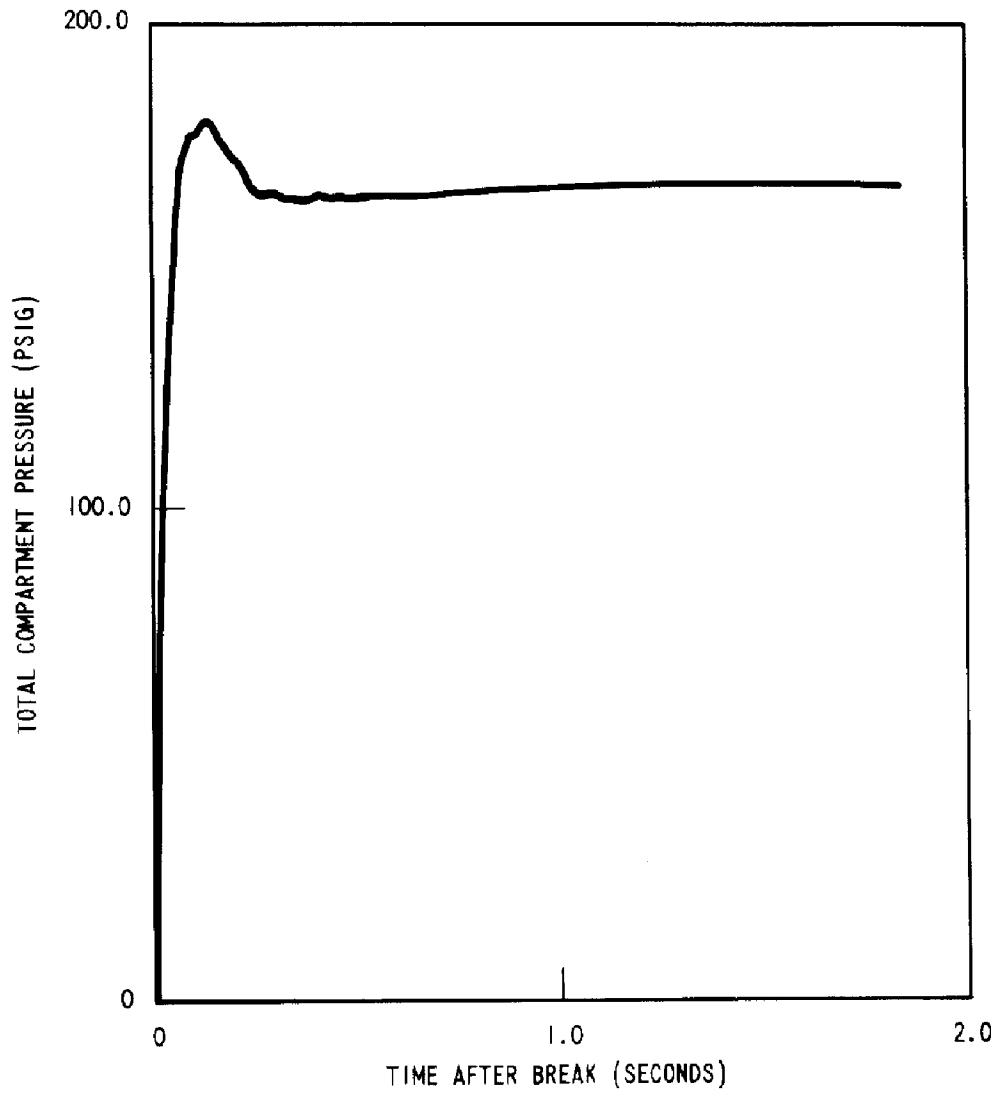


Figure 6-66. Reactor Cavity Analysis, Element 35

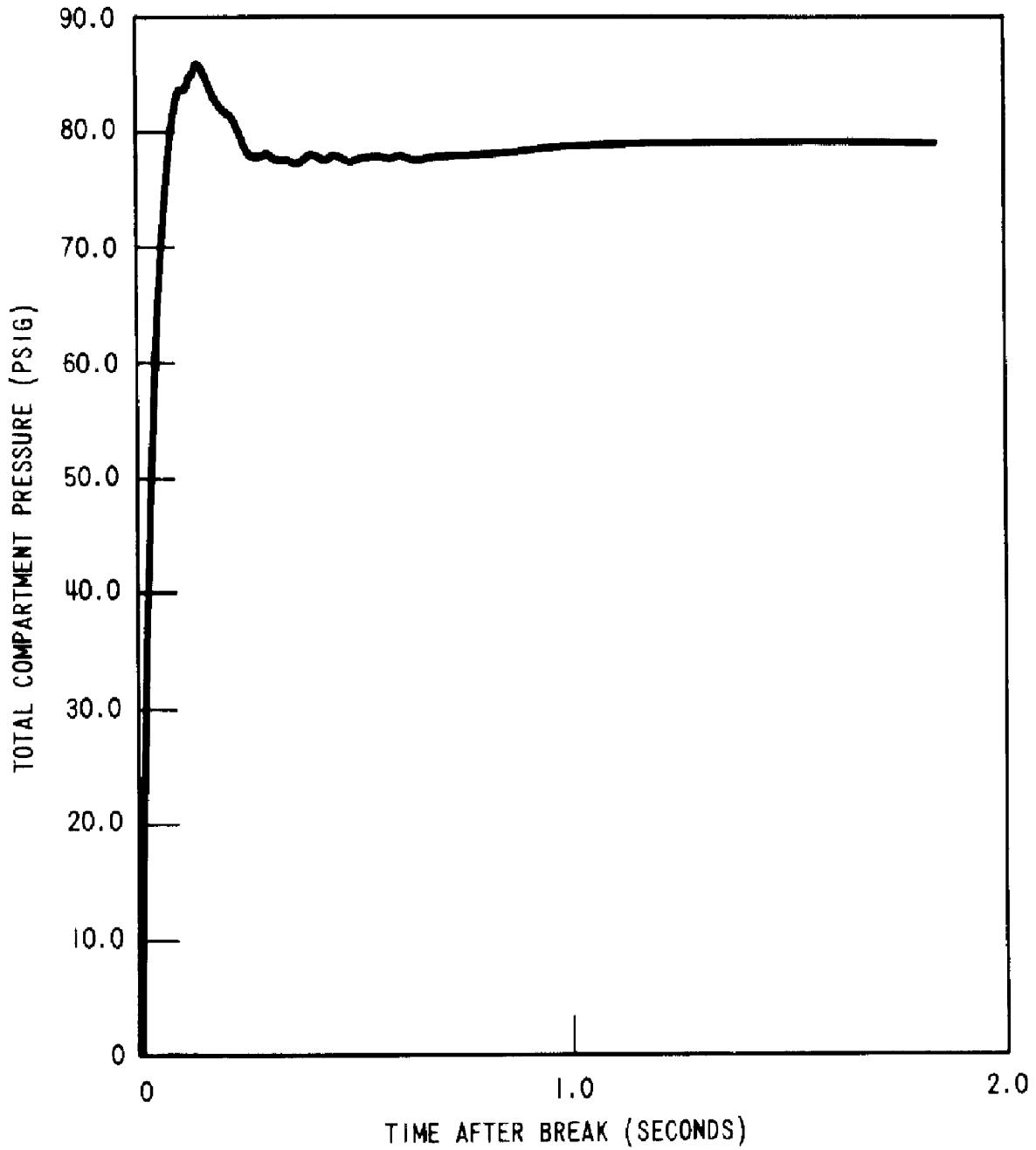


Figure 6-67. Reactor Cavity Analysis, Element 36

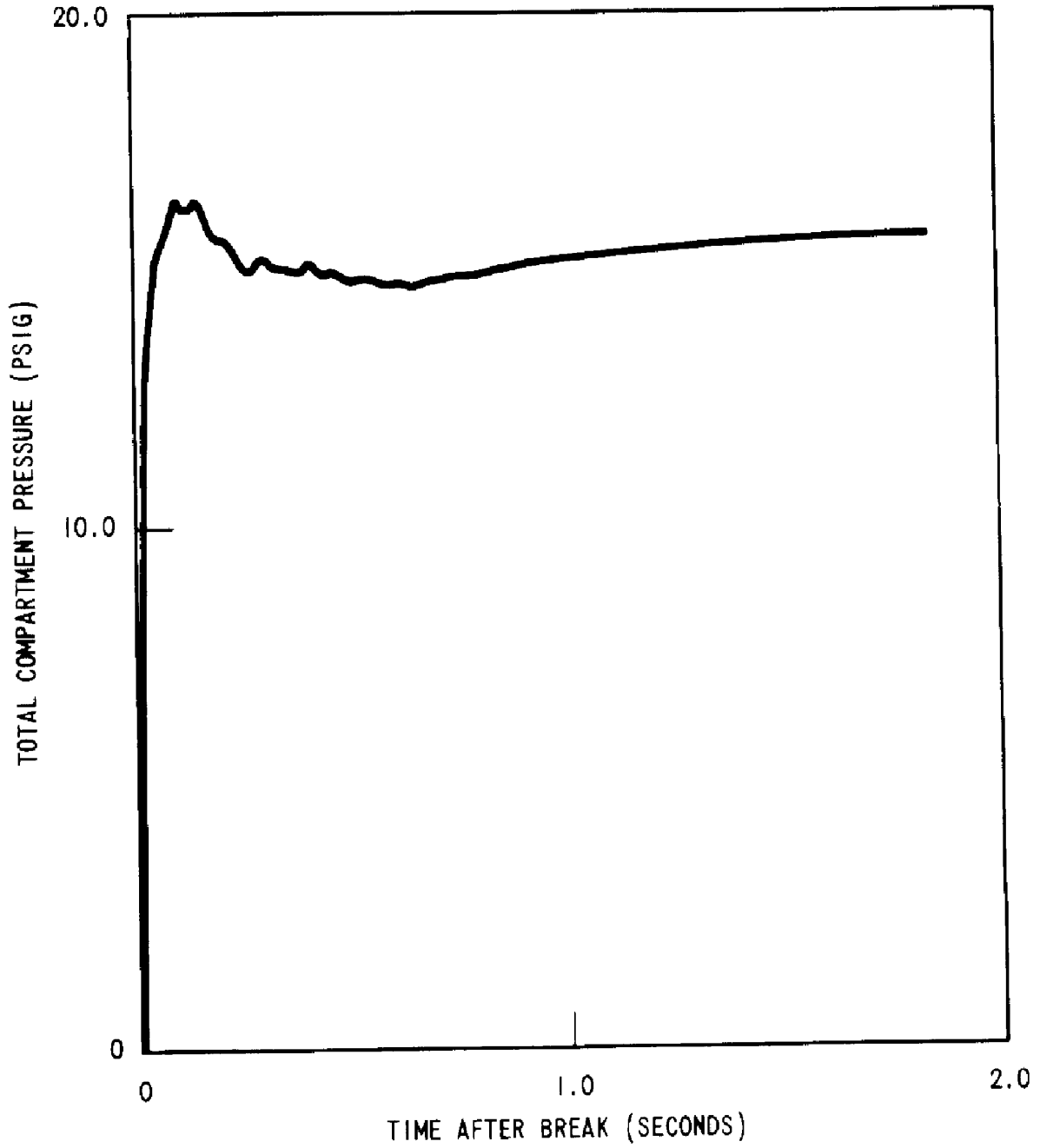


Figure 6-68. Reactor Cavity Analysis, Element 37

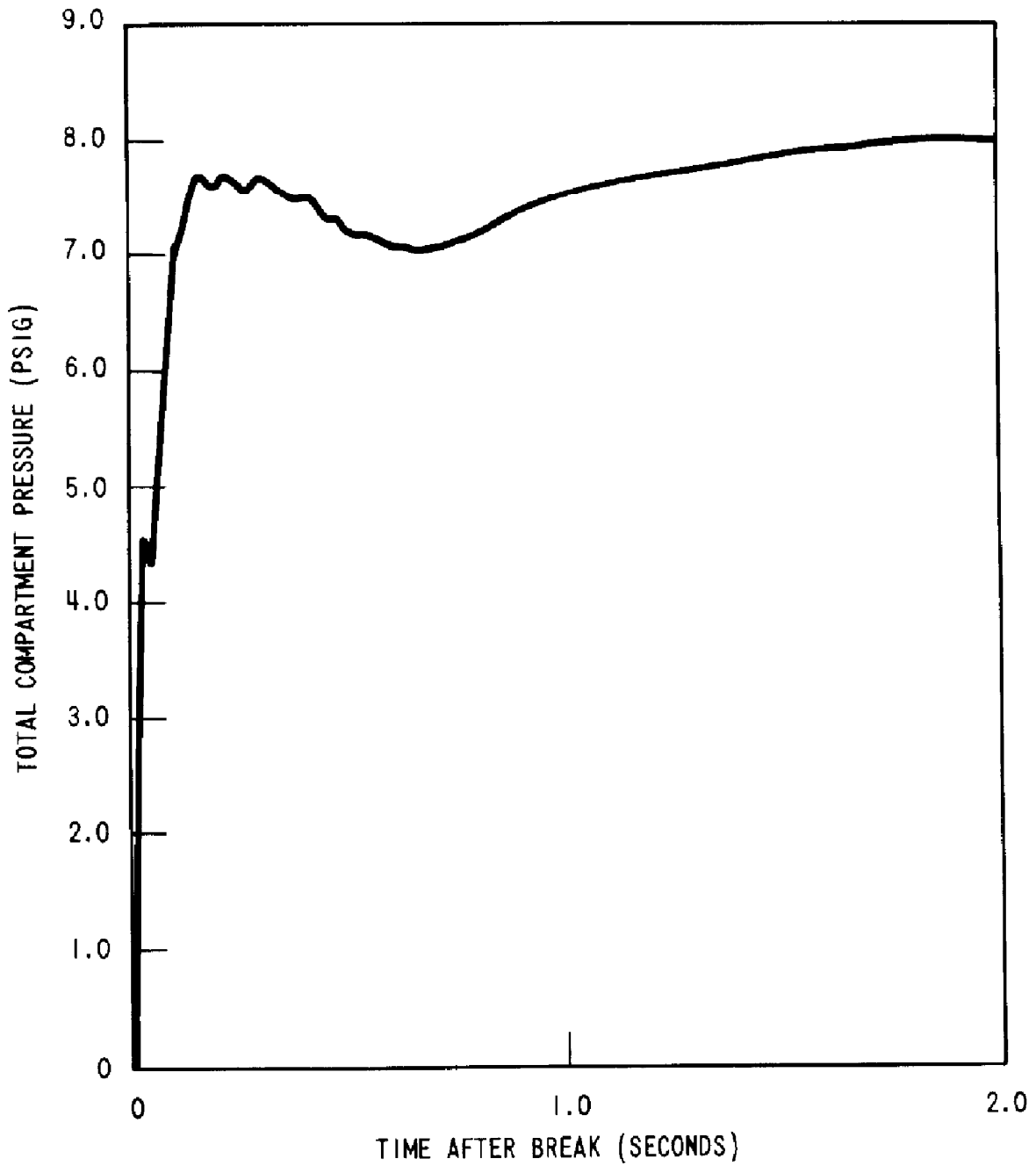


Figure 6-69. Reactor Cavity Analysis, Element 38

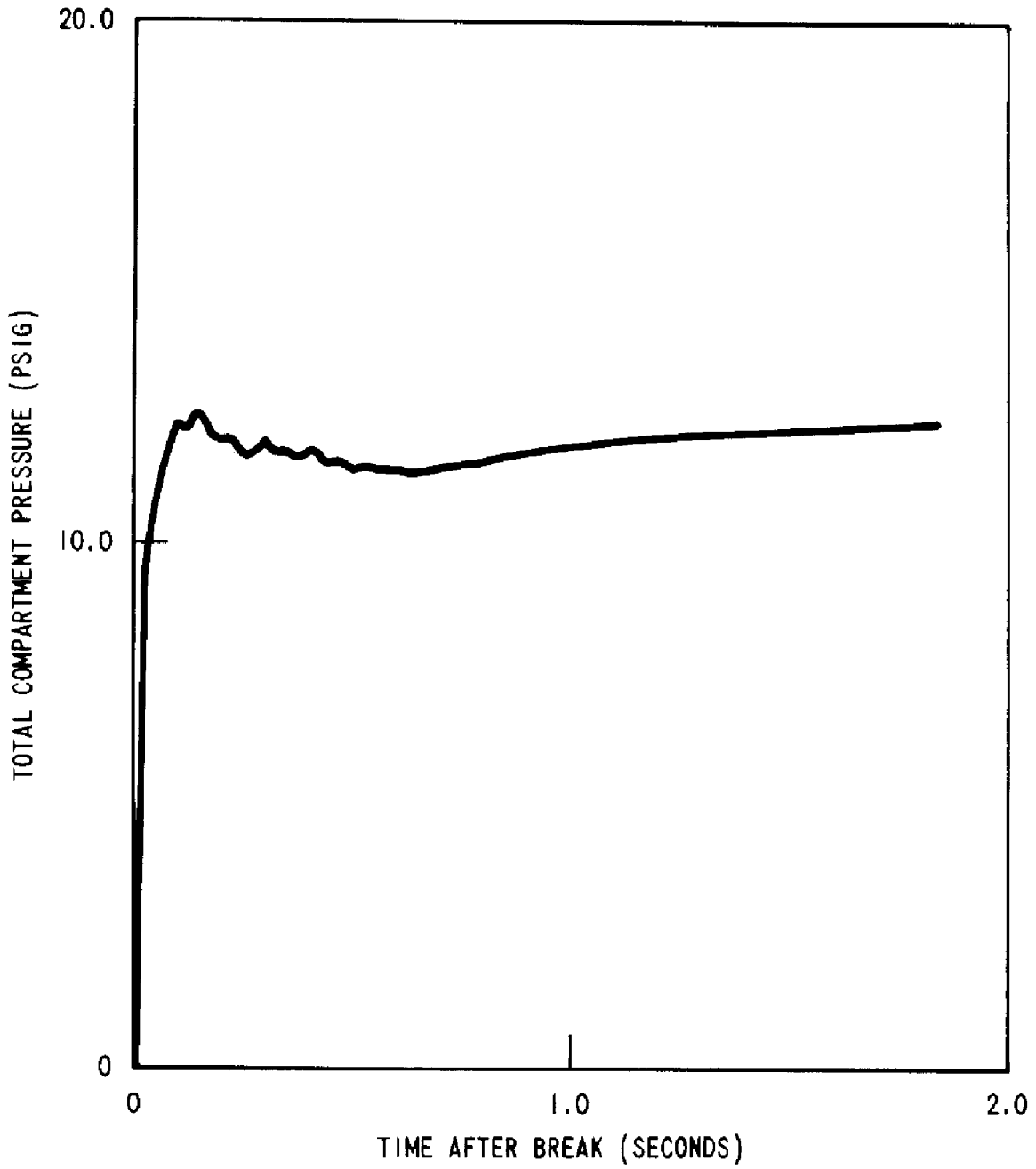


Figure 6-70. Reactor Cavity Analysis, Element 39

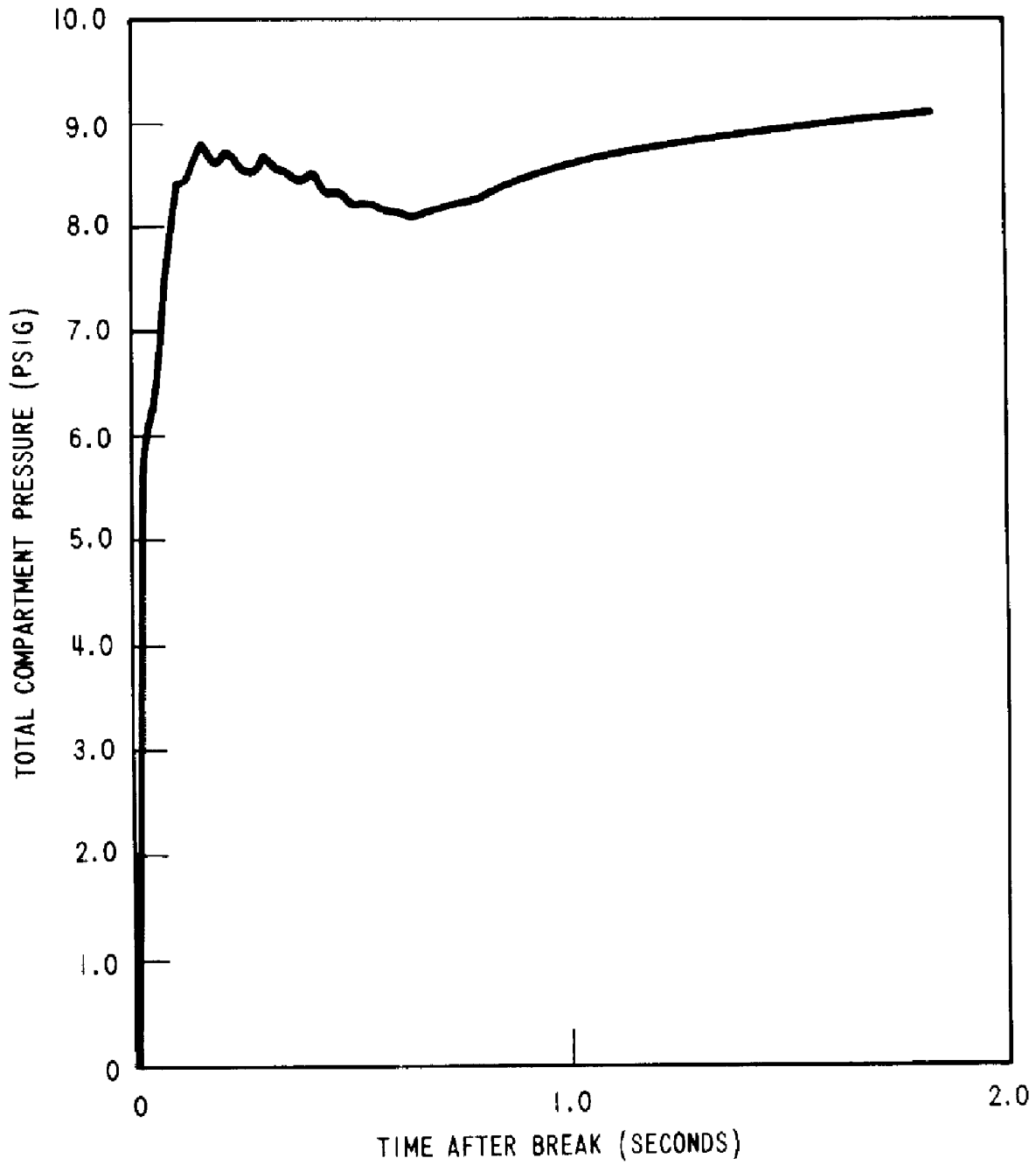


Figure 6-71. Reactor Cavity Analysis, Element 40

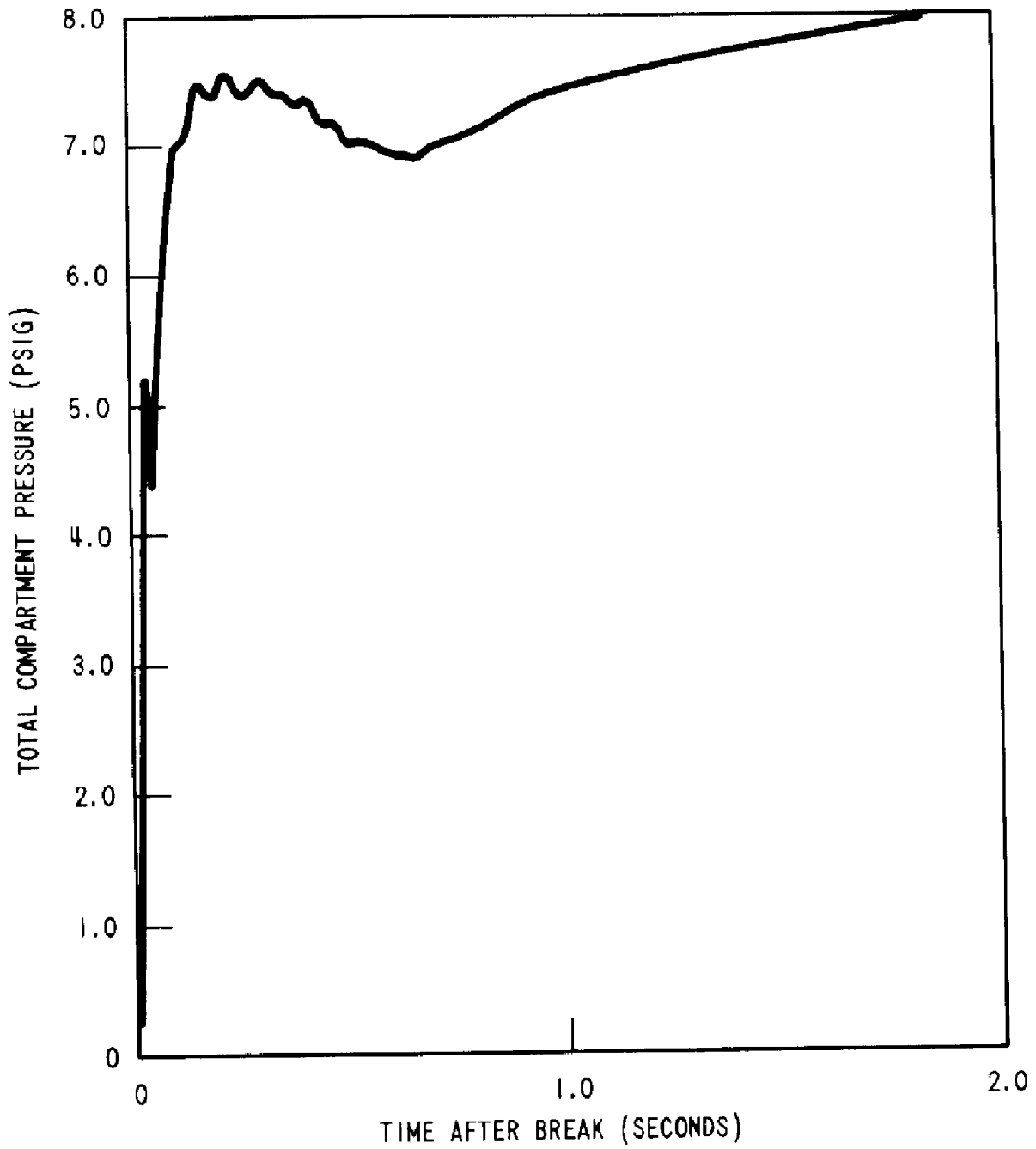


Figure 6-72. Reactor Cavity Analysis, Element 41

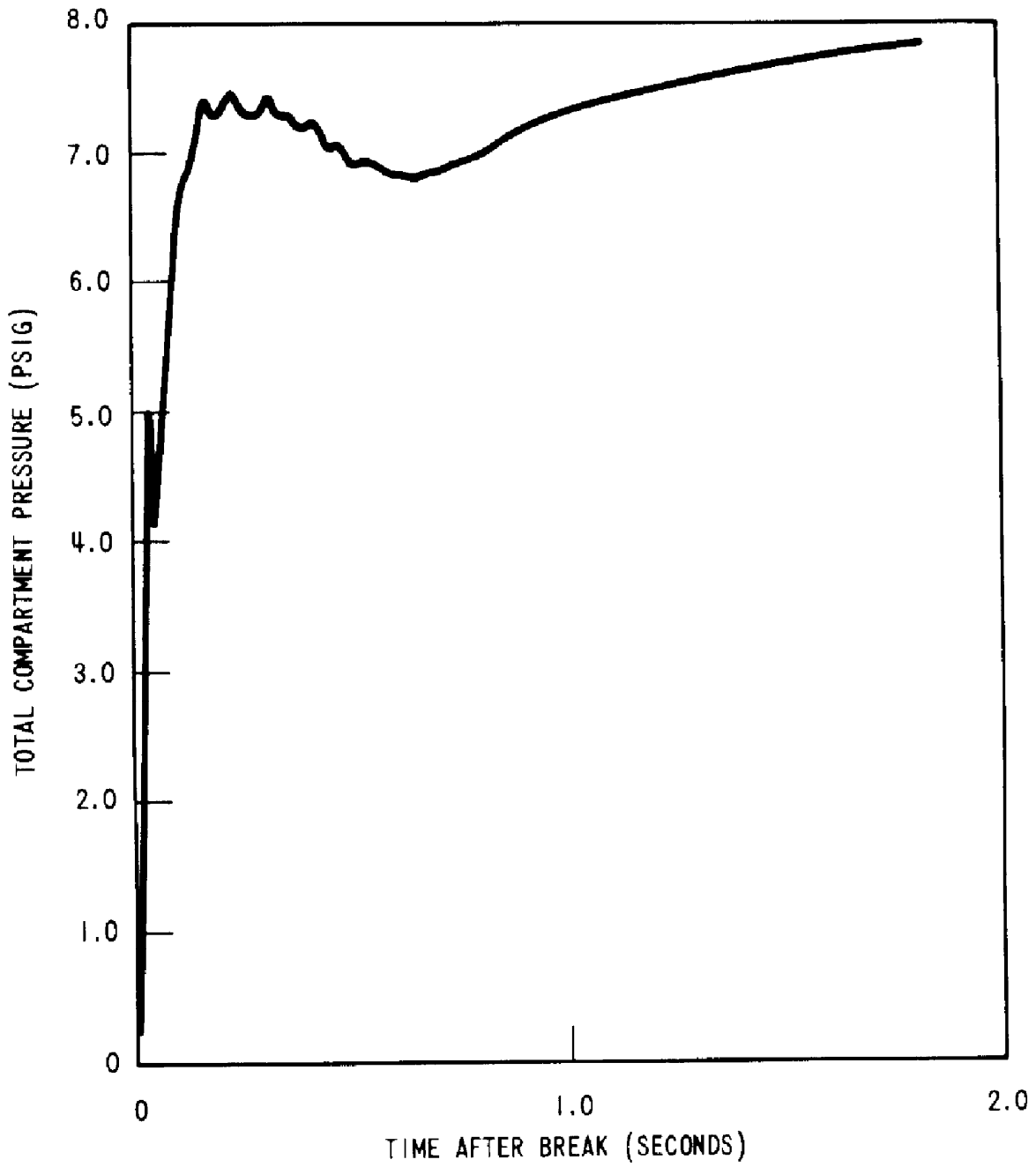


Figure 6-73. Reactor Cavity Analysis, Element 42

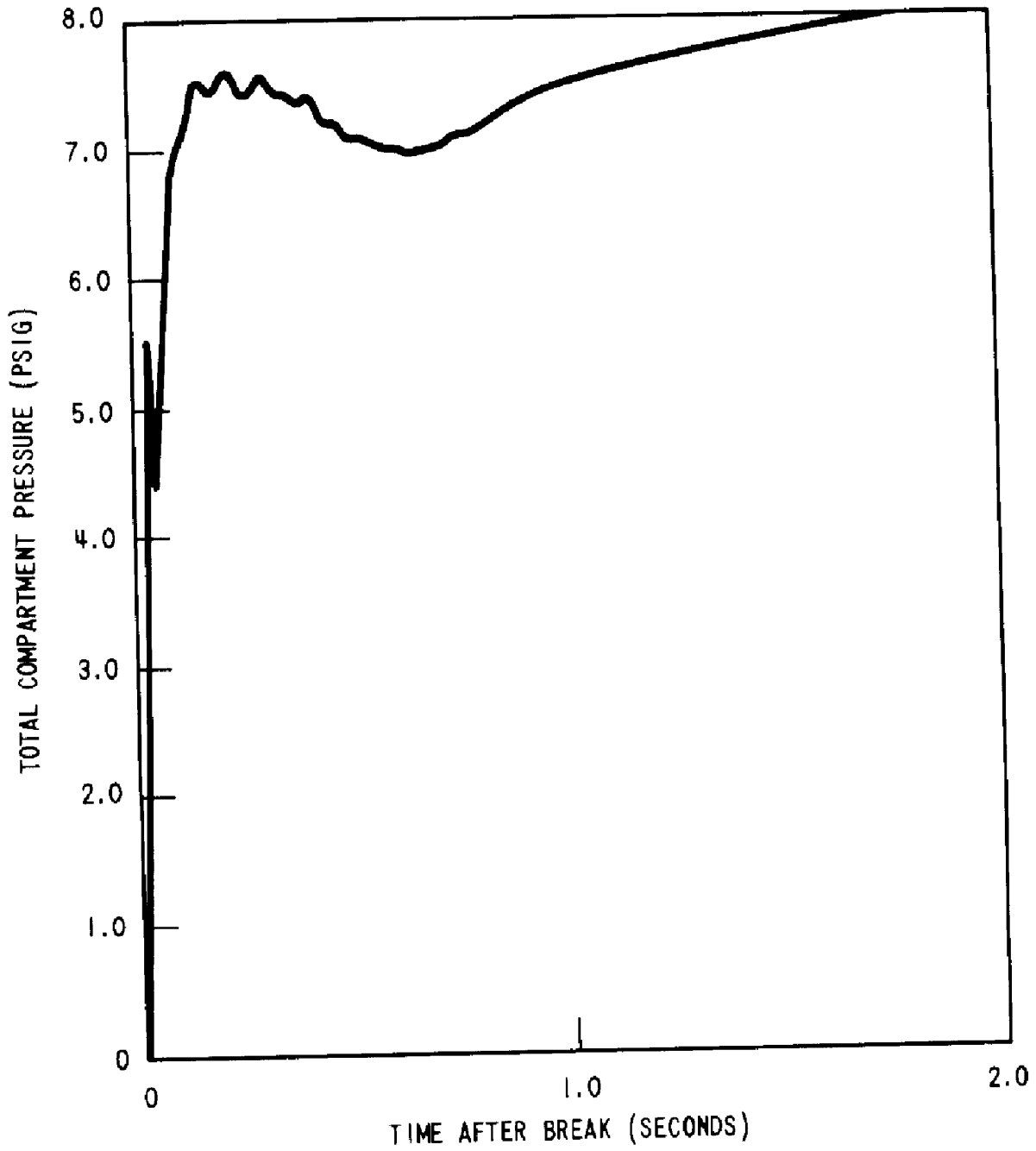


Figure 6-74. Reactor Cavity Analysis, Element 43

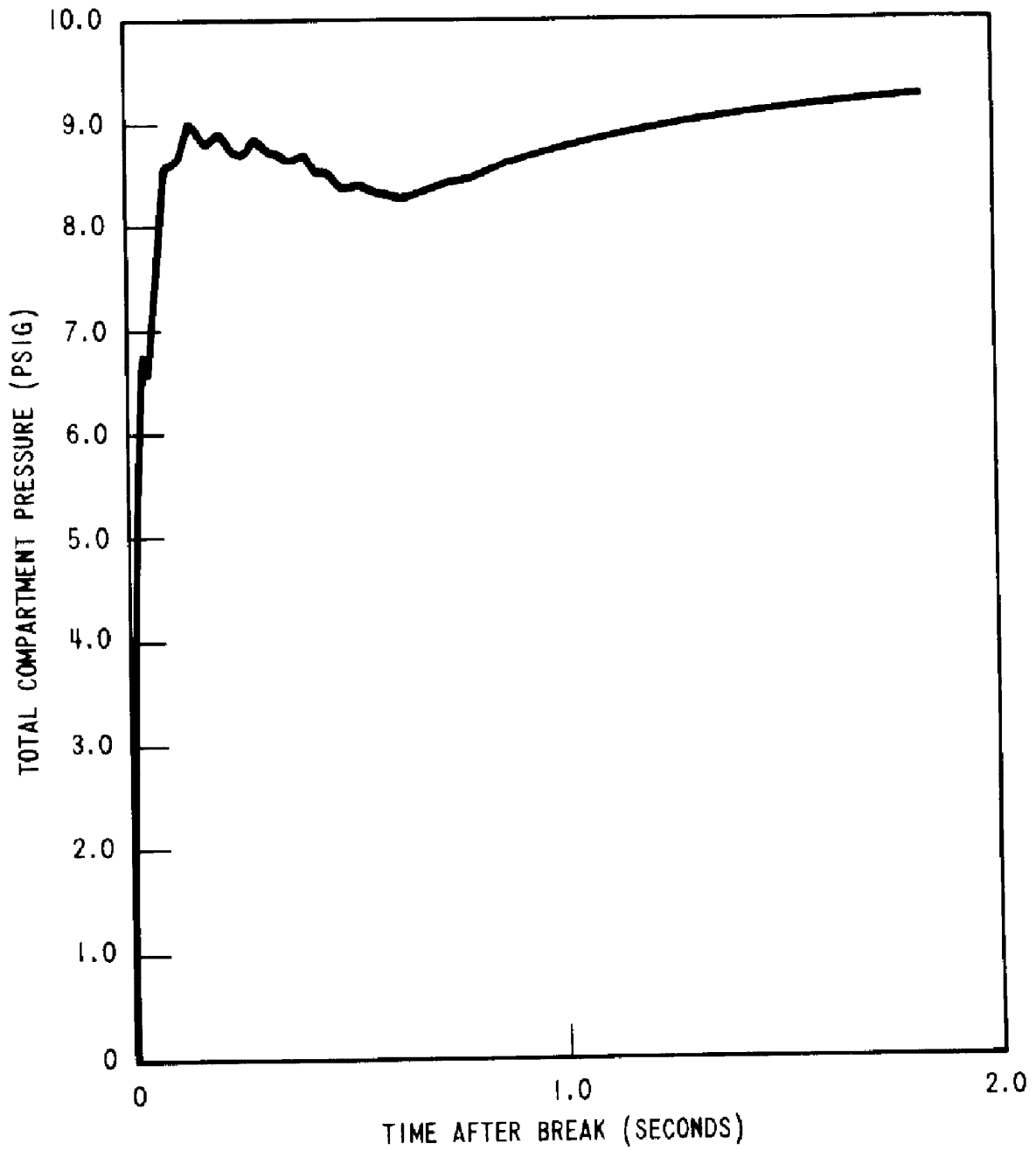


Figure 6-75. Reactor Cavity Analysis, Element 44

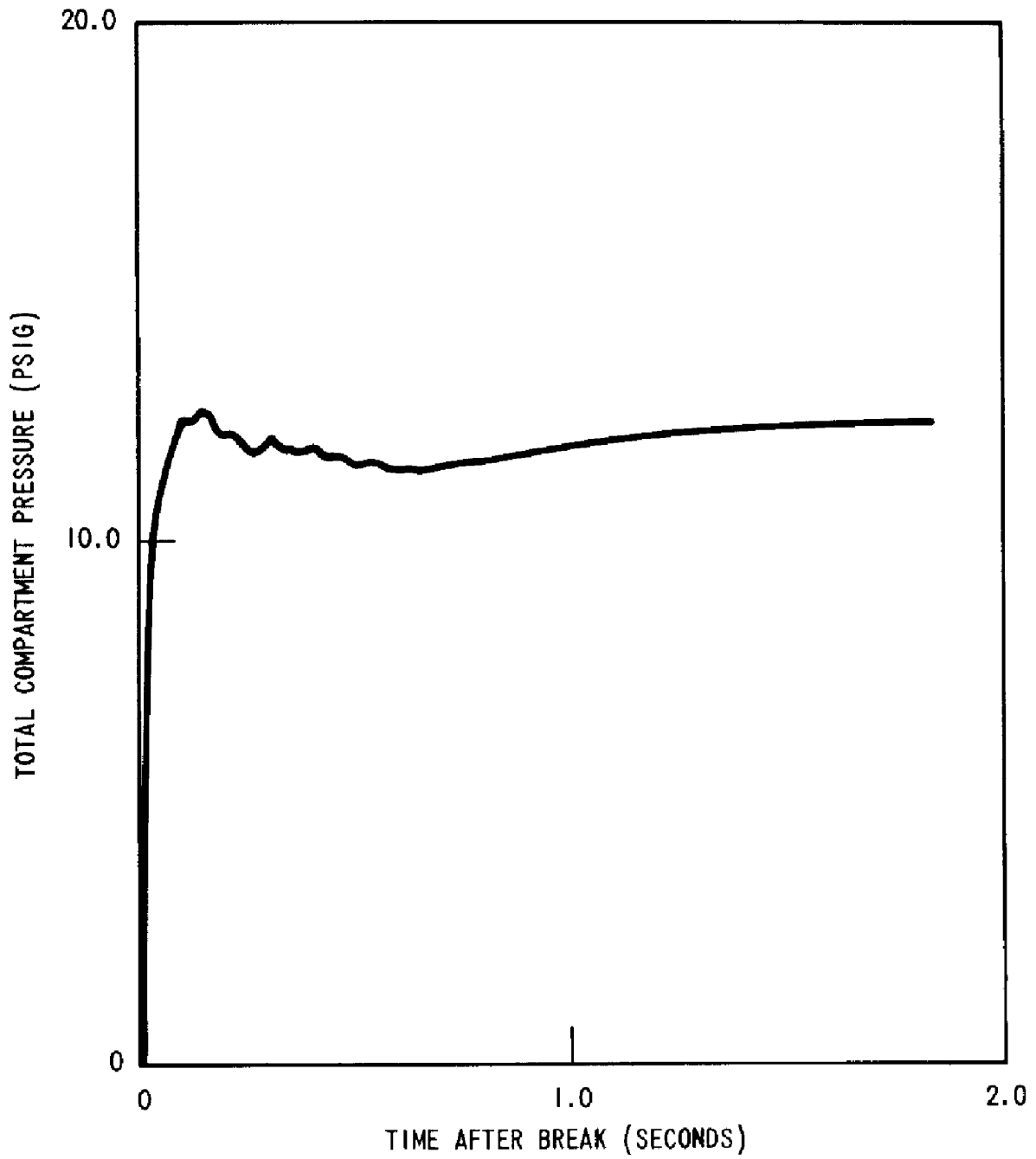


Figure 6-76. Reactor Cavity Analysis, Element 45

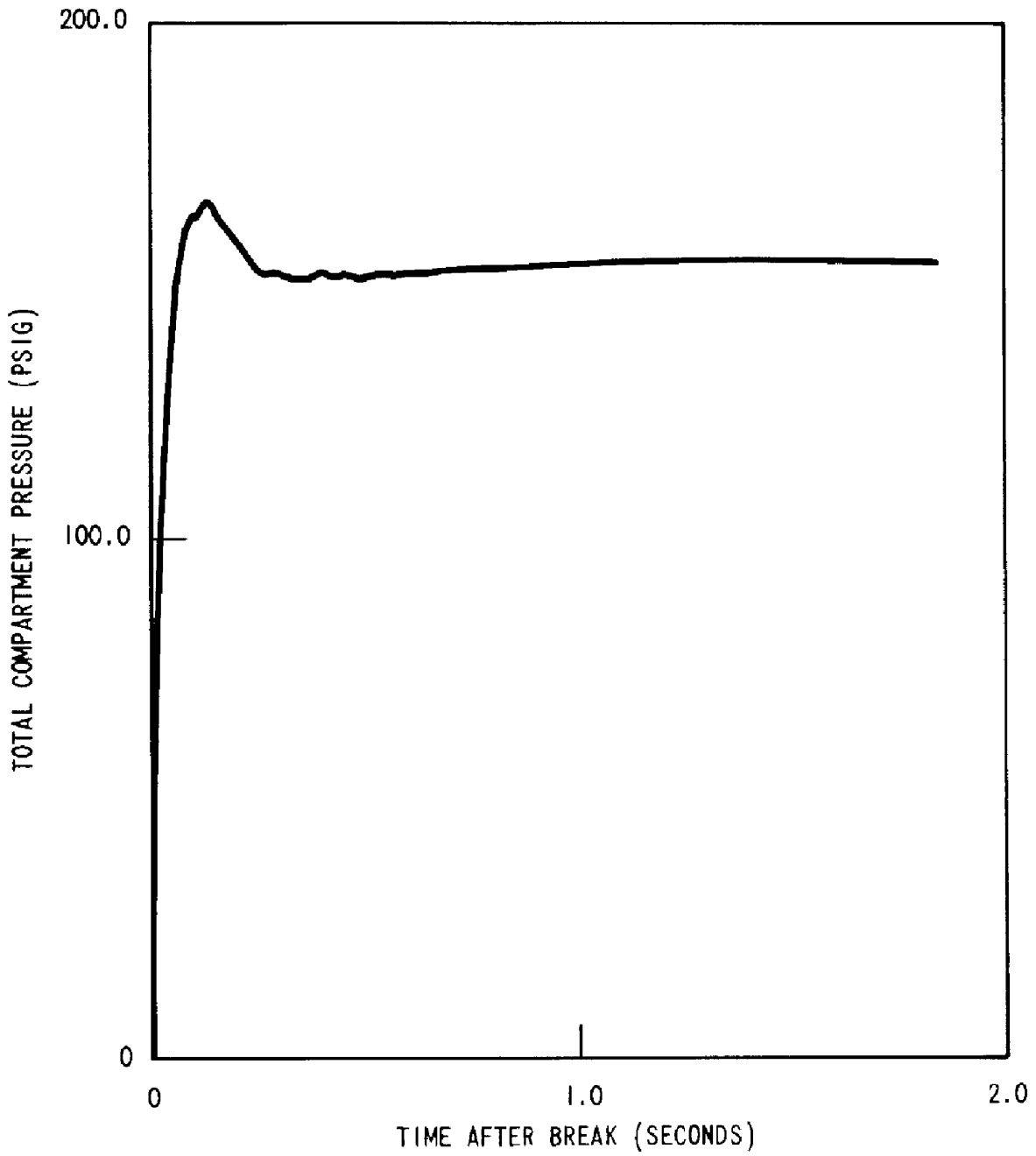


Figure 6-77. Reactor Cavity Analysis, Element 46

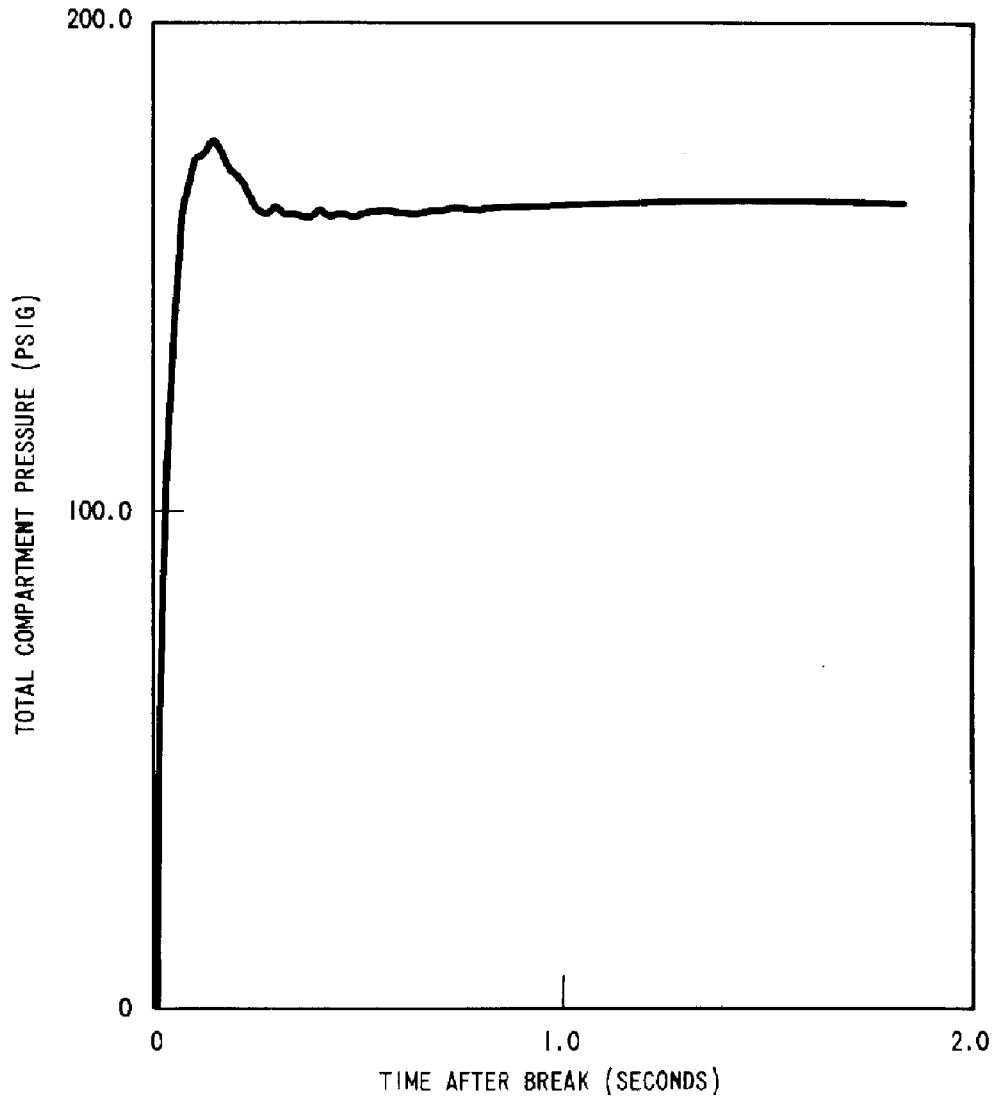


Figure 6-78. Reactor Cavity Analysis, Element 47

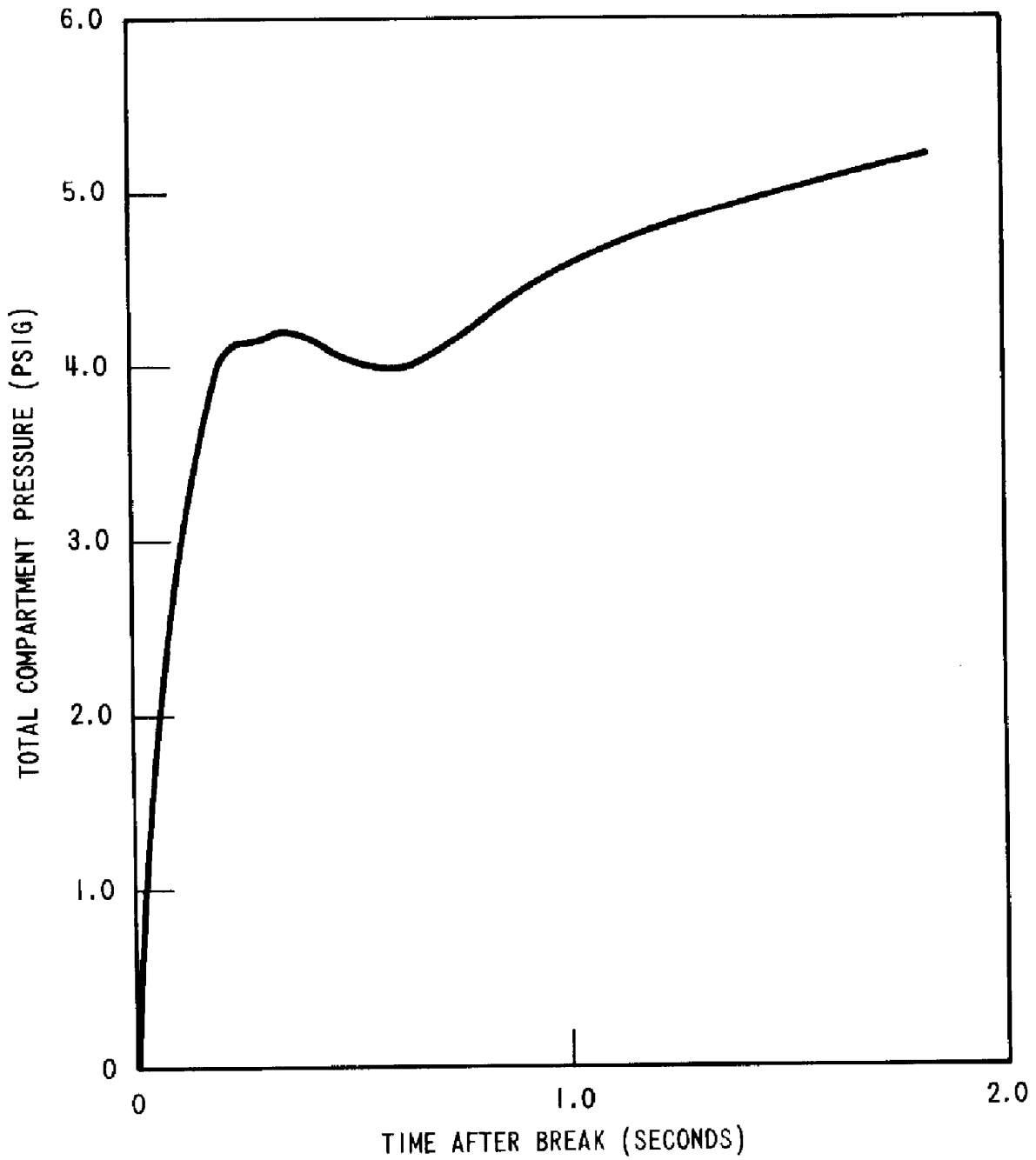


Figure 6-79. Reactor Cavity Analysis, Element 53

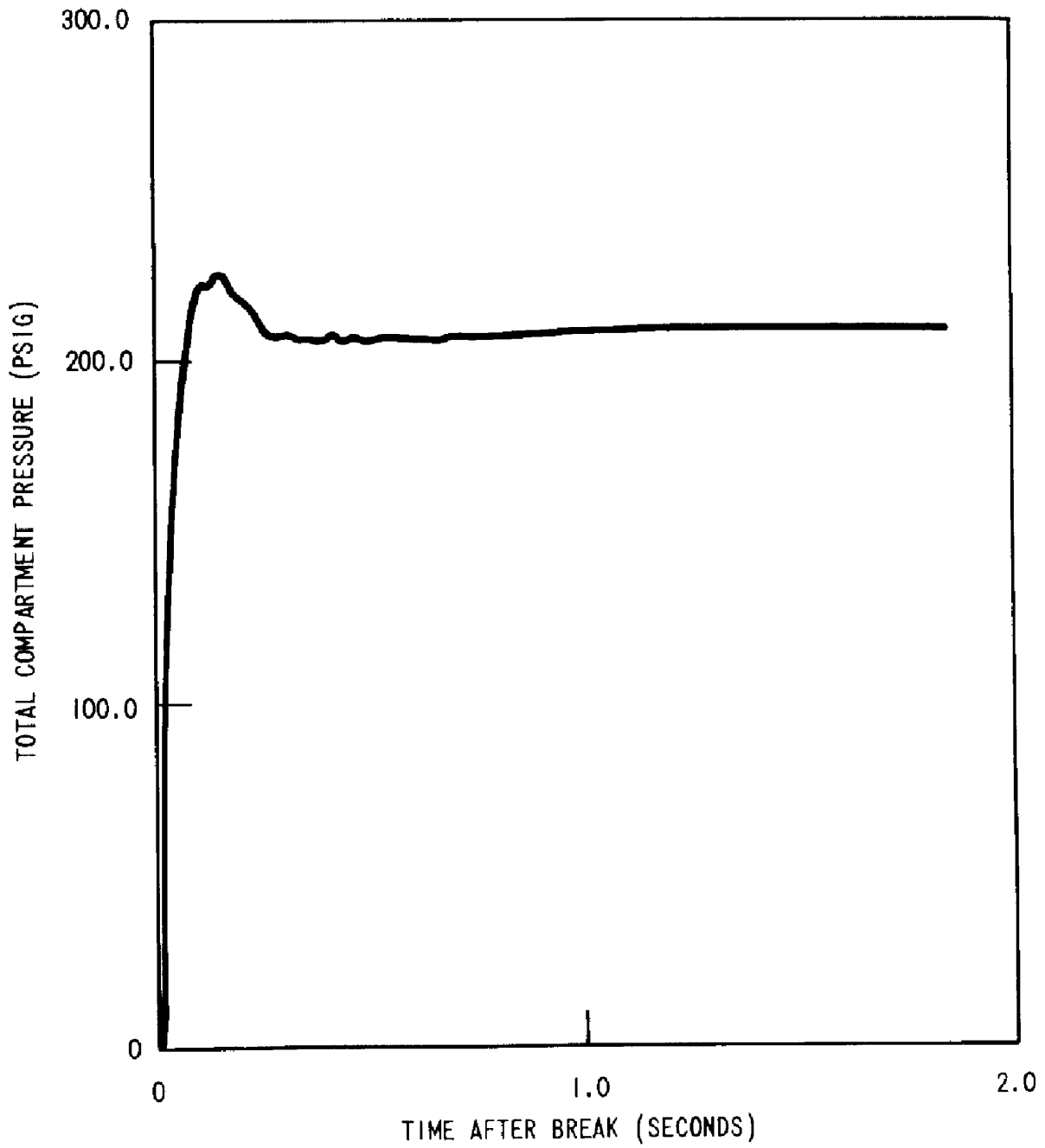


Figure 6-80. Reactor Cavity Analysis, Element 54

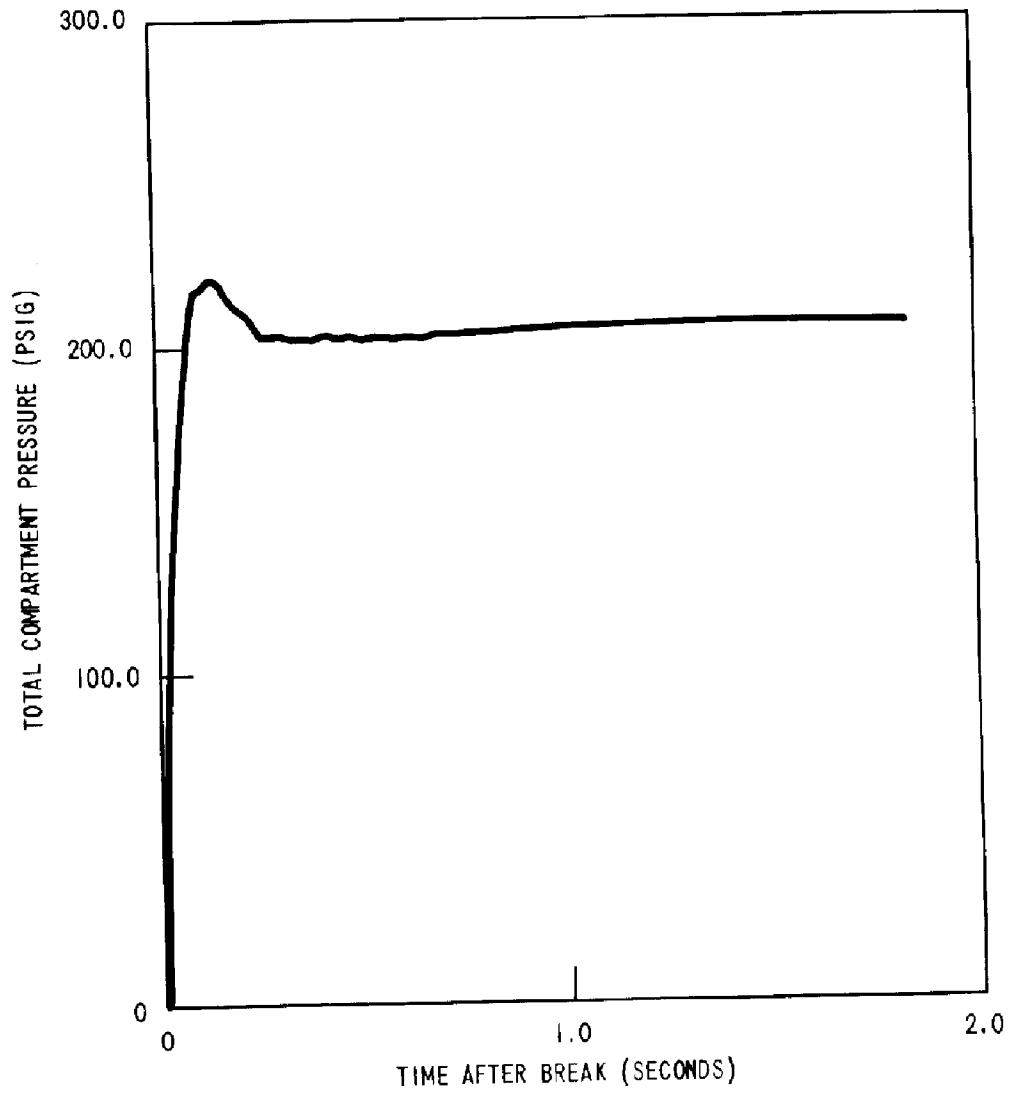


Figure 6-81. Hot Leg Double Ended Guillotine Break

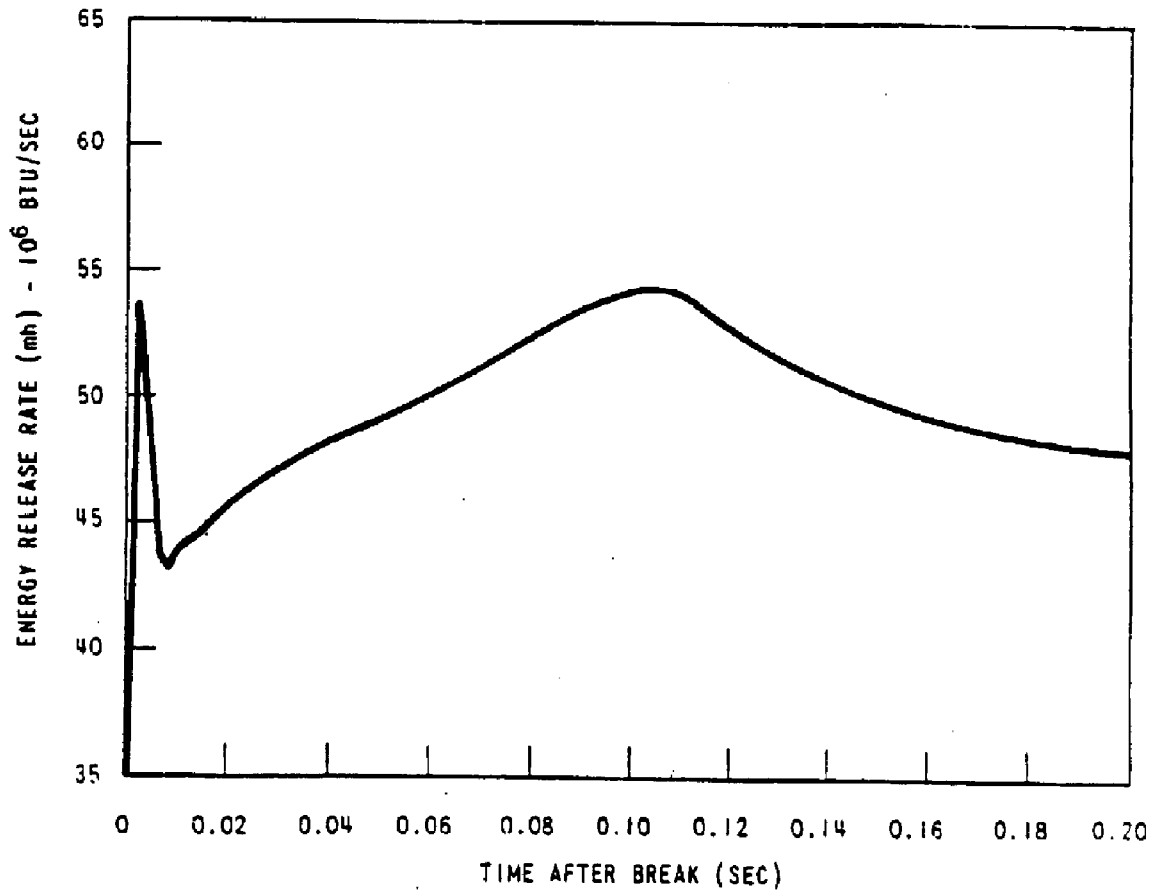


Figure 6-82. Hot Leg Double Ended Guillotine Break

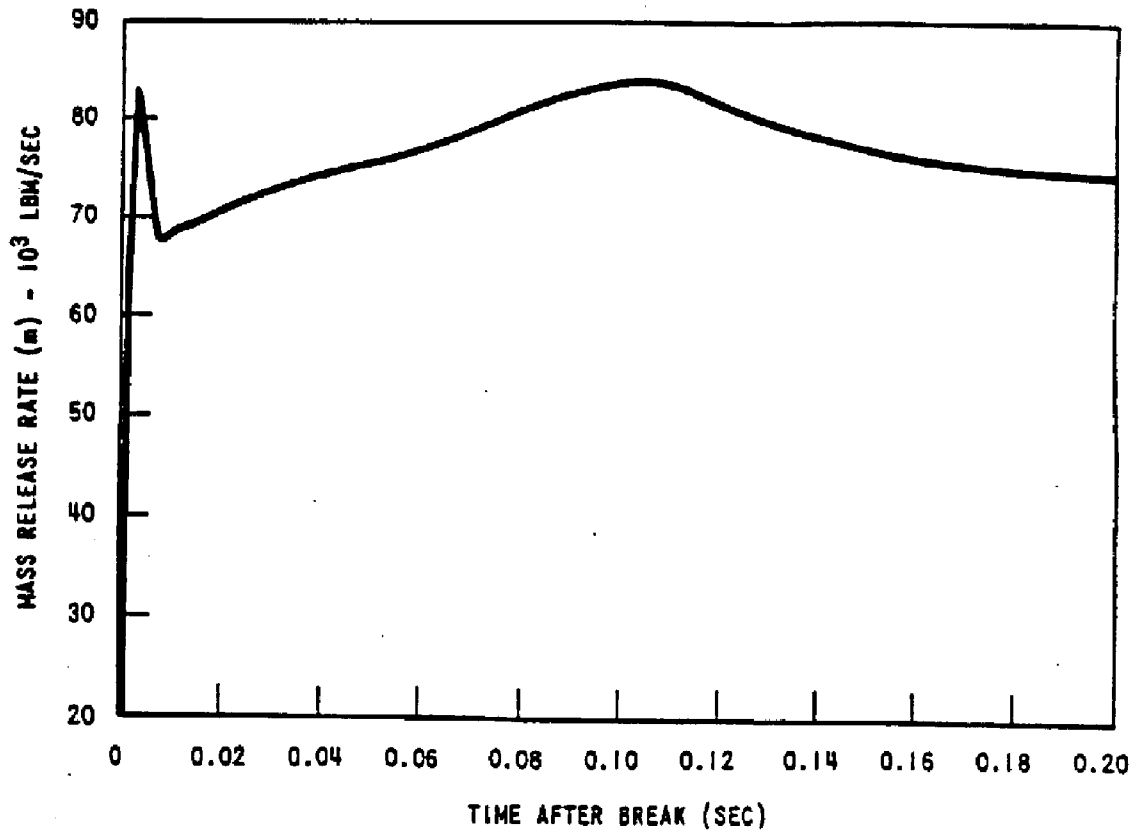


Figure 6-83. Cold Leg Double Ended Guillotine Break

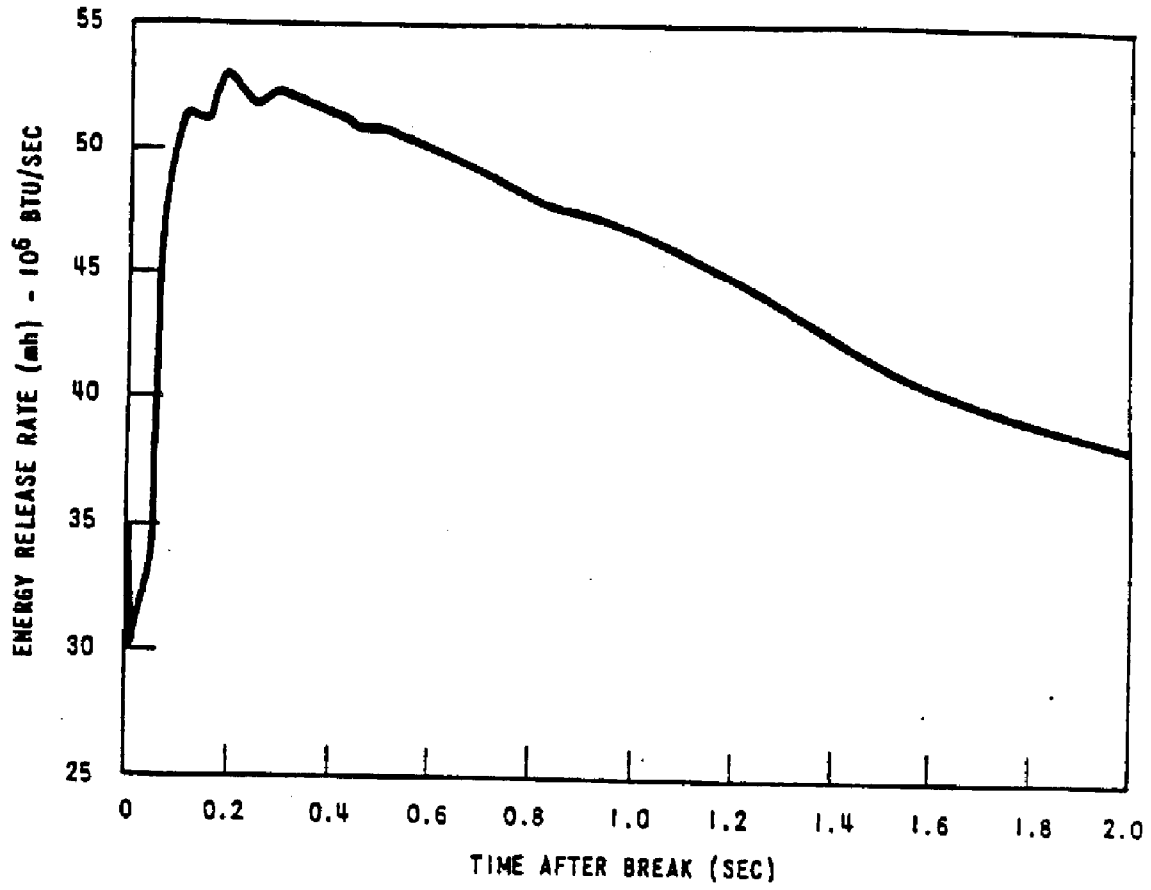


Figure 6-84. Cold Leg Double Ended Guillotine Break

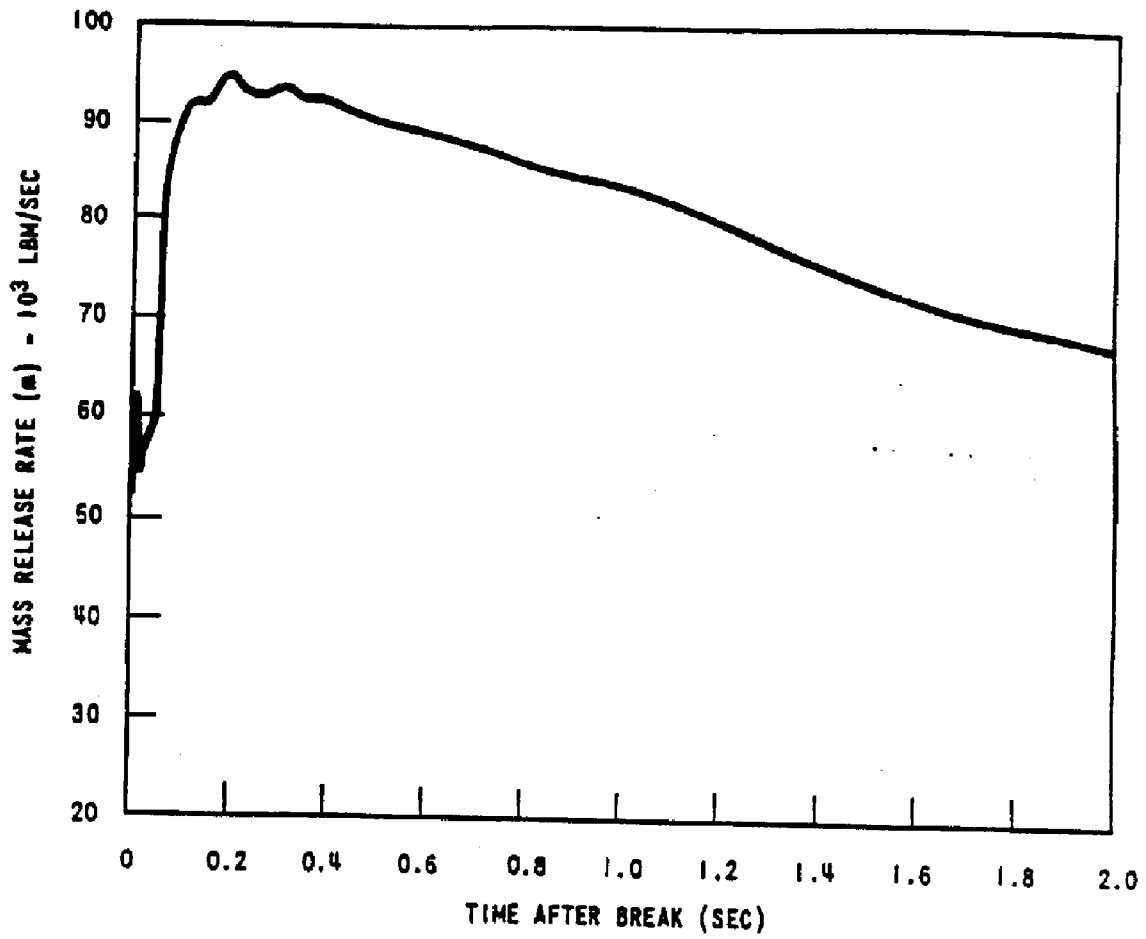


Figure 6-85. Hot Leg Single Ended Split Break

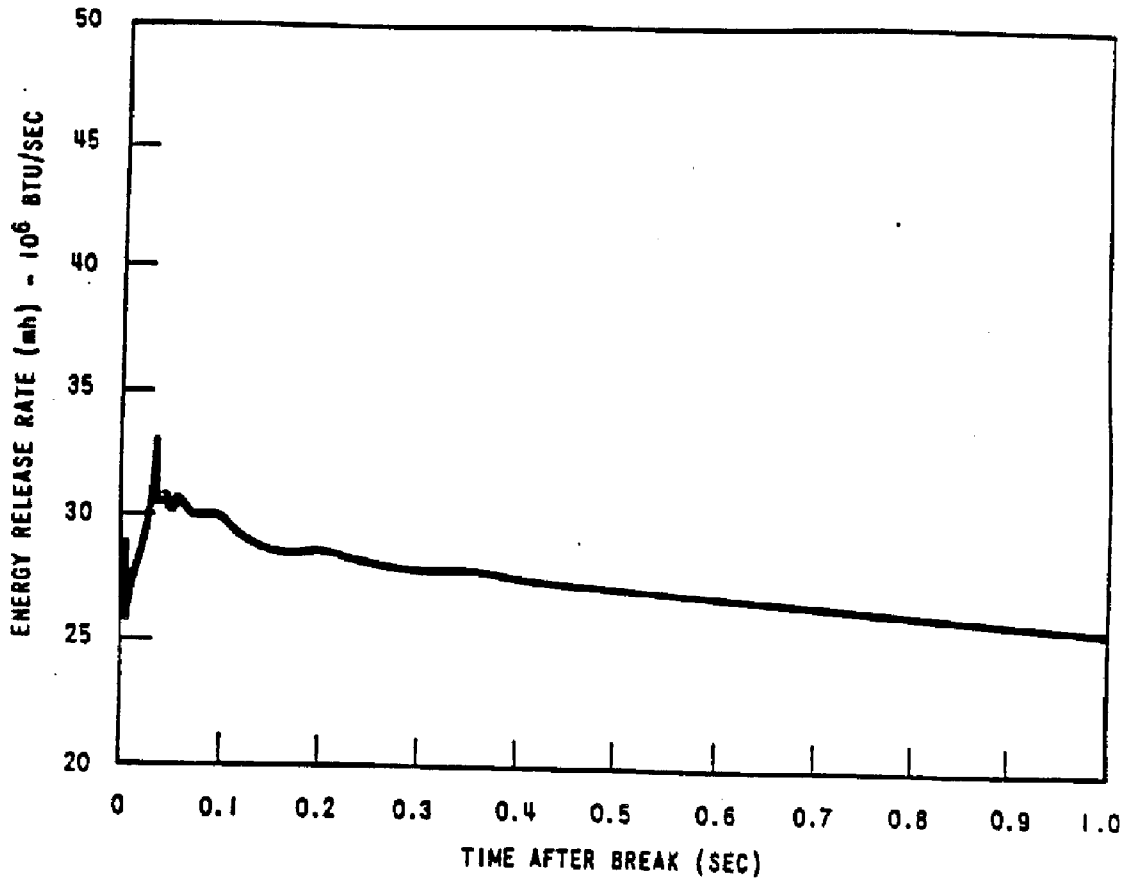


Figure 6-86. Hot Leg Single Ended Split Break

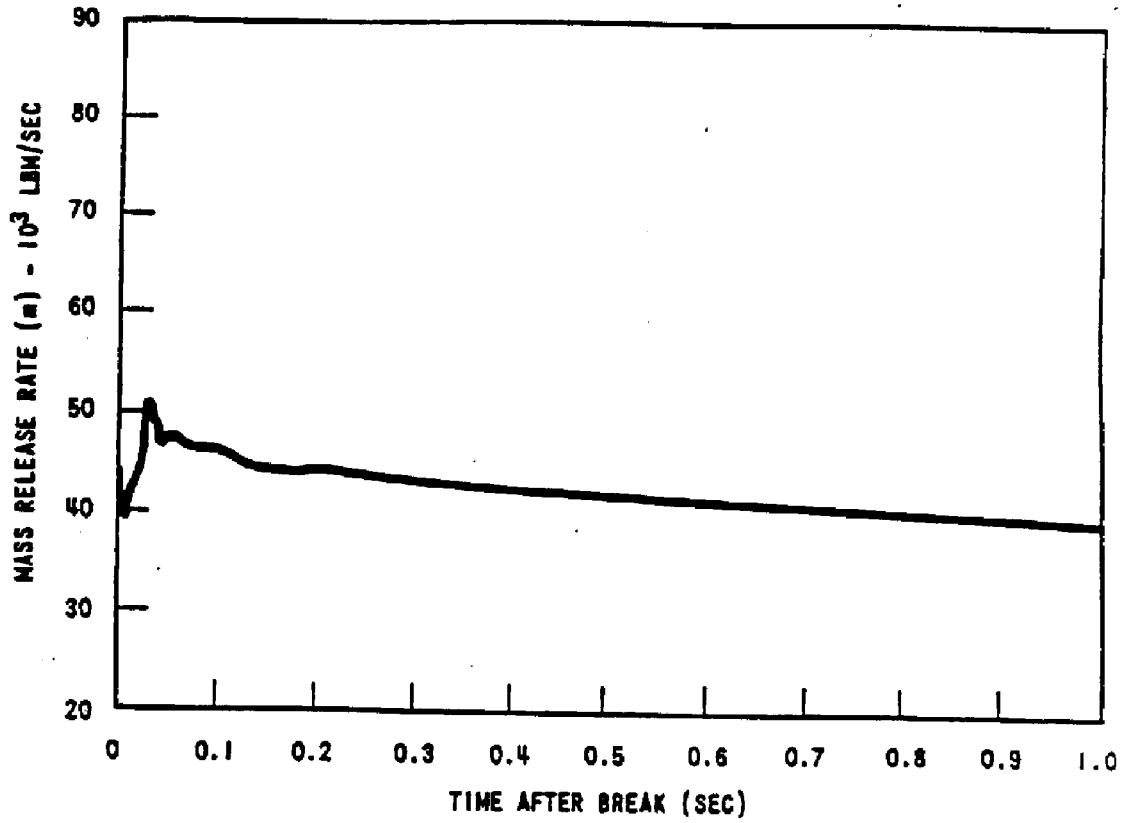


Figure 6-87. Cold Leg Single Ended Split Break

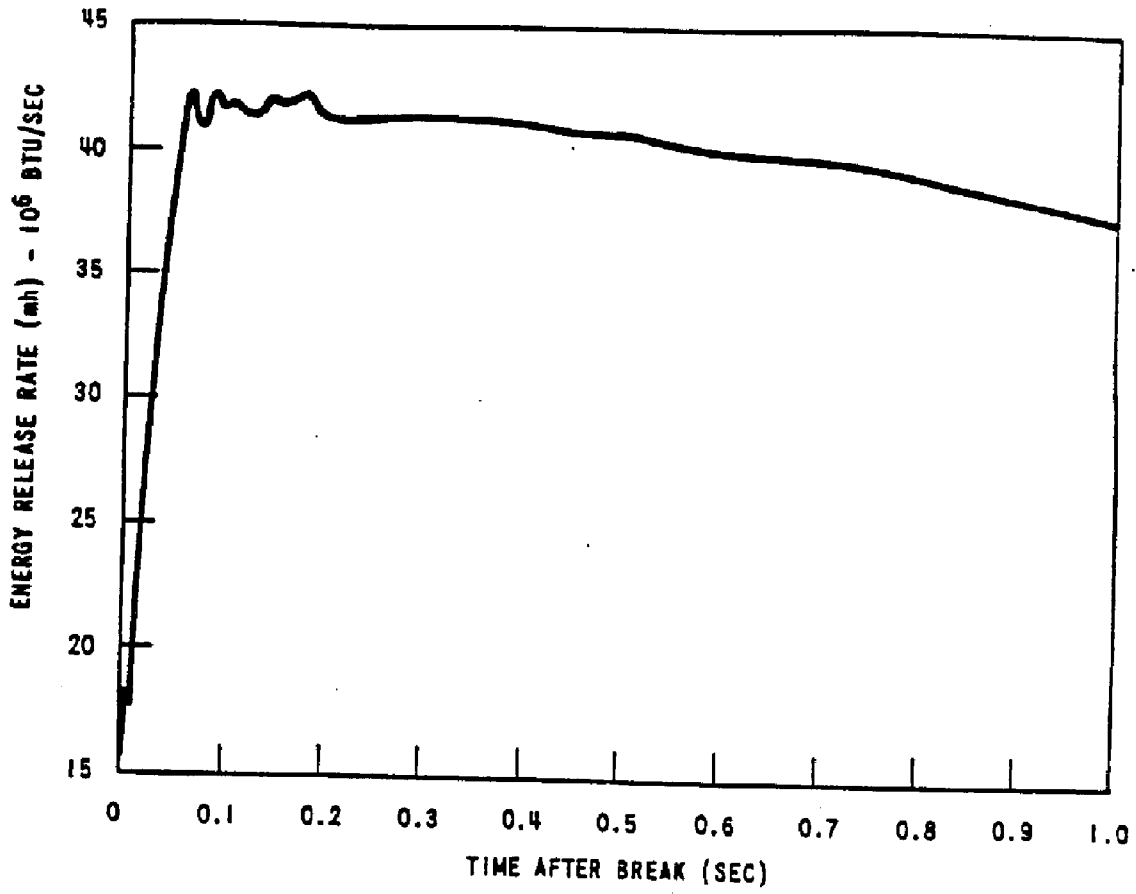


Figure 6-88. Cold Leg Single Ended Split Break

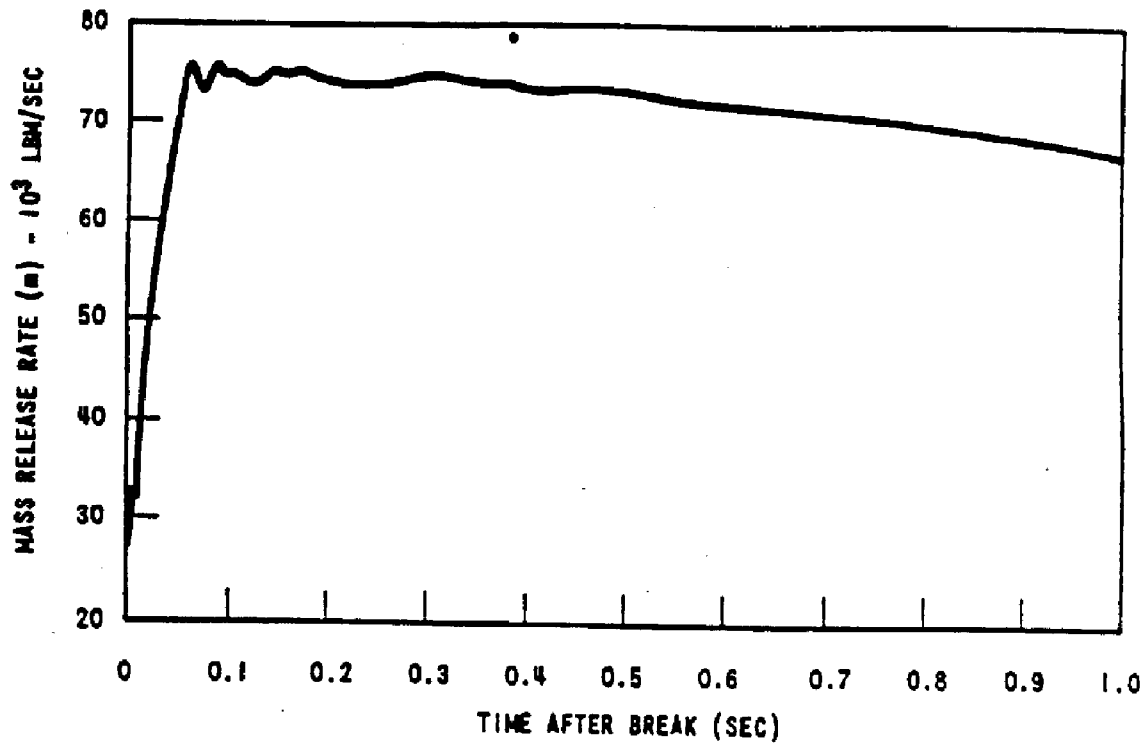


Figure 6-89. Comparison of Satan to Henry Fauske

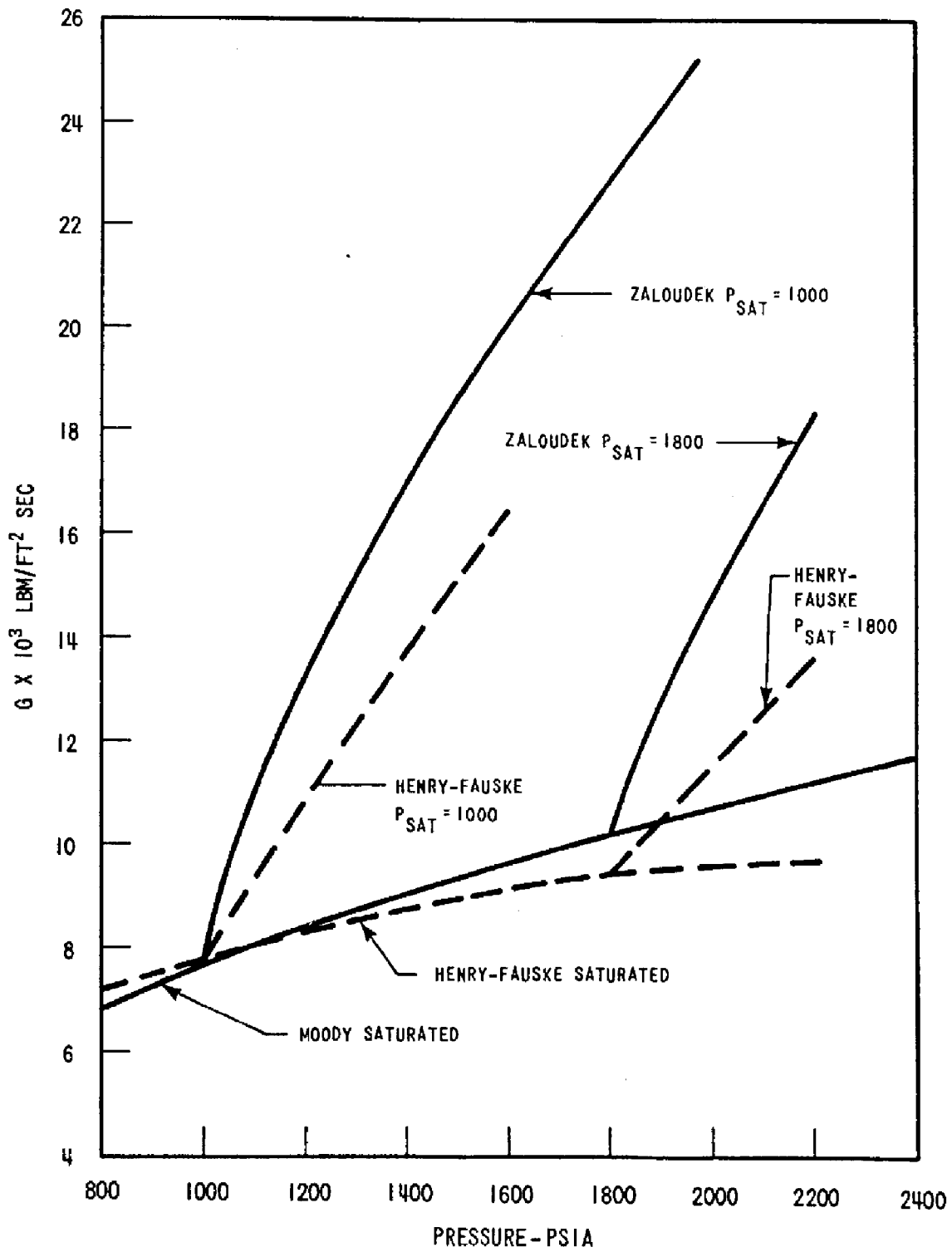


Figure 6-90. Comparison of Satan to Moody Subcooled

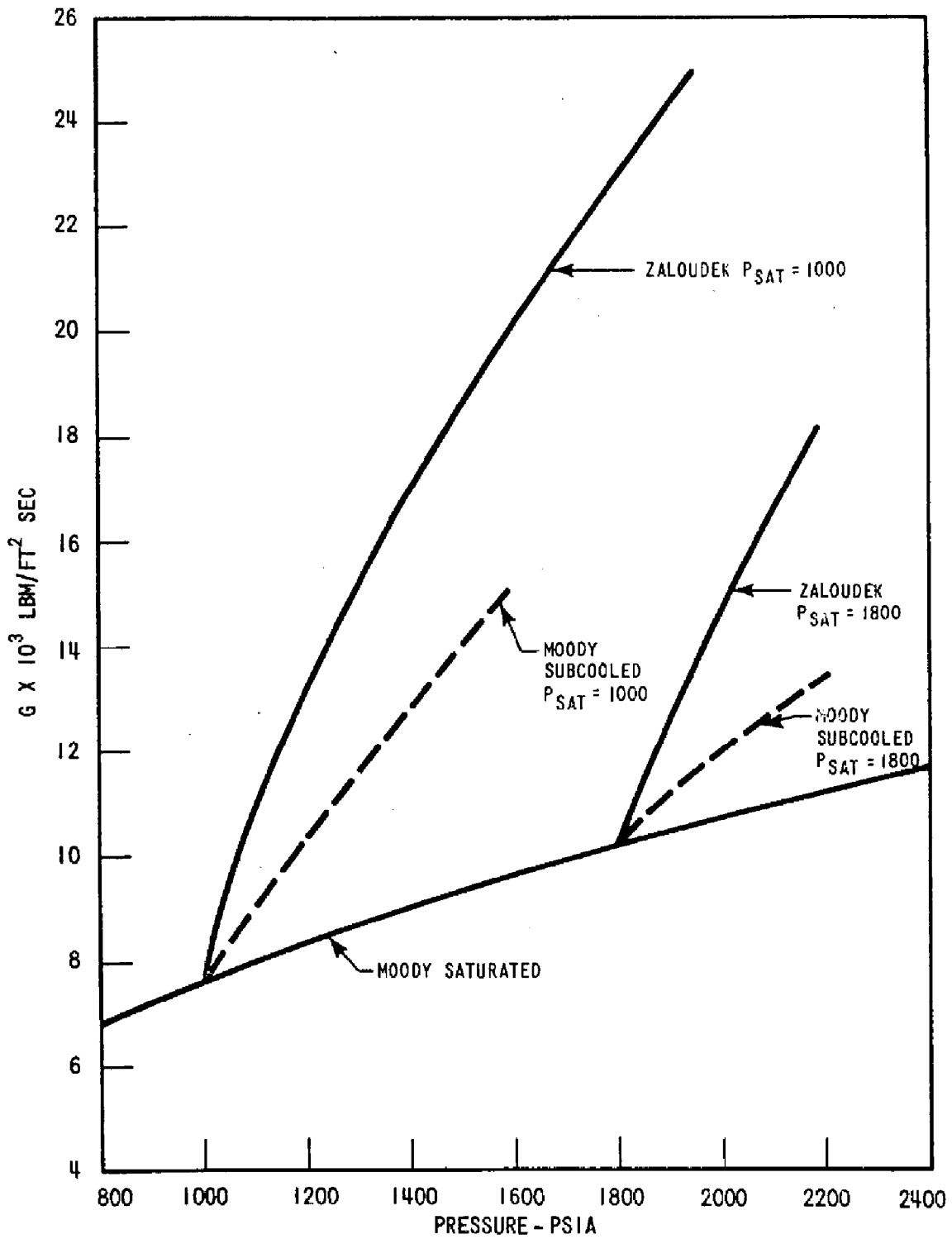


Figure 6-91. Zaloudek Measured Data Versus Modified Zaloudek Correlation

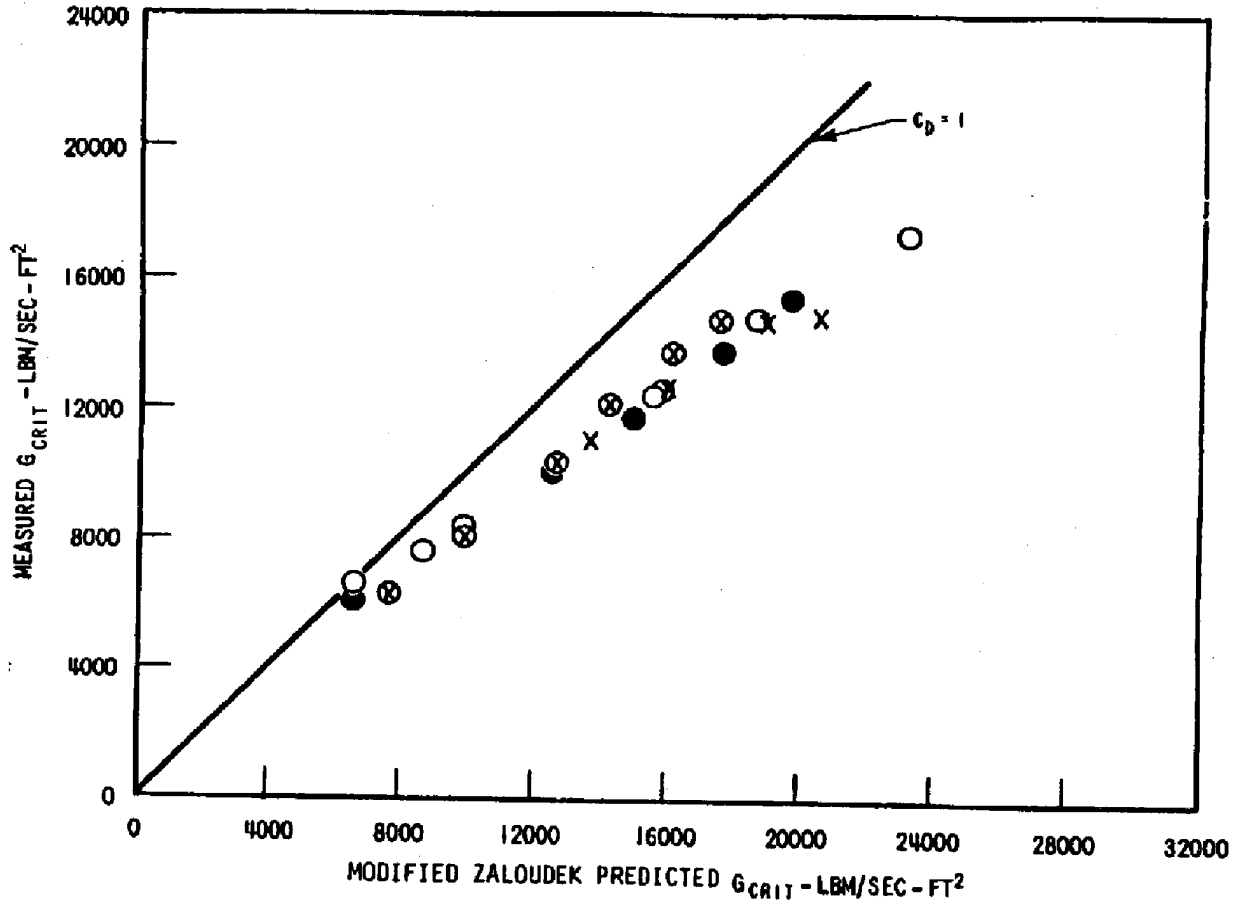


Figure 6-92. Zaloudek Short Tube Data

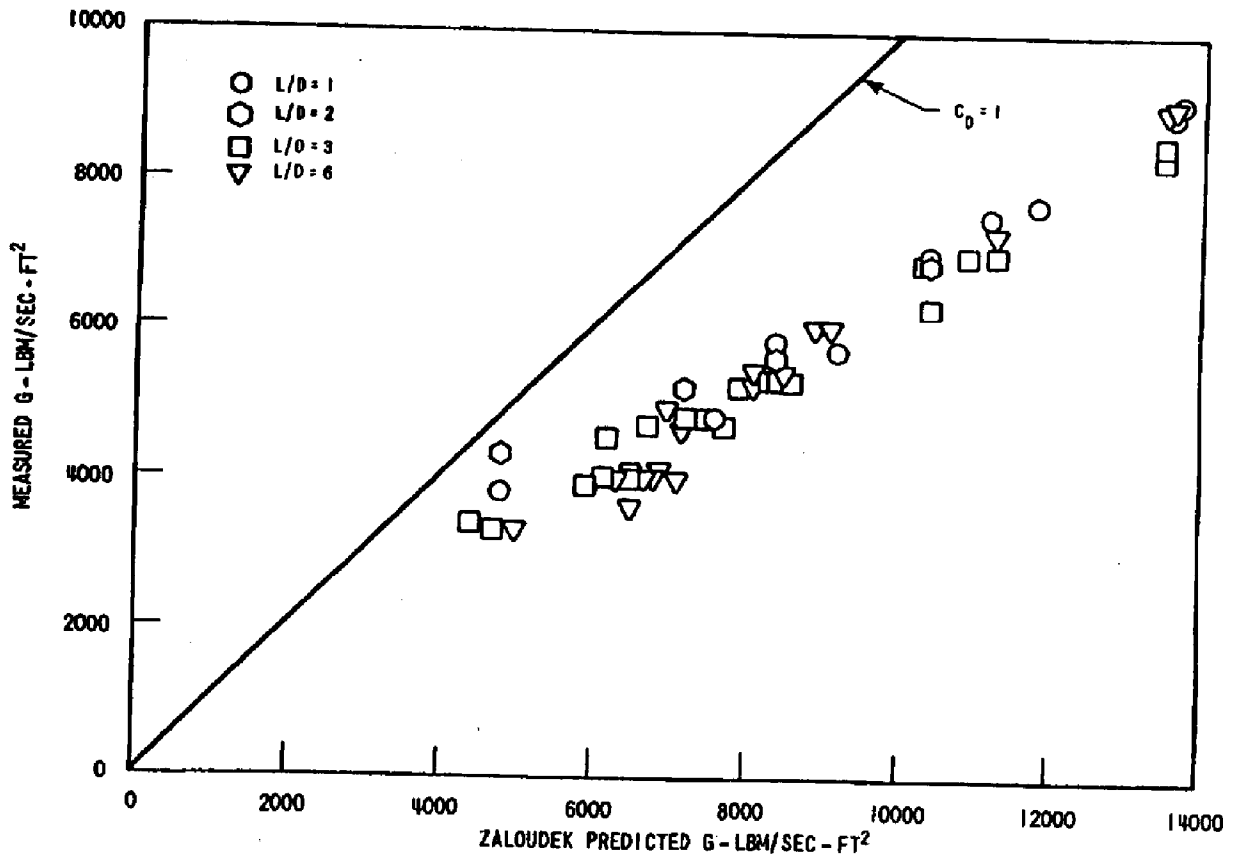


Figure 6-93. Exit Plane Quality as a Function of Upstream Pressure for Saturated Liquid

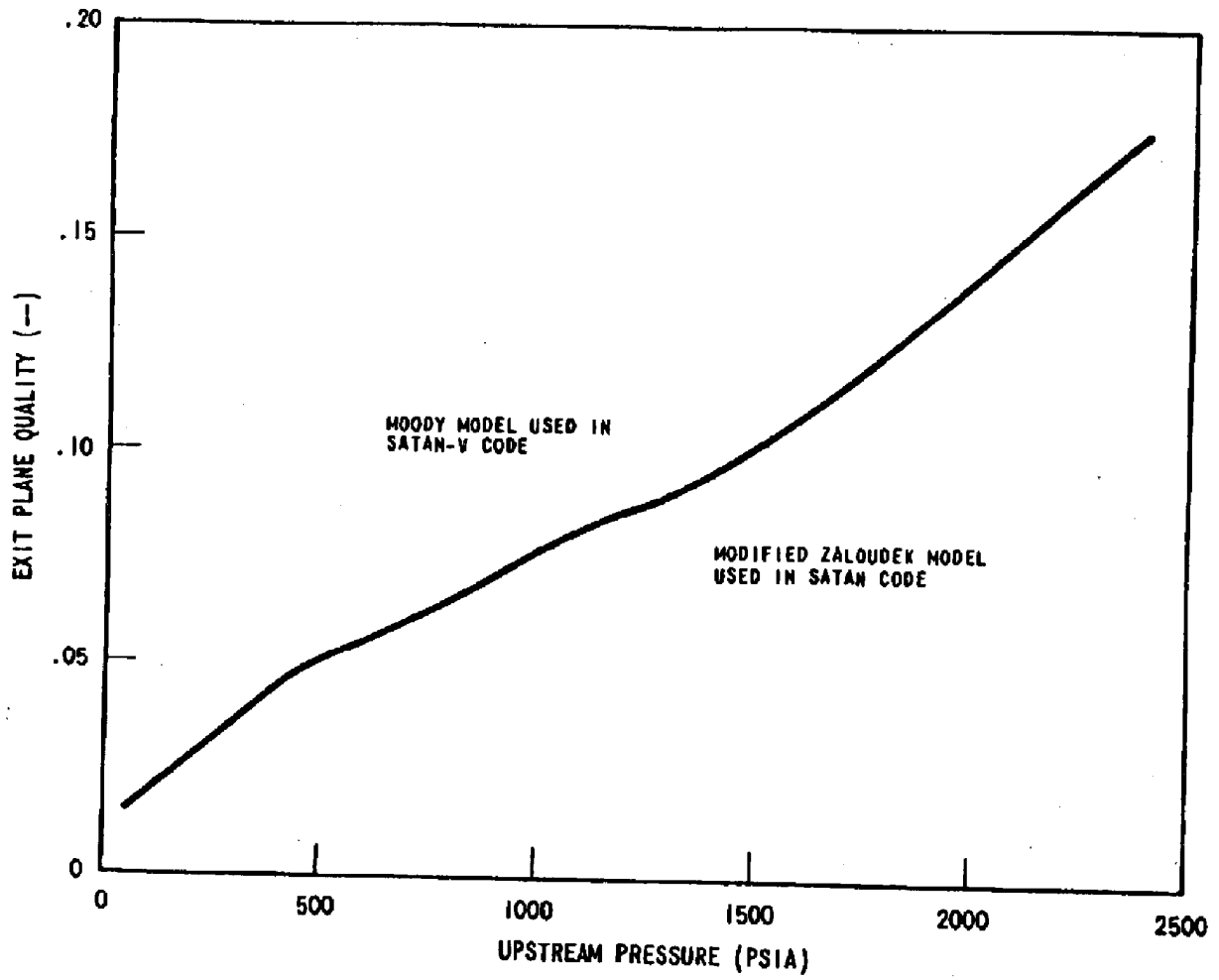


Figure 6-94. Henry ANL 7740 Data

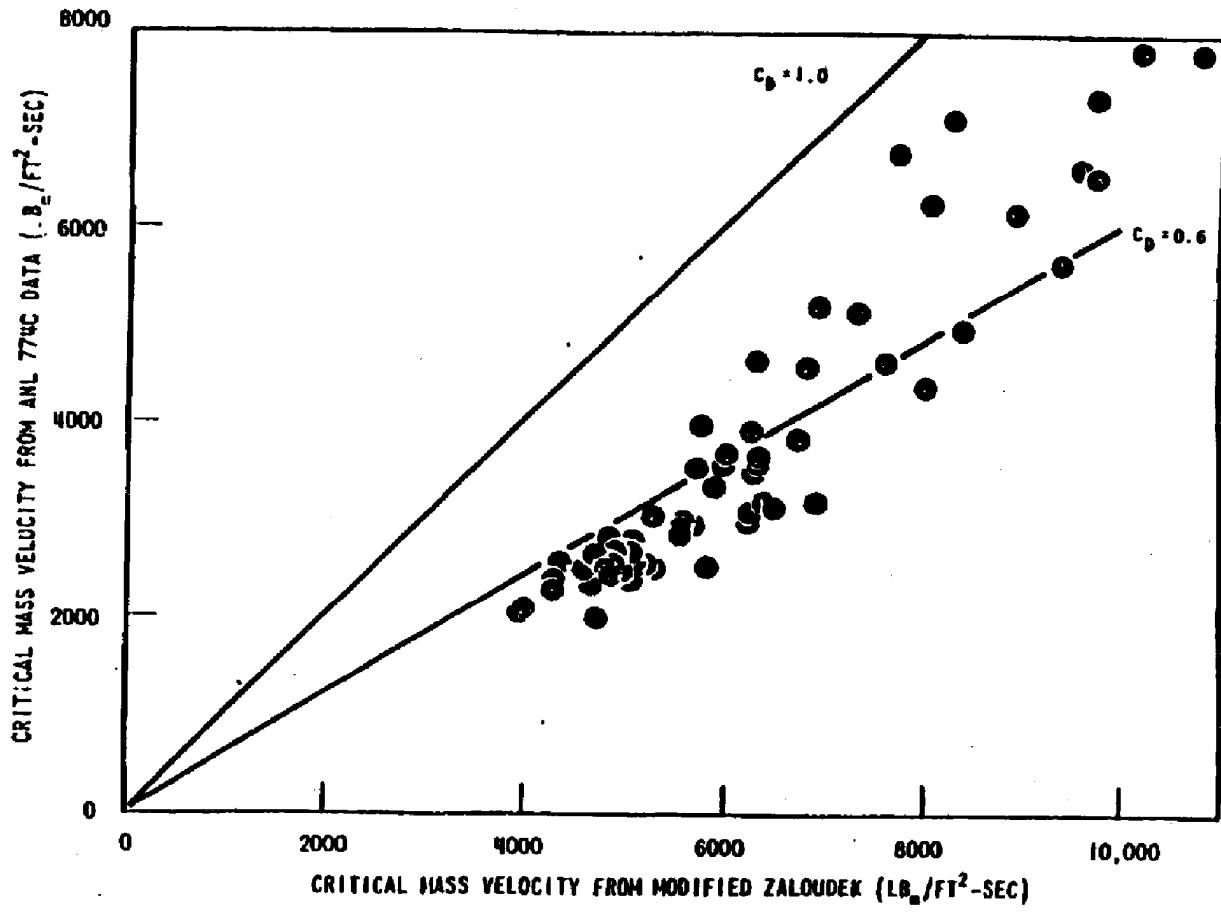


Figure 6-95. Loft Tests 809 and 813 Gage P-1

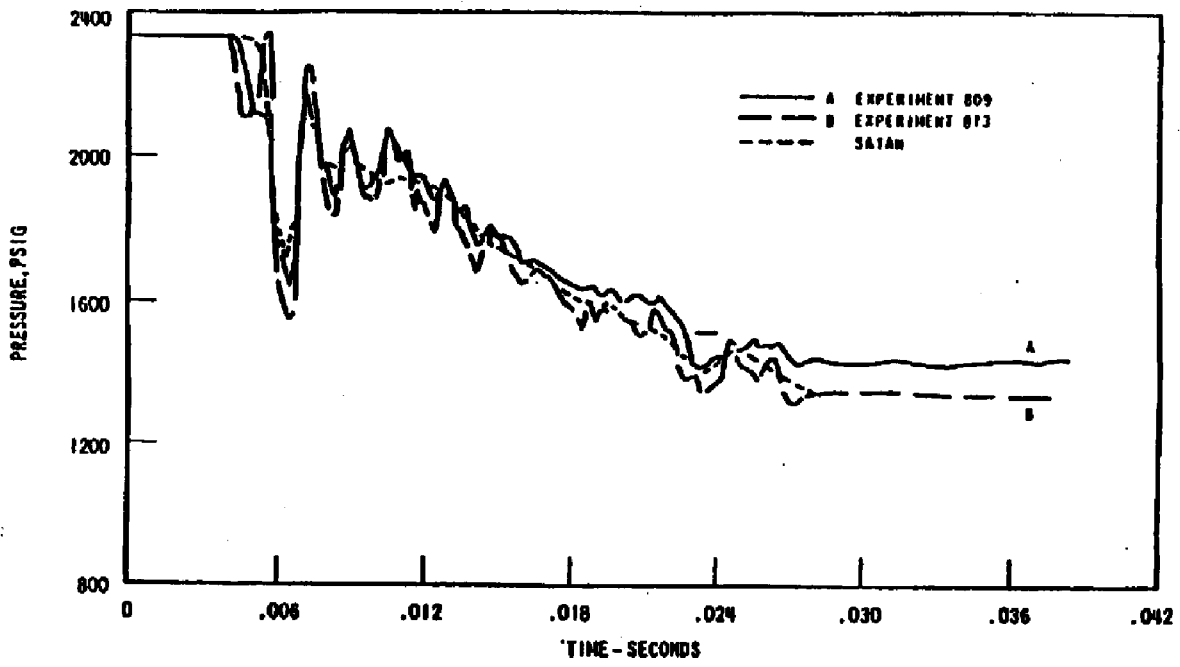


Figure 6-96. Deleted Per 2001 Update

Figure 6-97. Deleted Per 2001 Update

Figure 6-98. Deleted Per 2001 Update

Figure 6-99. Deleted Per 2001 Update

Figure 6-100. Deleted Per 2001 Update

Figure 6-101. Deleted Per 2001 Update

Figure 6-102. Illustration of Choked Flow Characteristics

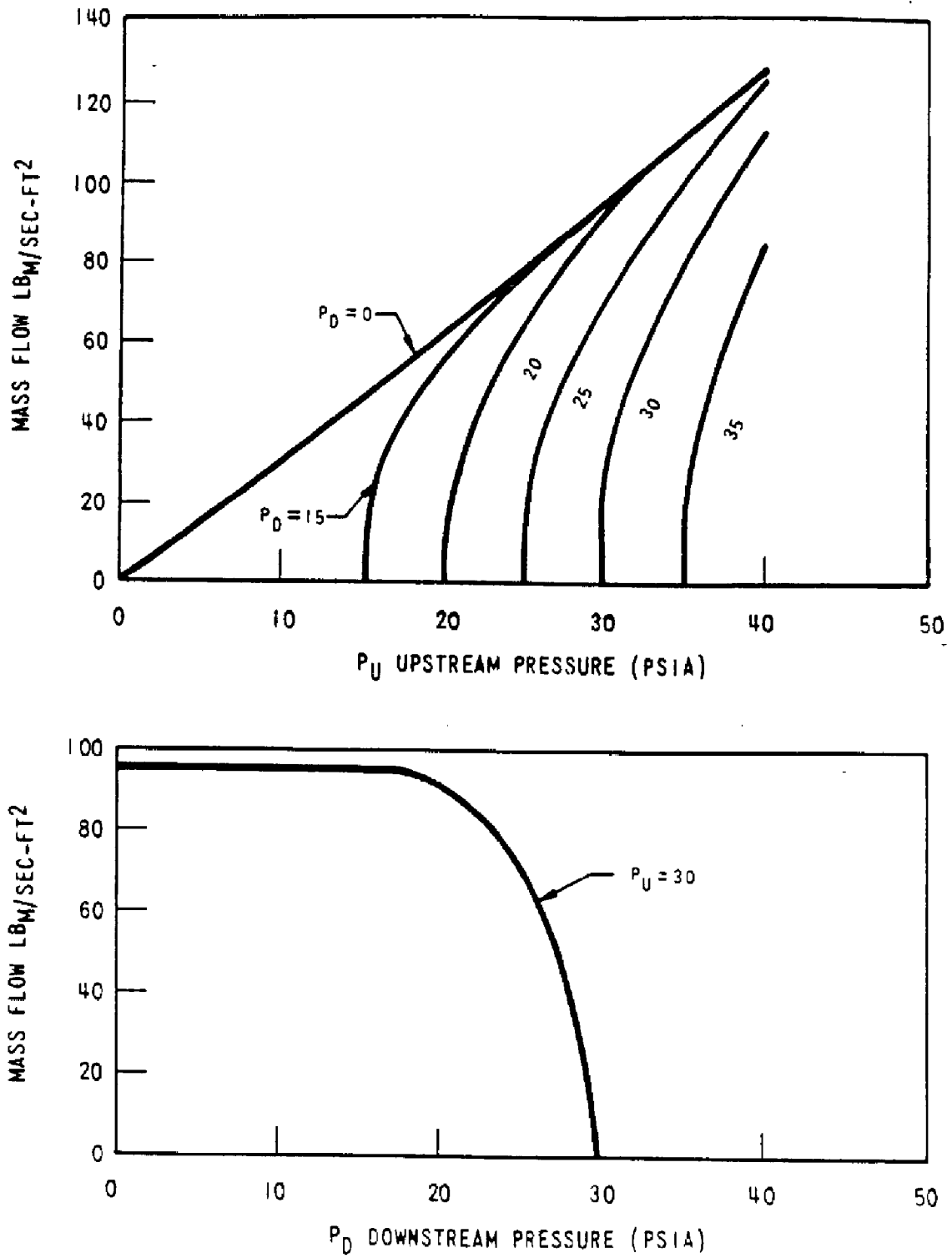


Figure 6-103. Flow Diagram of Containment Air Return Exchange & Hydrogen Skimmer System

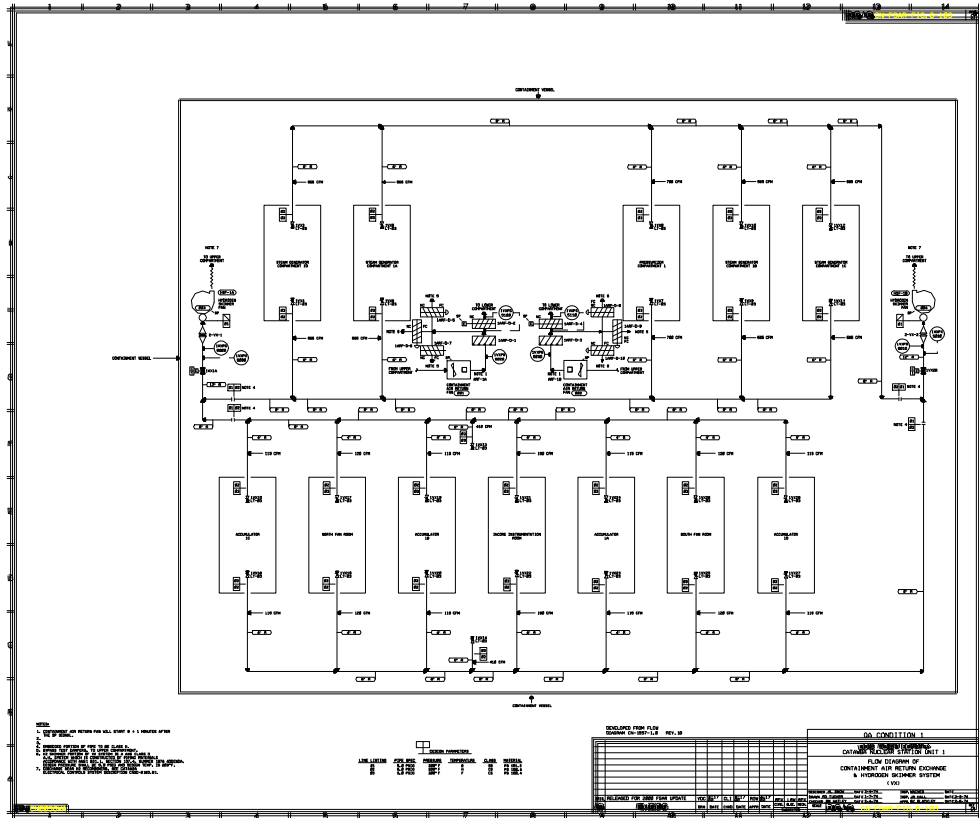


Figure 6-104. Reactor Building Plan at Elev. 565 + 3 Hydrogen Skimmer System

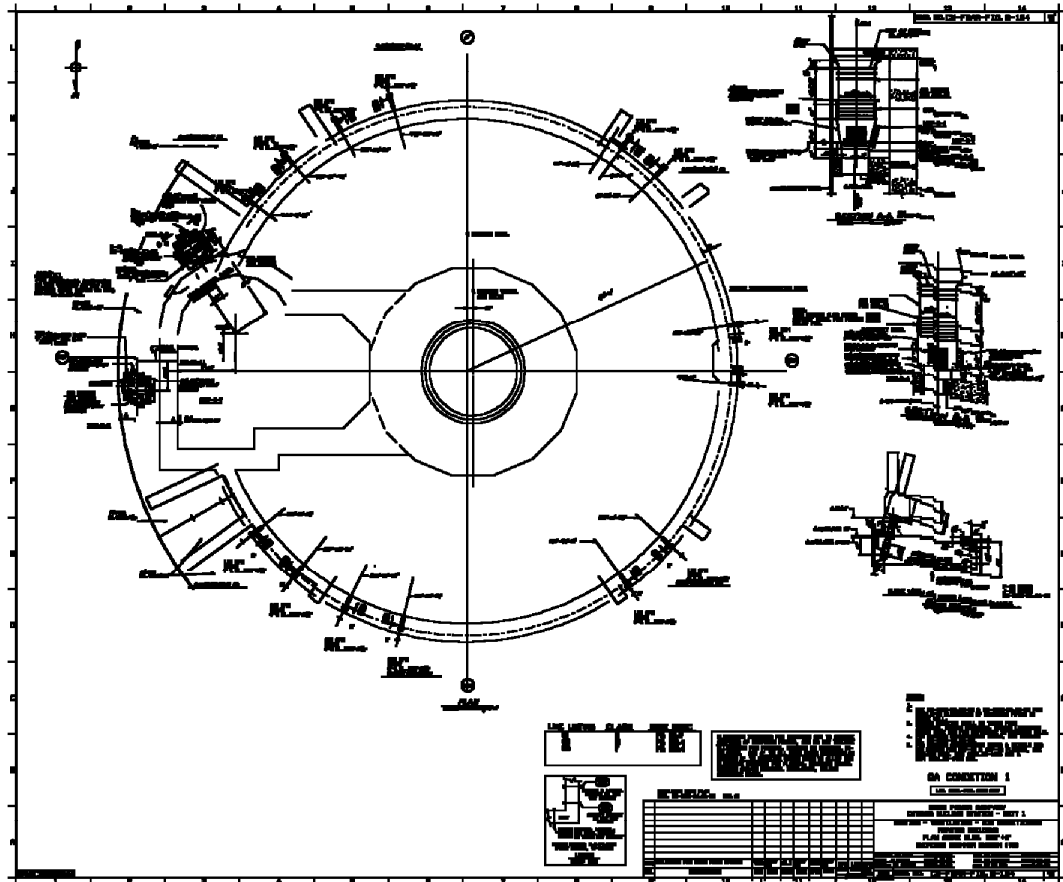


Figure 6-105. Reactor Building Hydrogen Skimmer System

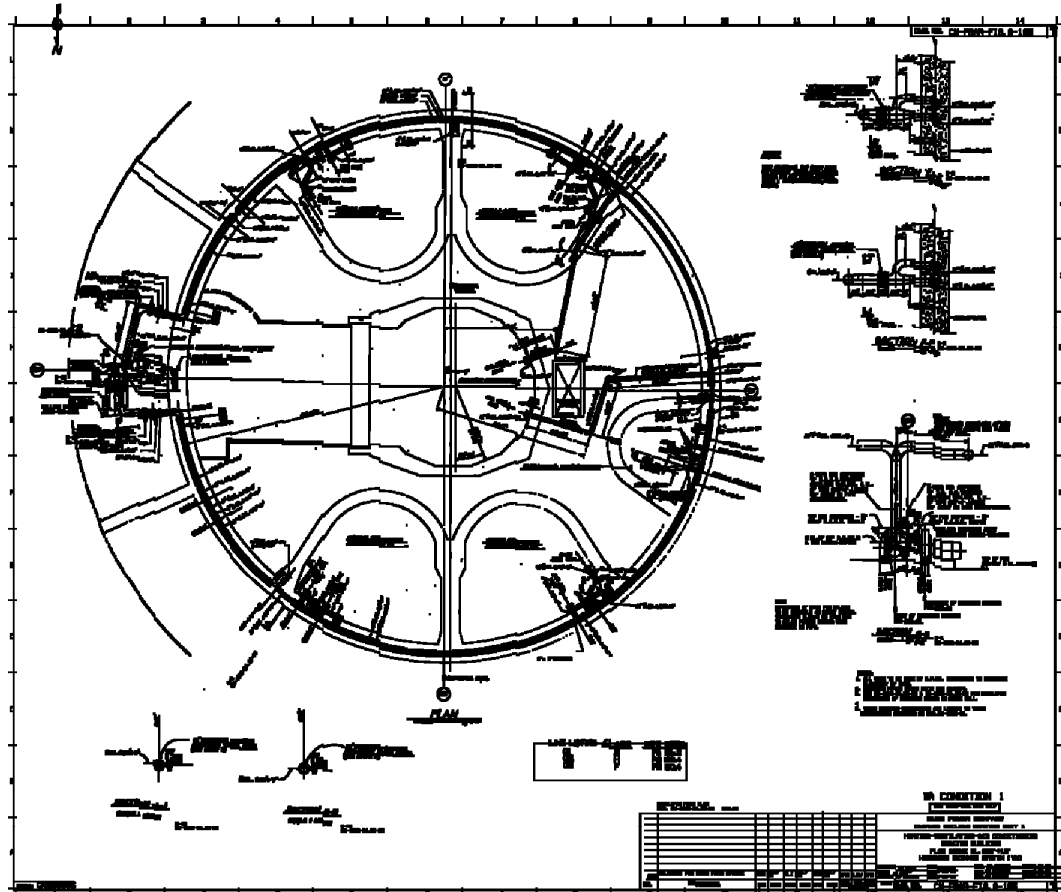


Figure 6-106. Containment Air Return Fan Performance Curve

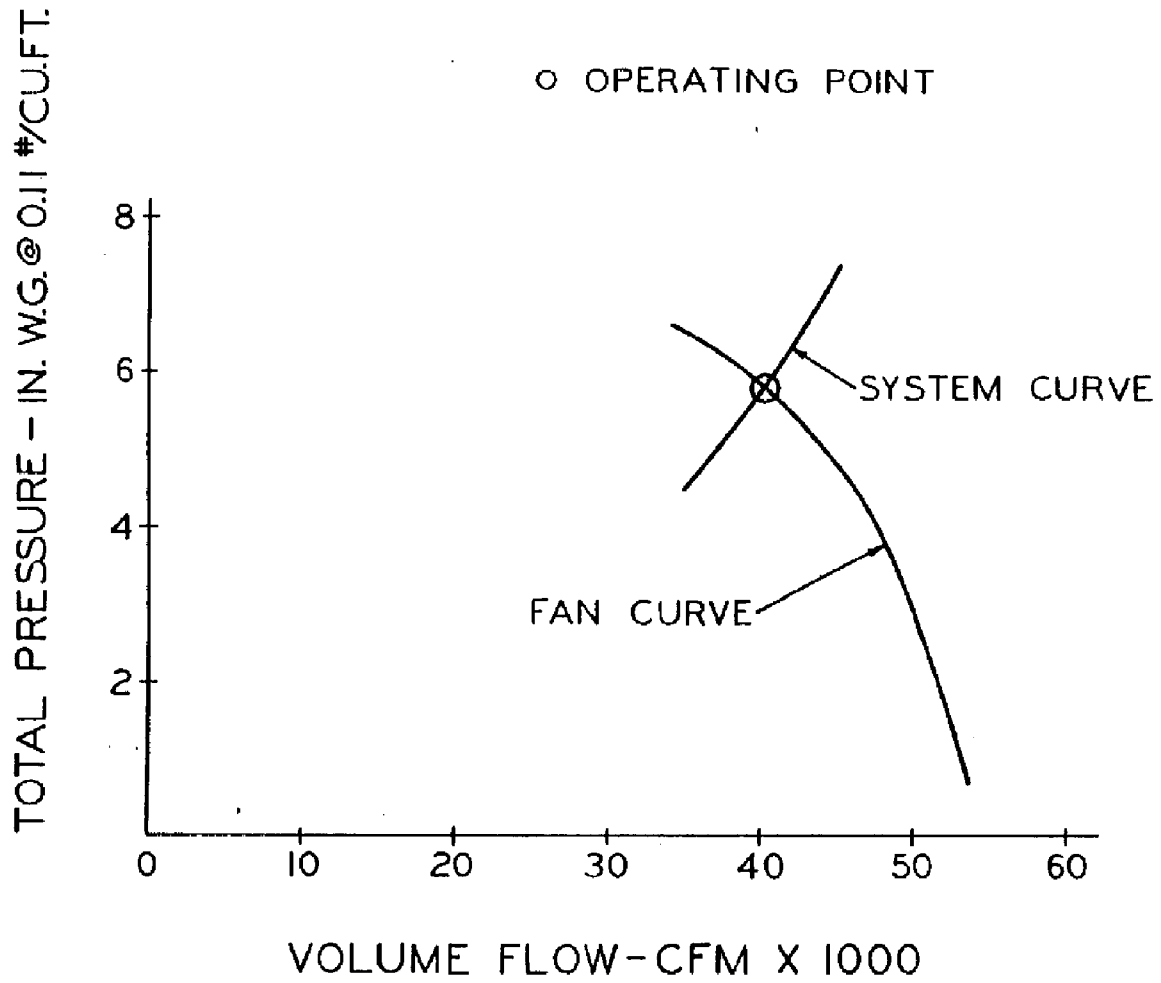


Figure 6-107. Hydrogen Skimmer Fan Performance Curve

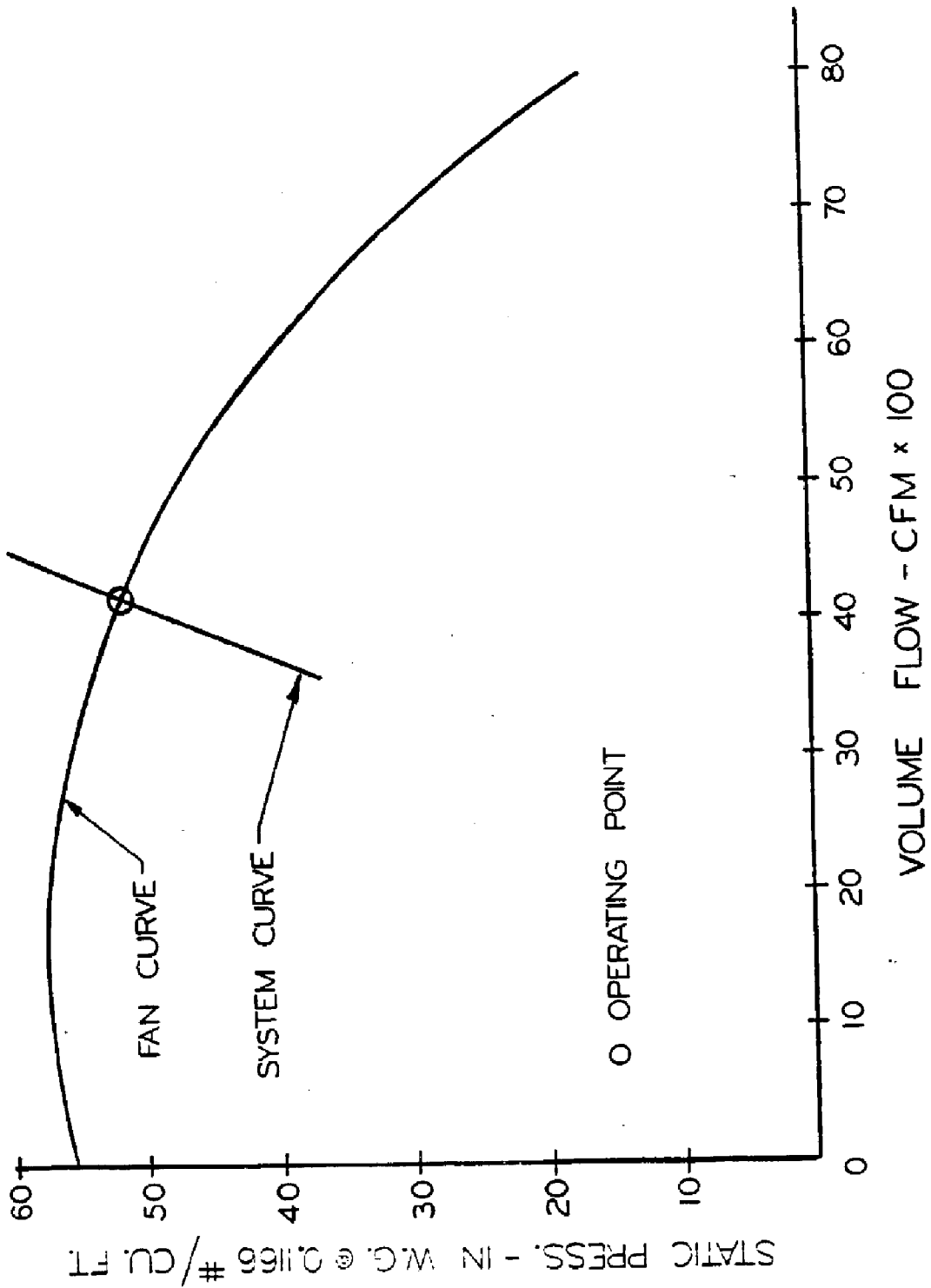


Figure 6-108. Areas of Potential Hydrogen Pockets

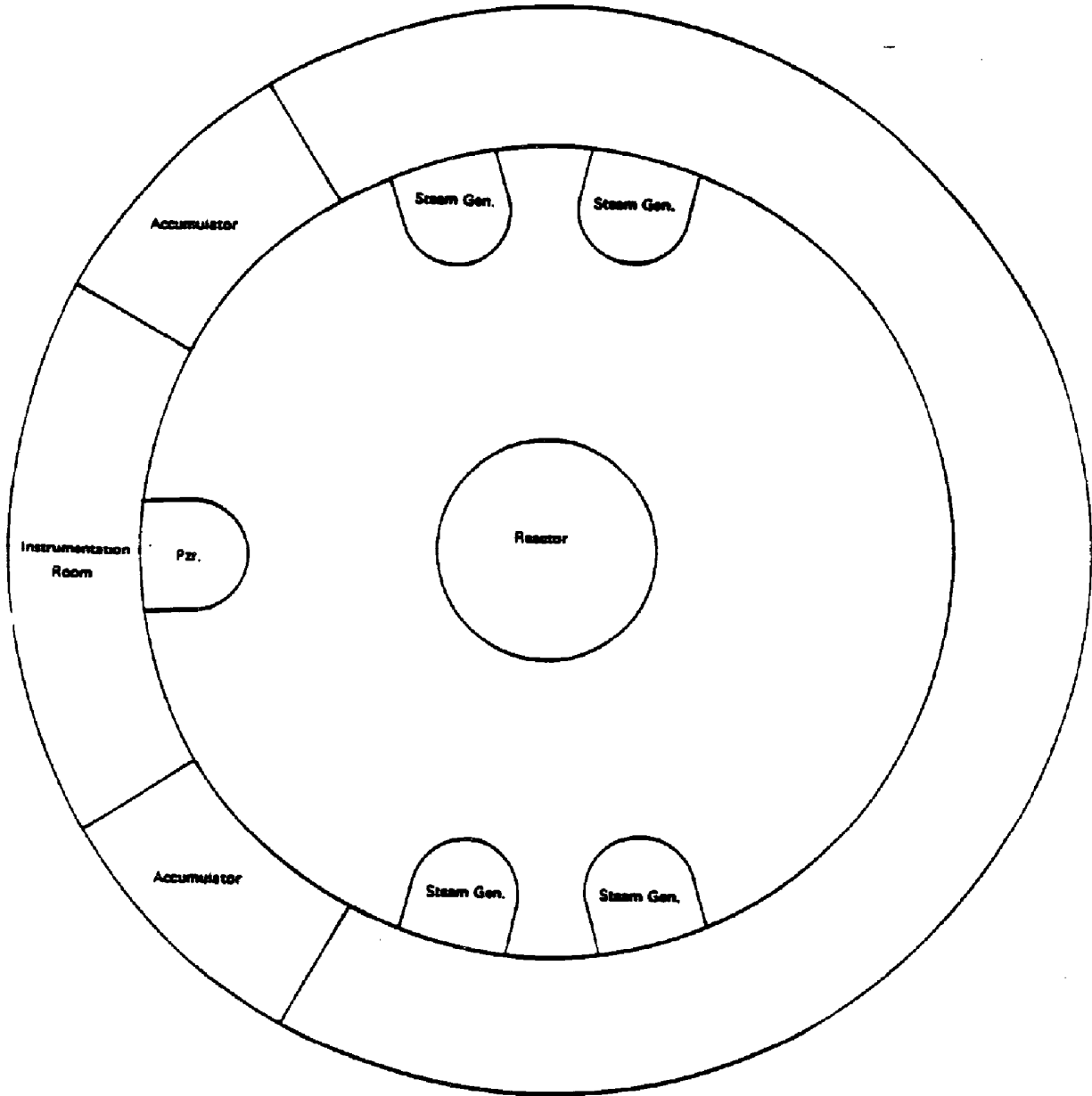


Figure 6-109. Flow Diagram of Containment Spray System

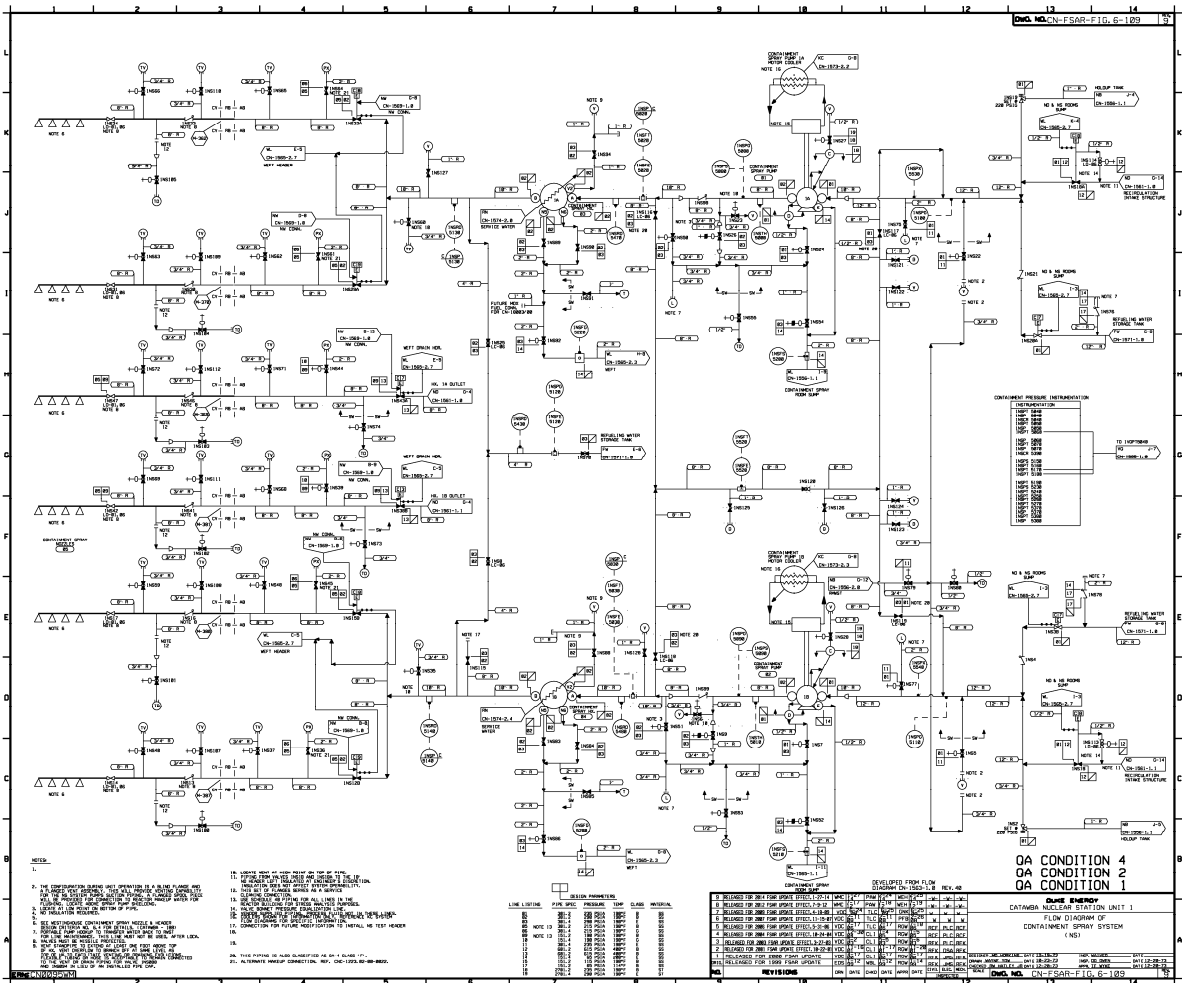


Figure 6-110. Containment Spray Pump Performance Curve

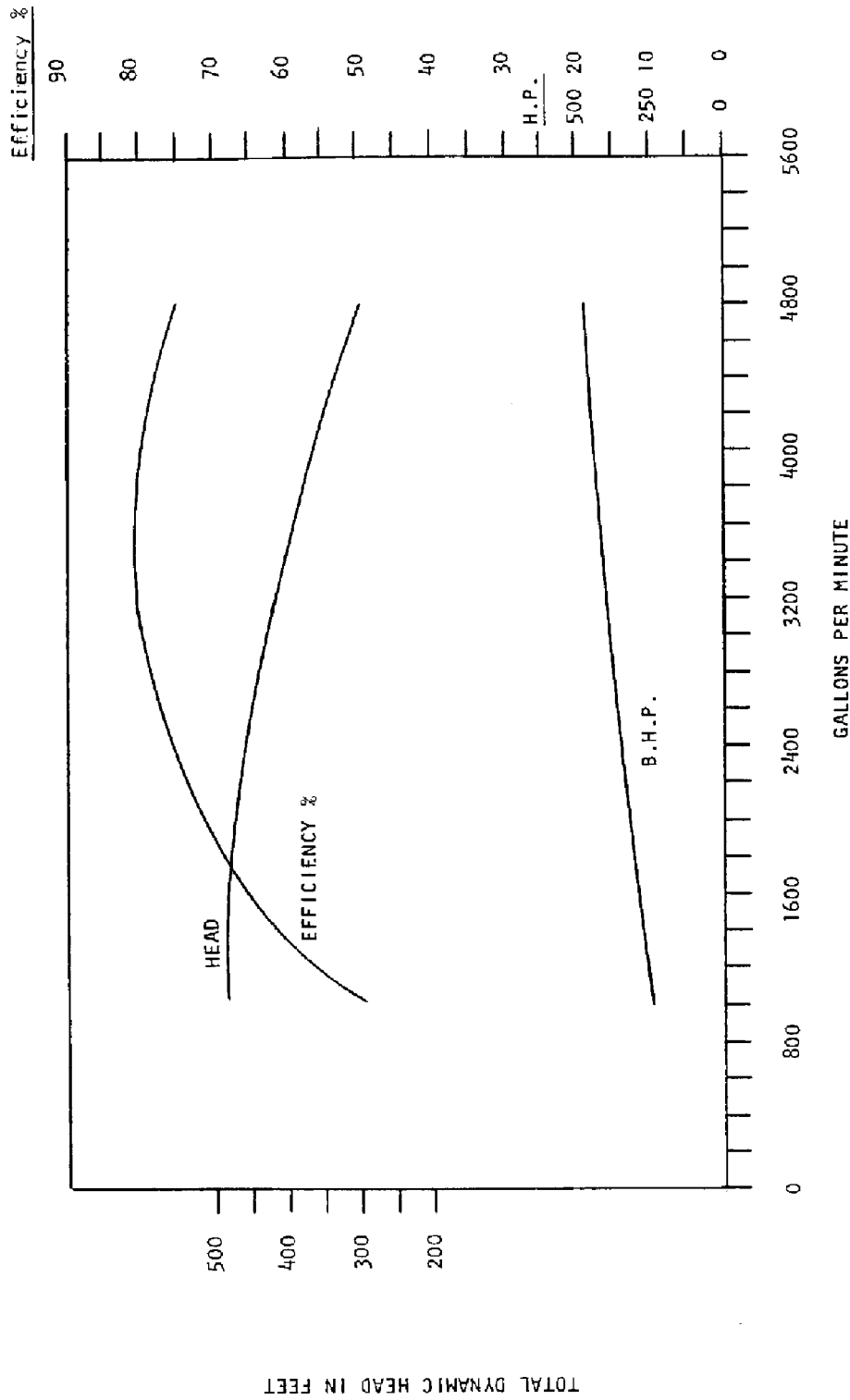


Figure 6-112. Containment Piping Penetration Valve Arrangements

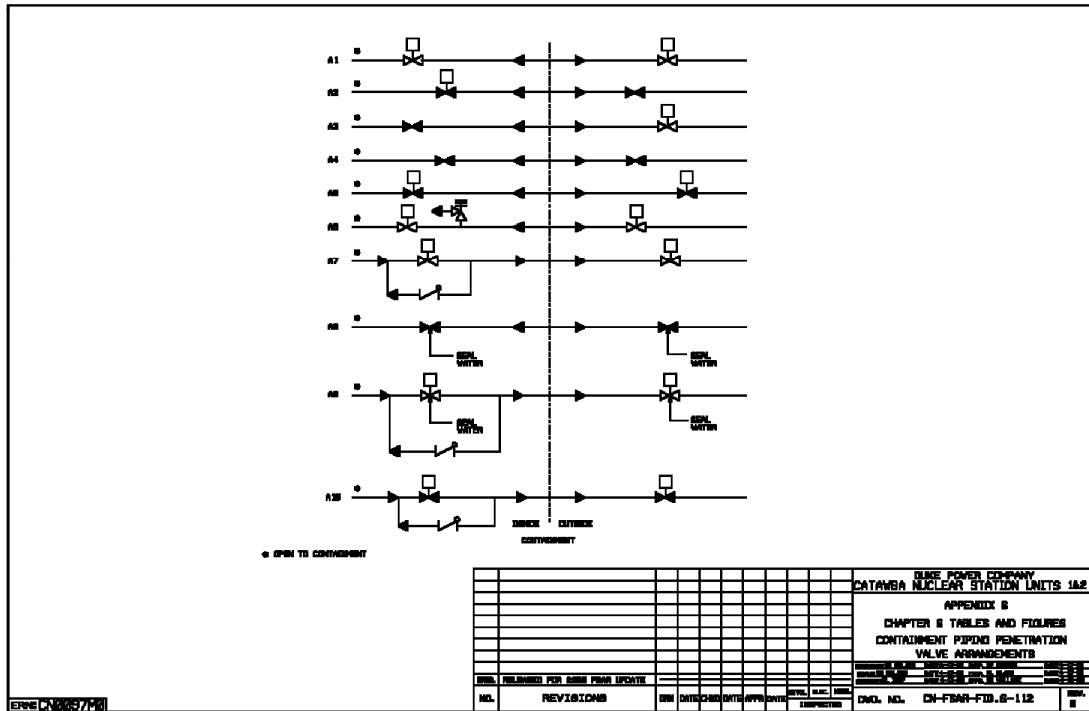


Figure 6-113. Containment Piping Penetration Valve Arrangements

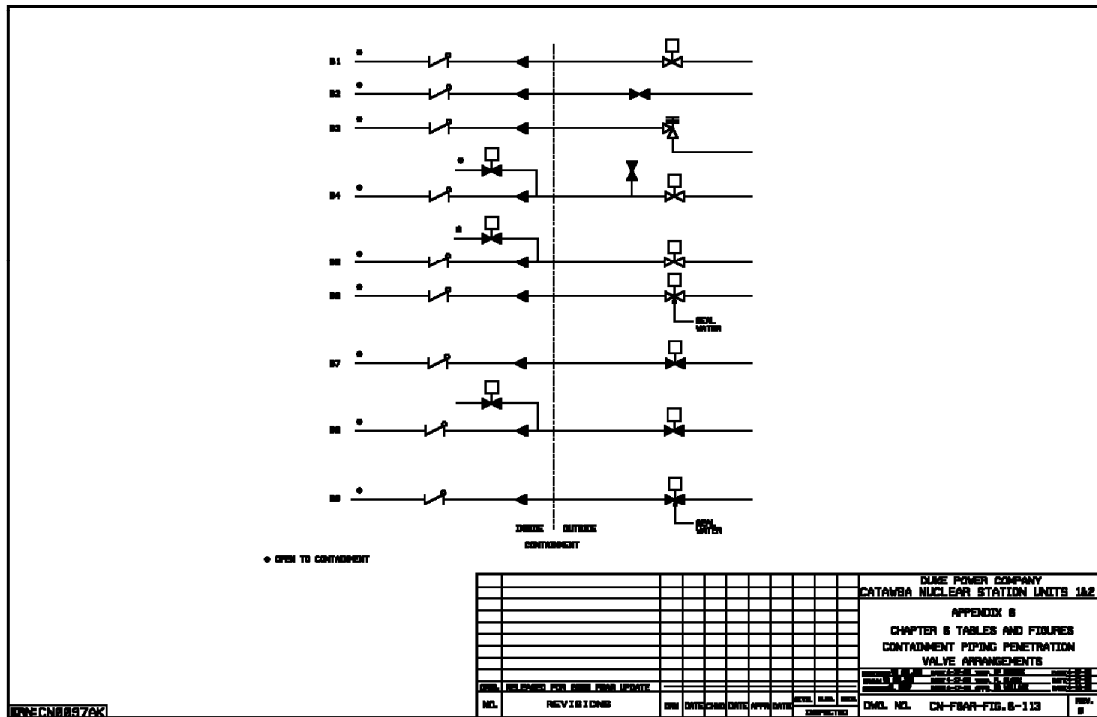


Figure 6-114. Containment Piping Penetration Valve Arrangements

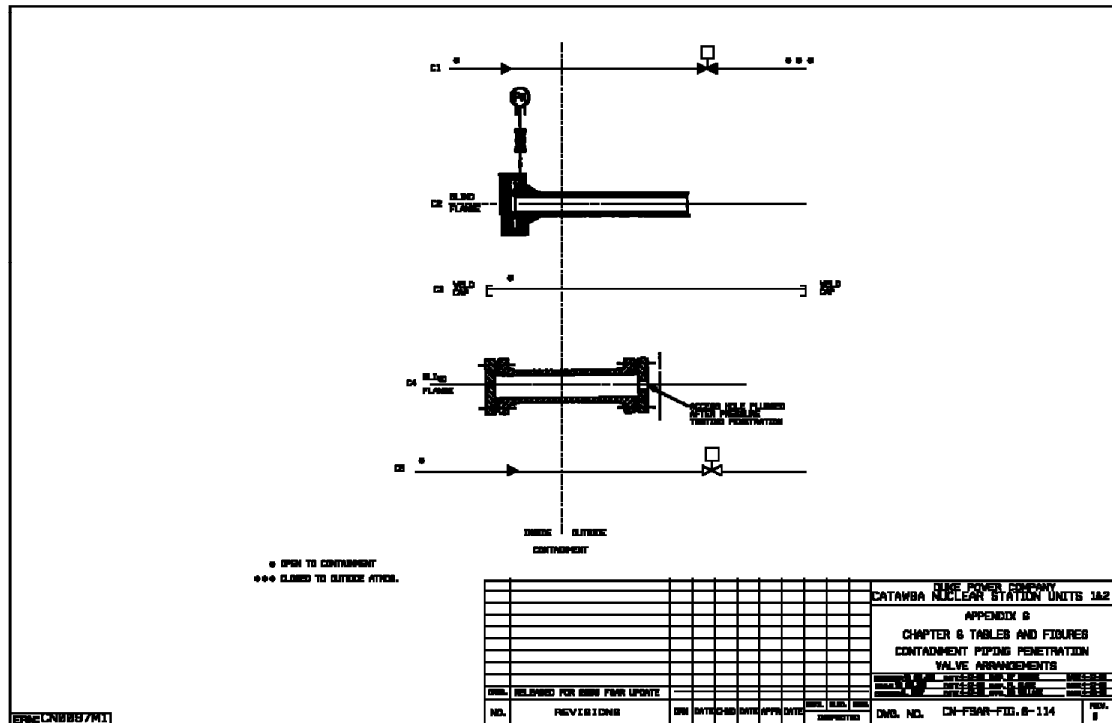


Figure 6-115. Containment Piping Penetration Valve Arrangements

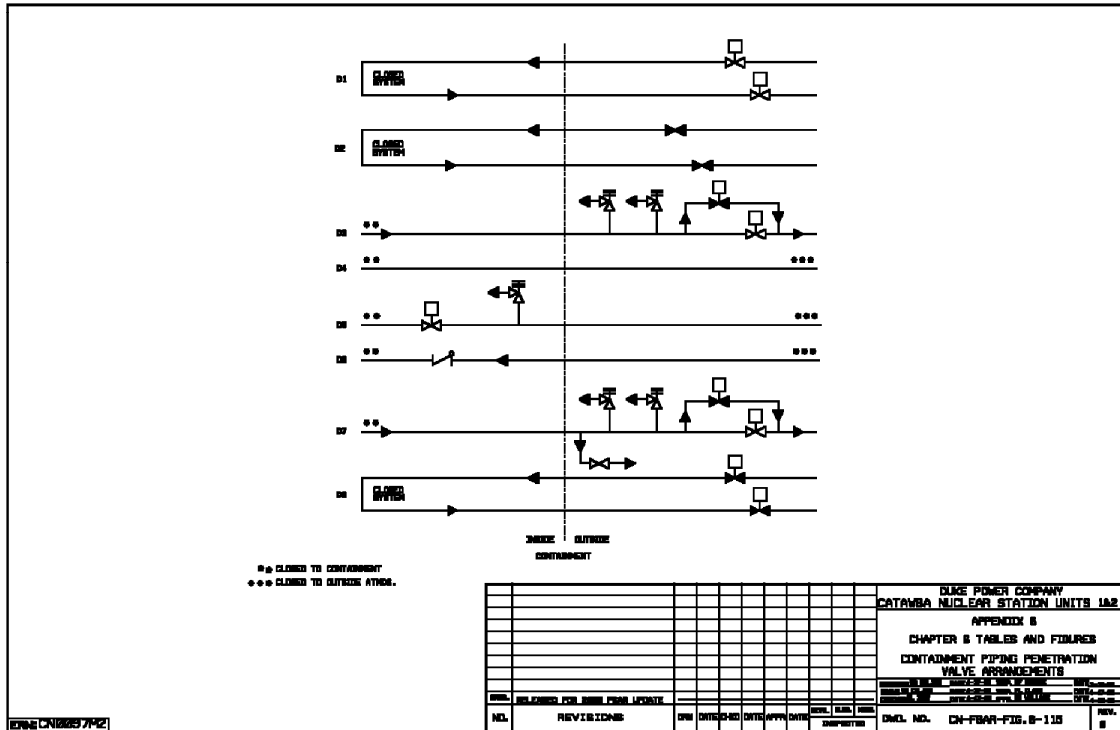
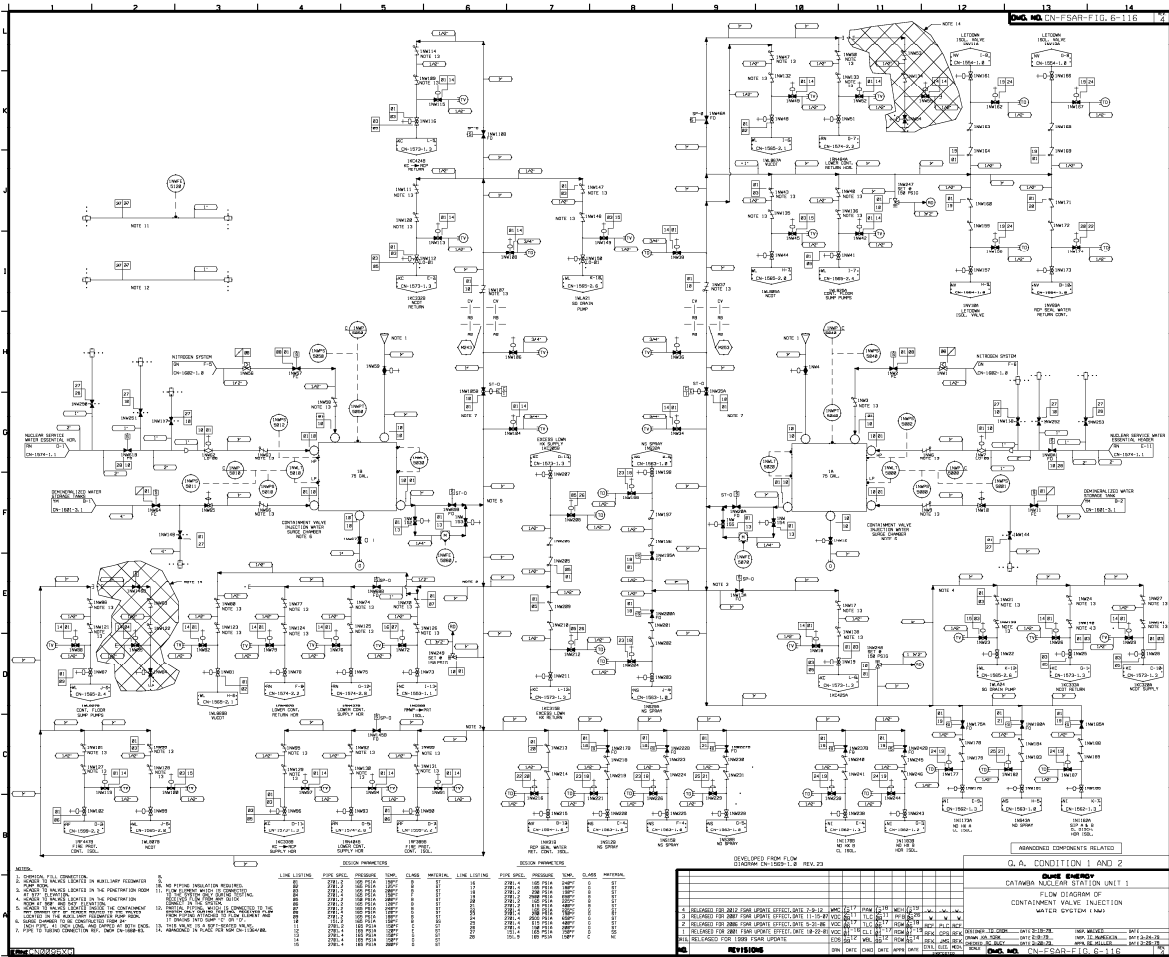


Figure 6-116. Flow Diagram of Containment Valve Injection Water System



NOTES:

1. SYSTEM FULL OPERATIONAL IN ALL UNIT OPERATIONS.
2. SYSTEM FULL OPERATIONAL IN ALL UNIT OPERATIONS.
3. SYSTEM FULL OPERATIONAL IN ALL UNIT OPERATIONS.
4. SYSTEM FULL OPERATIONAL IN ALL UNIT OPERATIONS.
5. SYSTEM FULL OPERATIONAL IN ALL UNIT OPERATIONS.
6. SYSTEM FULL OPERATIONAL IN ALL UNIT OPERATIONS.
7. SYSTEM FULL OPERATIONAL IN ALL UNIT OPERATIONS.
8. SYSTEM FULL OPERATIONAL IN ALL UNIT OPERATIONS.
9. SYSTEM FULL OPERATIONAL IN ALL UNIT OPERATIONS.
10. SYSTEM FULL OPERATIONAL IN ALL UNIT OPERATIONS.
11. SYSTEM FULL OPERATIONAL IN ALL UNIT OPERATIONS.
12. SYSTEM FULL OPERATIONAL IN ALL UNIT OPERATIONS.
13. SYSTEM FULL OPERATIONAL IN ALL UNIT OPERATIONS.
14. SYSTEM FULL OPERATIONAL IN ALL UNIT OPERATIONS.

LINE LISTING	LINE NO.	SIZE	MATERIAL	LINE LISTING	LINE NO.	SIZE	MATERIAL
1000	1000	12"	304 SS	1000	1000	12"	304 SS
1001	1001	12"	304 SS	1001	1001	12"	304 SS
1002	1002	12"	304 SS	1002	1002	12"	304 SS
1003	1003	12"	304 SS	1003	1003	12"	304 SS
1004	1004	12"	304 SS	1004	1004	12"	304 SS
1005	1005	12"	304 SS	1005	1005	12"	304 SS
1006	1006	12"	304 SS	1006	1006	12"	304 SS
1007	1007	12"	304 SS	1007	1007	12"	304 SS
1008	1008	12"	304 SS	1008	1008	12"	304 SS
1009	1009	12"	304 SS	1009	1009	12"	304 SS
1010	1010	12"	304 SS	1010	1010	12"	304 SS
1011	1011	12"	304 SS	1011	1011	12"	304 SS
1012	1012	12"	304 SS	1012	1012	12"	304 SS
1013	1013	12"	304 SS	1013	1013	12"	304 SS
1014	1014	12"	304 SS	1014	1014	12"	304 SS
1015	1015	12"	304 SS	1015	1015	12"	304 SS
1016	1016	12"	304 SS	1016	1016	12"	304 SS
1017	1017	12"	304 SS	1017	1017	12"	304 SS
1018	1018	12"	304 SS	1018	1018	12"	304 SS
1019	1019	12"	304 SS	1019	1019	12"	304 SS
1020	1020	12"	304 SS	1020	1020	12"	304 SS

SECTION PARAMETERS	SECTION	PARAMETER	VALUE
1000	1000	TEMP	100.0
1001	1001	TEMP	100.0
1002	1002	TEMP	100.0
1003	1003	TEMP	100.0
1004	1004	TEMP	100.0
1005	1005	TEMP	100.0
1006	1006	TEMP	100.0
1007	1007	TEMP	100.0
1008	1008	TEMP	100.0
1009	1009	TEMP	100.0
1010	1010	TEMP	100.0
1011	1011	TEMP	100.0
1012	1012	TEMP	100.0
1013	1013	TEMP	100.0
1014	1014	TEMP	100.0
1015	1015	TEMP	100.0
1016	1016	TEMP	100.0
1017	1017	TEMP	100.0
1018	1018	TEMP	100.0
1019	1019	TEMP	100.0
1020	1020	TEMP	100.0

REVISIONS	NO.	DATE	BY	APP.	DESCRIPTION
1	1	01/15/88	W. J. BROWN	W. J. BROWN	INITIAL RELEASE FOR 1988 YEAR UPDATES
2	2	01/15/88	W. J. BROWN	W. J. BROWN	INITIAL RELEASE FOR 1988 YEAR UPDATES
3	3	01/15/88	W. J. BROWN	W. J. BROWN	INITIAL RELEASE FOR 1988 YEAR UPDATES
4	4	01/15/88	W. J. BROWN	W. J. BROWN	INITIAL RELEASE FOR 1988 YEAR UPDATES
5	5	01/15/88	W. J. BROWN	W. J. BROWN	INITIAL RELEASE FOR 1988 YEAR UPDATES
6	6	01/15/88	W. J. BROWN	W. J. BROWN	INITIAL RELEASE FOR 1988 YEAR UPDATES
7	7	01/15/88	W. J. BROWN	W. J. BROWN	INITIAL RELEASE FOR 1988 YEAR UPDATES
8	8	01/15/88	W. J. BROWN	W. J. BROWN	INITIAL RELEASE FOR 1988 YEAR UPDATES
9	9	01/15/88	W. J. BROWN	W. J. BROWN	INITIAL RELEASE FOR 1988 YEAR UPDATES
10	10	01/15/88	W. J. BROWN	W. J. BROWN	INITIAL RELEASE FOR 1988 YEAR UPDATES
11	11	01/15/88	W. J. BROWN	W. J. BROWN	INITIAL RELEASE FOR 1988 YEAR UPDATES
12	12	01/15/88	W. J. BROWN	W. J. BROWN	INITIAL RELEASE FOR 1988 YEAR UPDATES
13	13	01/15/88	W. J. BROWN	W. J. BROWN	INITIAL RELEASE FOR 1988 YEAR UPDATES
14	14	01/15/88	W. J. BROWN	W. J. BROWN	INITIAL RELEASE FOR 1988 YEAR UPDATES
15	15	01/15/88	W. J. BROWN	W. J. BROWN	INITIAL RELEASE FOR 1988 YEAR UPDATES
16	16	01/15/88	W. J. BROWN	W. J. BROWN	INITIAL RELEASE FOR 1988 YEAR UPDATES
17	17	01/15/88	W. J. BROWN	W. J. BROWN	INITIAL RELEASE FOR 1988 YEAR UPDATES
18	18	01/15/88	W. J. BROWN	W. J. BROWN	INITIAL RELEASE FOR 1988 YEAR UPDATES
19	19	01/15/88	W. J. BROWN	W. J. BROWN	INITIAL RELEASE FOR 1988 YEAR UPDATES
20	20	01/15/88	W. J. BROWN	W. J. BROWN	INITIAL RELEASE FOR 1988 YEAR UPDATES

APPROVED COMPONENTS RELATED	COMPONENT	STATUS
1000	1000	OK
1001	1001	OK
1002	1002	OK
1003	1003	OK
1004	1004	OK
1005	1005	OK
1006	1006	OK
1007	1007	OK
1008	1008	OK
1009	1009	OK
1010	1010	OK
1011	1011	OK
1012	1012	OK
1013	1013	OK
1014	1014	OK
1015	1015	OK
1016	1016	OK
1017	1017	OK
1018	1018	OK
1019	1019	OK
1020	1020	OK

UFSAR Figure 6-116
CONTAINMENT VALVE INJECTION WATER SYSTEM FLOW DIAGRAM
G.A. CONDITION 1 AND 2
DATE: 01/15/88
BY: W. J. BROWN
APP: W. J. BROWN
INITIAL RELEASE FOR 1988 YEAR UPDATES

Figure 6-117. Fuel Transfer Tube

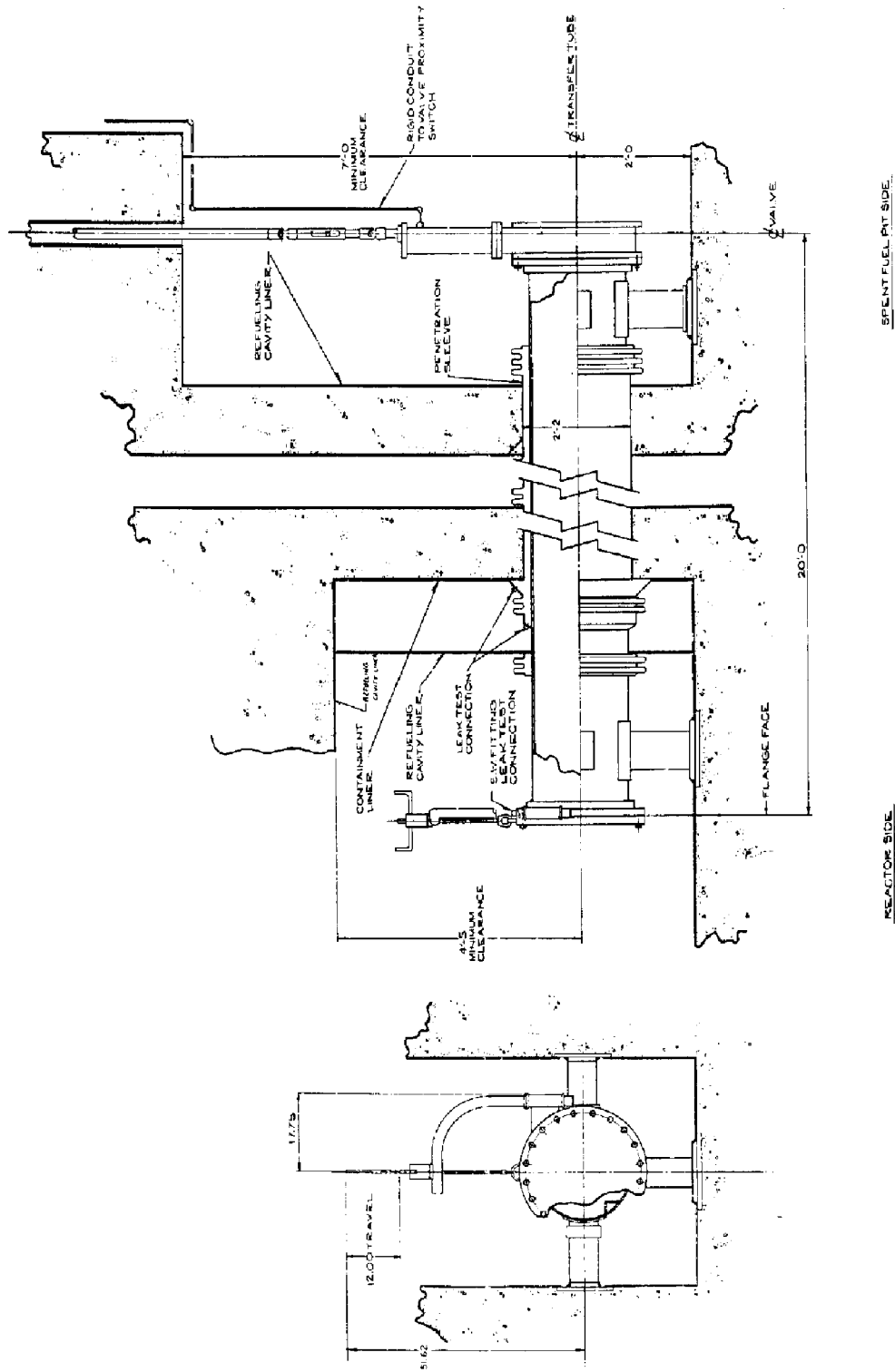


Figure 6-118. Model B Electric Hydrogen Recombiner-Cutaway
Historical information not required to be revised.

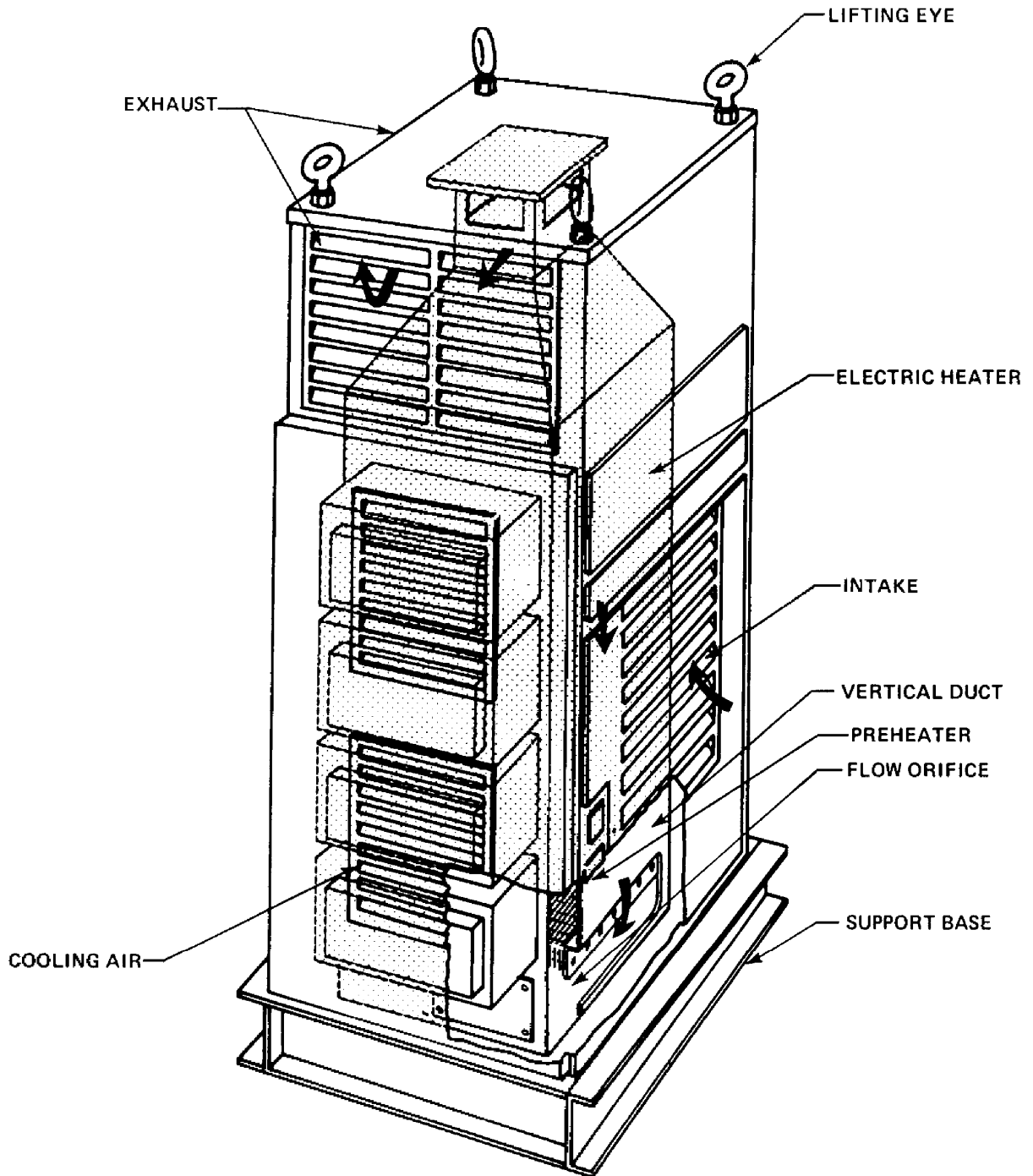


Figure 6-119. Recombiner Control System Schematic
Historical information not required to be revised.

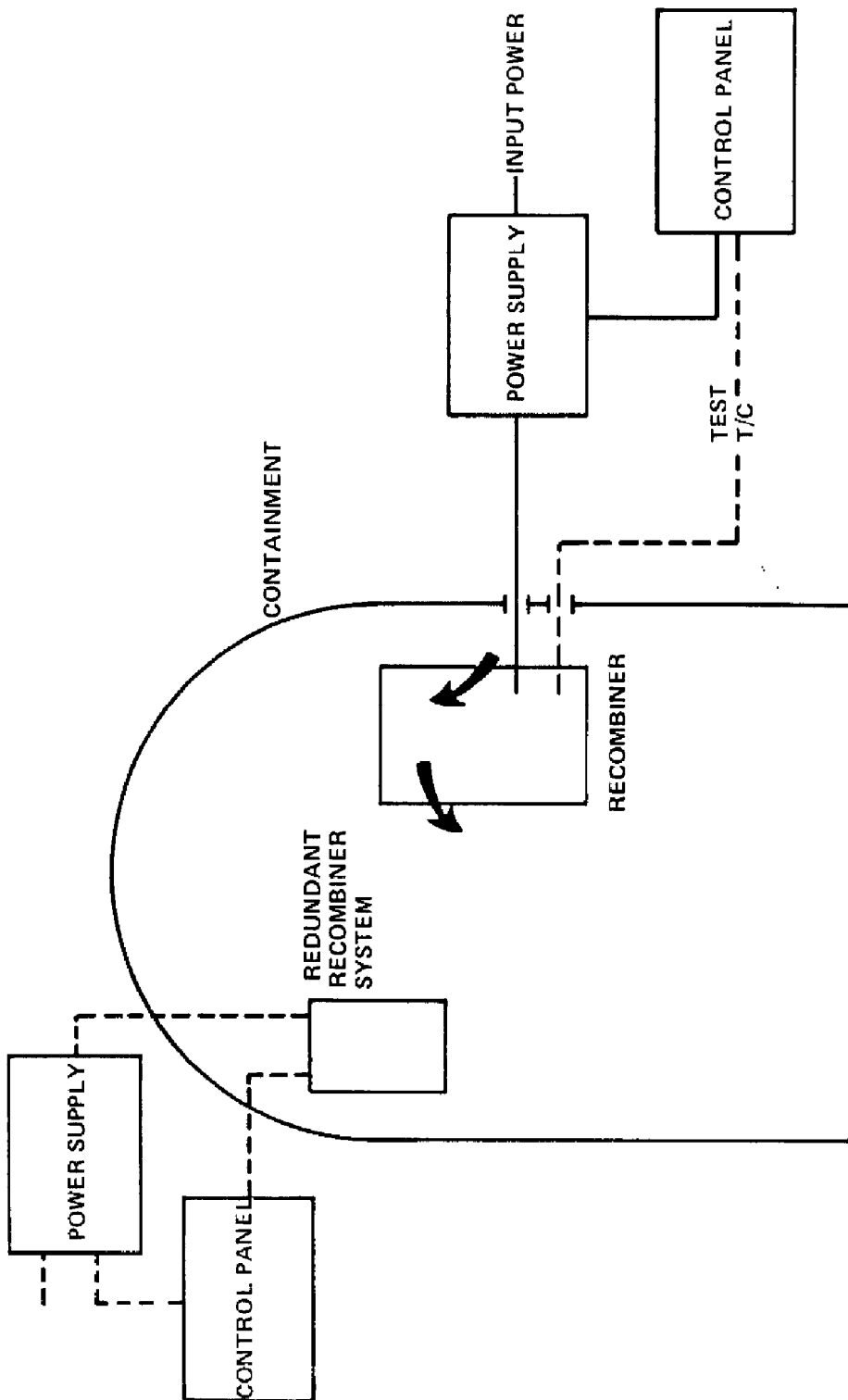


Figure 6-120. Flow Diagram of Containment Hydrogen Sample & Purge System

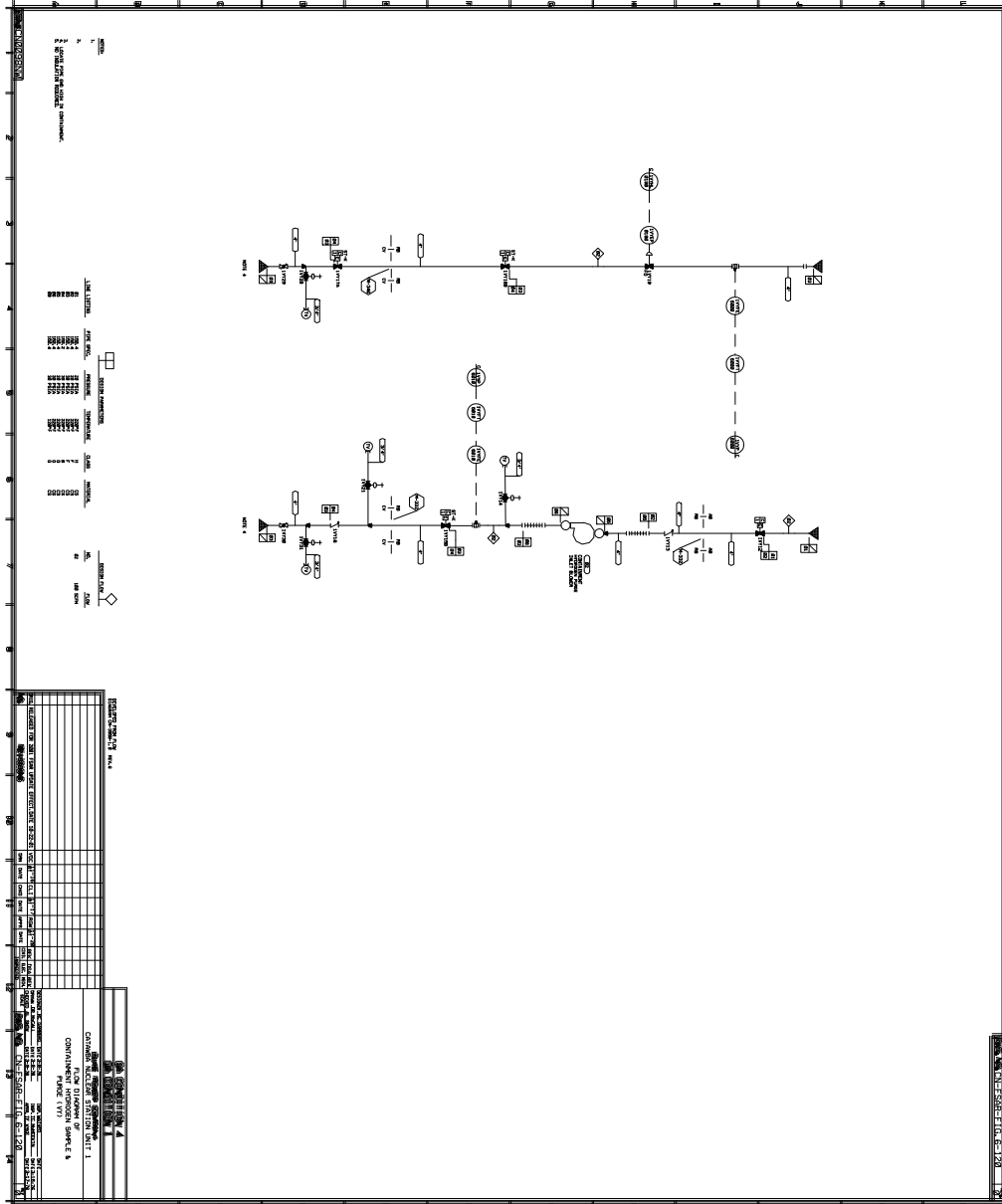


Figure 6-121. Deleted Per 1991 Update

Figure 6-122. Deleted Per 1991 Update

Figure 6-123. Deleted Per 1991 Update

Figure 6-124. Deleted Per 2004 Update

Figure 6-125. Deleted Per 2006 Update

Figure 6-126. Deleted Per 2006 Update

Figure 6-127. Deleted Per 2003 Update

Figure 6-128. Flow Diagram of Safety Injection System

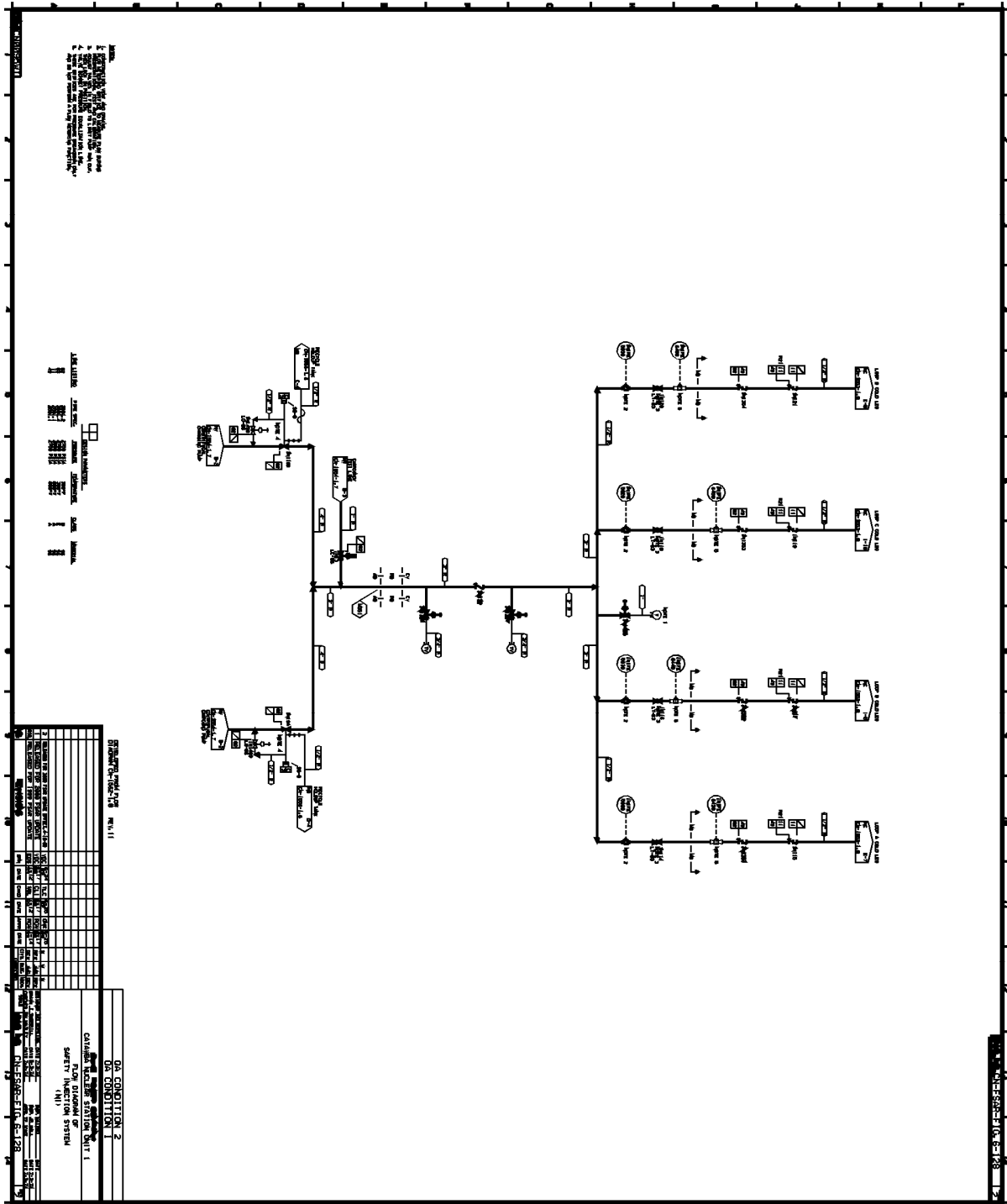


Figure 6-129. Flow Diagram of Safety Injection System

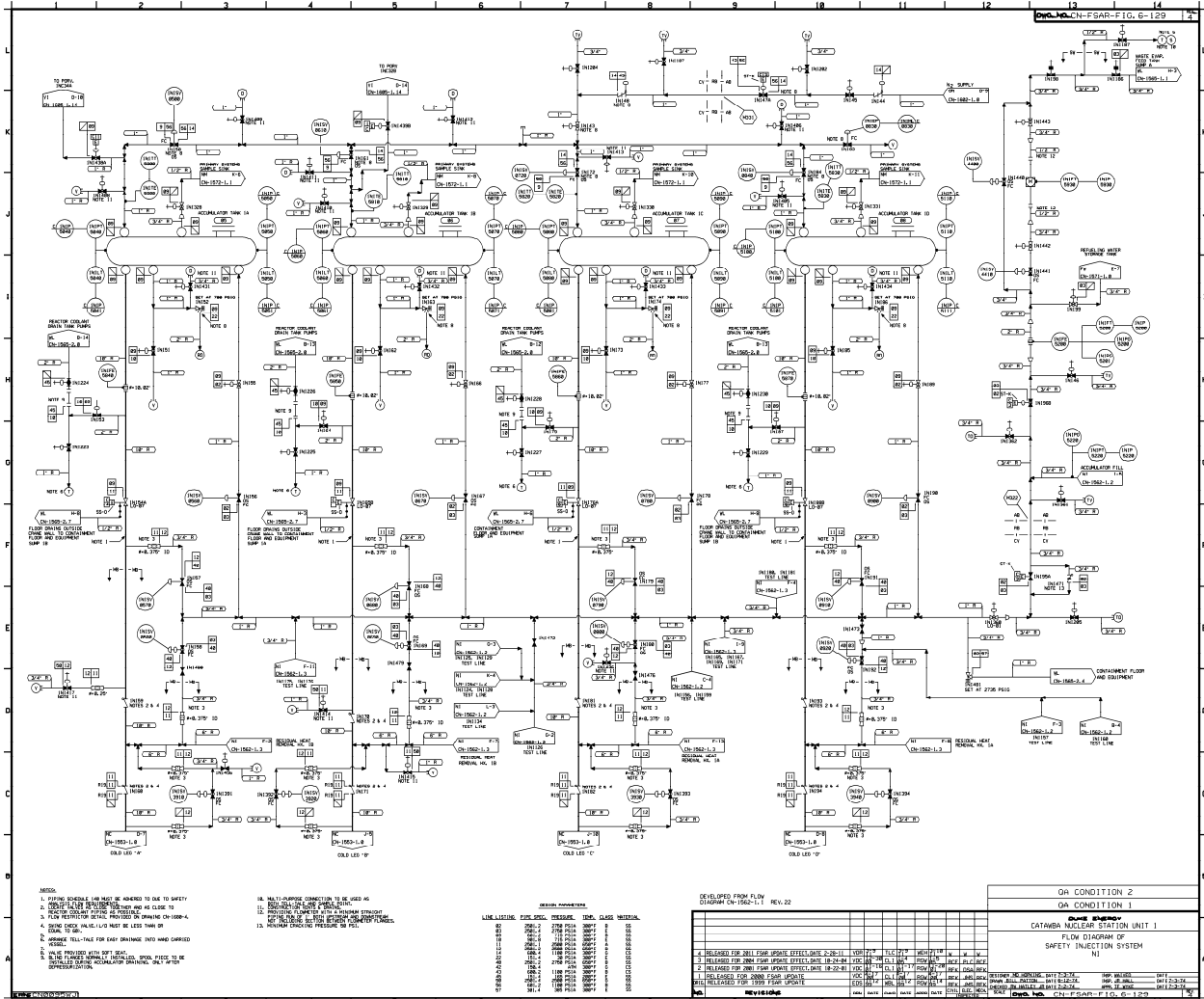


Figure 6-130. Flow Diagram of Safety Injection System

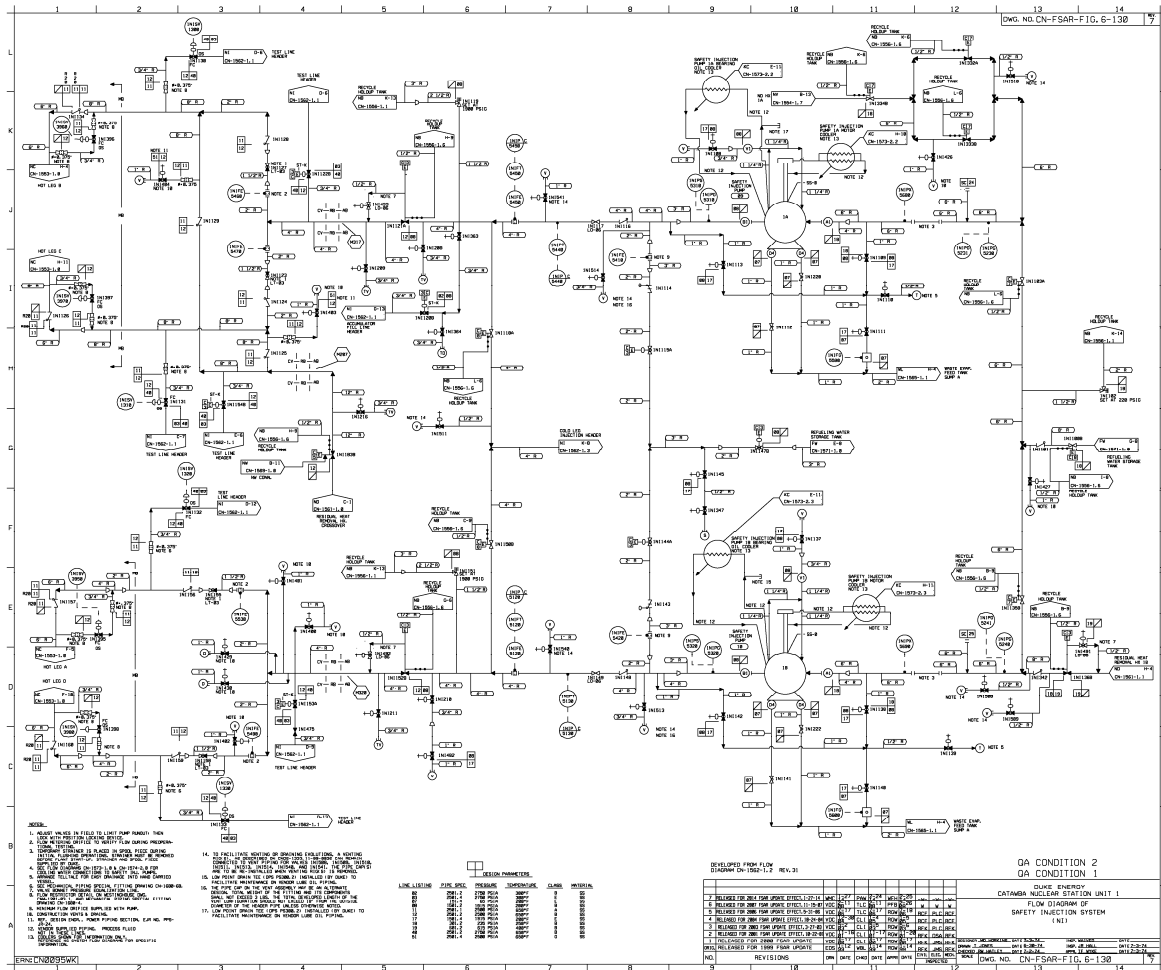


Figure 6-131. Flow Diagram of Safety Injection System

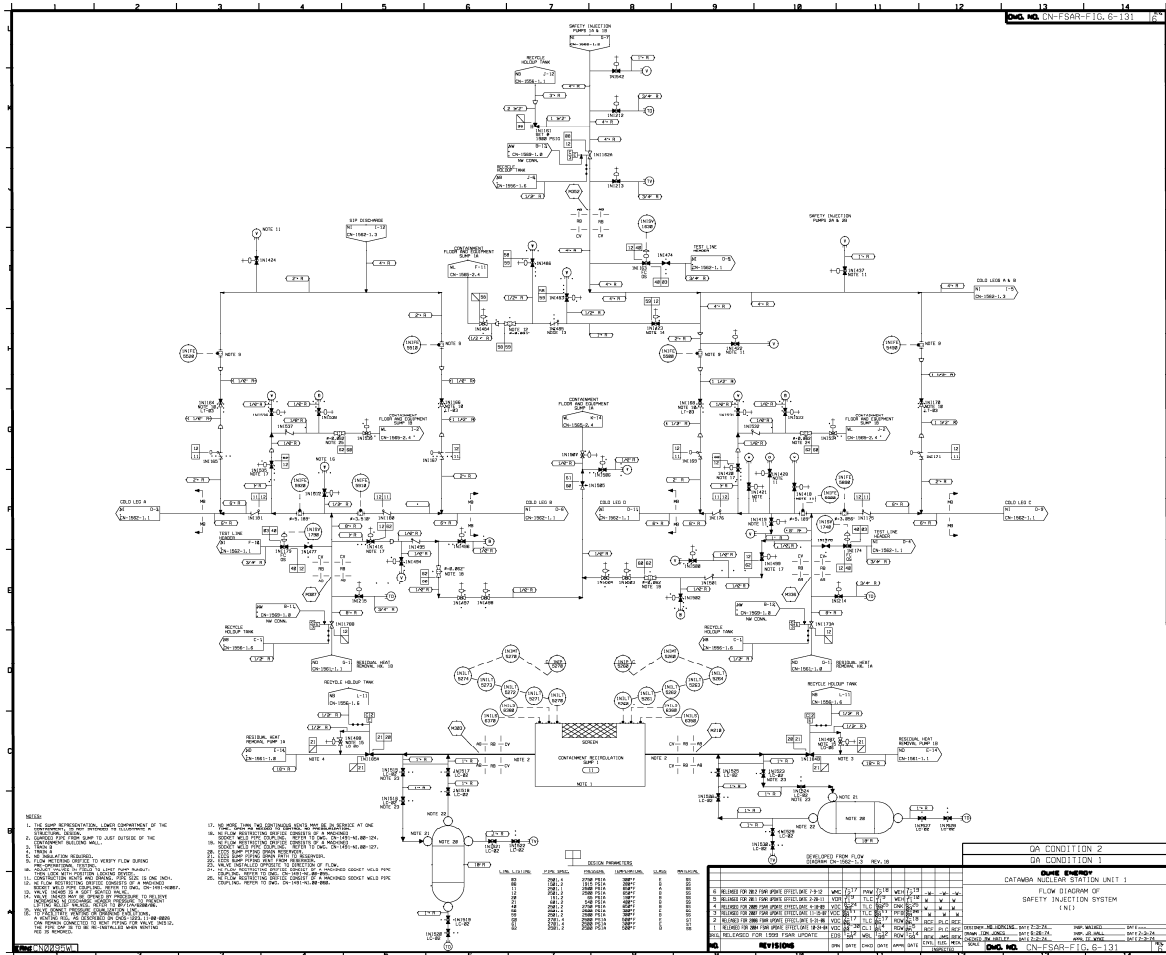


Figure 6-132. Safety Injection System

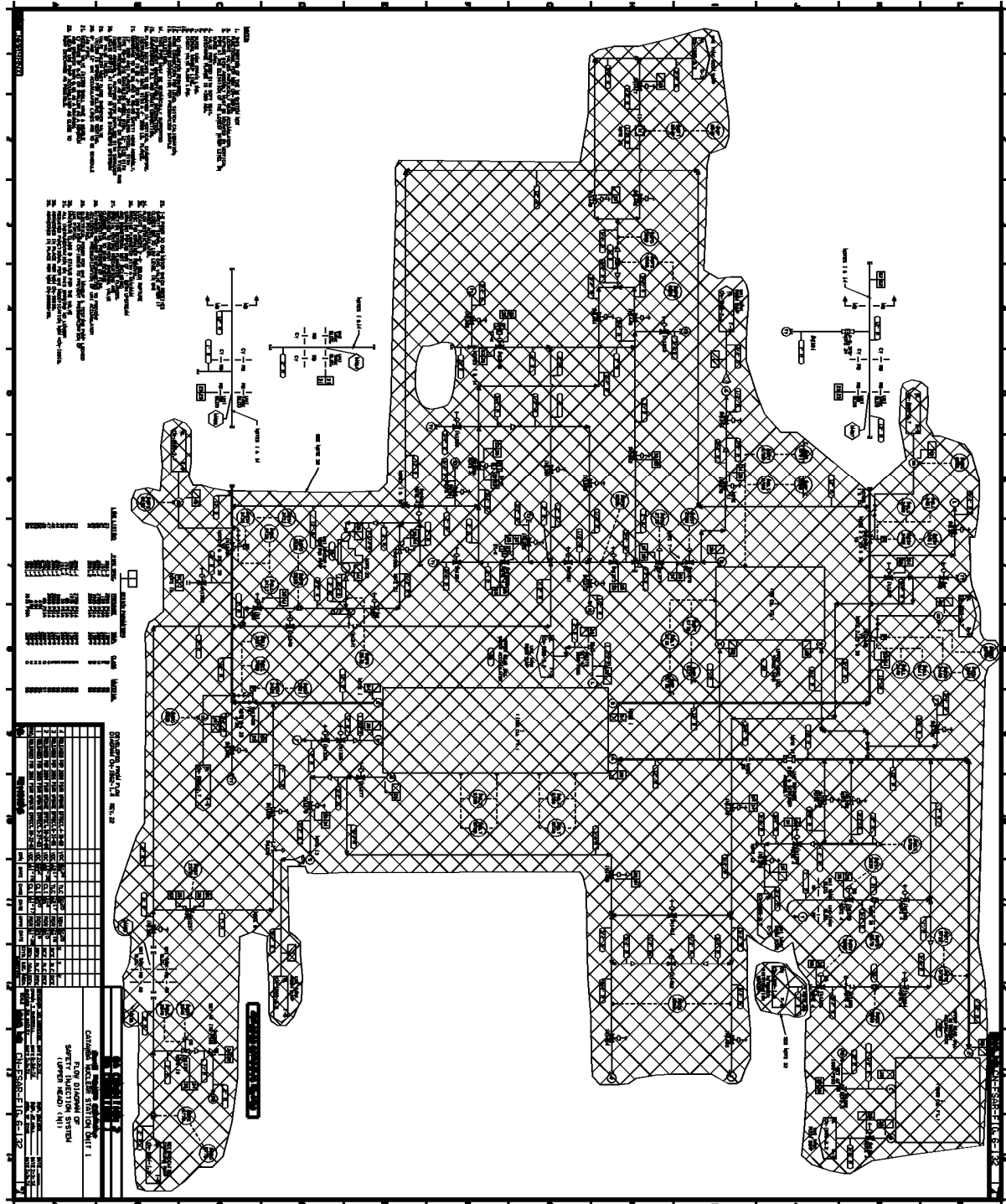


Figure 6-133. Residual Heat Removal Performance Curve

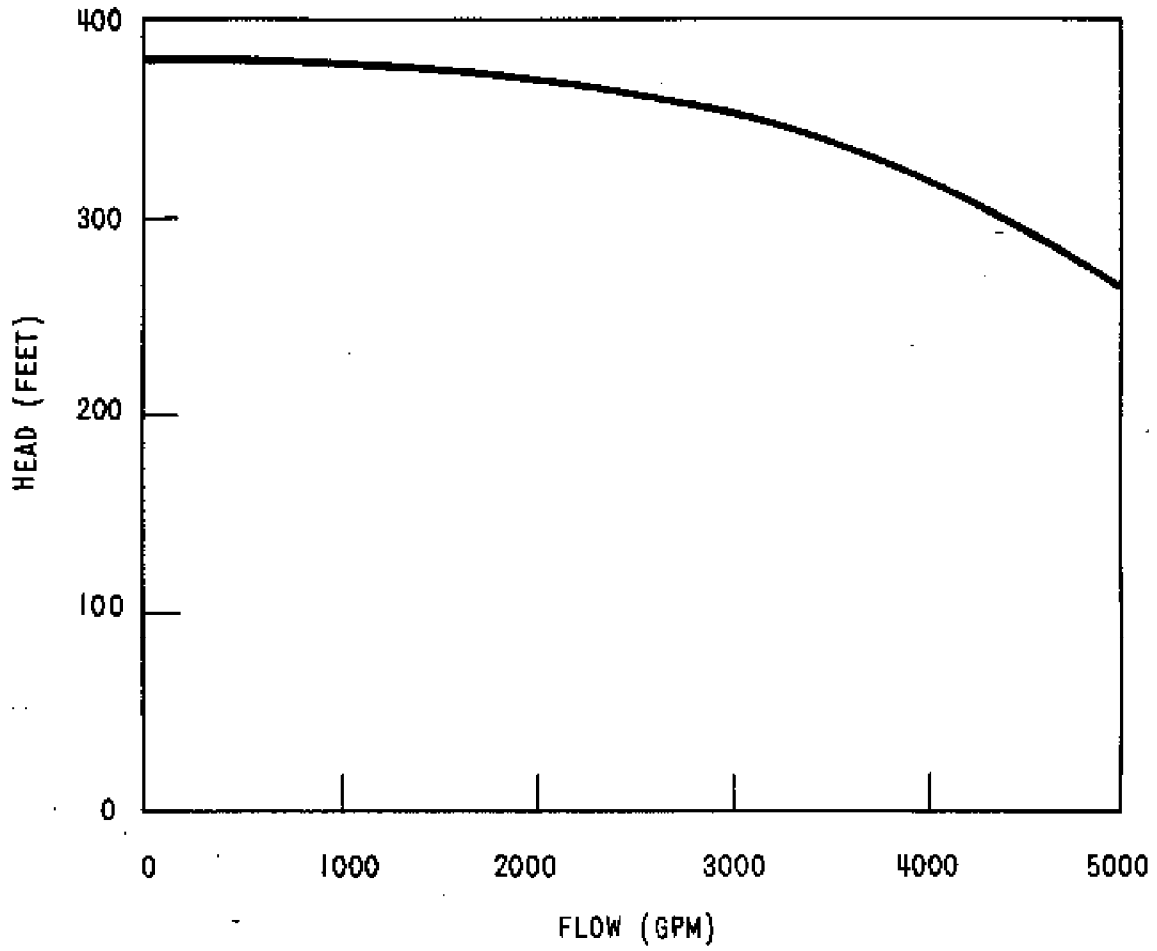


Figure 6-134. Centrifugal Charging Pump Performance Curve

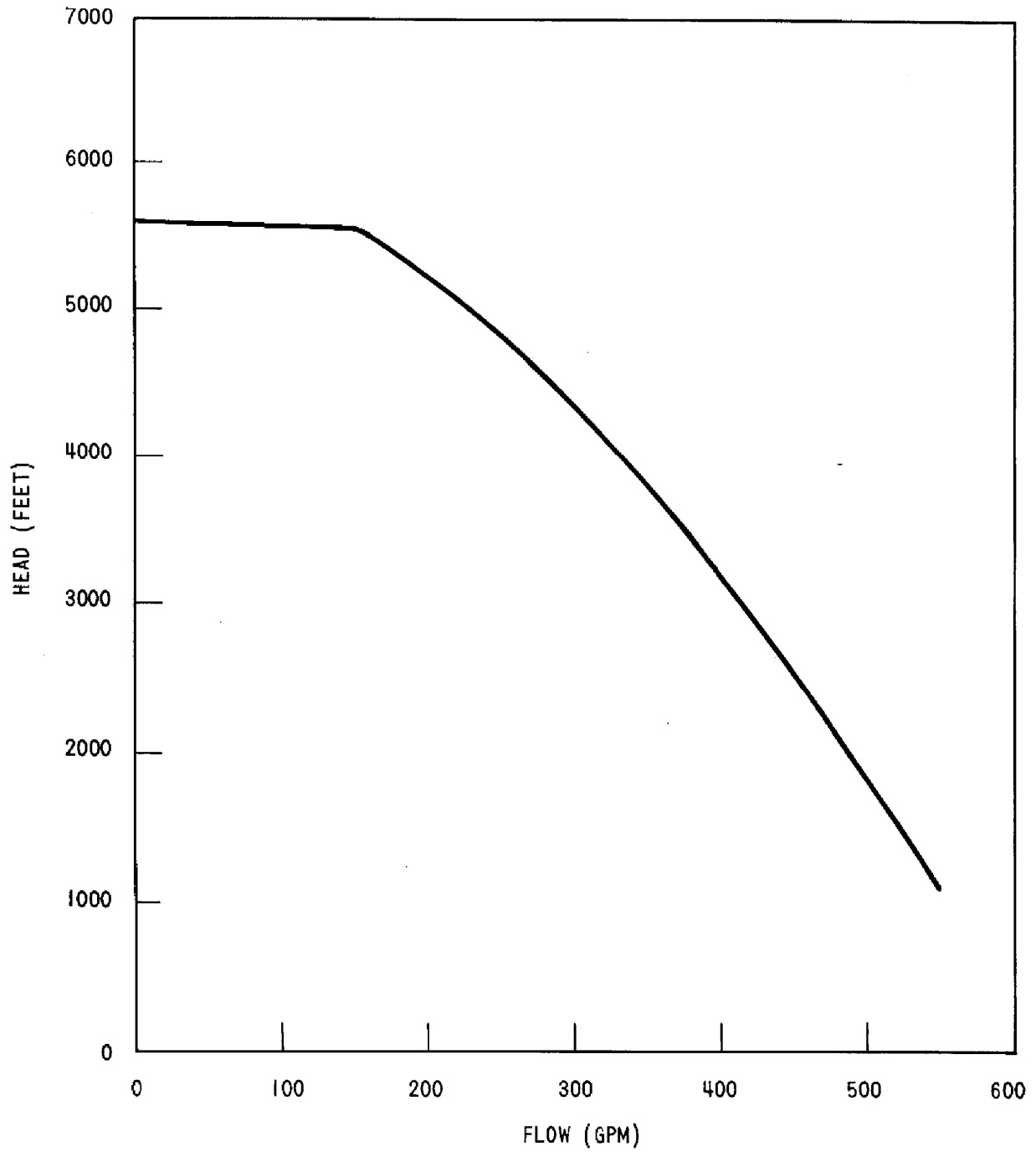


Figure 6-135. Safety Injection Pump Performance Curve

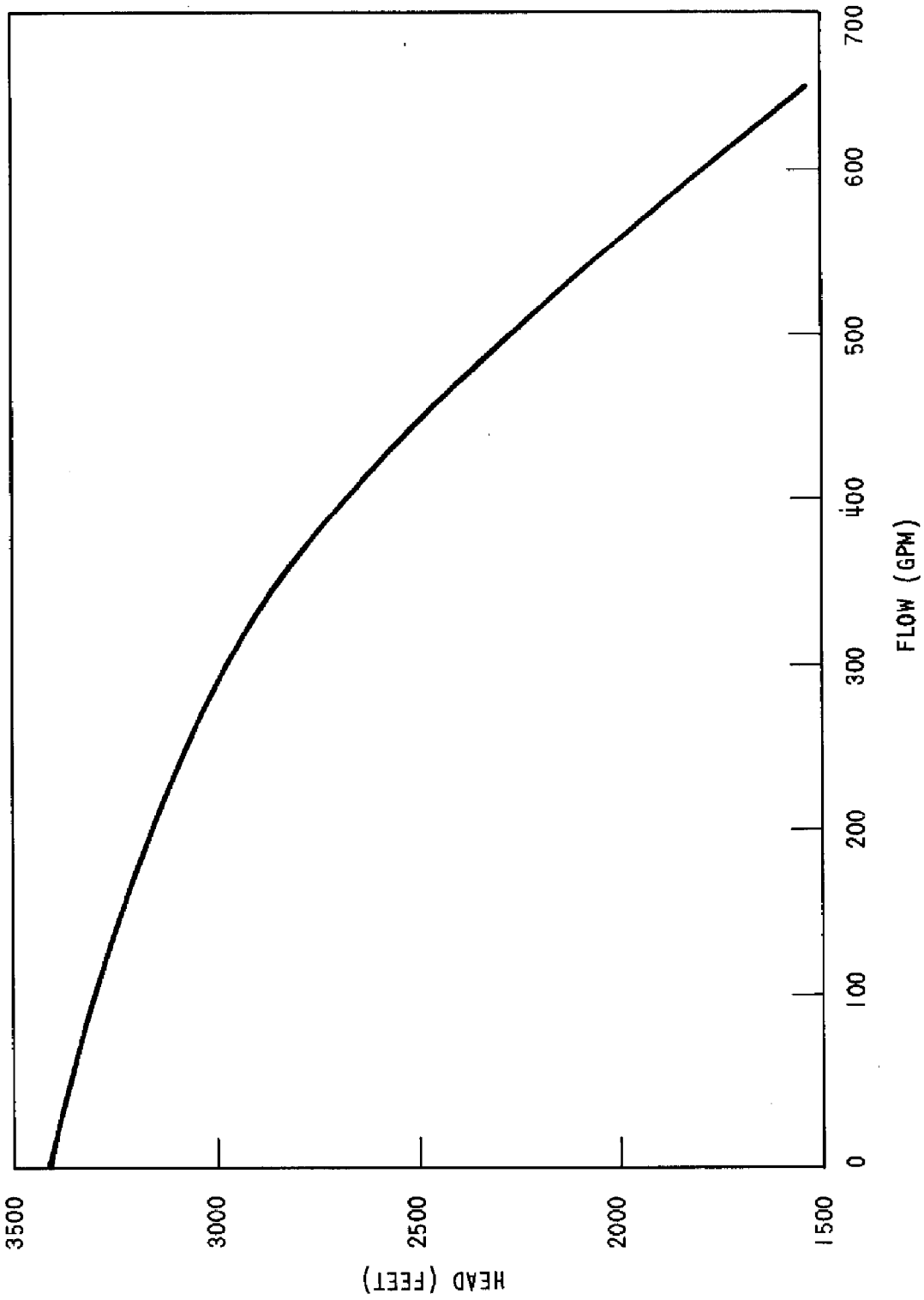
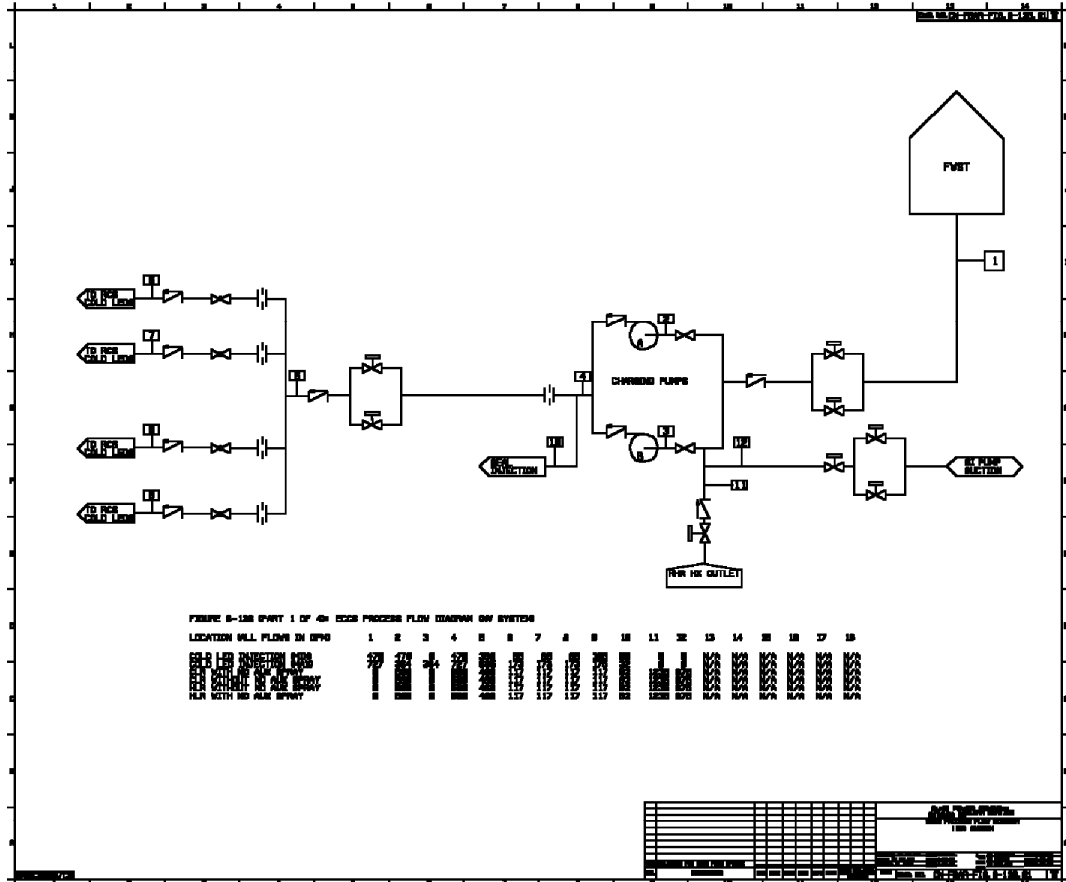


Figure 6-136. Safety Injection/Residual Heat Removal System Process Flow Diagram



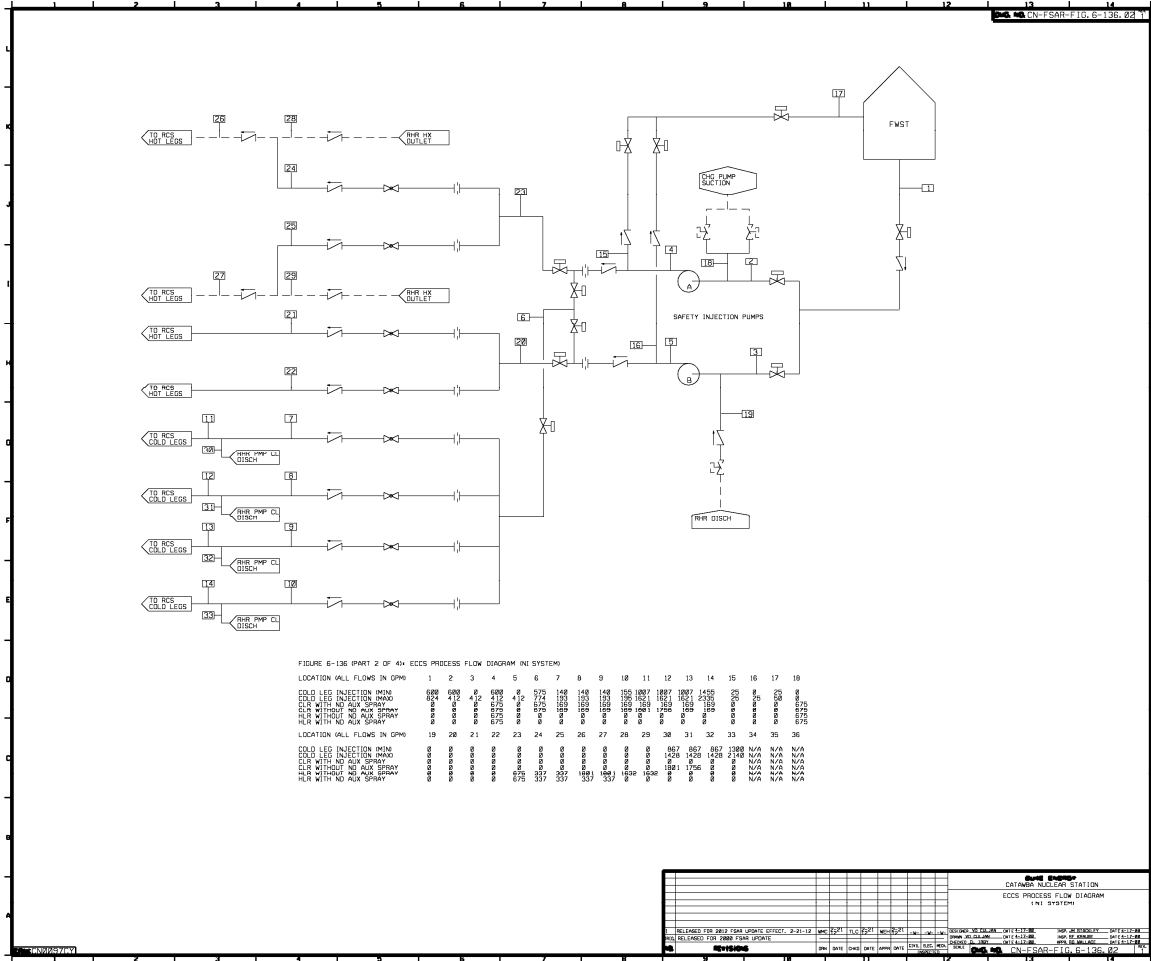


FIGURE 6-136 (PART 2 OF 4) ECCS PROCESS FLOW DIAGRAM (NI SYSTEM)

LOCATION (ALL FLOWS IN GPM)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
COLD LEG INJECTION MAIN	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888
COLD LEG INJECTION BYPASS	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888
COLD WITH NO AUX SPRAY	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888
COLD WITH NO AUX SPRAY	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888
HLR WITH NO AUX SPRAY	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888

LOCATION (ALL FLOWS IN GPM)	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
COLD LEG INJECTION MAIN	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888
COLD LEG INJECTION BYPASS	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888
COLD WITH NO AUX SPRAY	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888
COLD WITH NO AUX SPRAY	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888
HLR WITH NO AUX SPRAY	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888	6888

Revision										<p>Drawn by: []</p> <p>Checked by: []</p> <p>DATE: []</p> <p>SCALE: []</p> <p>PROJECT: []</p> <p>DESCRIPTION: []</p> <p>REVISIONS: []</p>									
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NOTES TO Figure 6-136
ECCS Process Flow Diagram (Notes)

1. The cold leg injection mode of operation assumes single train ECCS operation at minimum safeguards conditions, and two train ECCS operation at maximum safeguards conditions. Minimum injection flow rates are representative of three NV/NI lines at the minimum of the flow balance TAC windows and the single NV/NI line (attached to a broken loop) at the maximum of the flow balance TAC windows. Maximum injection flow rates are representative of all NV/NI lines at the maximum of the flow balance TAC windows.
2. Maximum water temperatures are 100°F (at the FWST) and 150°F (at the ND HX outlet) for injection and recirculation modes, respectively. Reference RCS pressure for all ECCS modes is 0 psig.
3. For minimum cold leg injection and recirculation conditions, seal injection flow rates are maximum values, thereby reducing the cold leg injection flow. For maximum cold leg injection conditions, the seal injection flow rate is a conservative nominal value of 32 gpm, thereby maximizing the cold leg injection flow rates.
4. The recirculation modes of operation assume single train ECCS operation at runout conditions. Runout flow rates are 560 gpm, 675 gpm, and 4500 gpm for a single NV, NI, and ND pump, respectively. The NV and NI injection lines are assumed to be balanced at their maximum flow balance TAC values. ND injection lines are not required to be balanced, but are assumed to be balanced equally for illustrative purposes of this diagram. The same is true for NI hot leg injection lines.
5. All flow rates are either taken directly, or indirectly determined from calculation file DPC-1552.08-00-0109, Safety Injection Flows for Safety Analysis.

Figure 6-137. Ice Condenser

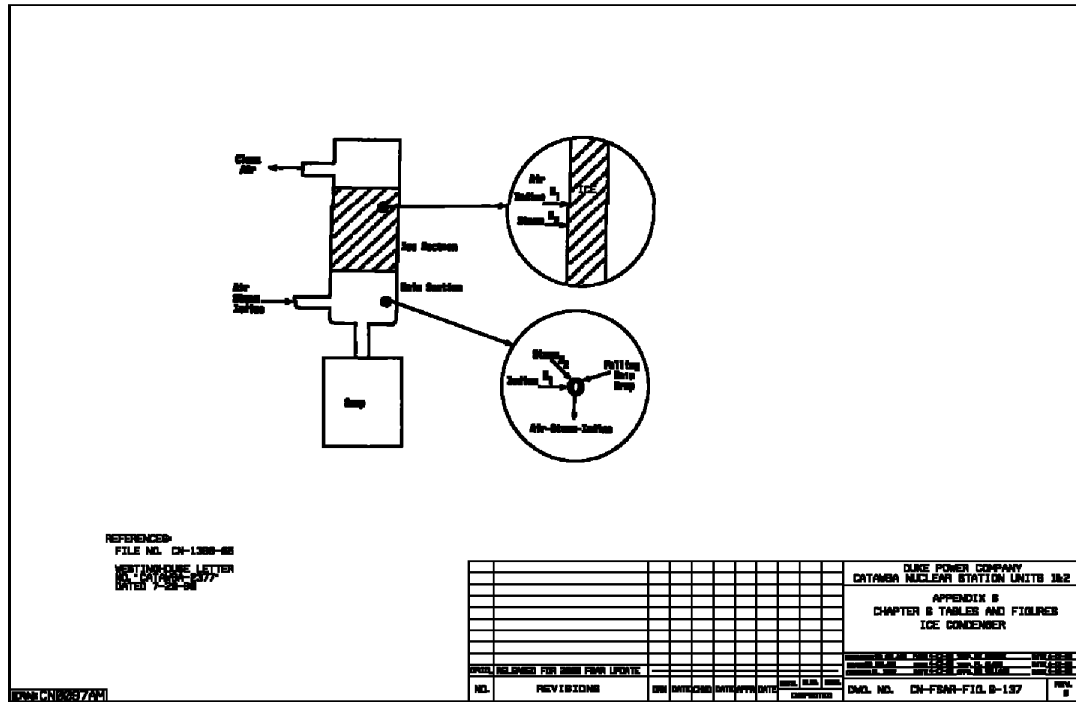


Figure 6-138. Isometric of Ice Condenser

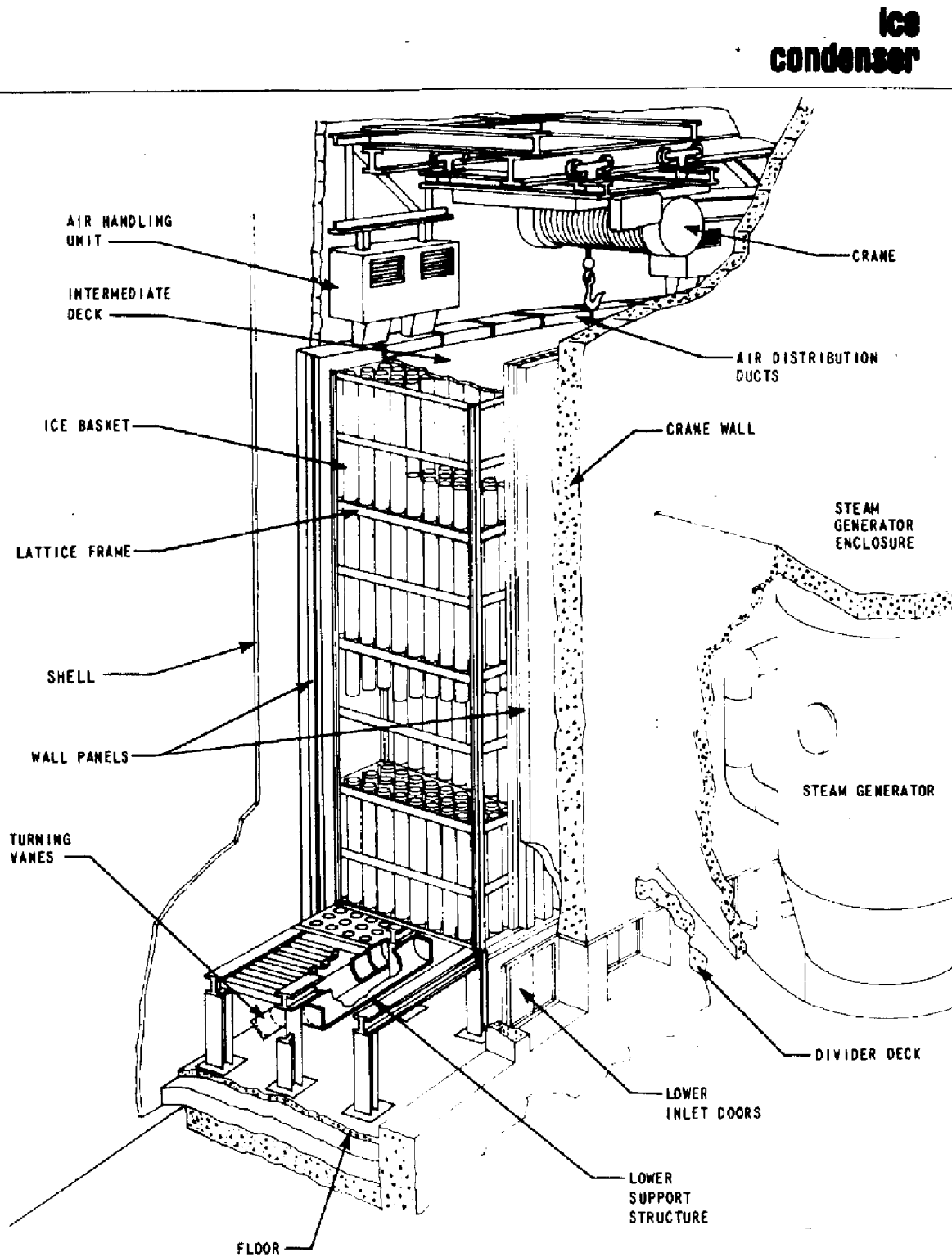


Figure 6-139. Floor Structure

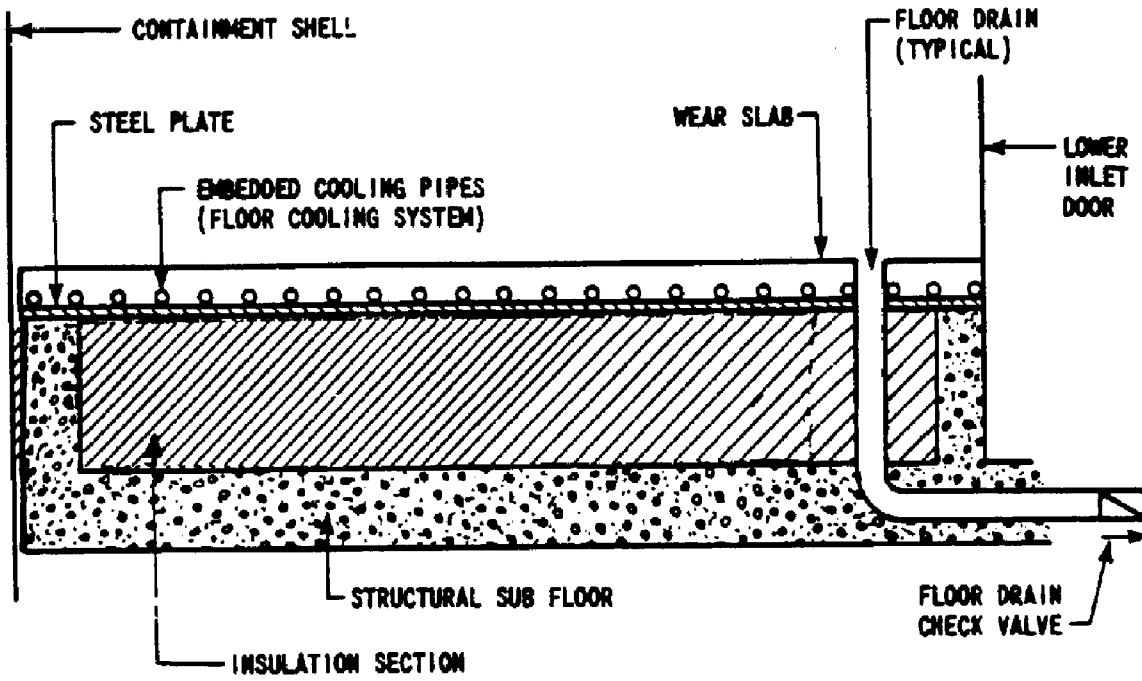


Figure 6-140. Wear Slab Top Surface Area Showing Typical Coolant Piping Layout

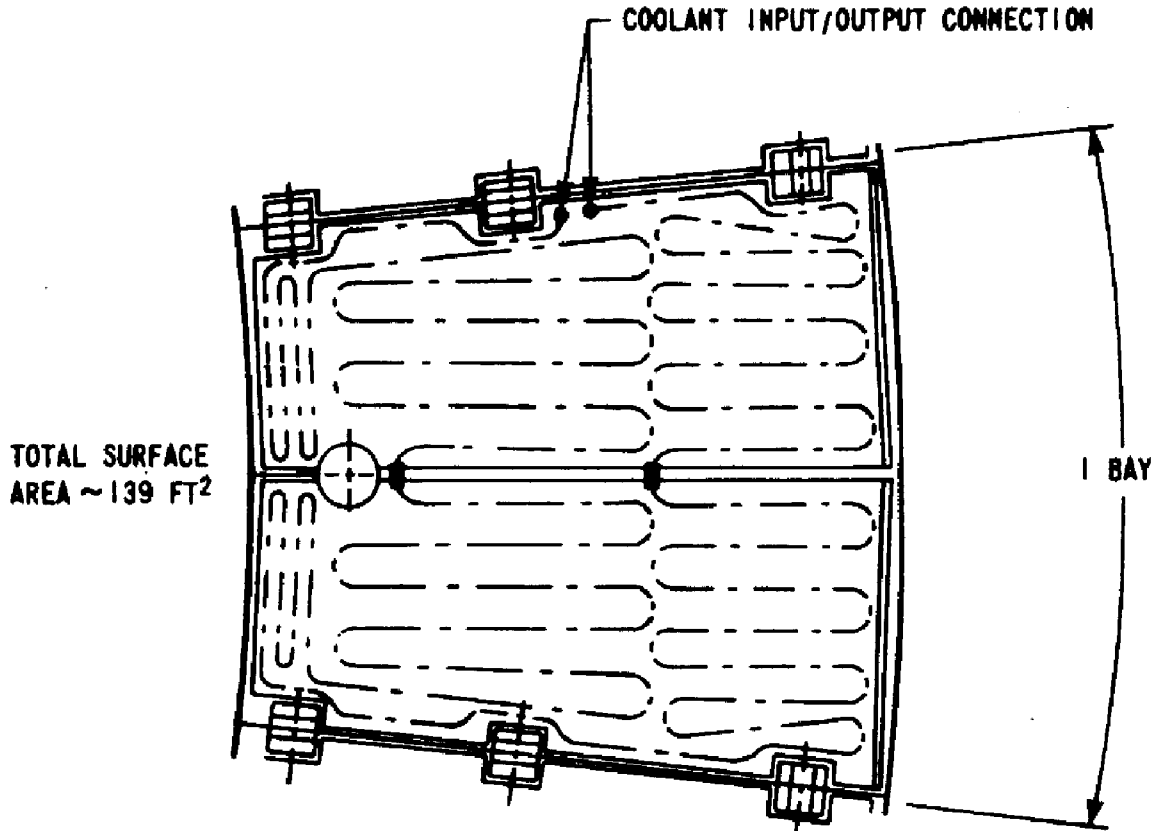
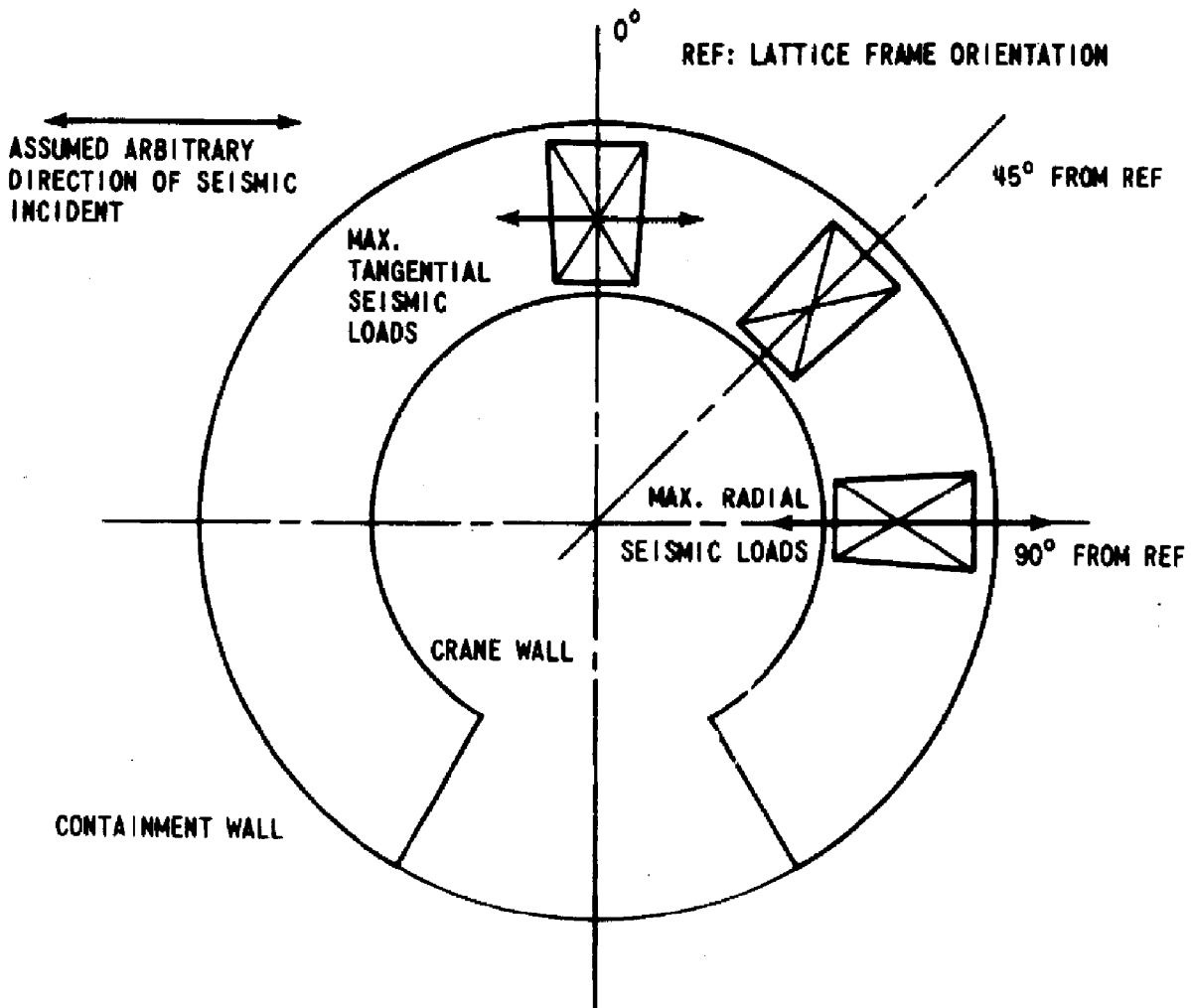


Figure 6-141. Lattice Frame Orientation



NOTES:

1. MAXIMUM TANGENTIAL AND RADIAL SEISMIC LOADS CANNOT OCCUR SIMULTANEOUSLY.
2. TANGENTIAL AND RADIAL SEISMIC LOADS 45 DEGREES FROM THE REFERENCE DIRECTION OF SEISMIC INPUT OCCUR SIMULTANEOUSLY AND THE MAGNITUDE IS THE AVERAGE OF MAXIMUM RADIAL AND MAXIMUM TANGENTIAL TIMES THE COSINE OF 45°, OR $\left(\frac{\text{RADIAL} + \text{TANGENTIAL}}{2} \right) .707$.
3. HORIZONTAL AND VERTICAL SEISMIC LOADS CAN OCCUR HORIZONTALLY.
4. BLOWDOWN LOADS, TANGENTIAL, RADIAL AND VERTICAL CAN OCCUR SIMULTANEOUSLY. RADIAL BLOWDOWN LOADS ALWAYS OCCUR IN THE DIRECTION OF THE CONTAINMENT WALL.

* In an individual lattice frame.

Figure 6-142. Load Distribution For Tangential Seismic And Blowdown Loads In Analytical Model

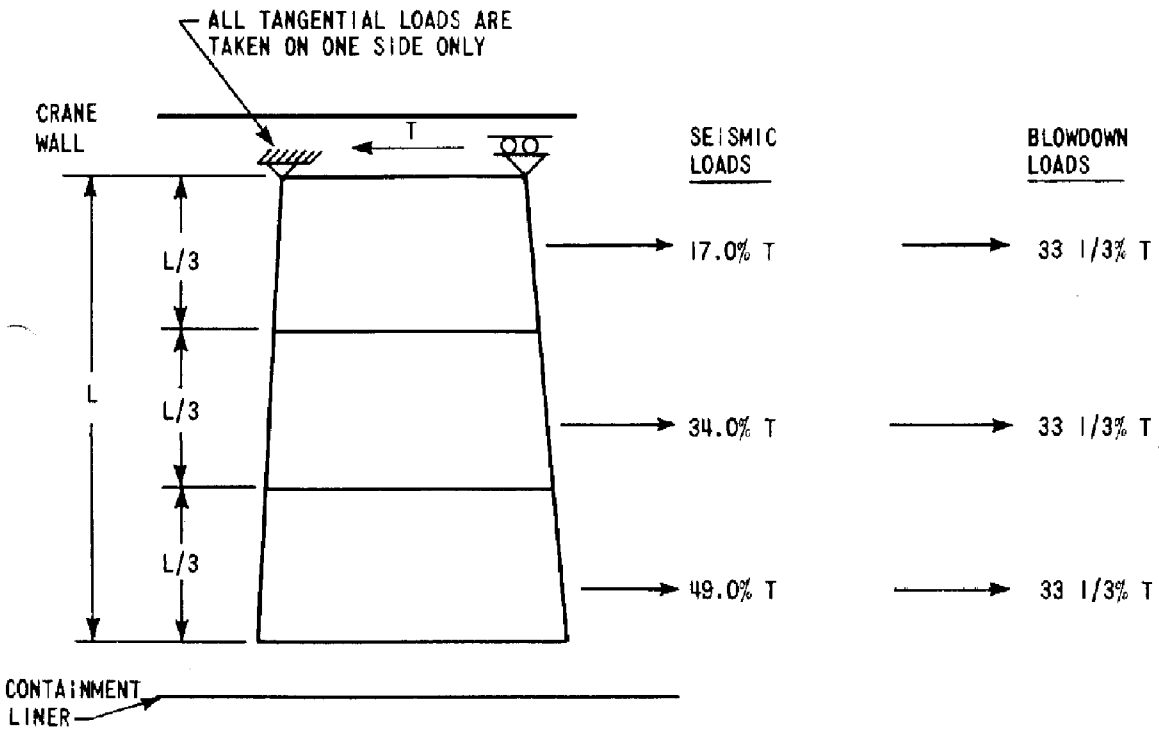
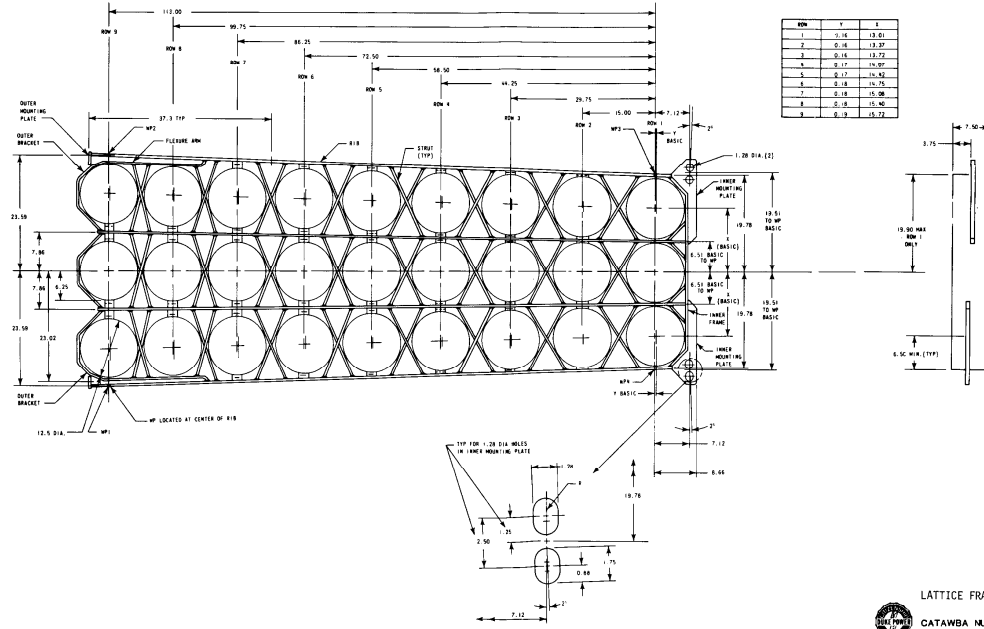


Figure 6-143. Lattice Frame



LATTICE FRAME
 CATAWBA NUCLEAR STATION
 Figure 6.7.3-3

Figure 6-144. Lattice Frame Analysis Model

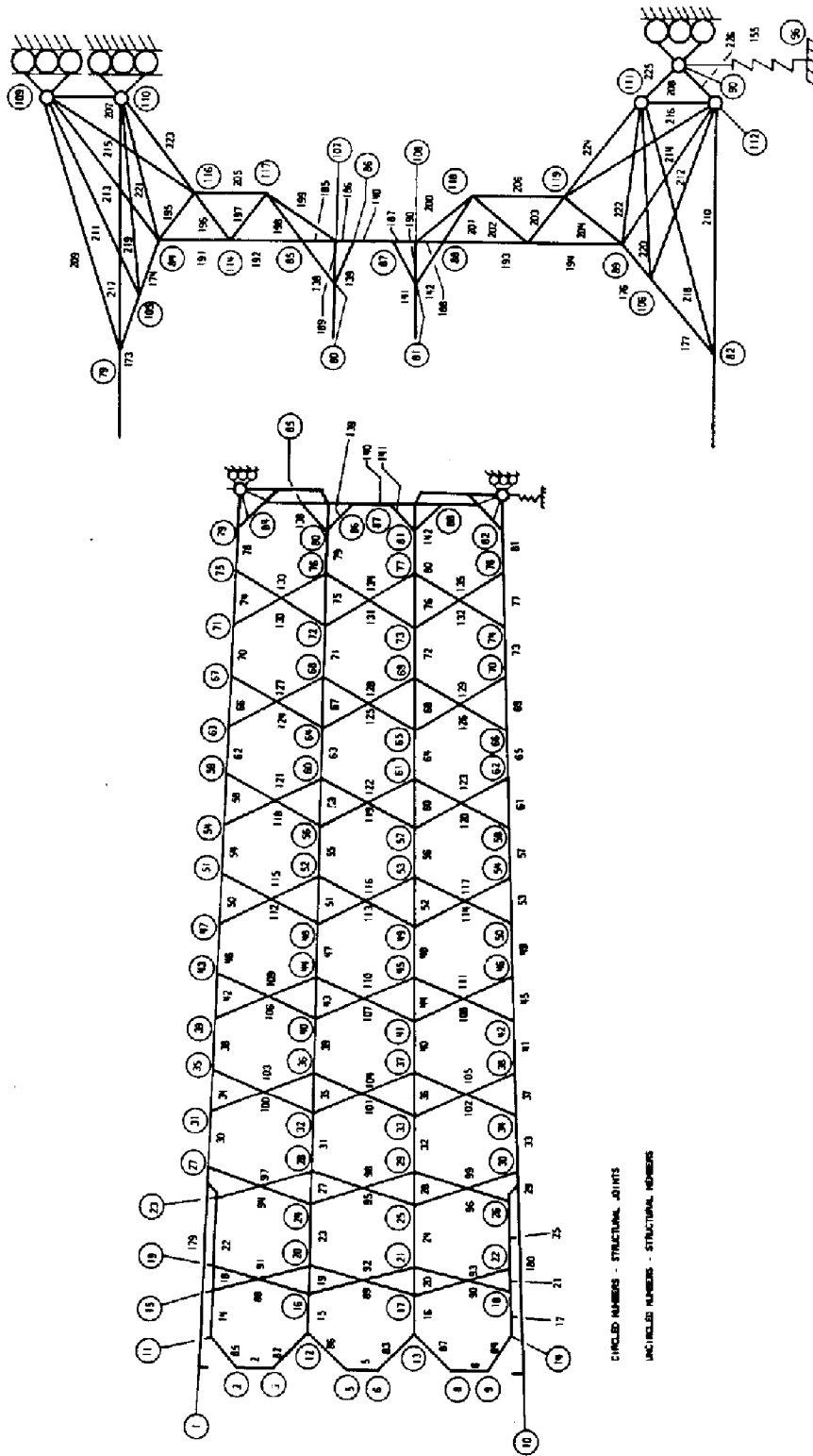


Figure 6-145. Typical Bottom Ice Basket Assembly

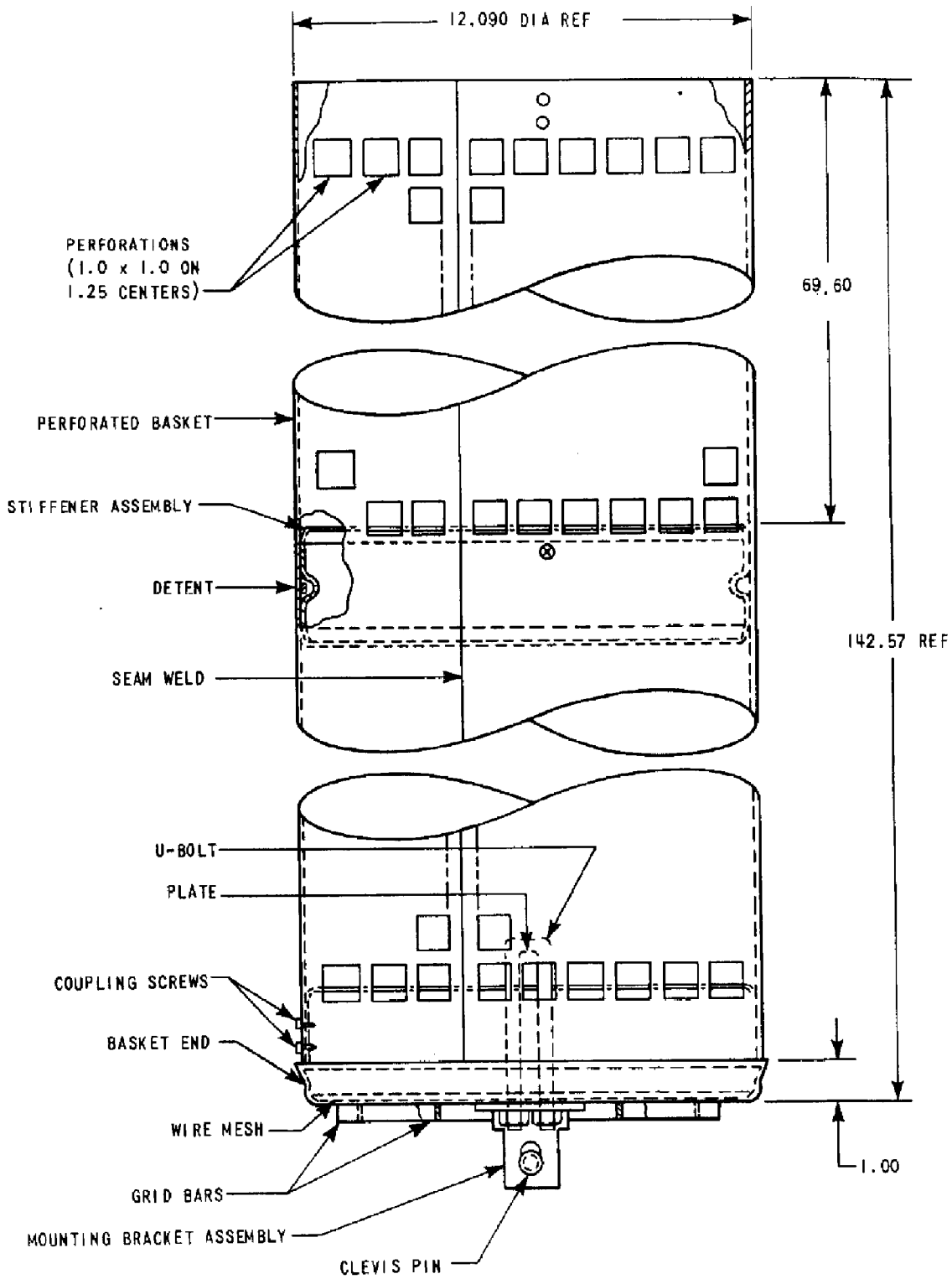


Figure 6-146. Combinations of Concentric Axial Load and Distribution Load

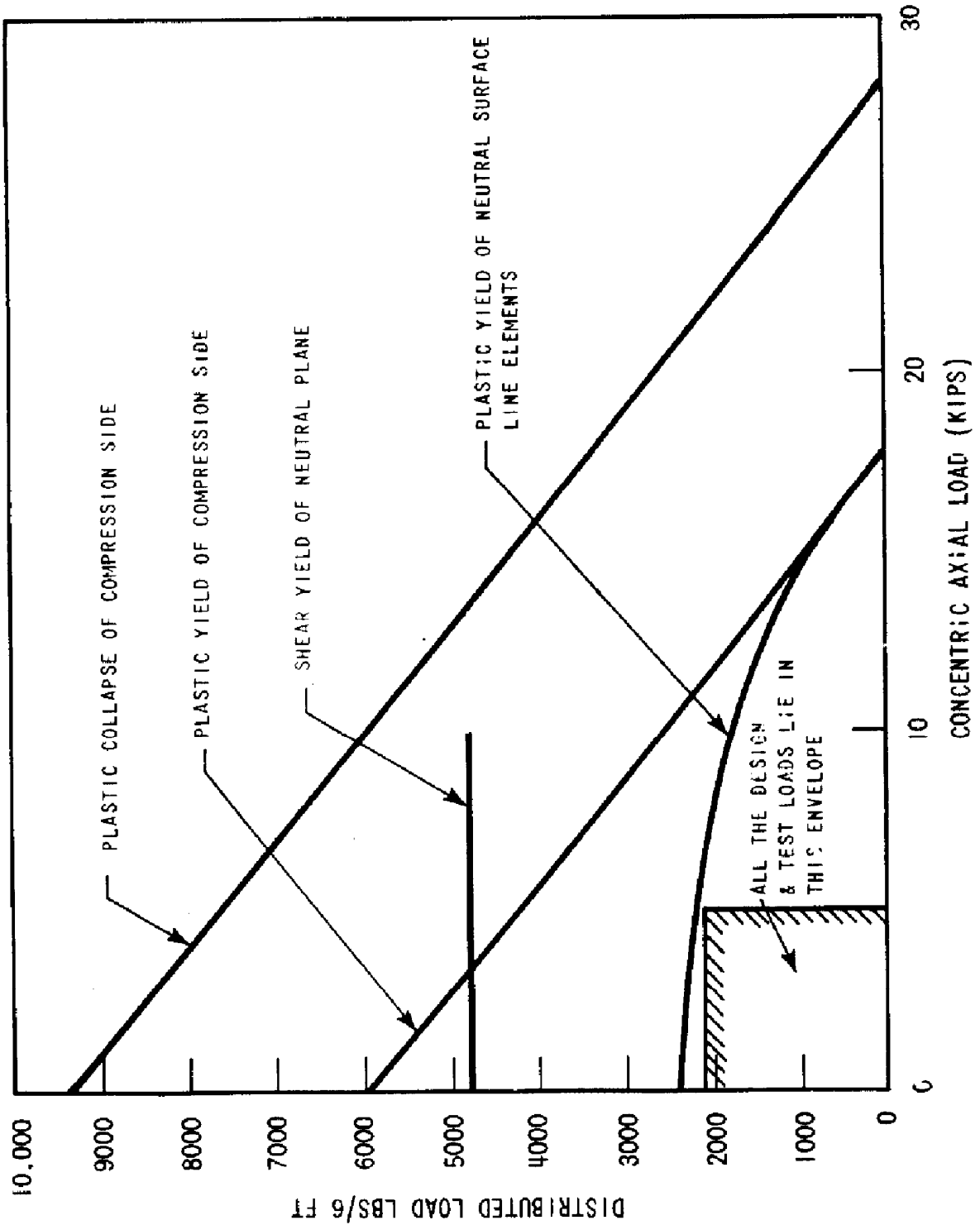
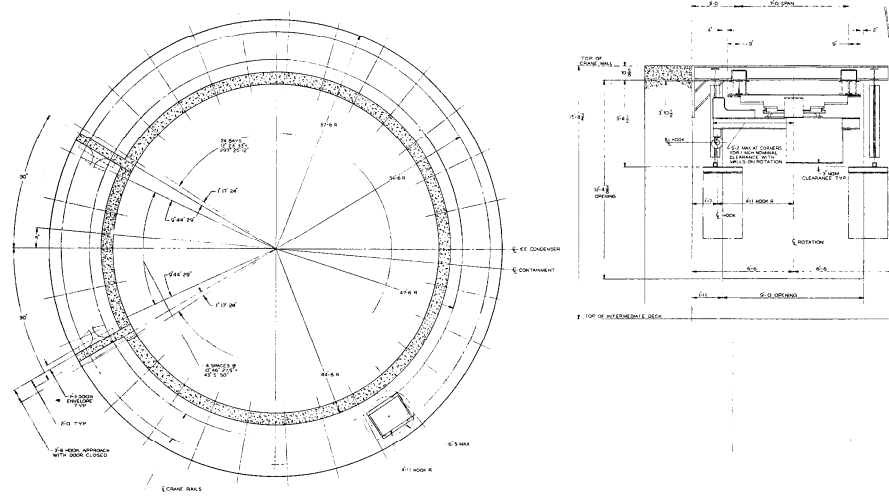


Figure 6-147. Crane Assembly



CRANE ASSEMBLY
CATAWBA NUCLEAR STATION
Figure 6.7.5-1

Figure 6-149. Refrigerant Cycle Diagram

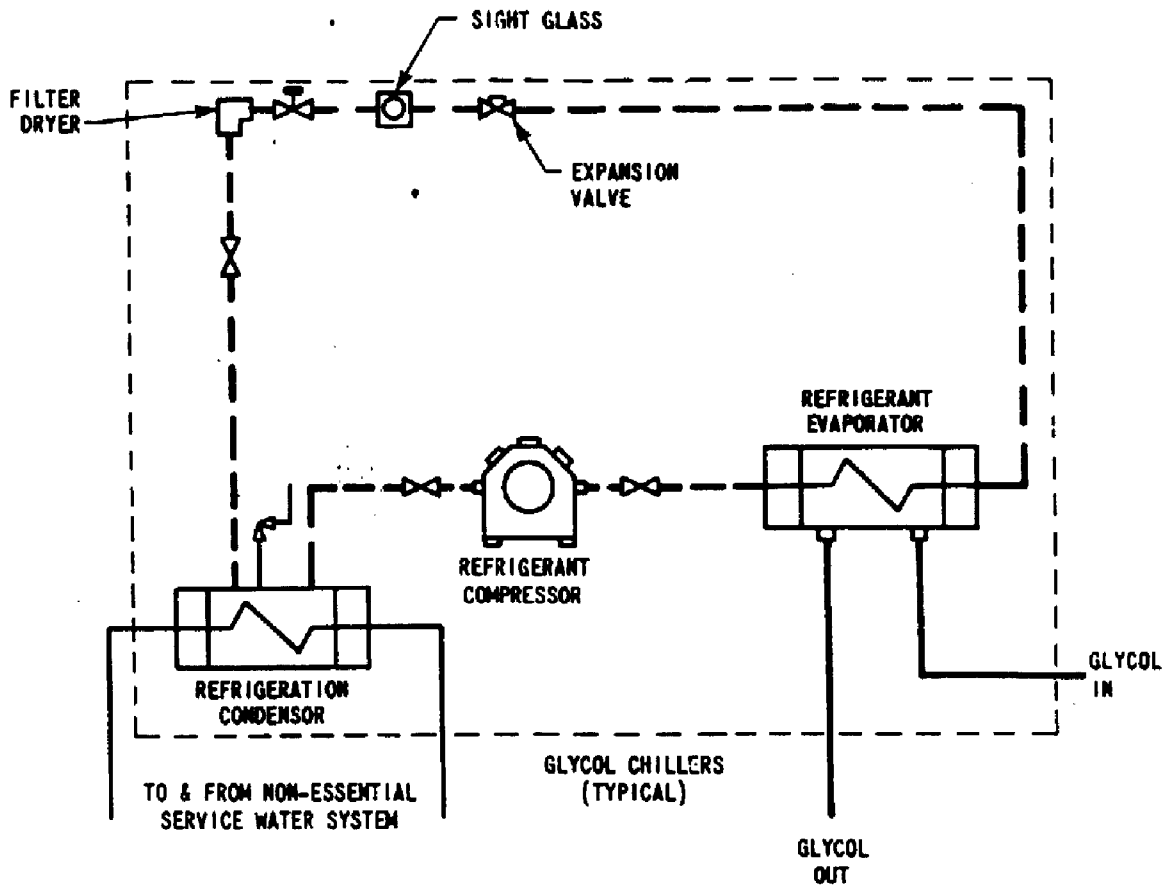


Figure 6-150. Glycol Cycle to Each Containment

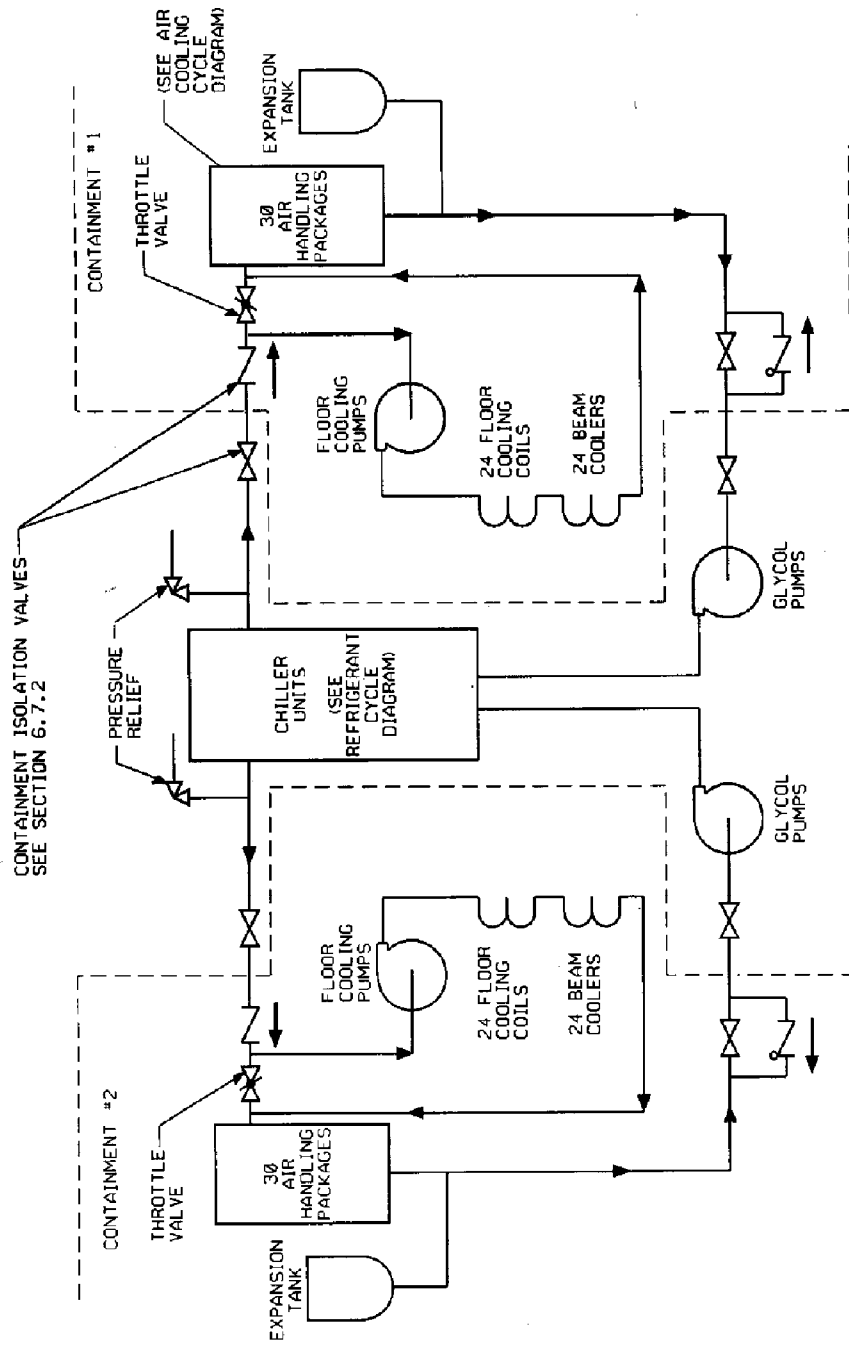


Figure 6-151. Schematic Flow Diagrams of Air Cooling Cycle

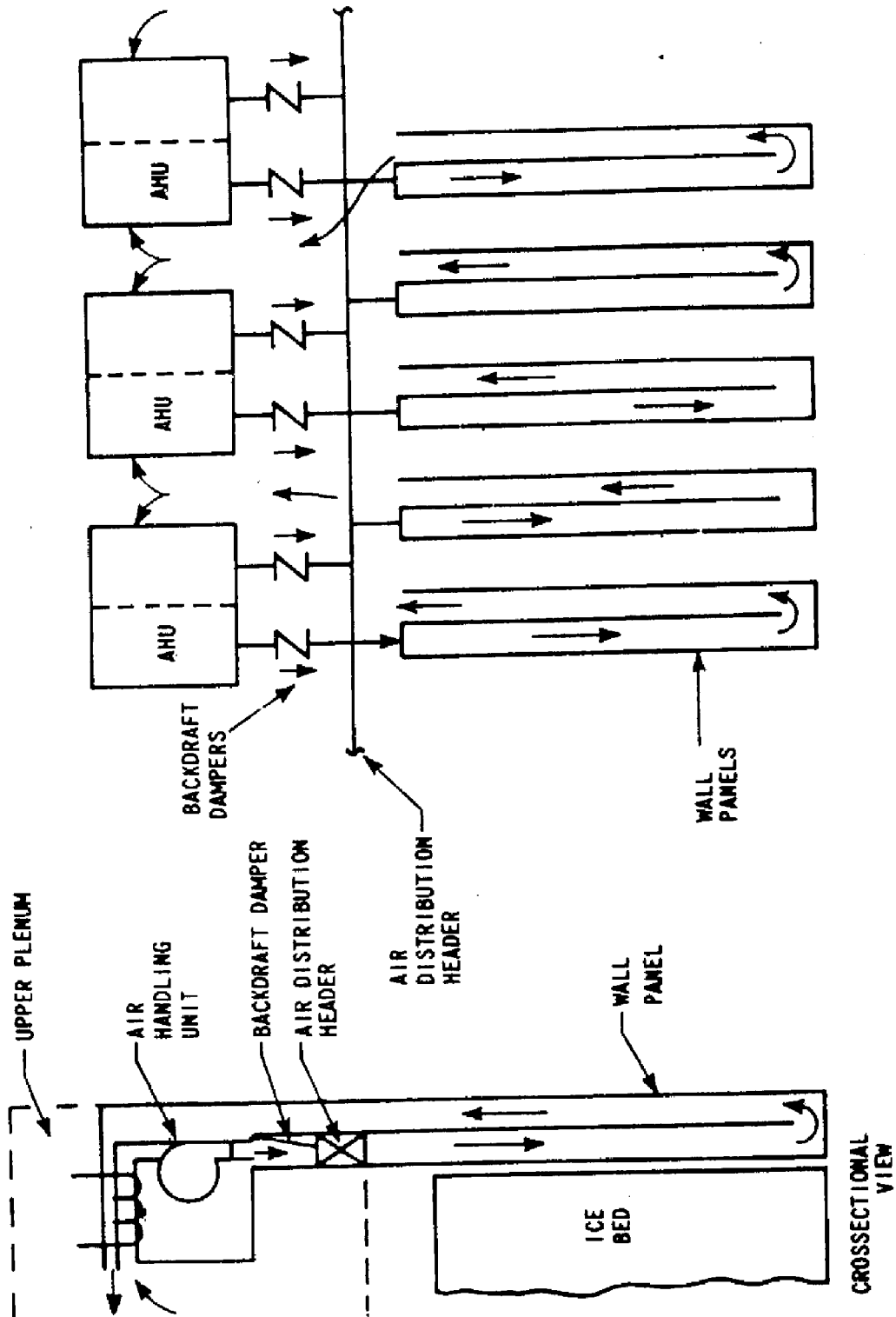


Figure 6-152. Air Handling Unit Support Structure

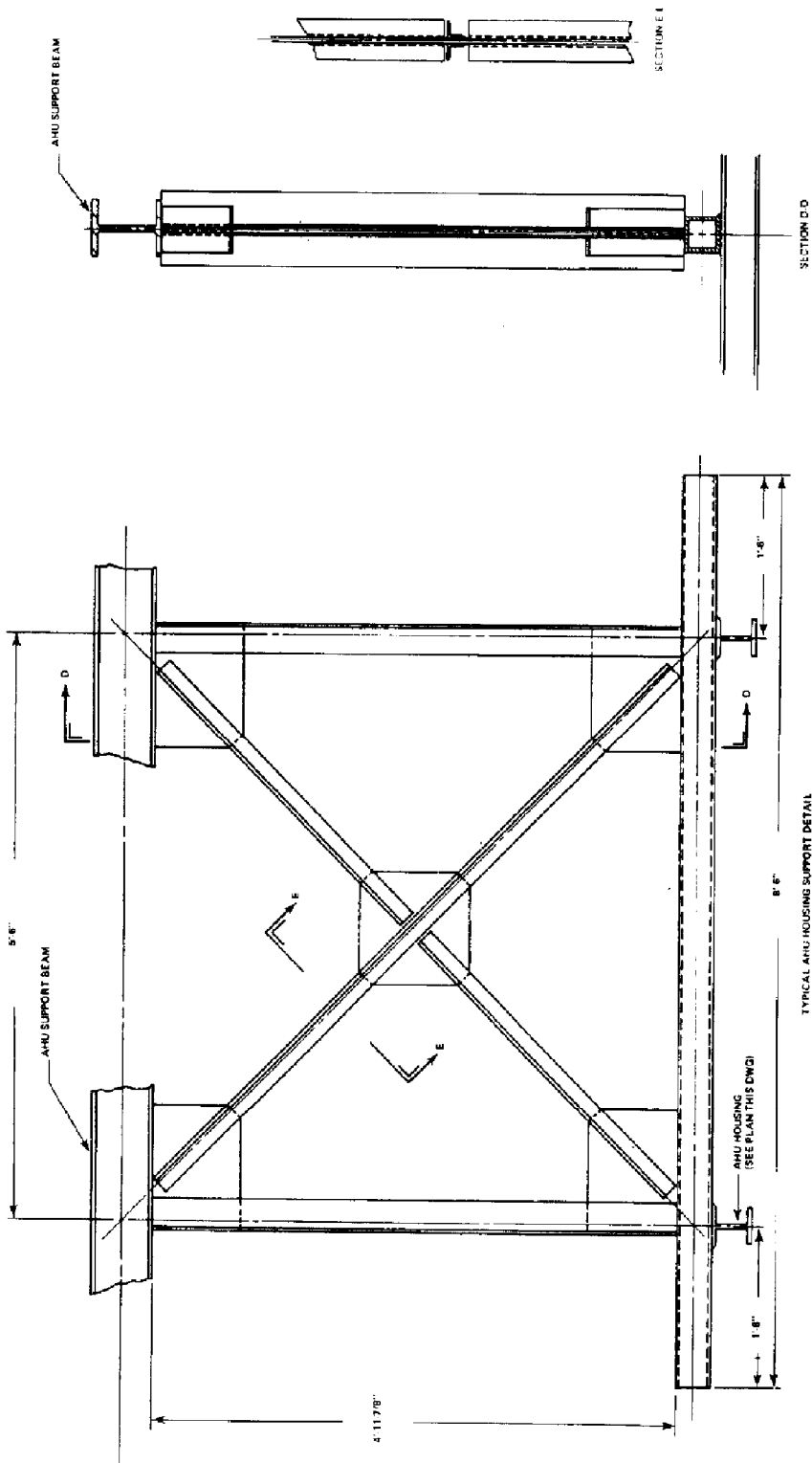
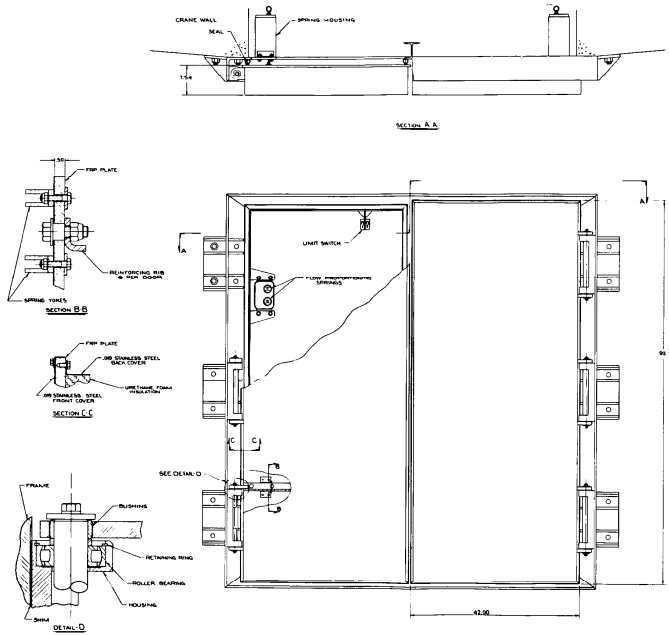


Figure 6-153. Deleted Per 2010 Update

Figure 6-154. Lower Inlet Door Assembly



LOWER INLET DOOR ASSEMBLY
CATAWBA NUCLEAR STATION
Figure 6.7.8-2

Figure 6-155. Details of Lower Inlet Door Showing Hinge, Proportioning Mechanism Limit Switches and Seals

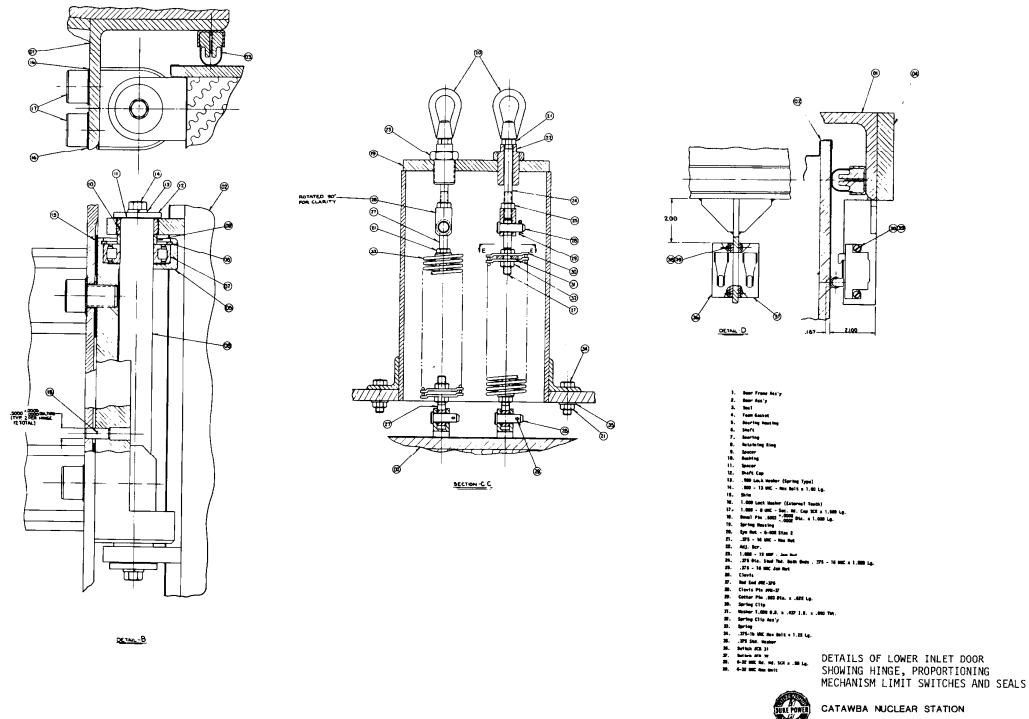


Figure 6-156. Inlet Door Frame Assembly

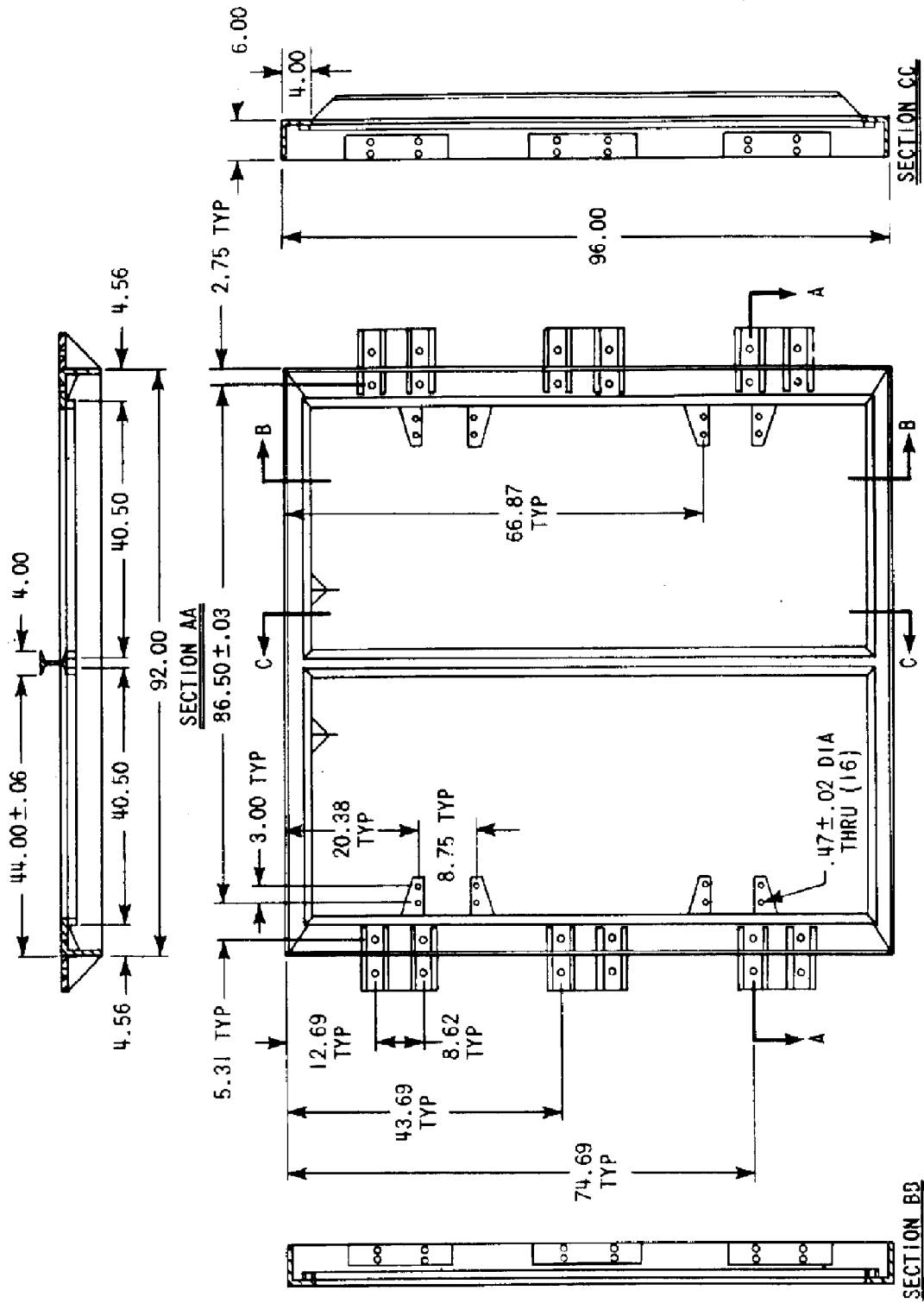


Figure 6-157. Inlet Door Panel Assembly

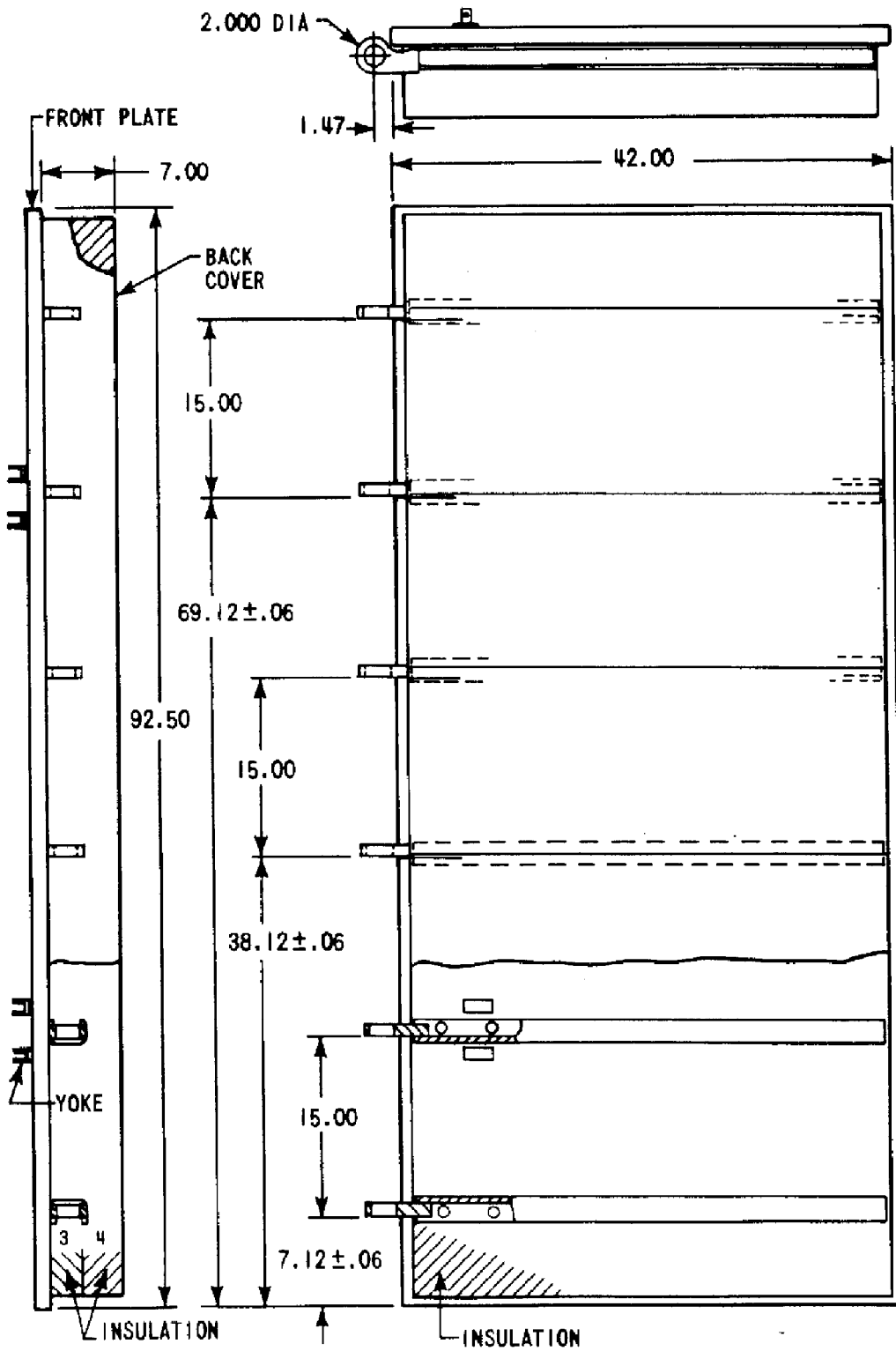


Figure 6-158. Lower Inlet Door Shock Absorber Assembly

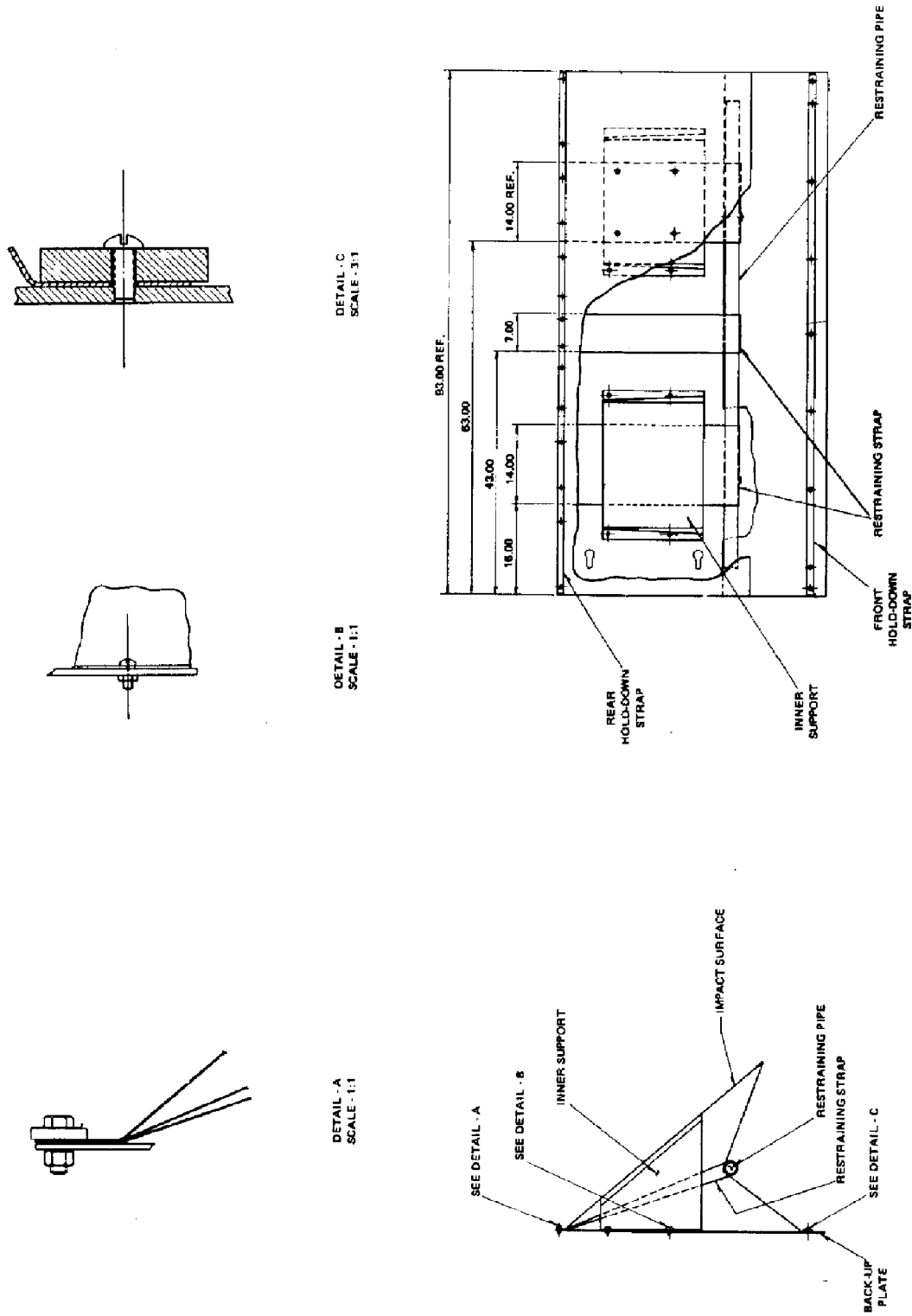
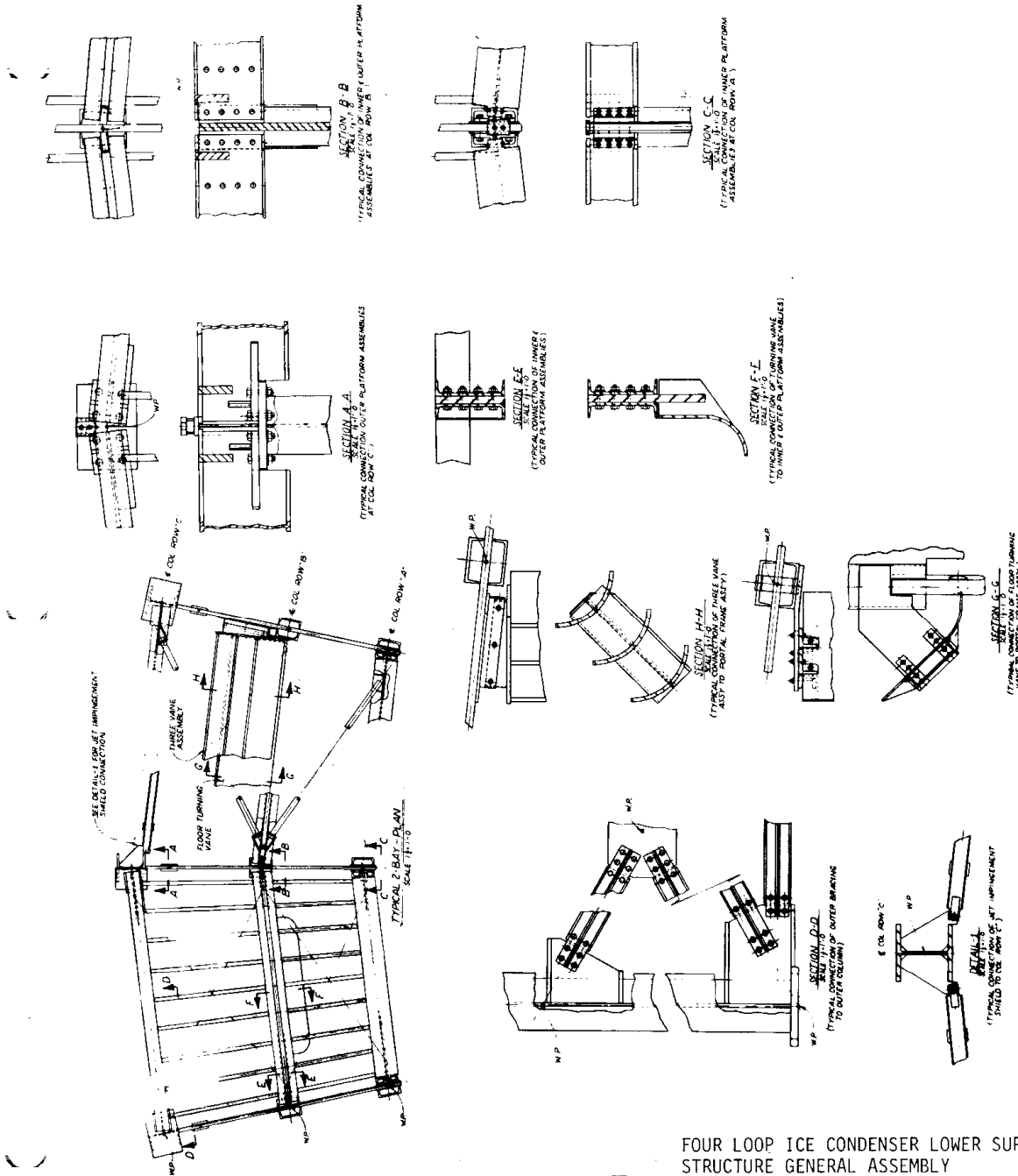


Figure 6-160. Four Loop Ice Condenser Lower Support Structure General Assembly



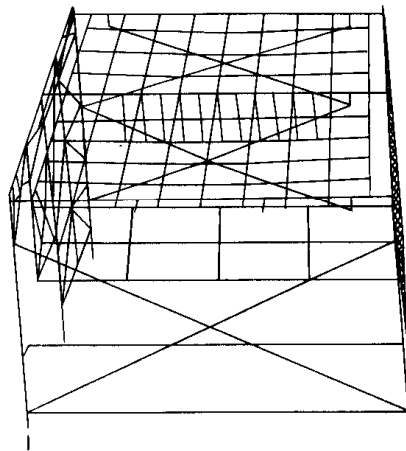
FOUR LOOP ICE CONDENSER LOWER SUPPORT STRUCTURE GENERAL ASSEMBLY

CATAWBA NUCLEAR STATION



Figure 6.7.9-2

Figure 6-161. Ansys Model Assembly



ANSYS MODEL ASSEMBLY

CATAWBA NUCLEAR STATION

Figure 6.7.9-3

Figure 6-162. Finite Element Model of Postal Frame

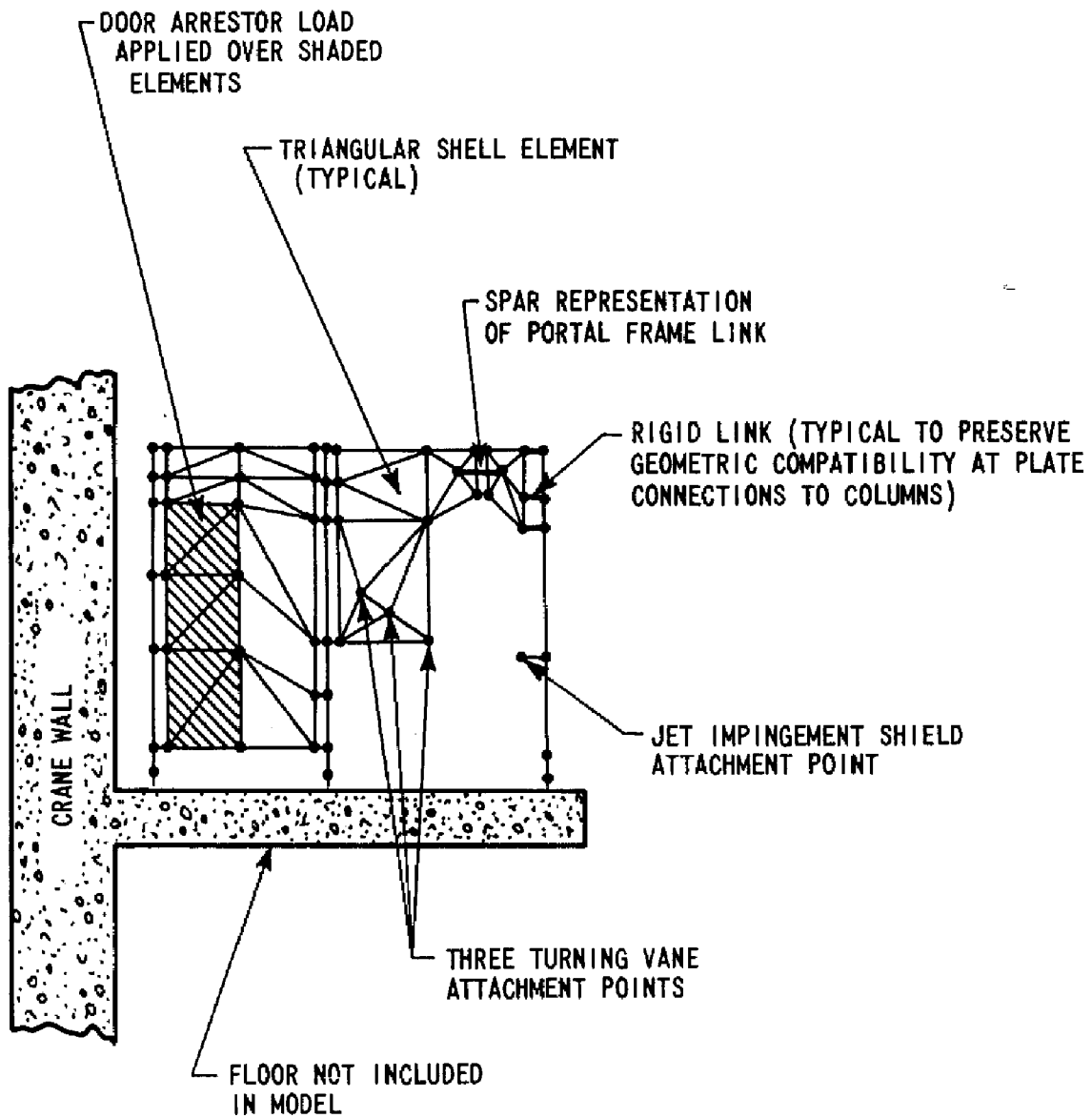


Figure 6-163. Schematic Diagram of Force Applied to Three Pier Lower Support Structure

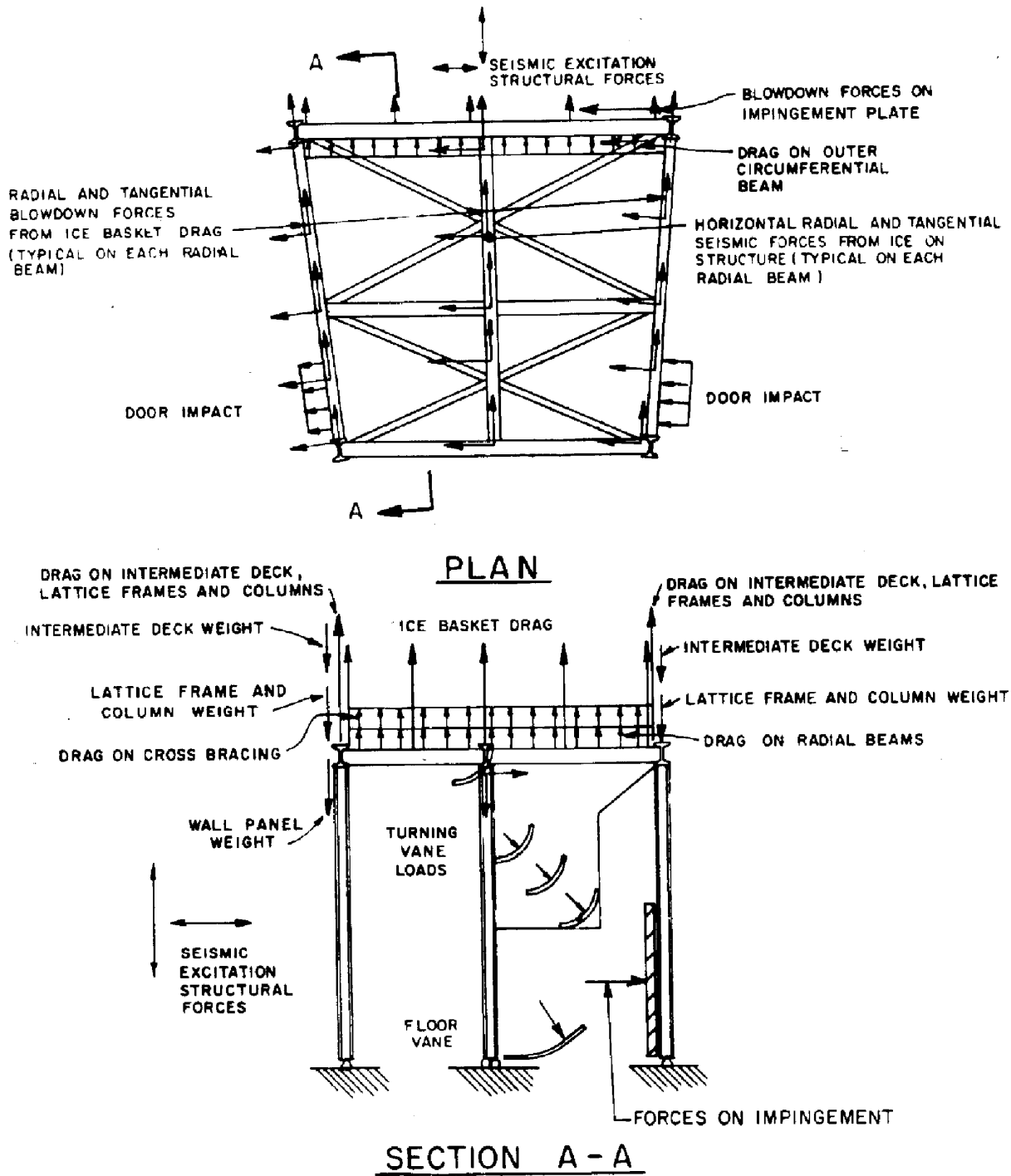


Figure 6-164. Force Transient Hot Leg Break

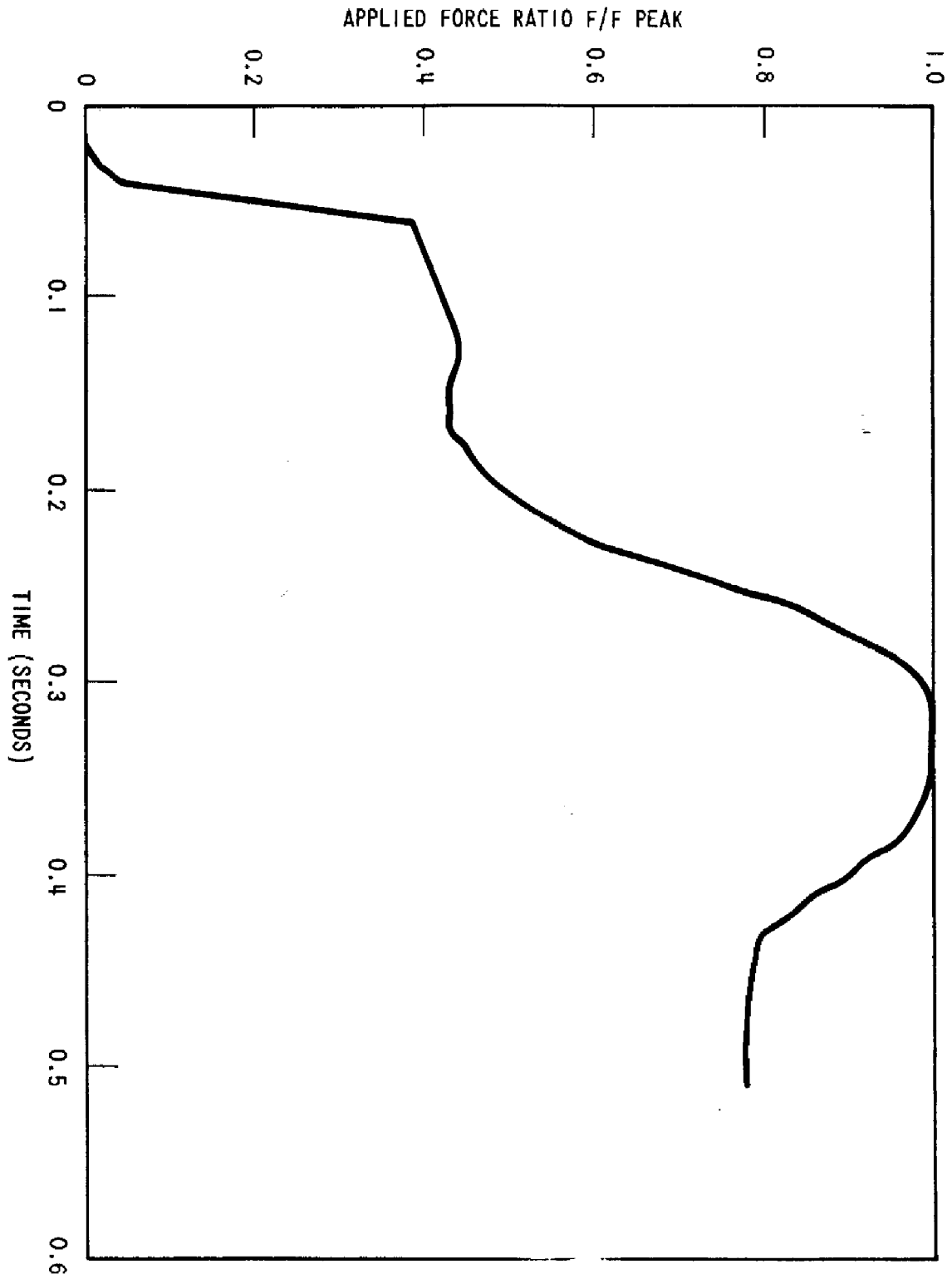


Figure 6-165. DLF Spectra Hot Leg Break Force Transient

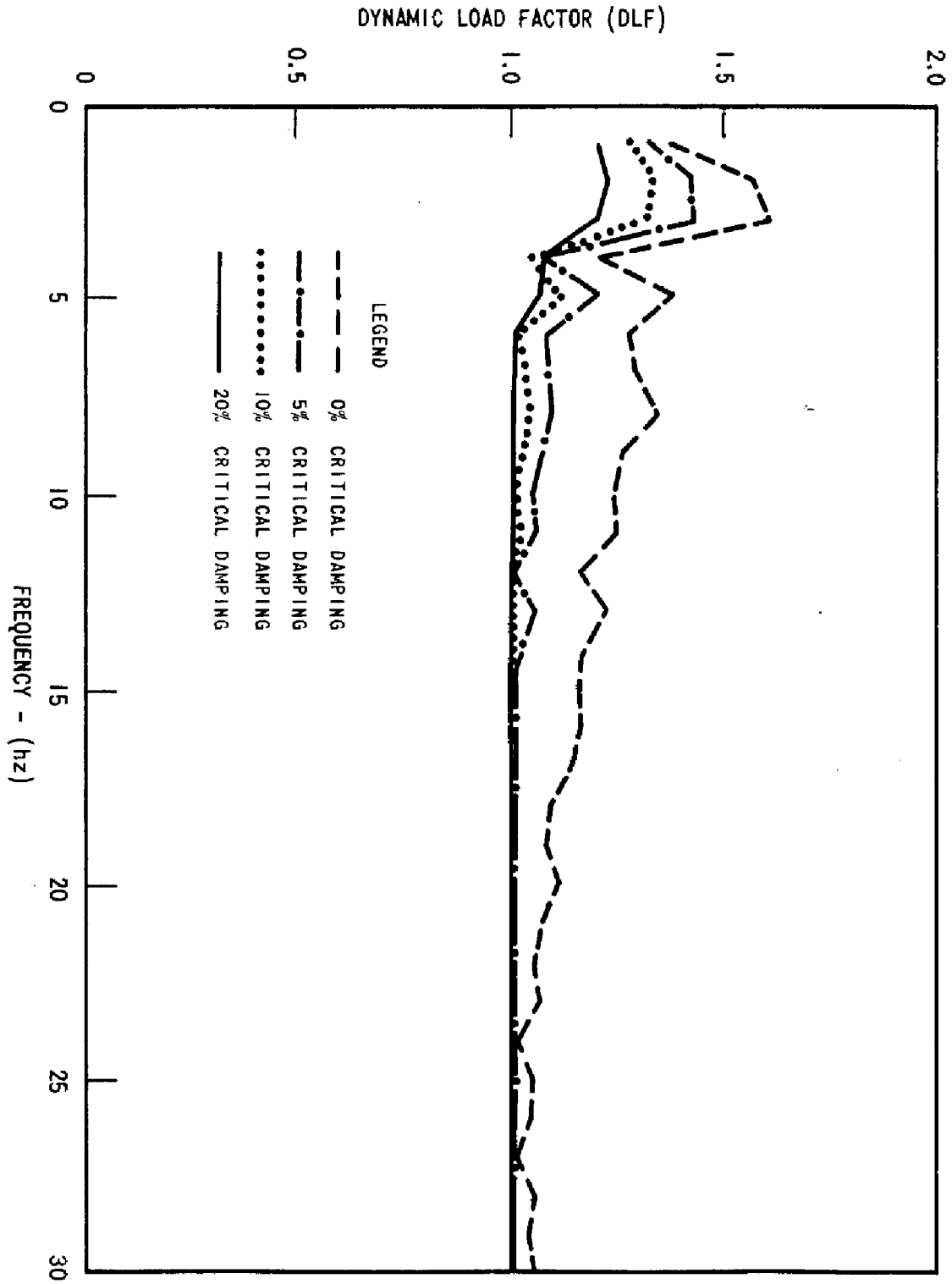
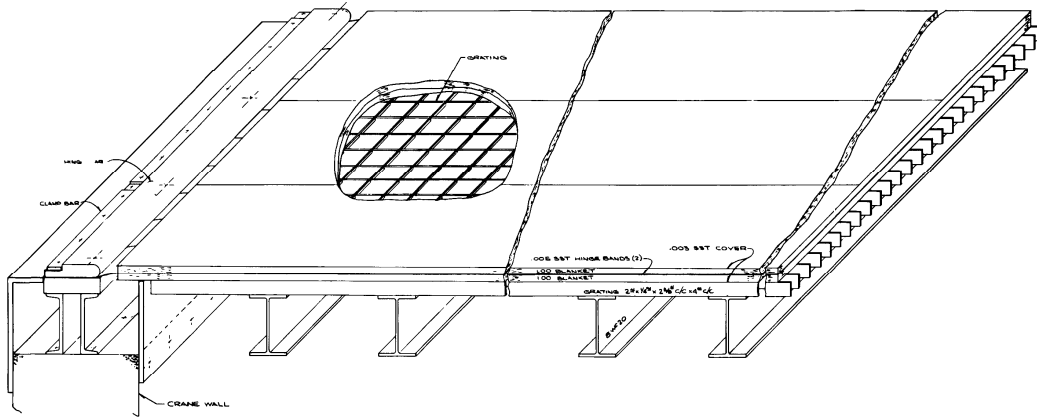
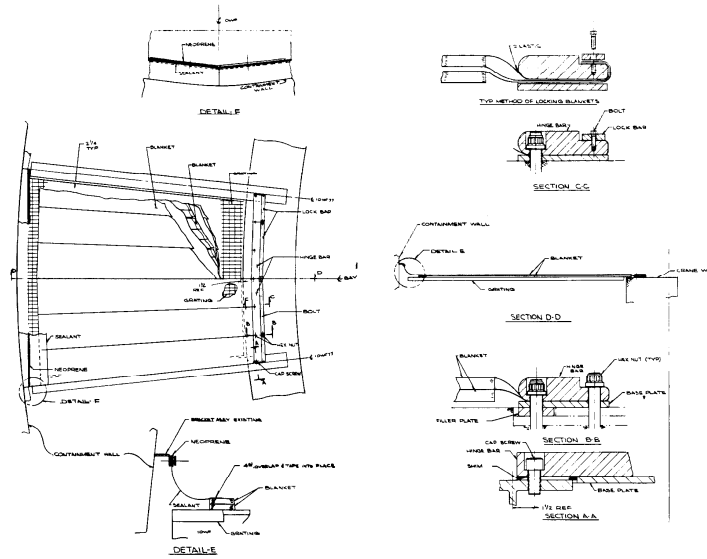


Figure 6-166. Top Deck Test Assembly



TOP DECK TEST ASSEMBLY
CATAWBA NUCLEAR STATION
Figure 6.7.10-1

Figure 6-167. Details of Top Deck Door Assembly



DETAILS OF TOP DECK DOOR ASSEMBLY
CATAWBA NUCLEAR STATION
Figure 6.7.10-2

Figure 6-168. Intermediate Deck Door Assembly

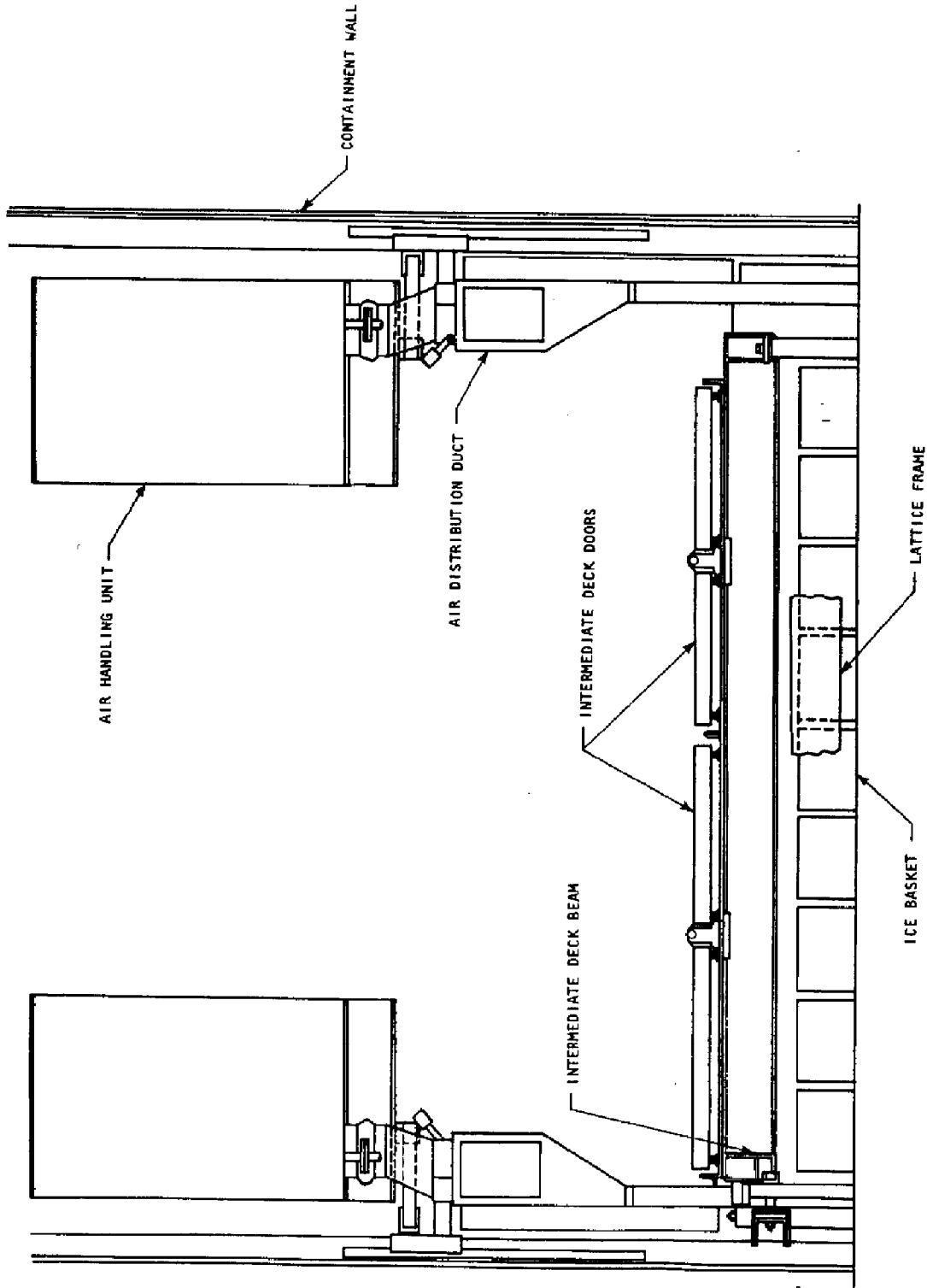


Figure 6-169. Air Distribution Duct

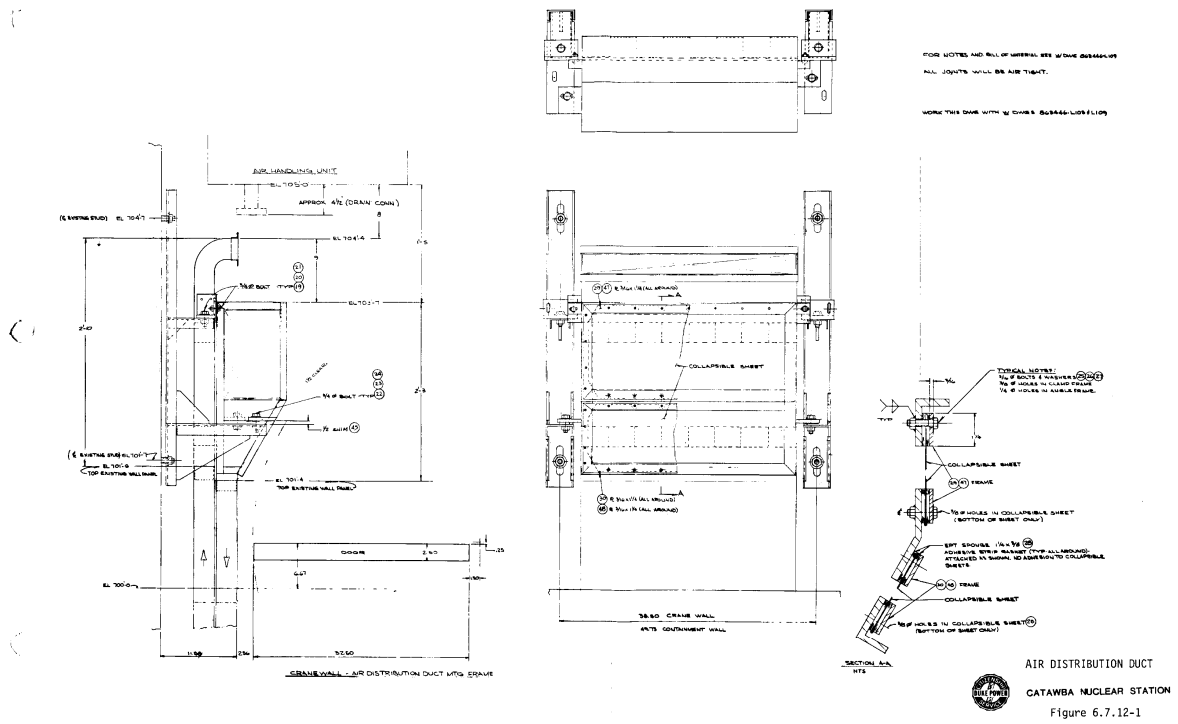


Figure 6-170. Air Distribution Duct

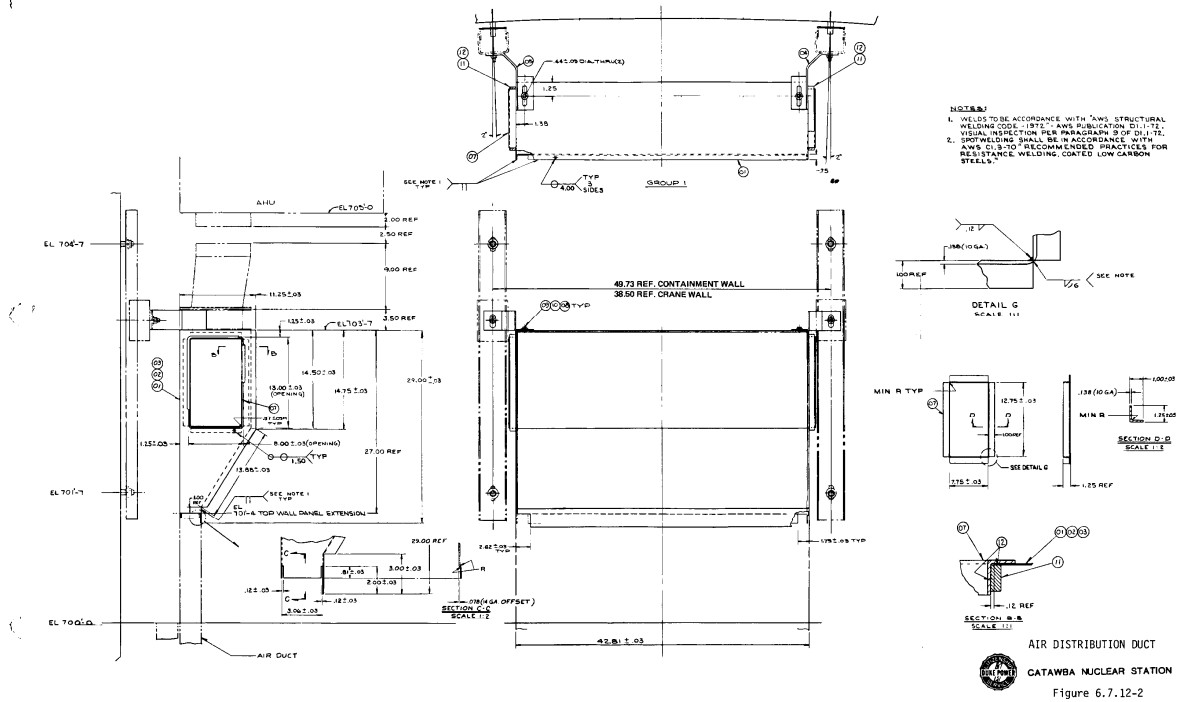


Figure 6-171. Phase Diagram for $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$ System at One Atmosphere

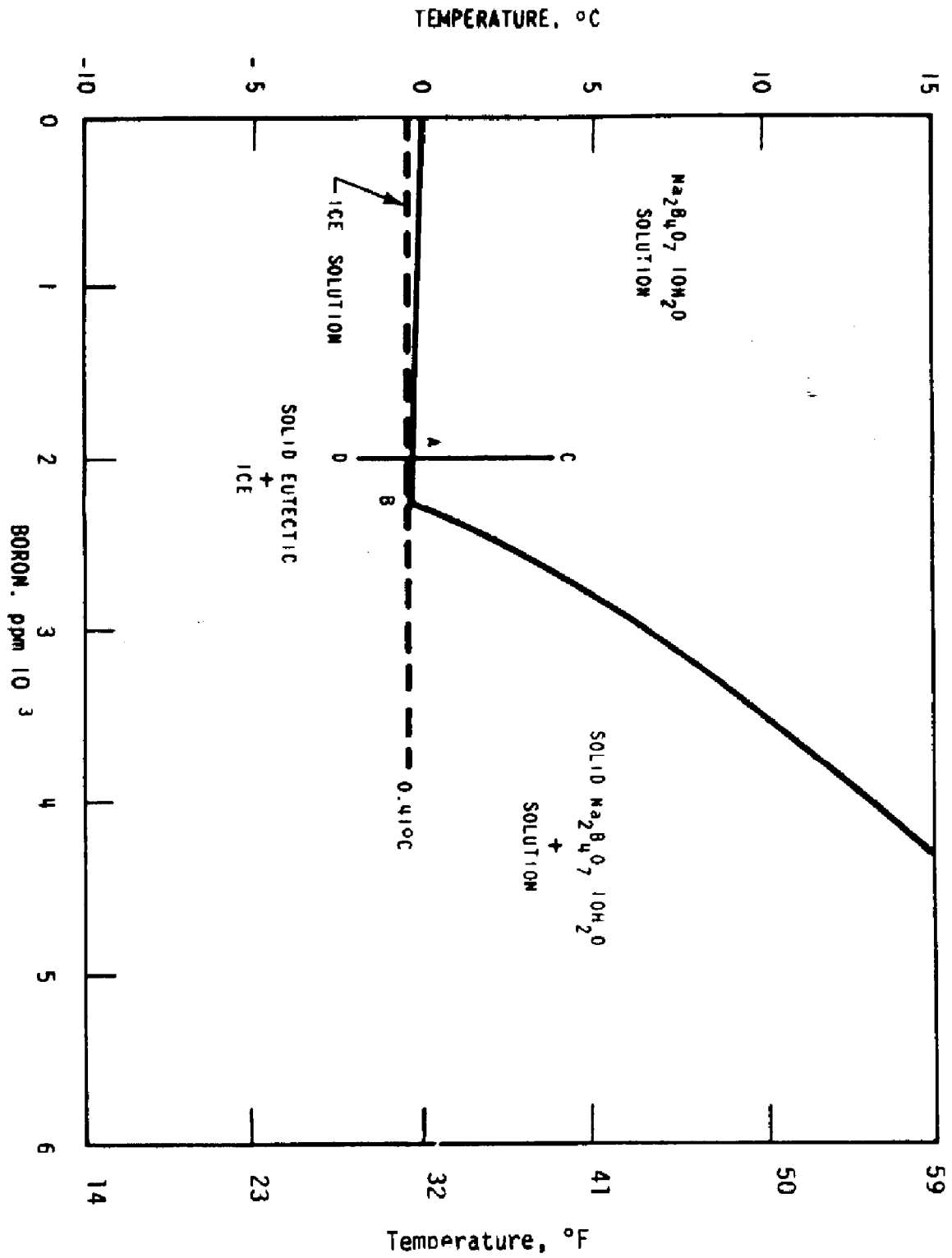


Figure 6-172. Ice Bed Compaction Versus Time

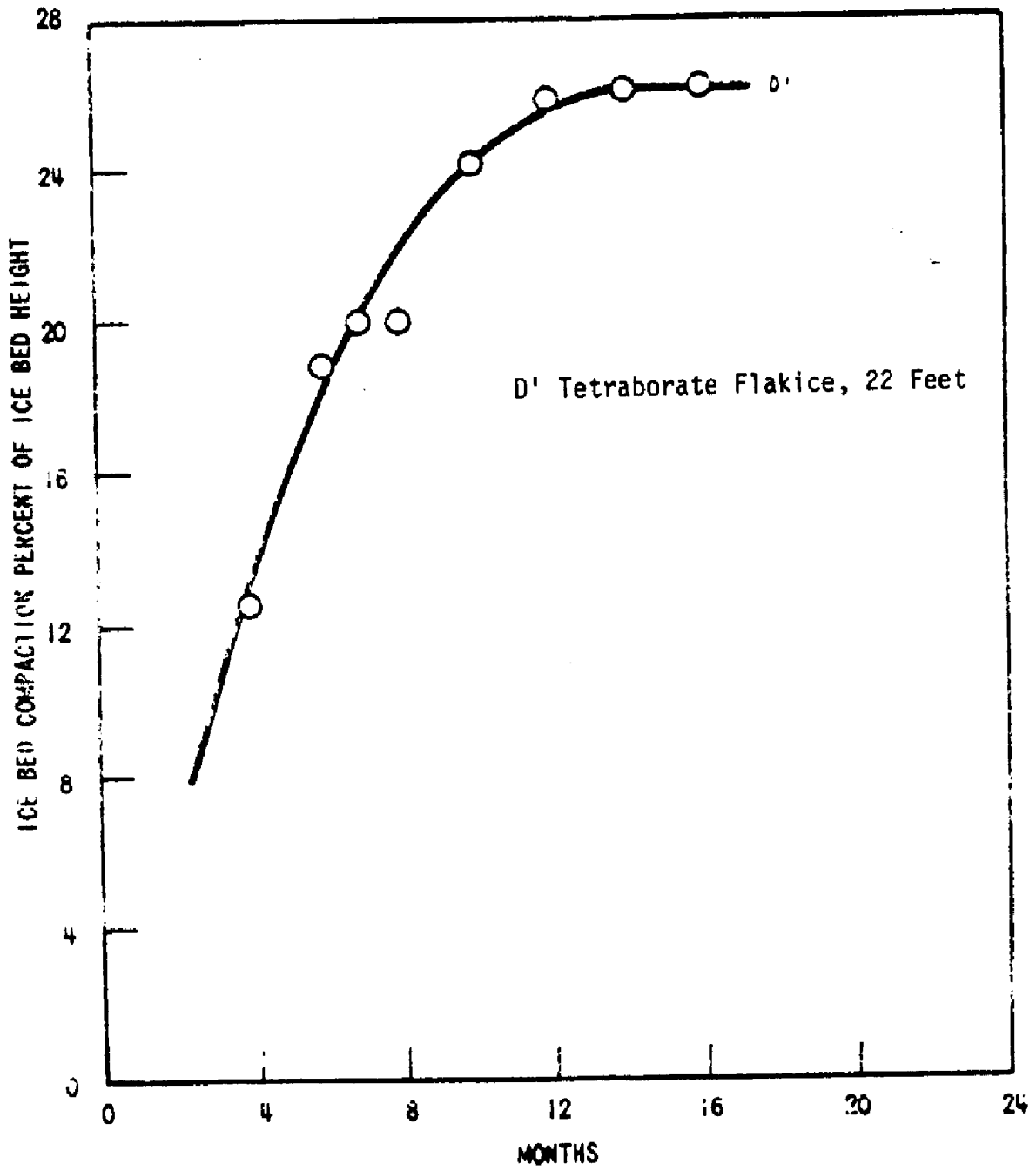


Figure 6-173. Test Ice Bed Compaction Versus Ice Bed Height

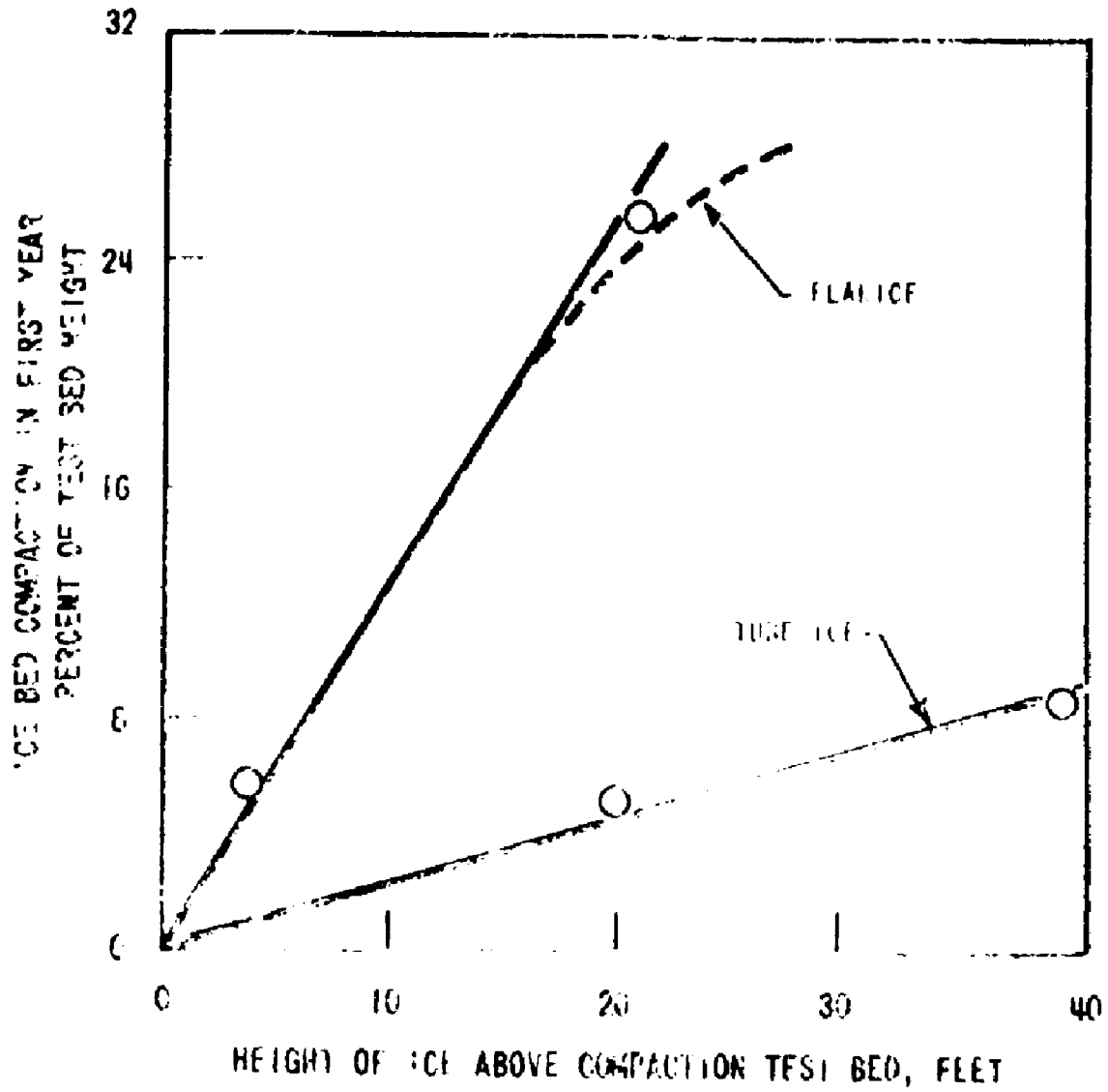


Figure 6-174. Total Ice Compaction Versus Ice Bed Height

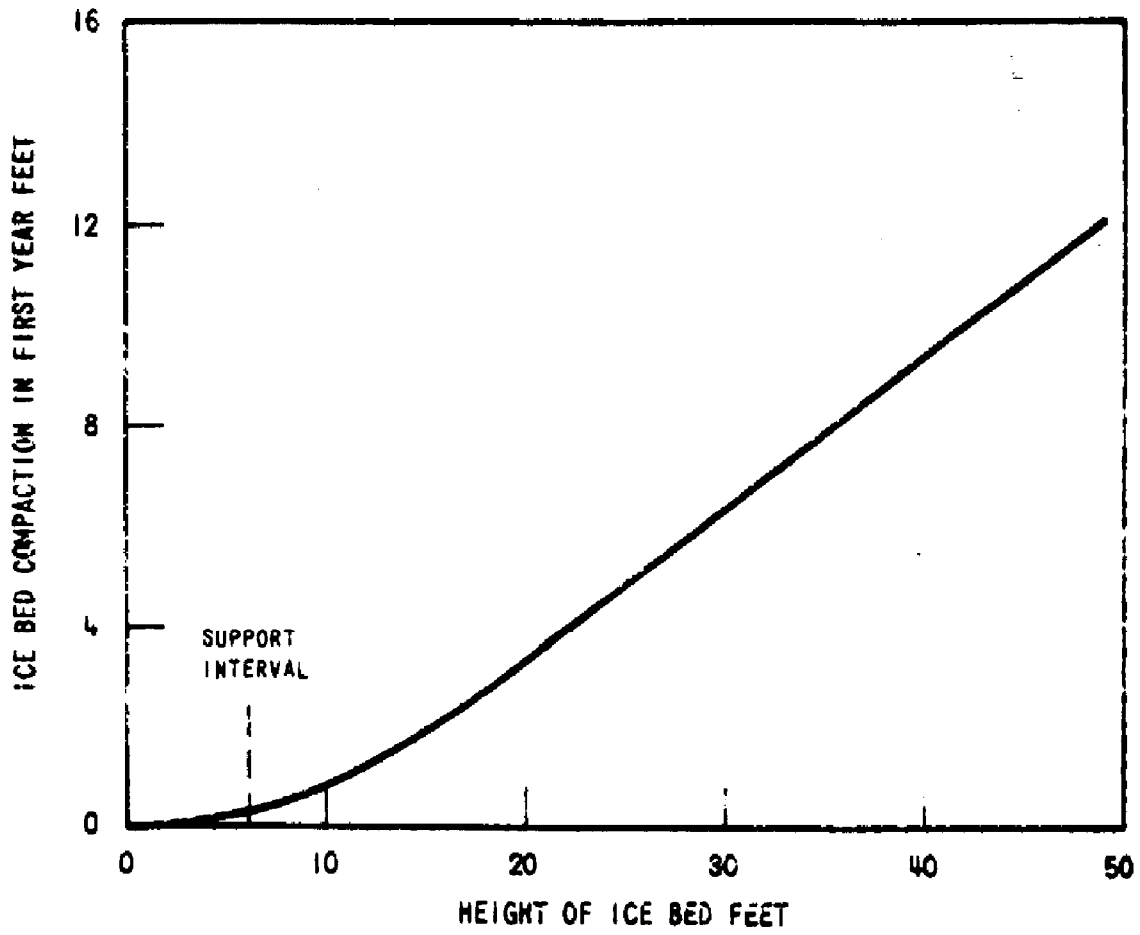


Figure 6-175. Ice Condenser RTD Location

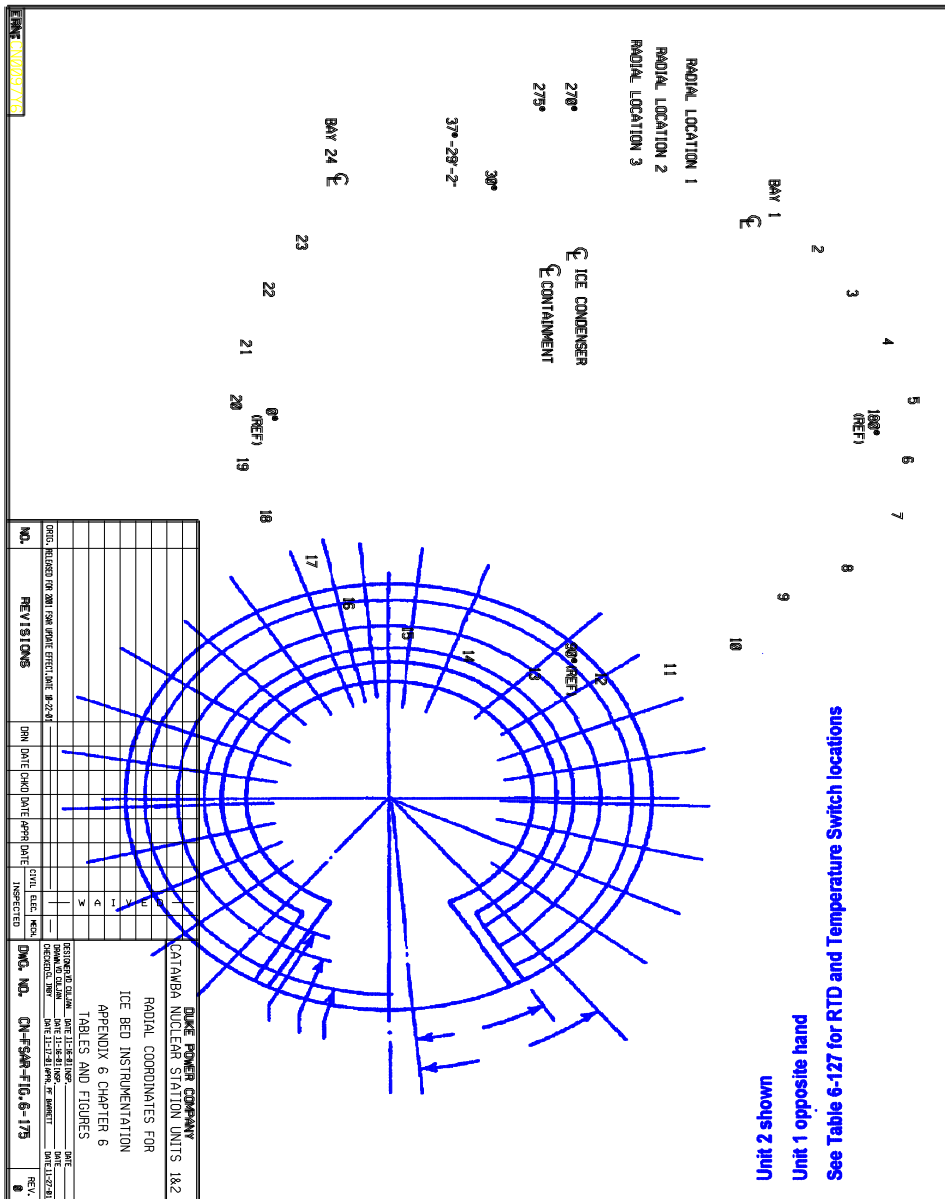


Figure 6-176. Block Diagram: Ice Condenser Temperature Monitoring System

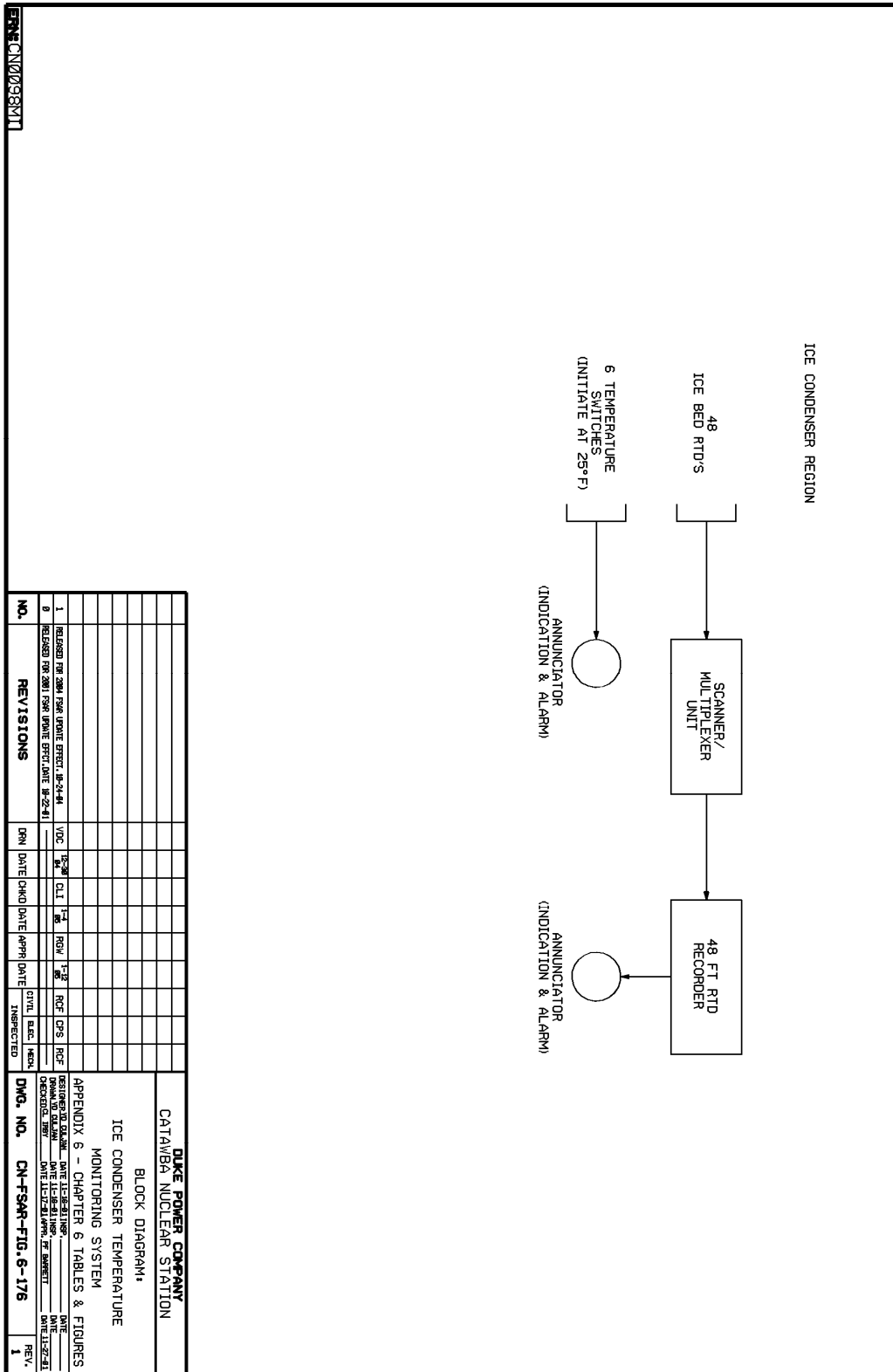


Figure 6-177. Door Monitoring Zones

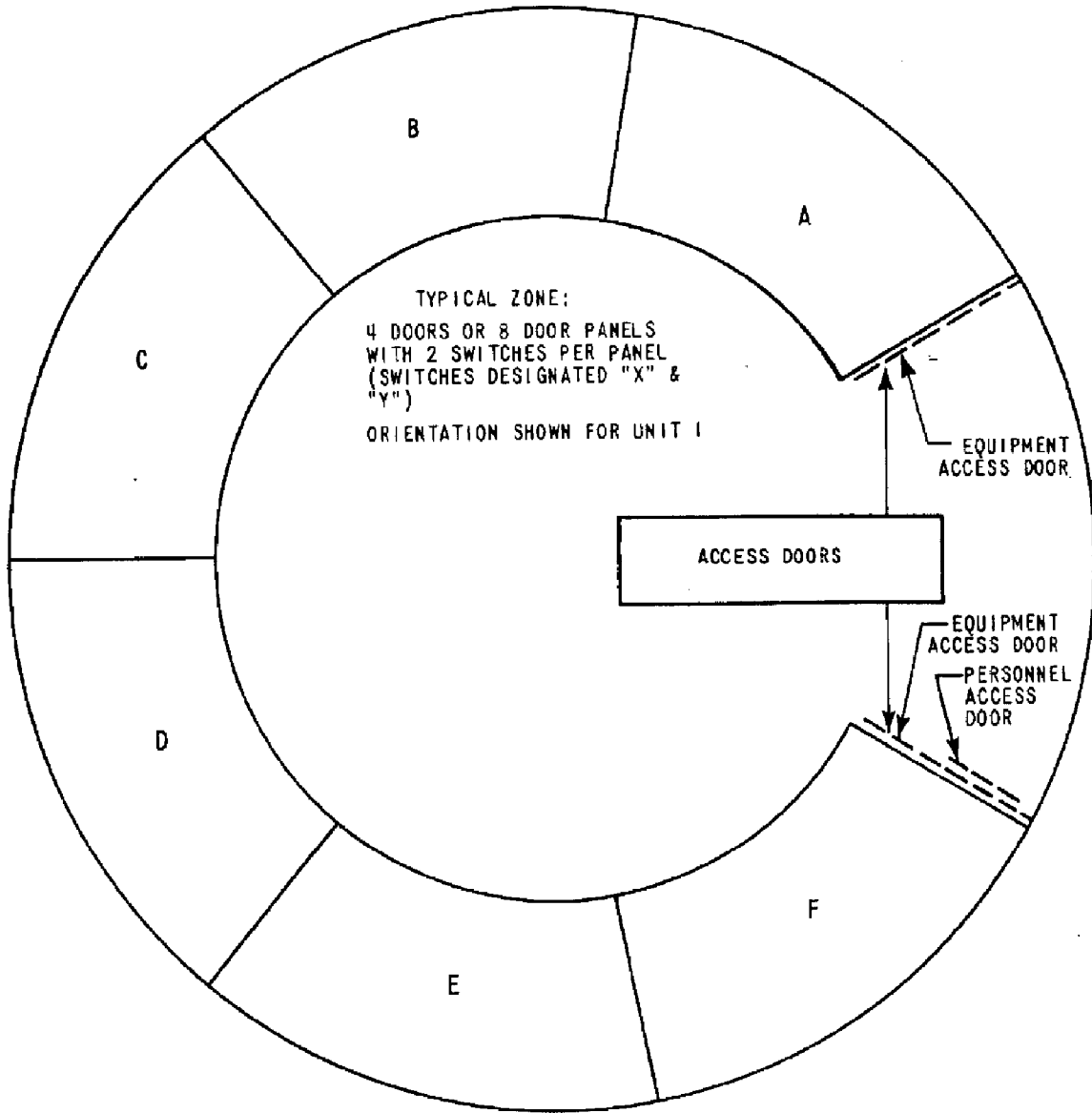


Figure 6-179. Wiring Diagram: "X" Switches Lower Inlet Doors

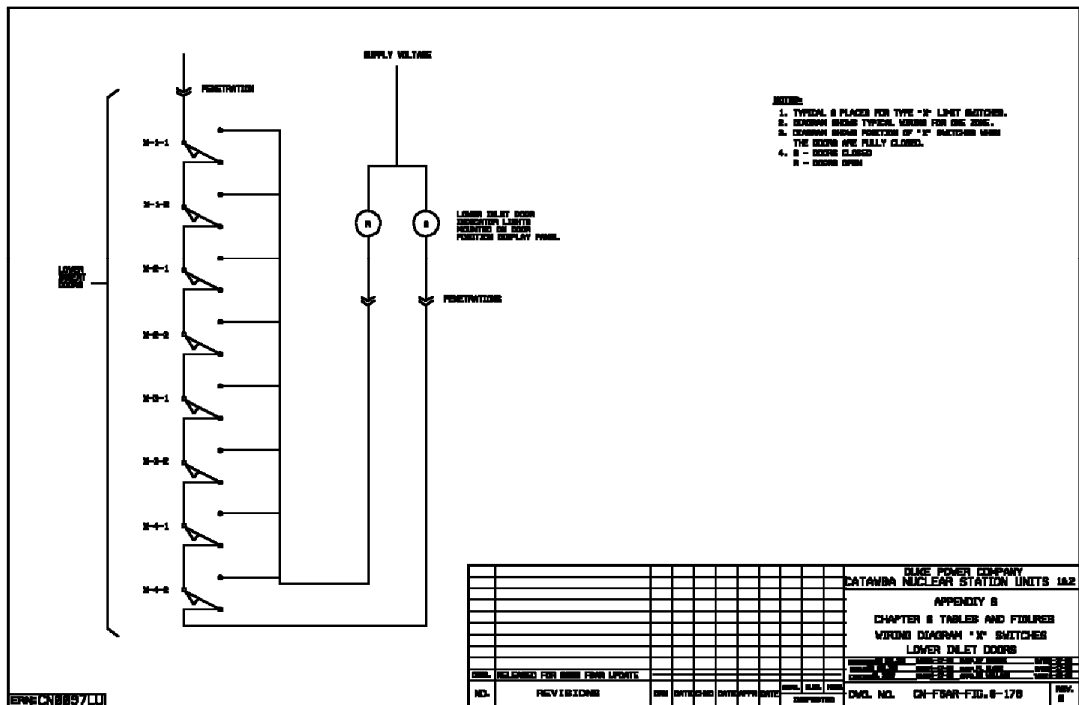


Figure 6-180. Deleted Per 2001 Update

Figure 6-181. Model of Horizontal Lattice Frame Structure

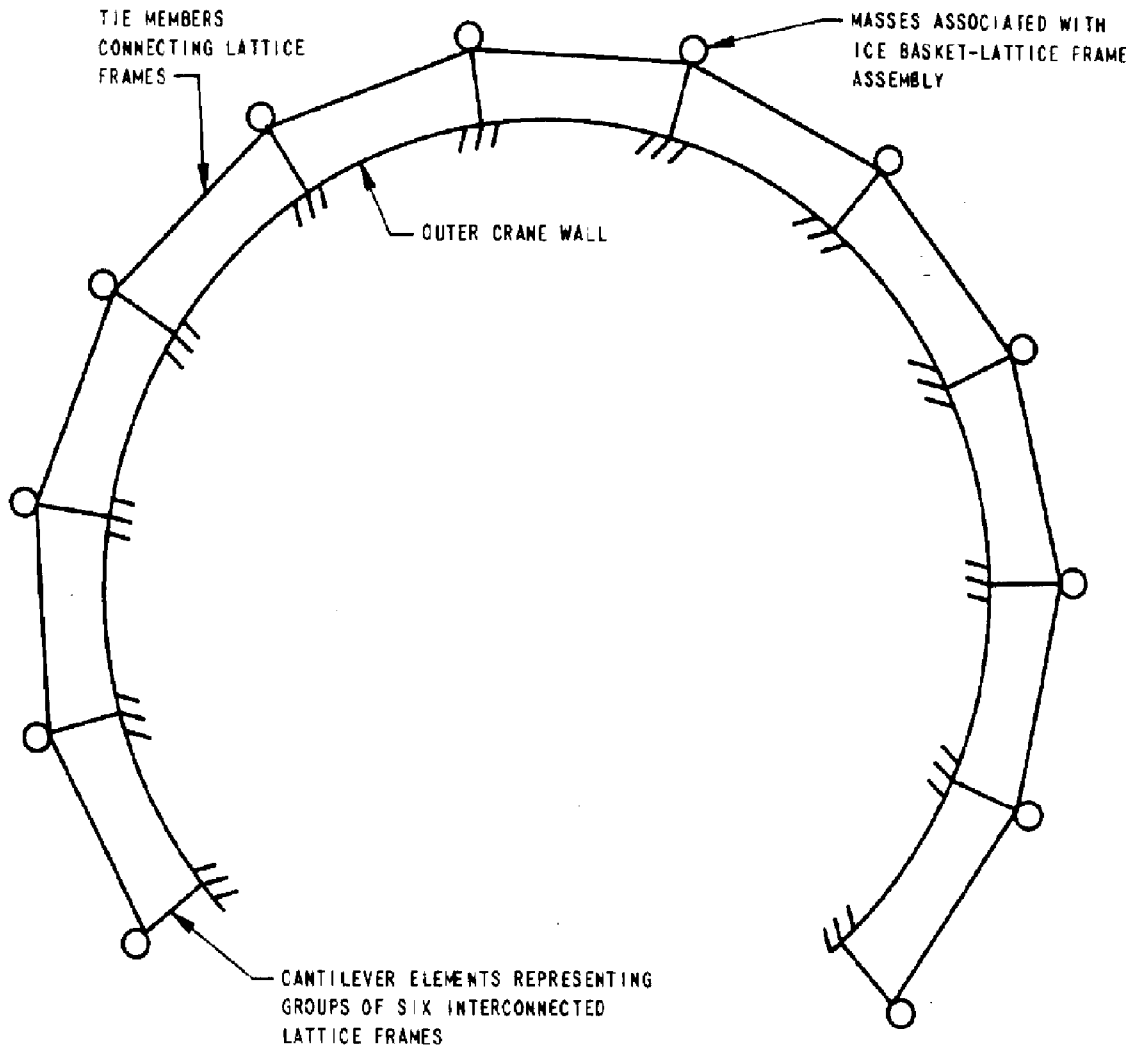


Figure 6-182. Group of Six Interconnected Lattice Frames

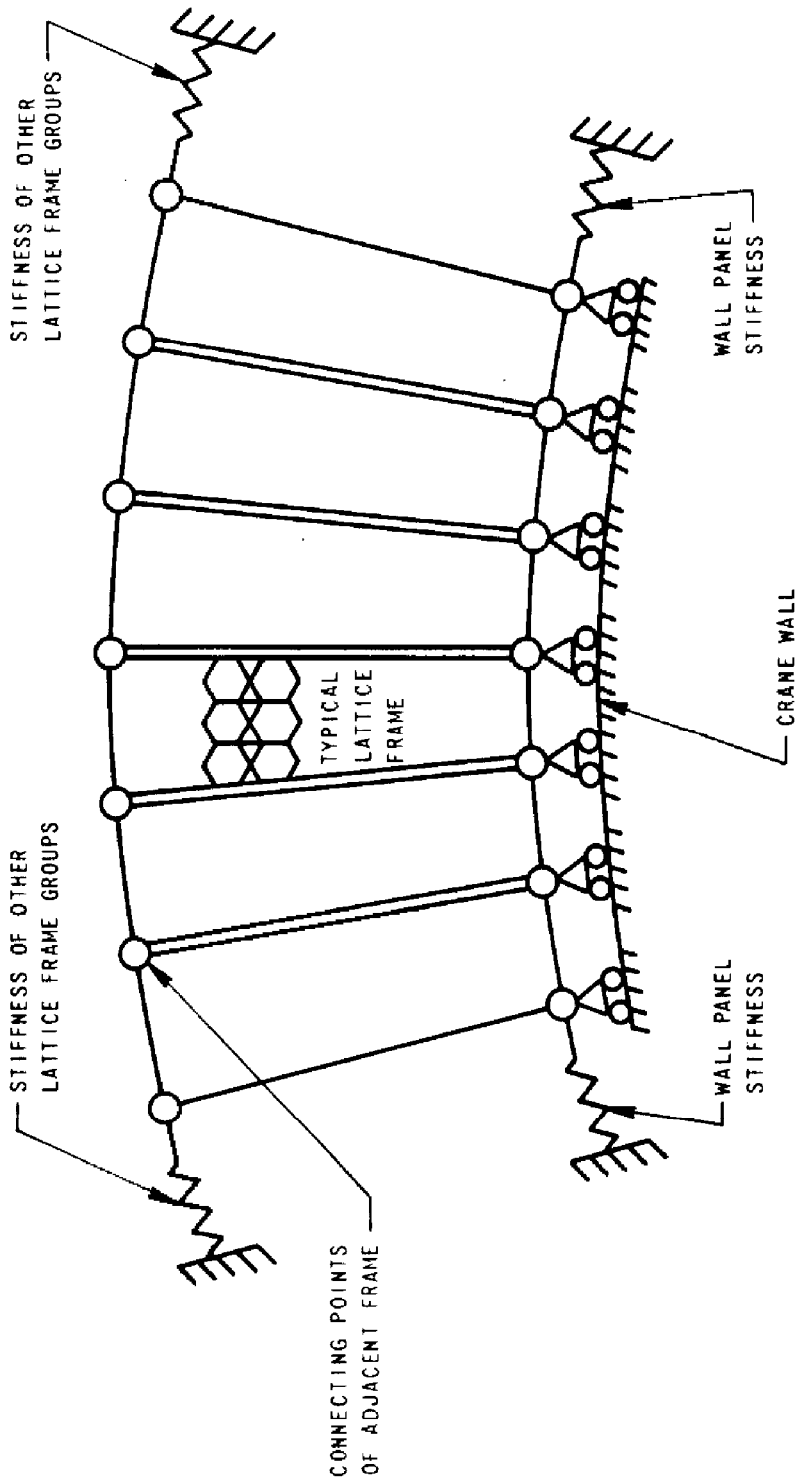


Figure 6-183. Lattice Frame Ice Basket Gap

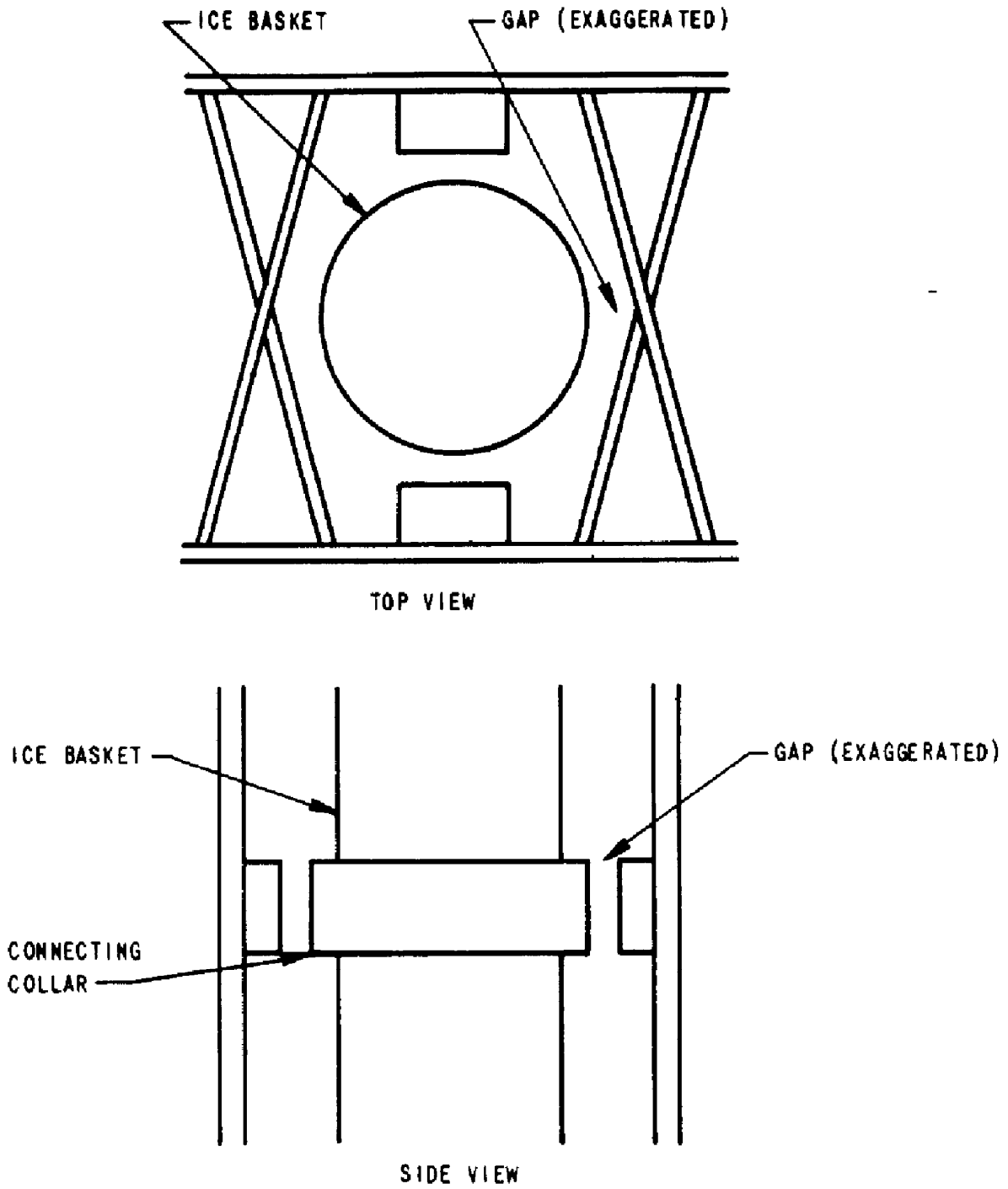


Figure 6-184. Typical Displacement Time History for 12 Foot Basket with End Supports - Pluck Test

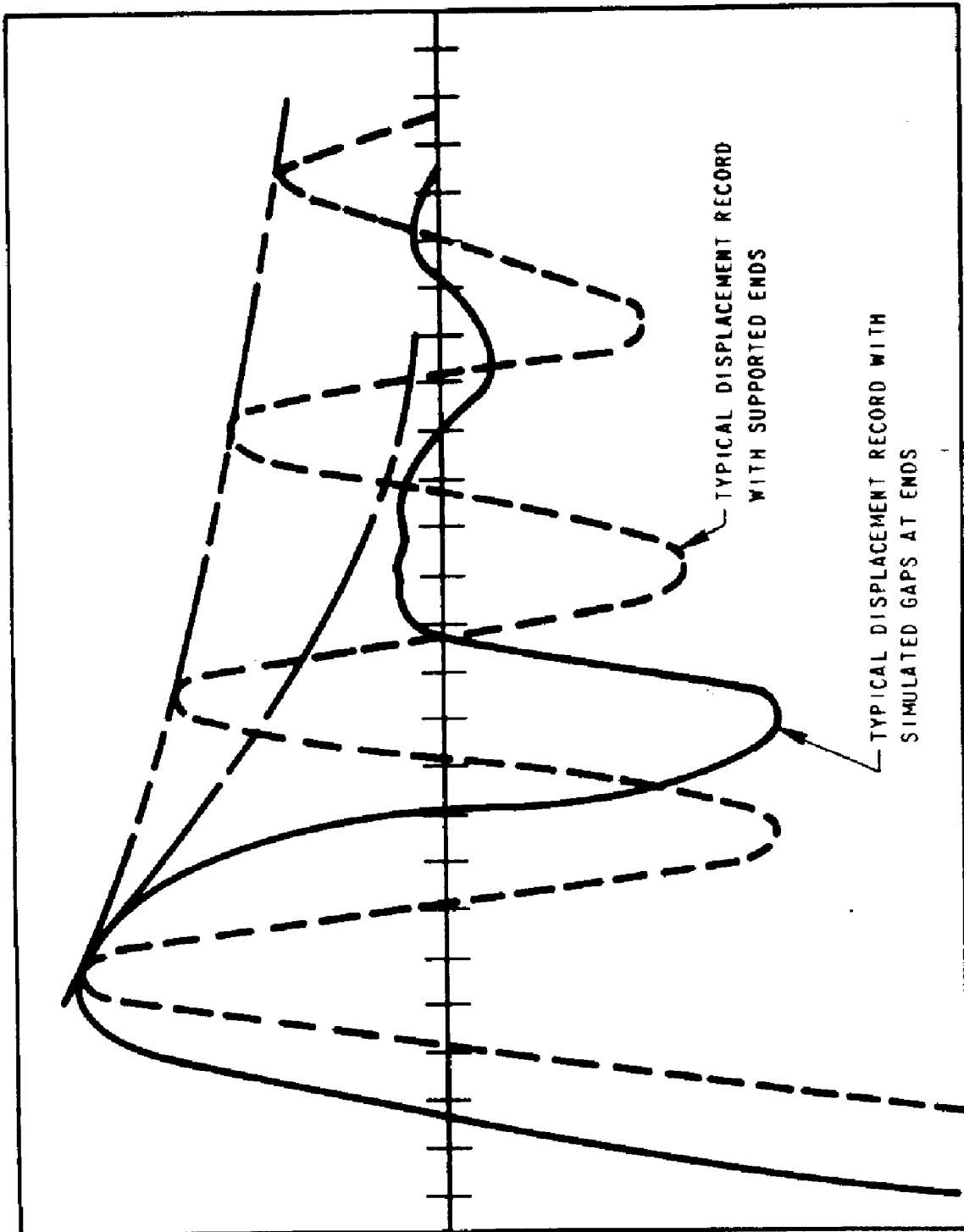


Figure 6-185. Non Linear Dynamic Model

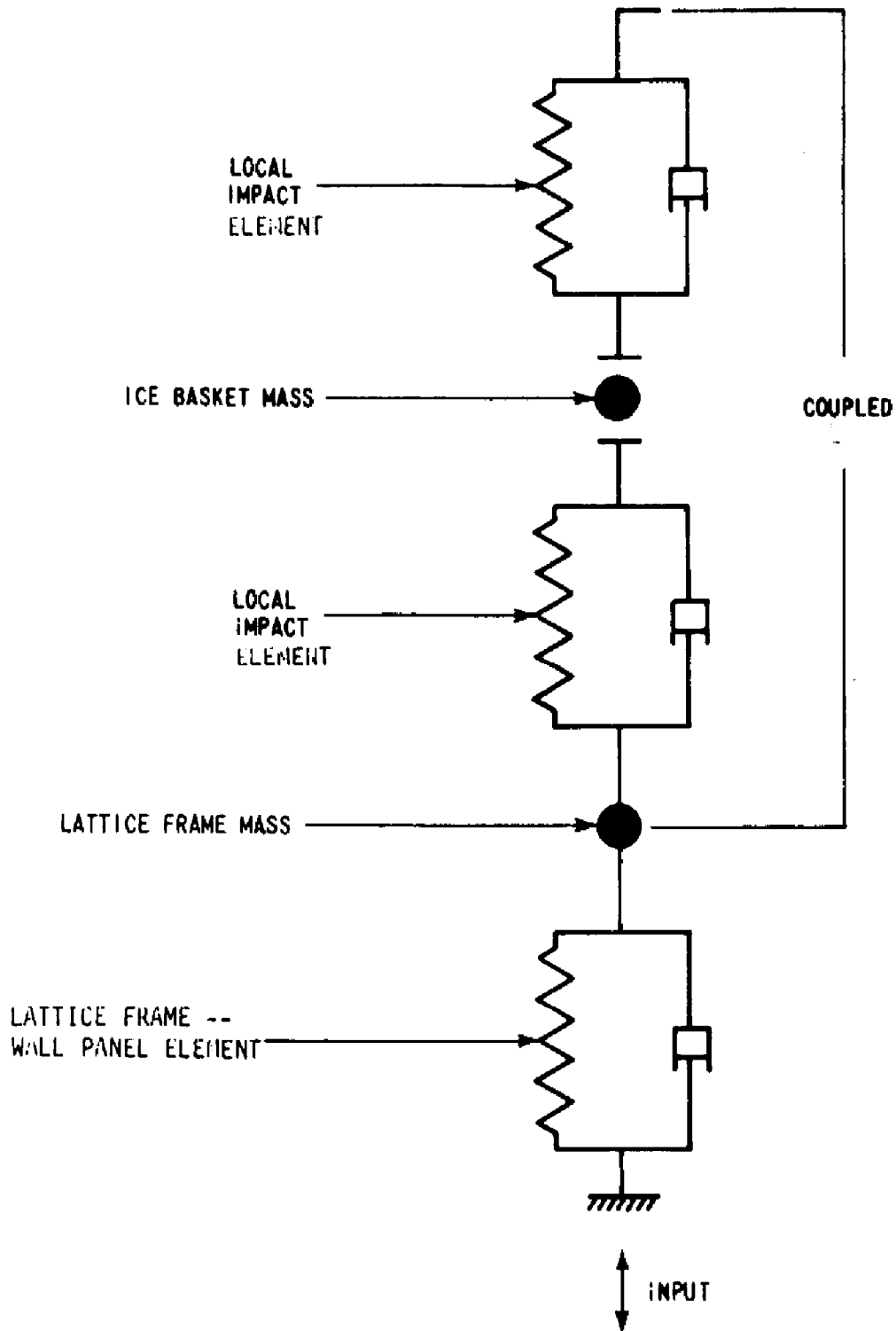


Figure 6-186. 3 Mass Tangential Ice Basket Model

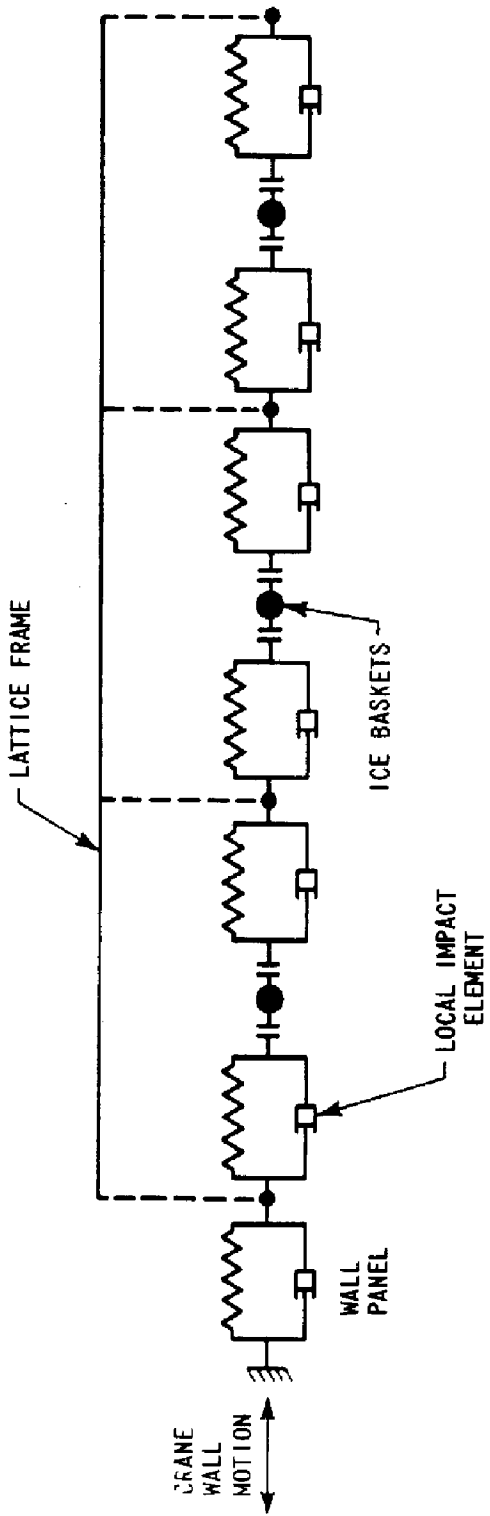


Figure 6-187. 9 Mass Radial Ice Basket Model

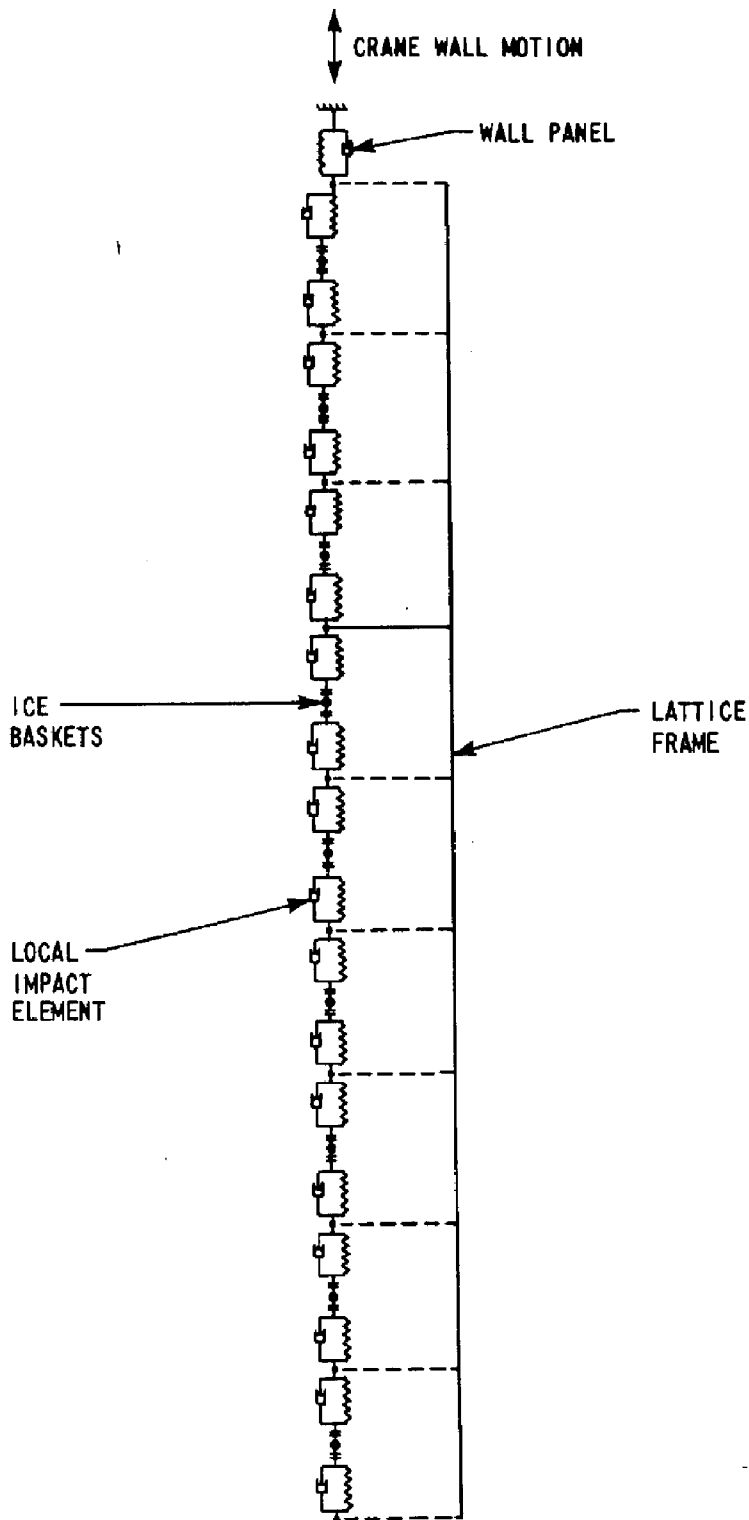


Figure 6-188. 48 Foot Beam Model

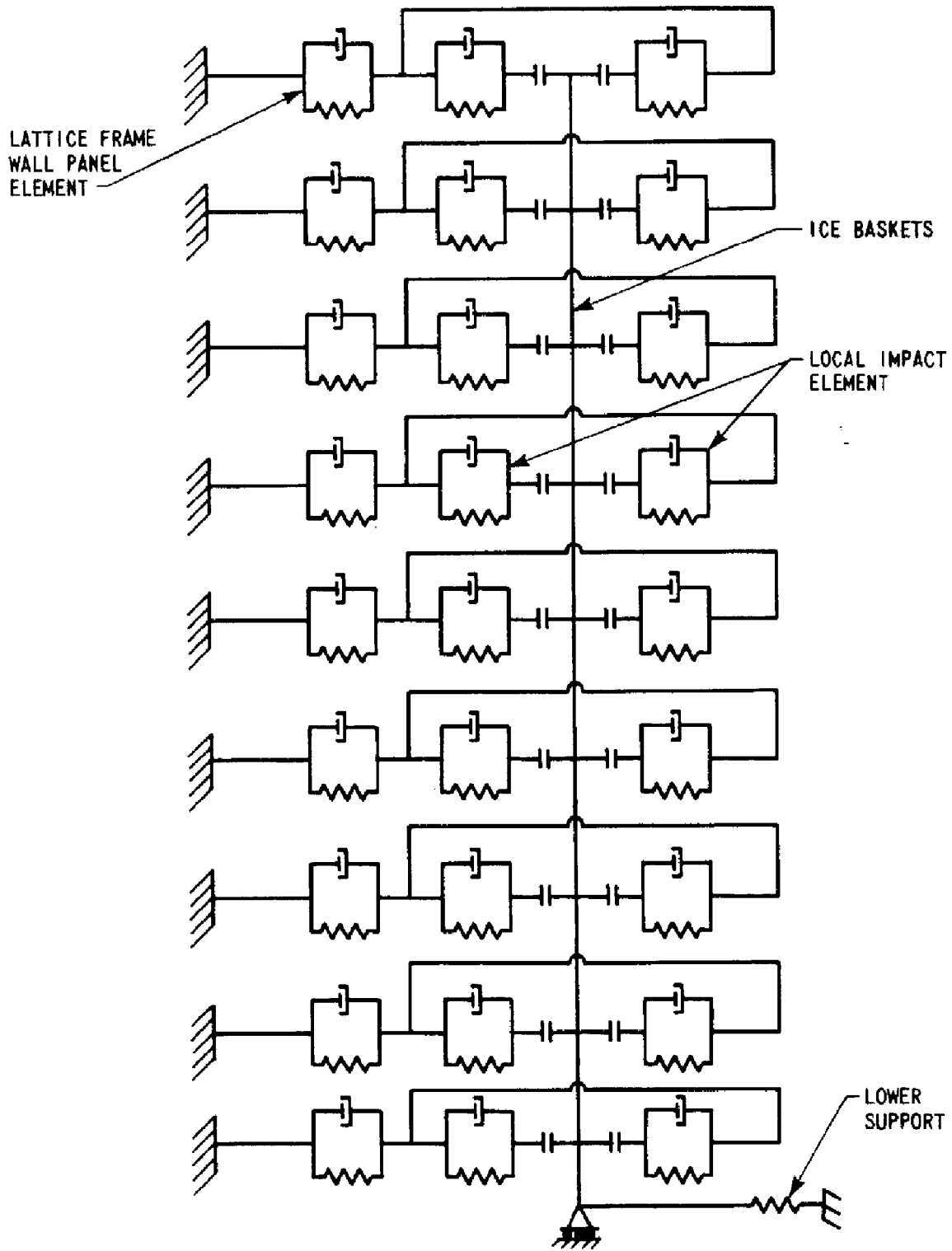


Figure 6-189. Phasing Mass Model of Adjacent Lattice Frame Bays

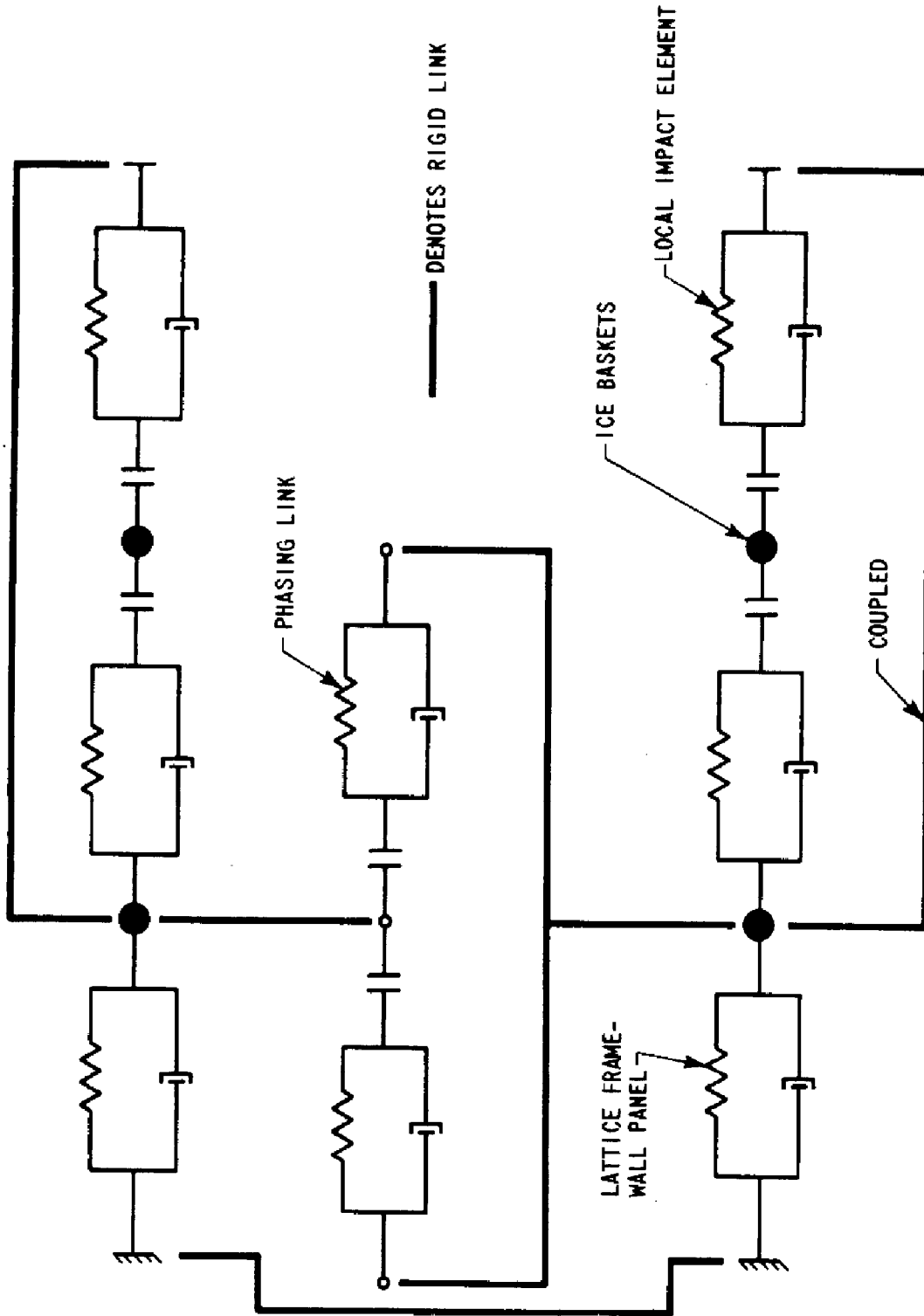


Figure 6-190. Phasing Study Model, 1 Level Lattice Frame 300 Degrees Non-Linear Model

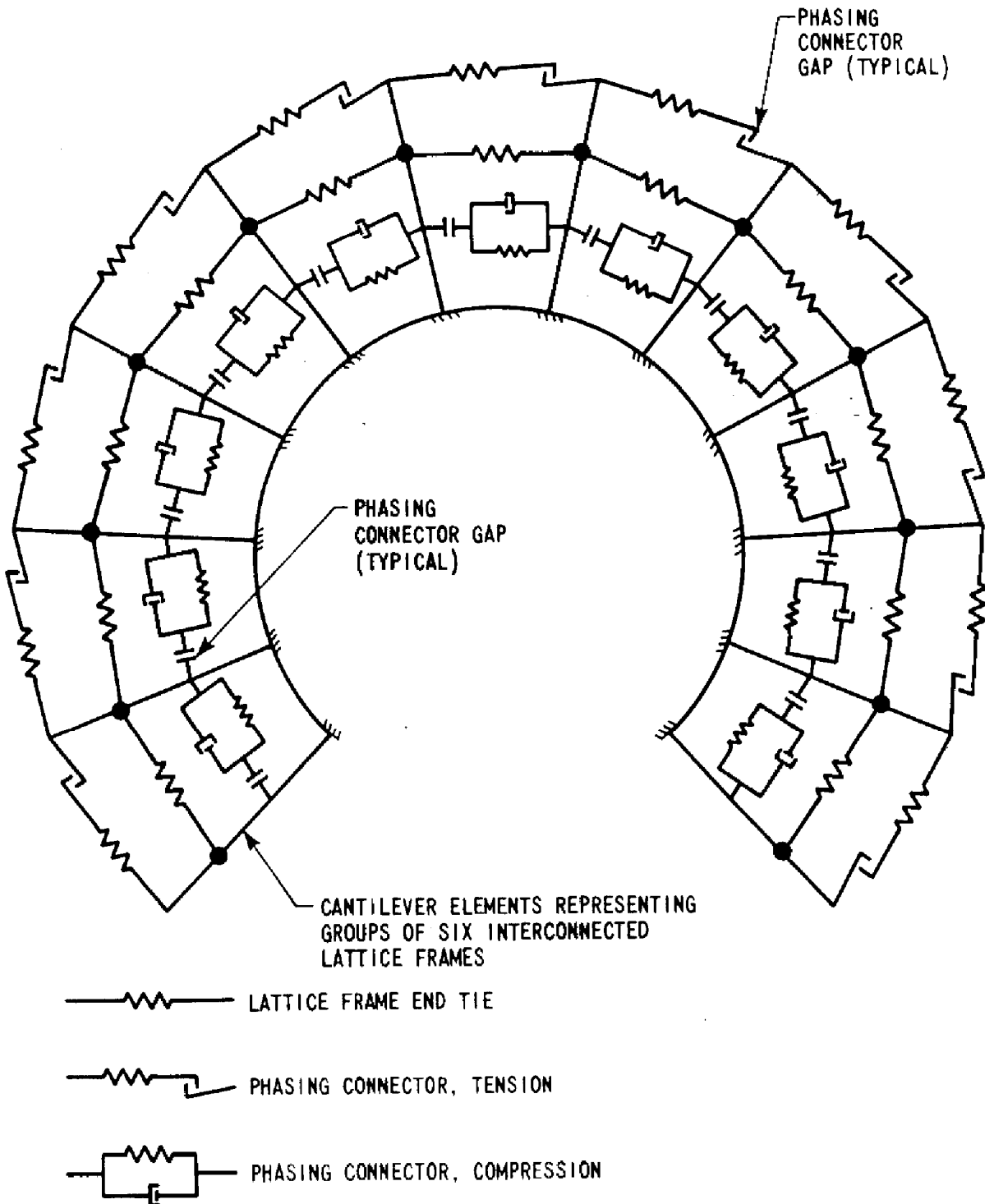


Figure 6-191. Typical Crane Wall Displacement

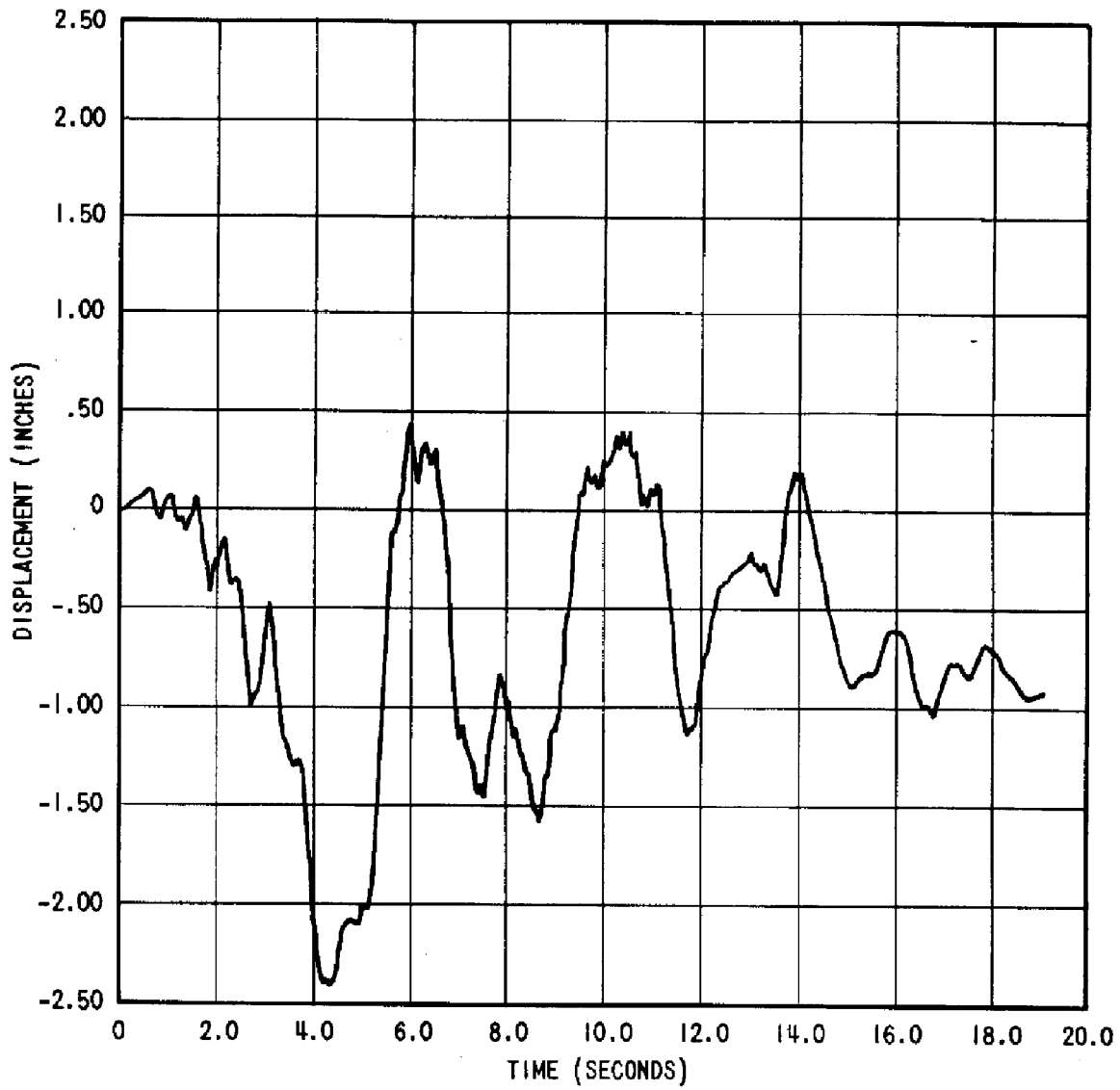


Figure 6-192. Typical Ice Basket Displacement Response

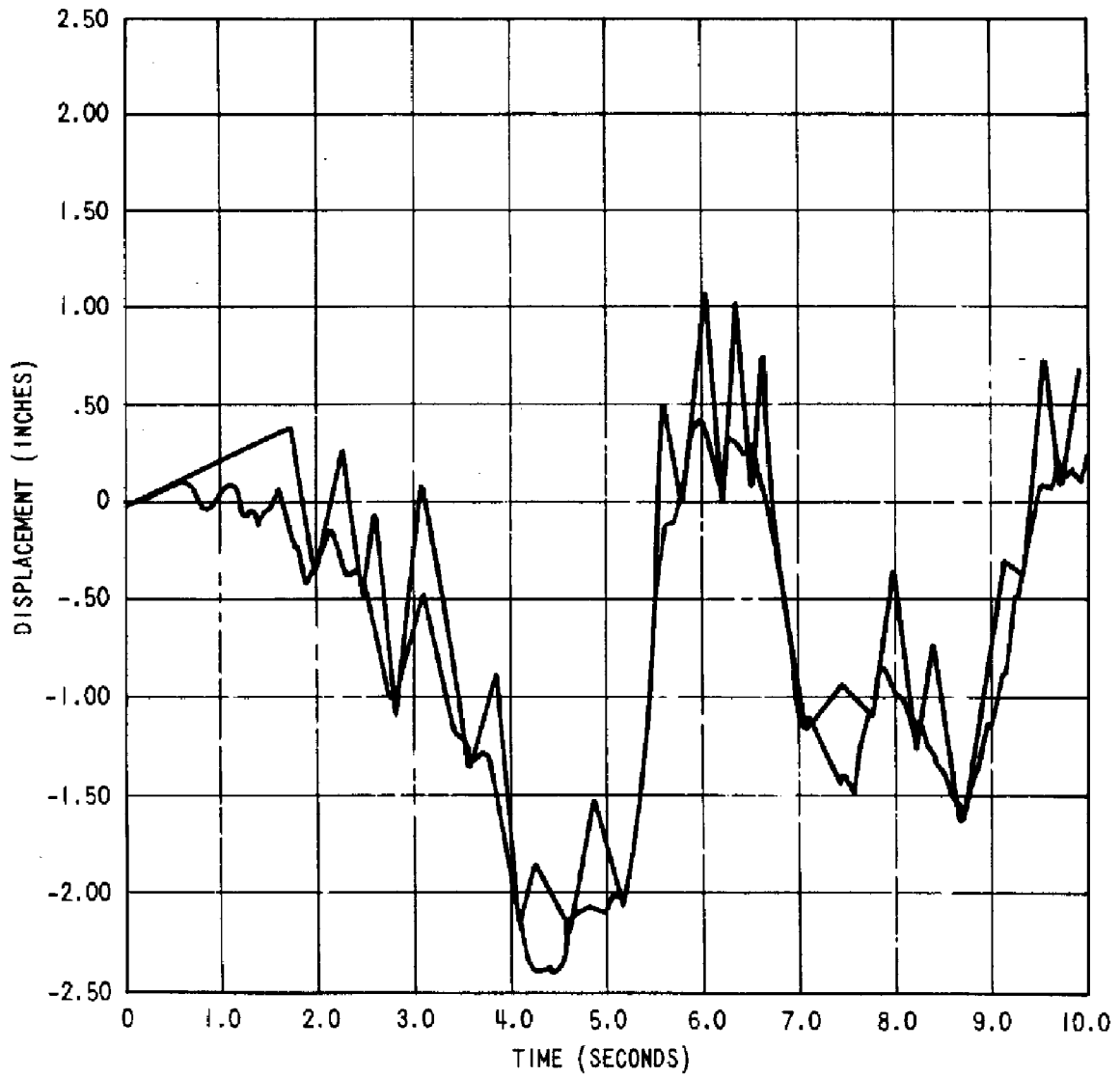


Figure 6-193. Typical Ice Basket Impact Force Response

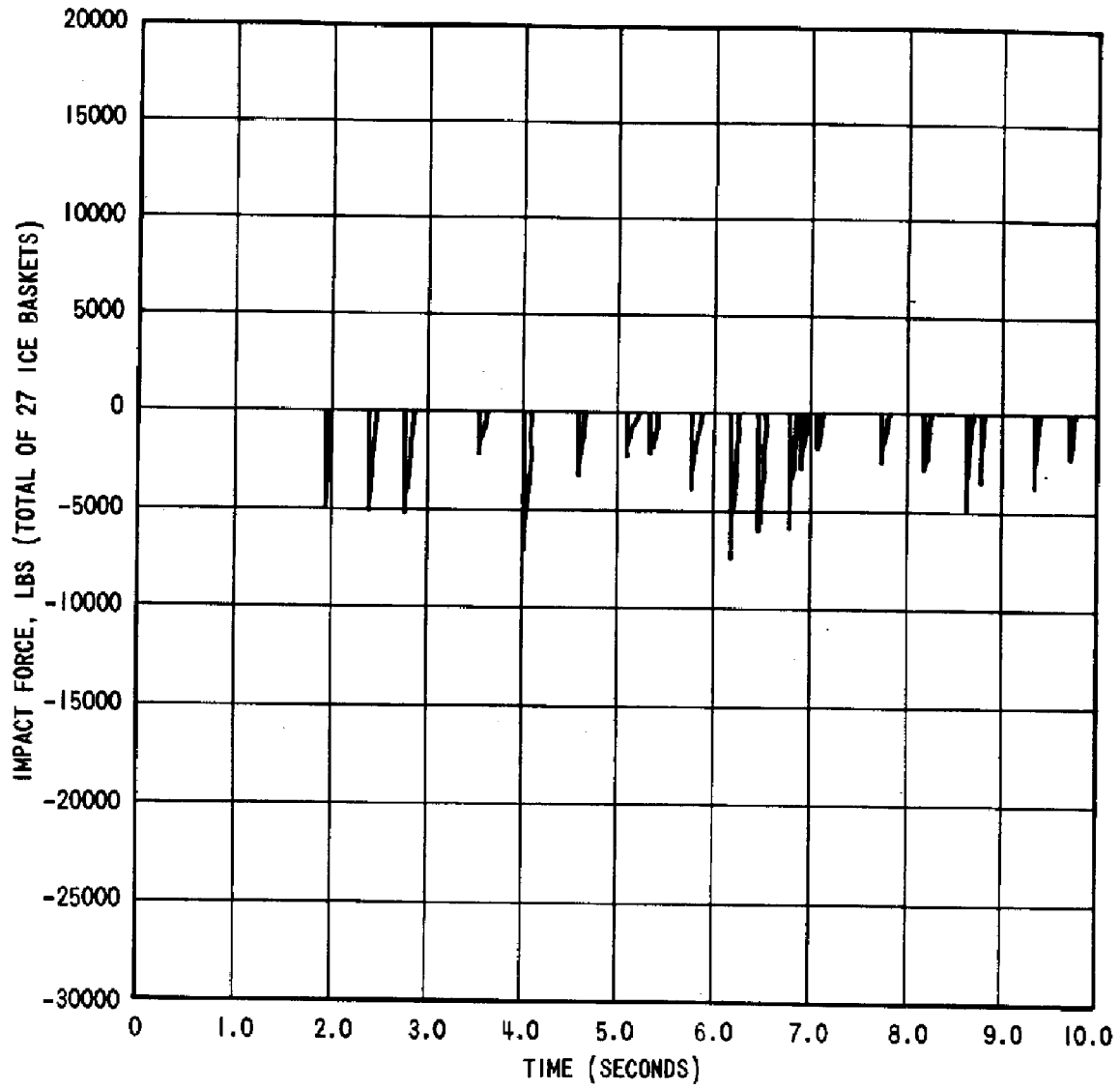


Figure 6-194. Typical Crane Wall Panel Load Response

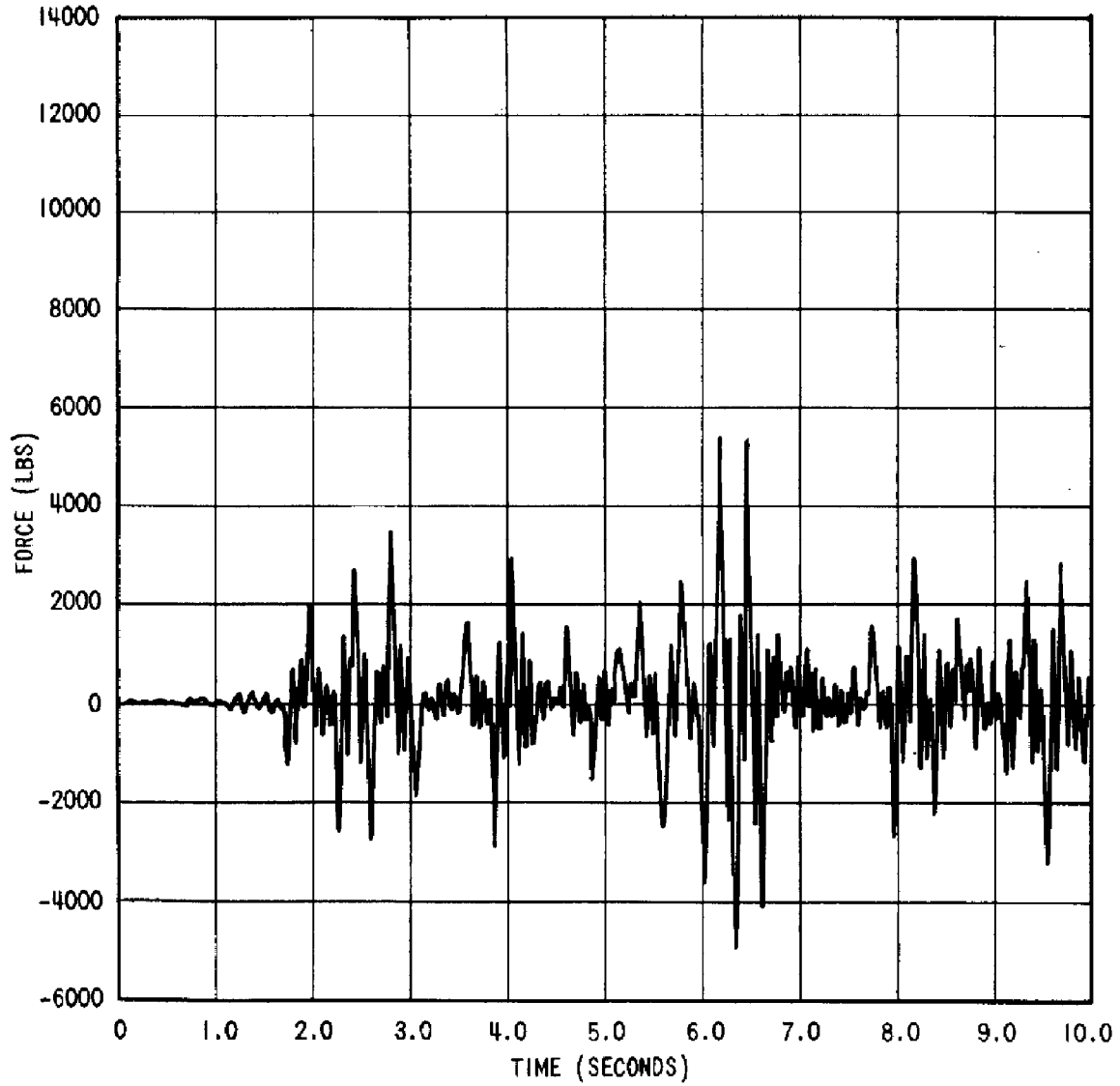


Figure 6-195. Wall Panel Design Load Distribution Obtained Using the 48-Foot Beam Model Tangential Case

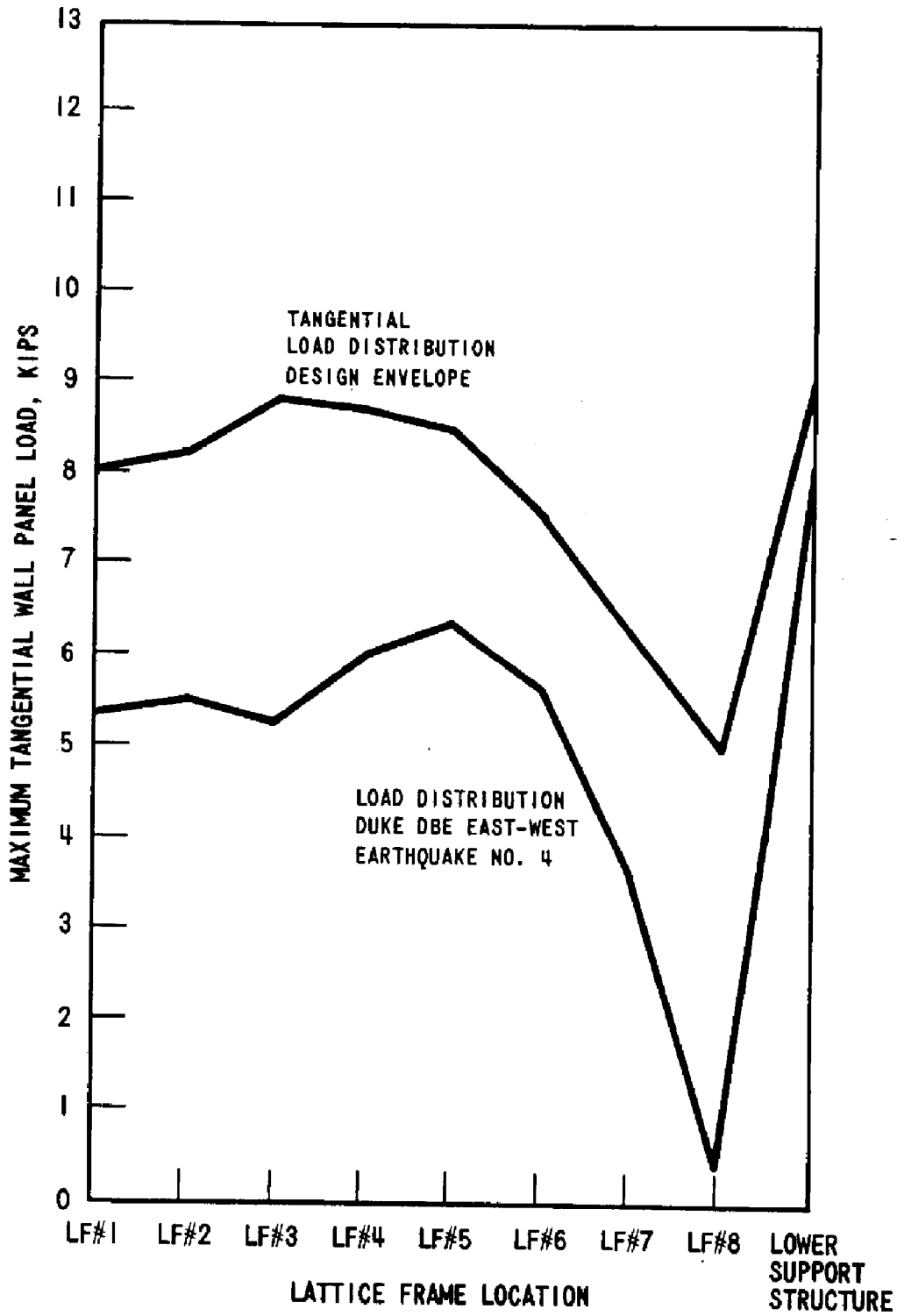


Figure 6-196. Wall Panel Design Load Distribution Obtained Using the 48-Foot Beam Model Radial Case

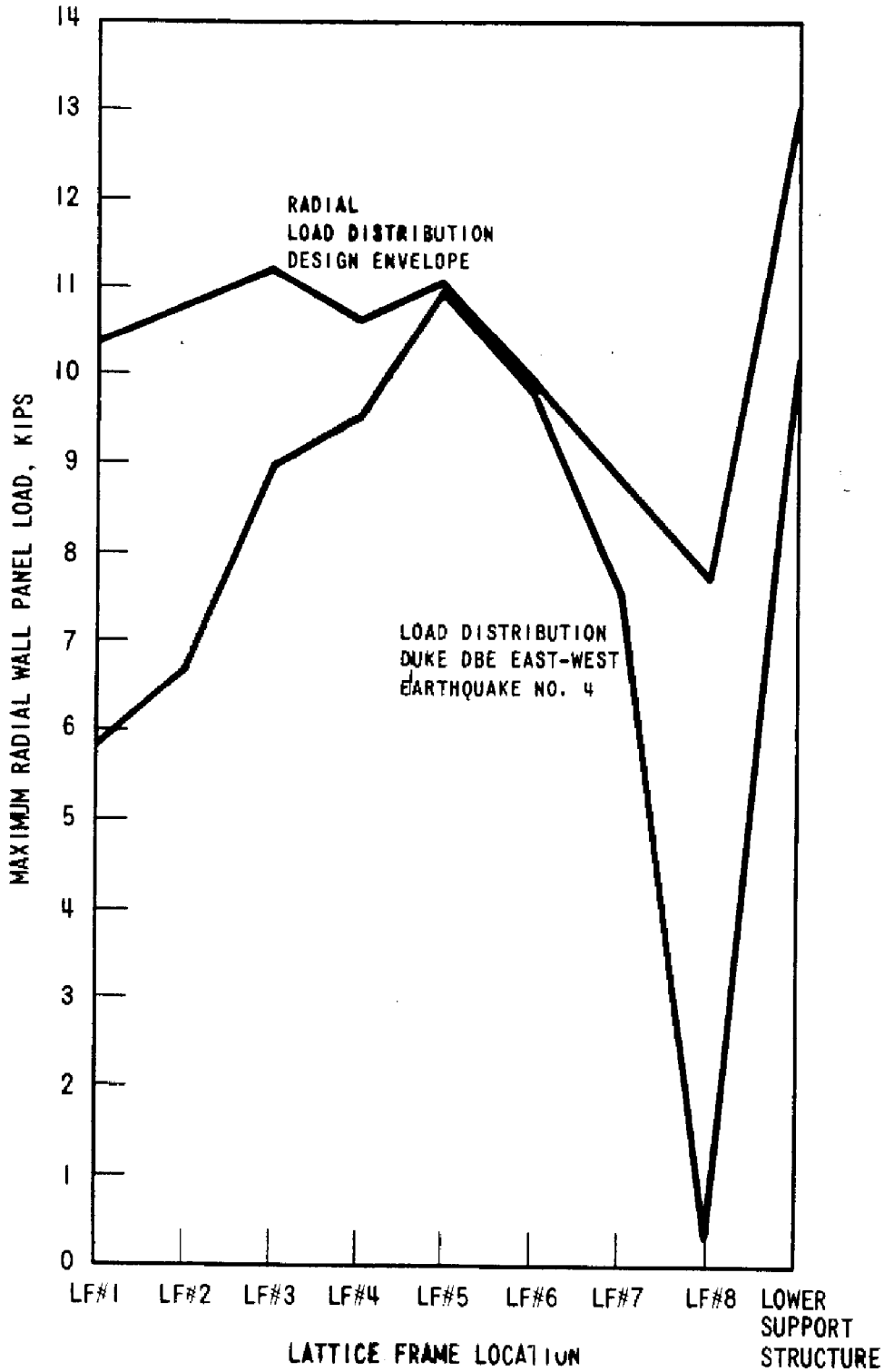


Figure 6-197. Ice Basket Swivel Bracket Assembly

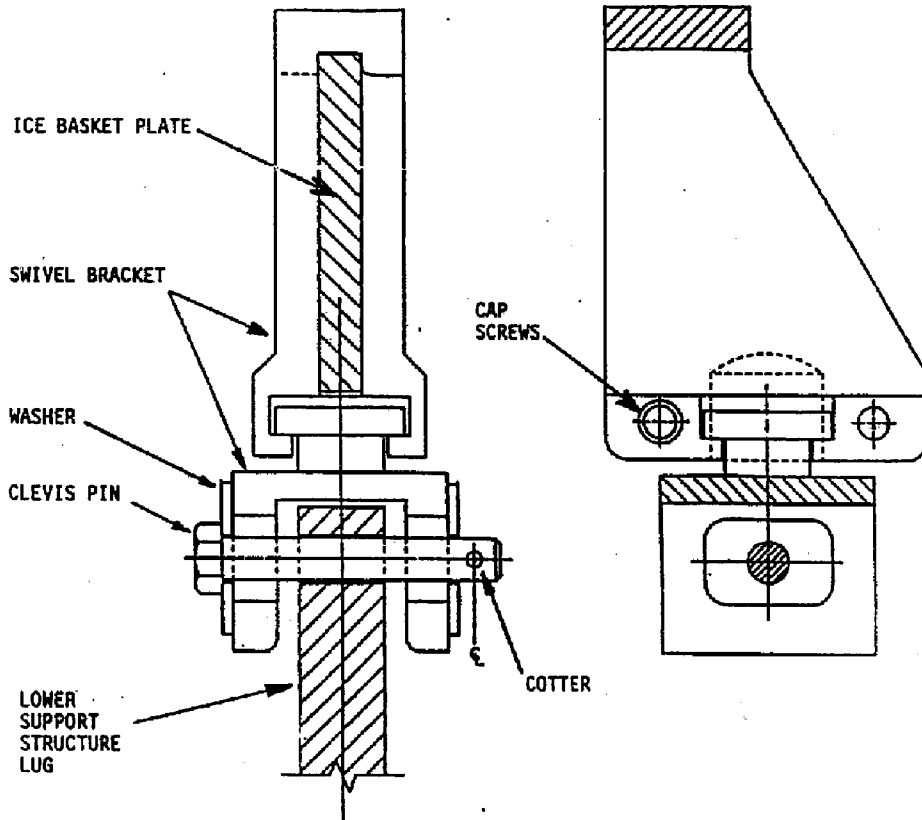


Figure 6-198. Block Ice Minimum Restriction Basket Assembly

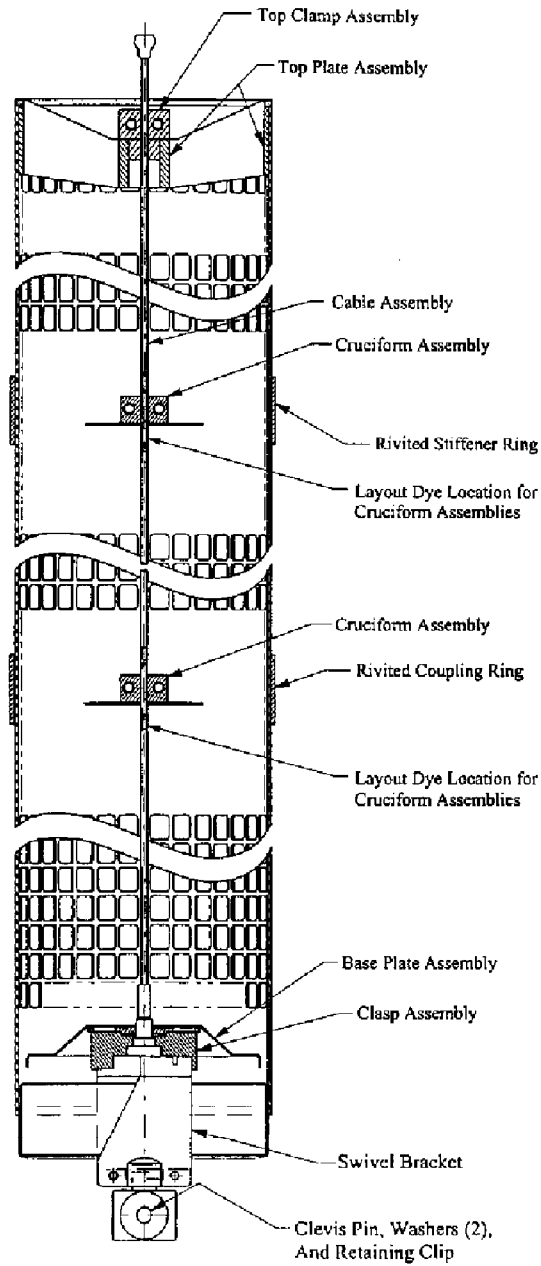


Figure 6-199. CNS-1 Double-Ended LBLOCA Mass and Energy Release Analyses

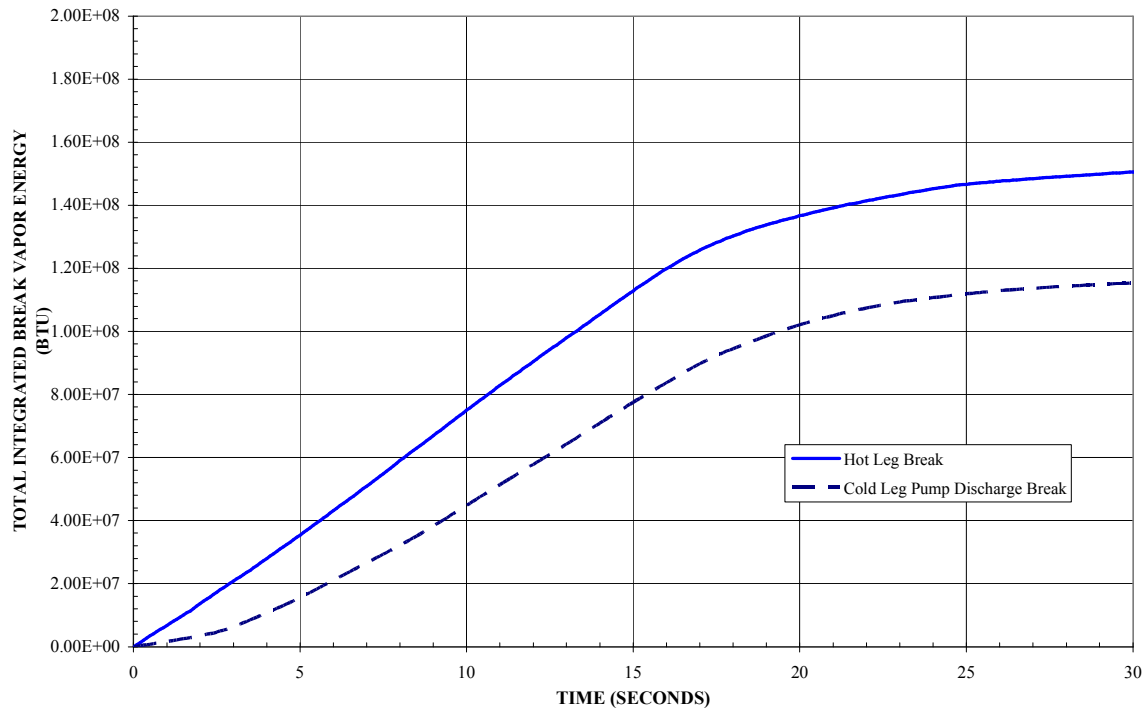


Figure 6-200. CNS-1 Double-Ended LBLOCA Mass and Energy Release Analyses

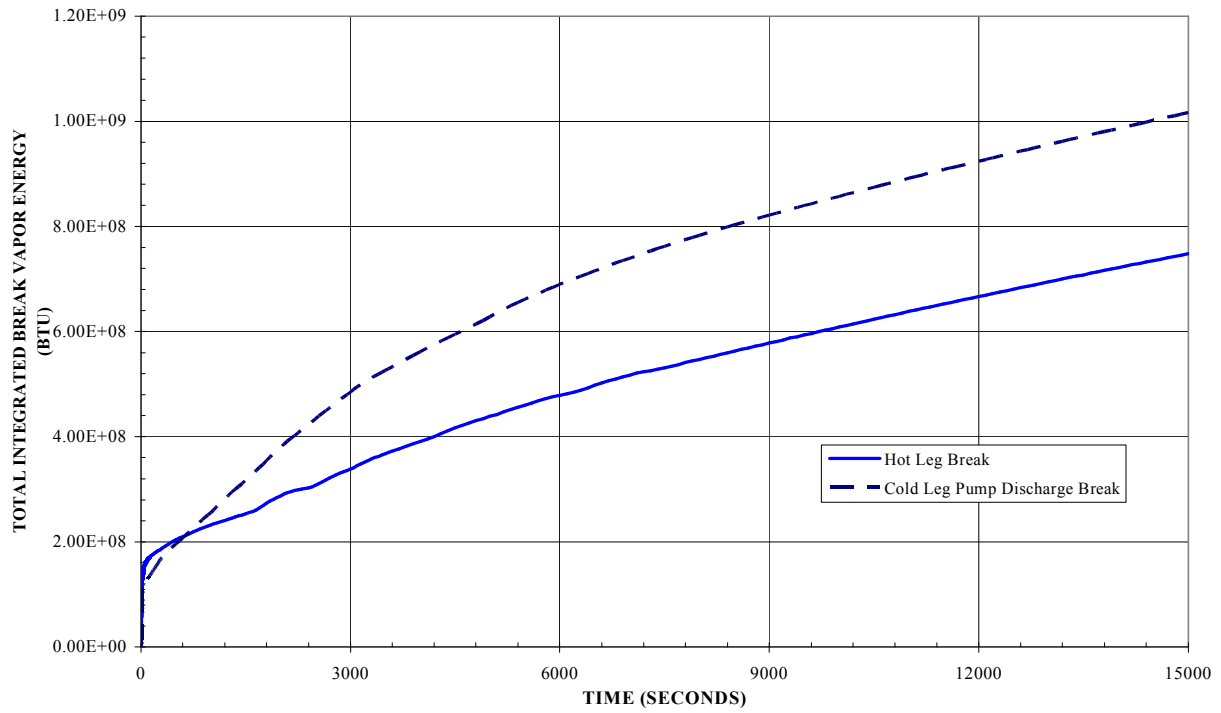


Figure 6-201. CNS-1 Double-Ended LBLOCA Mass and Energy Release Analyses

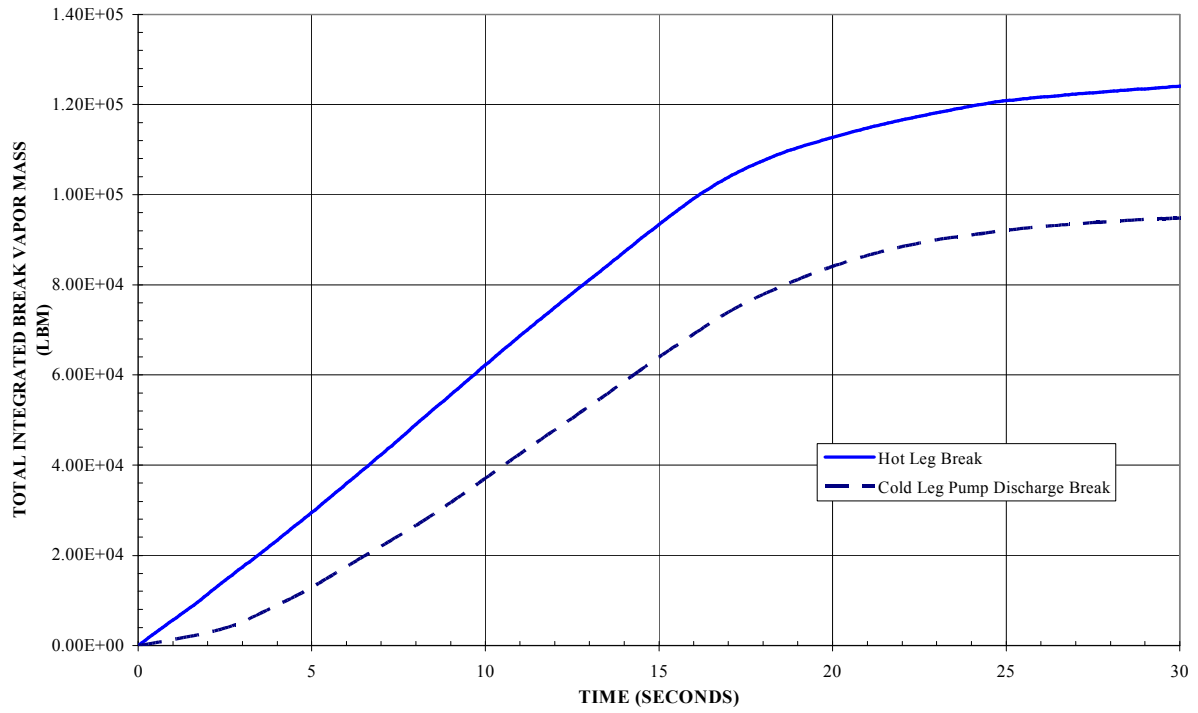


Figure 6-202. CNS-1 Double-Ended LBLOCA Mass and Energy Release Analyses

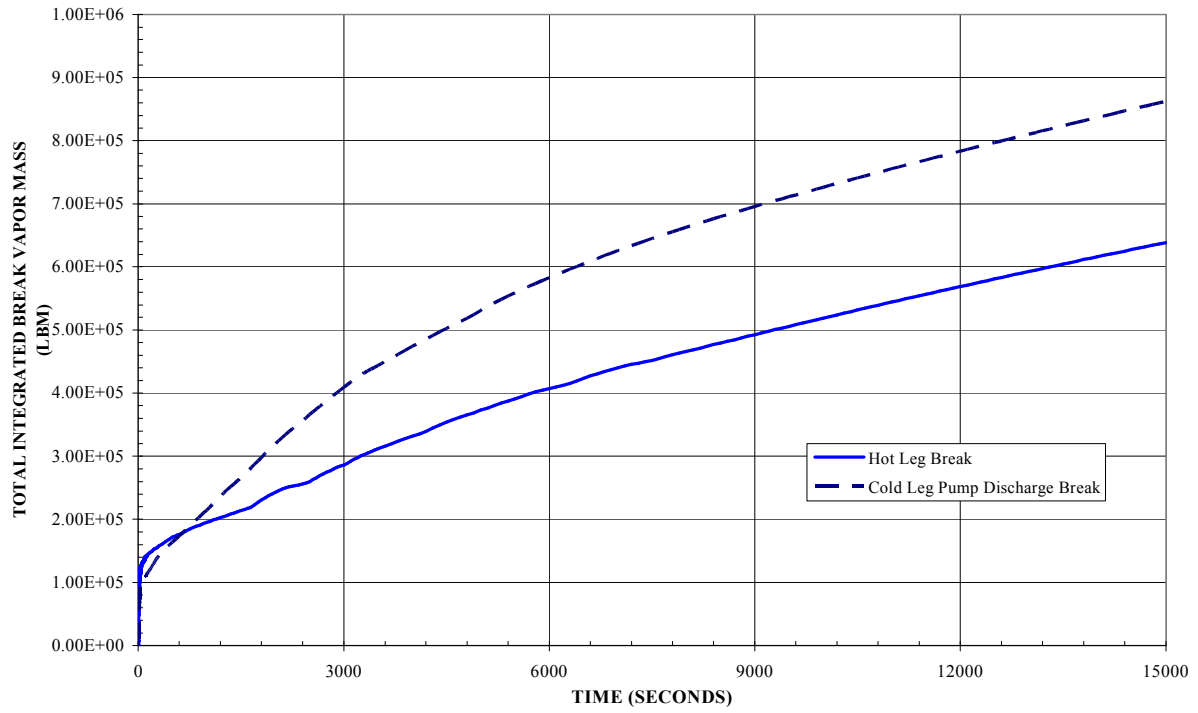


Figure 6-203. Deleted Per 2000 Update.

Figure 6-204. Upper and Lower Compartment Pressure, Min. Pressure Analysis

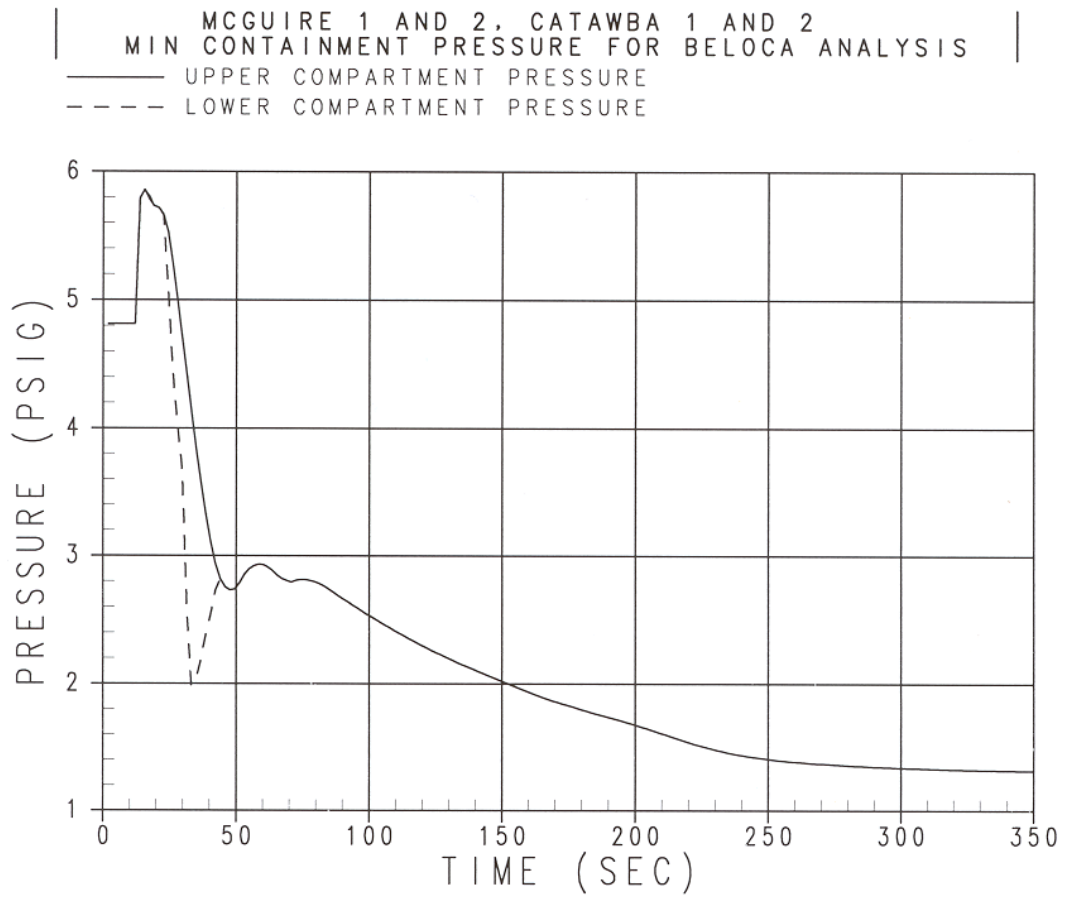


Figure 6-205. Upper Compartment Heat Removal Rate, Min. Pressure Analysis

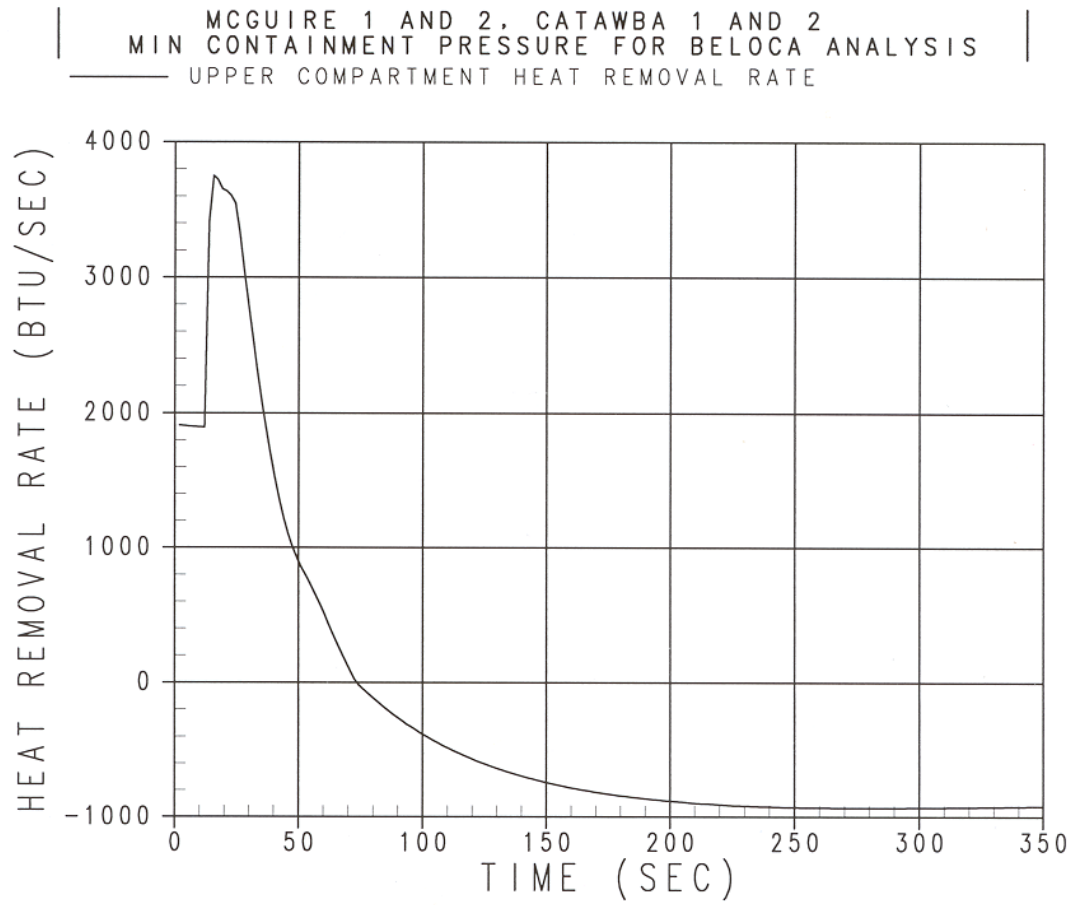


Figure 6-206. Lower Compartment Heat Removal Rate, Min. Pressure Analysis

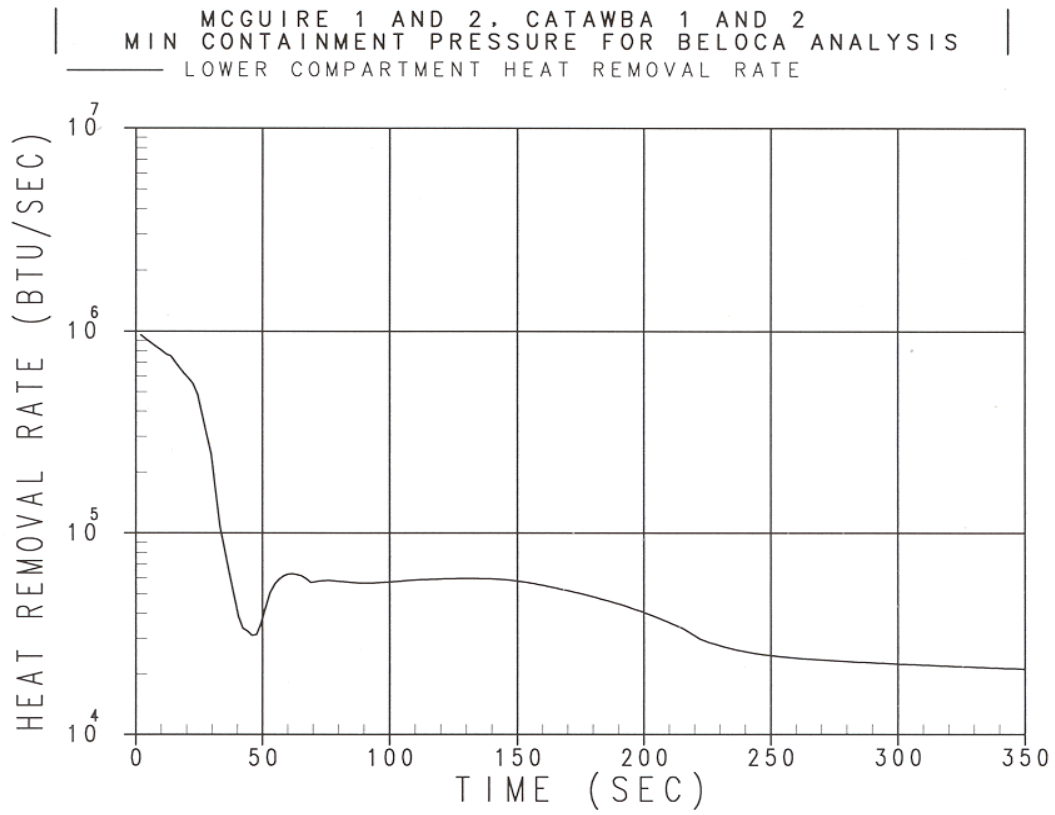


Figure 6-207. Upper and Lower Compartment Temperature, Min. Pressure Analysis

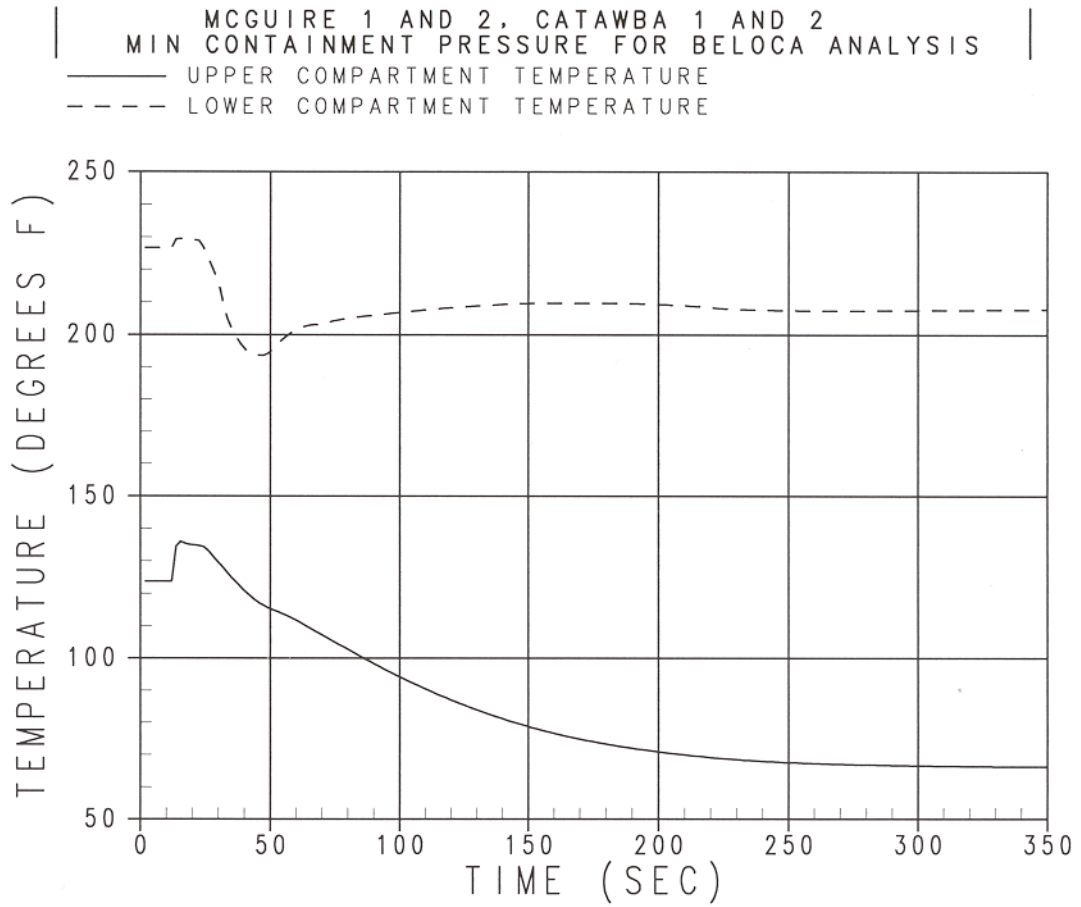


Figure 6-208. Ice Bed Heat Removal Rate, Min. Pressure Analysis

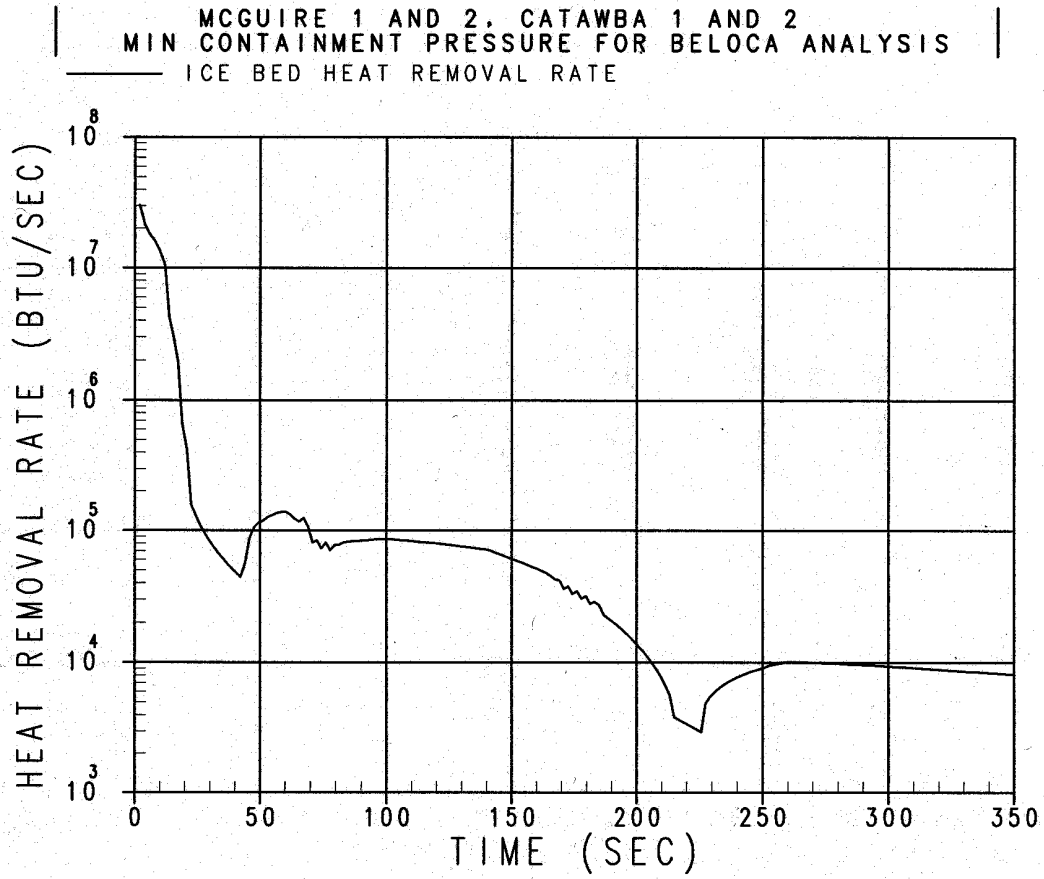


Figure 6-209. Heat Removal Rate by Lower Compartment Drain, Min. Pressure Analysis

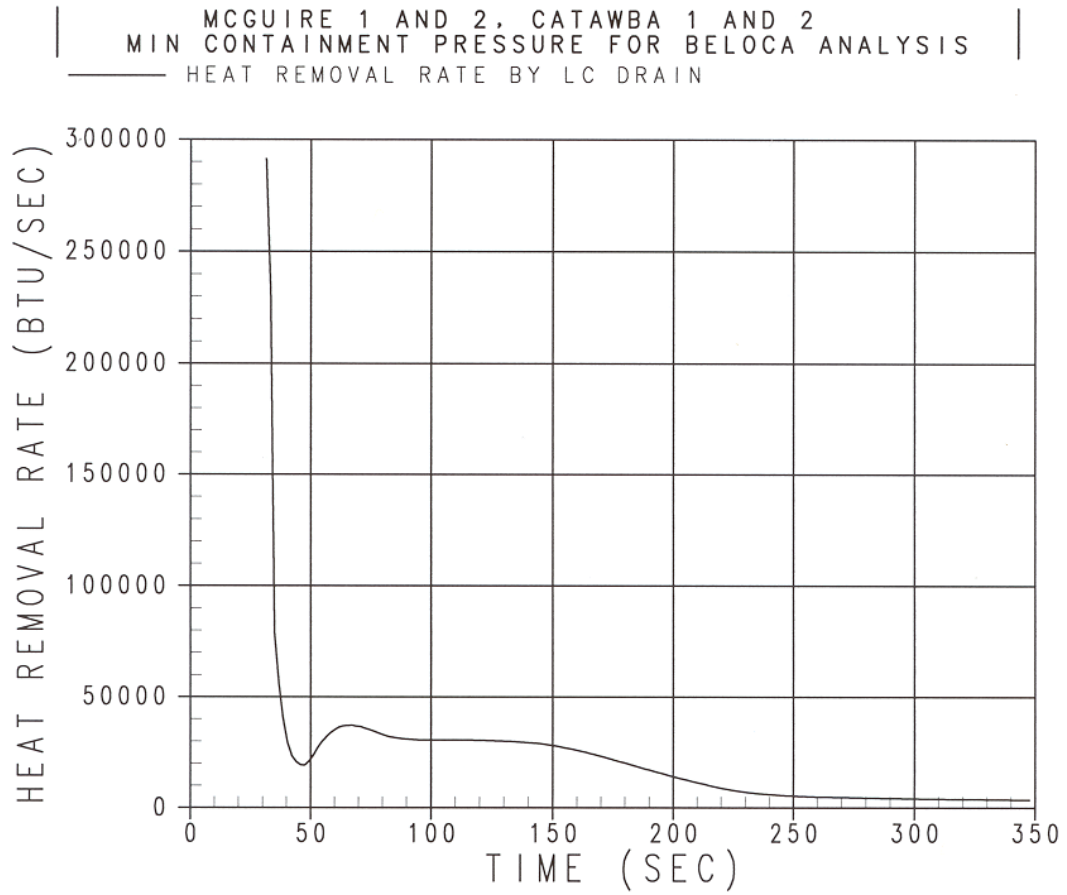


Figure 6-210. Heat Removal Rate by Sump and Spray, Min. Pressure Analysis

