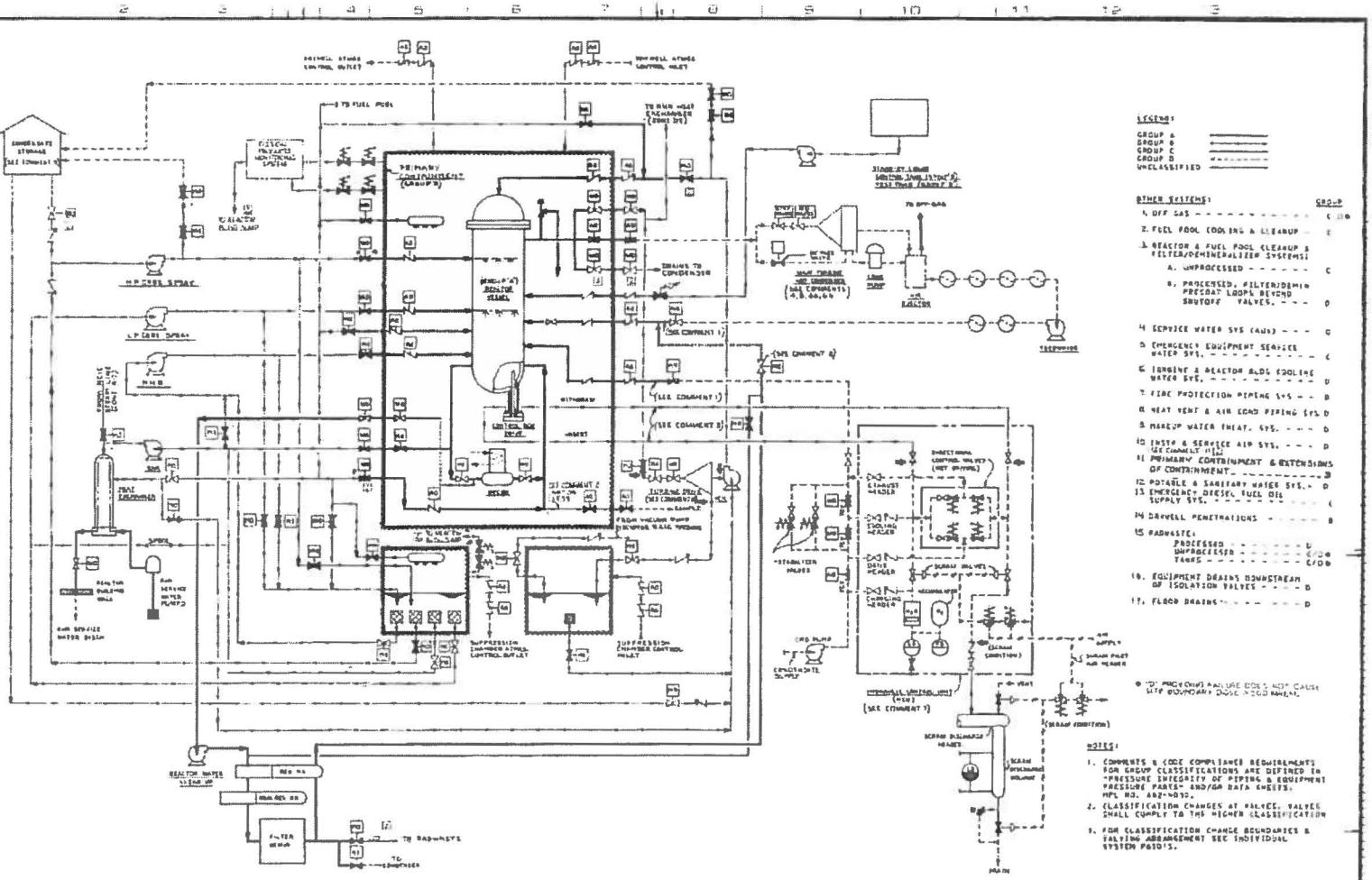


FIGURE 3.2-1

GROUP CLASSIFICATION DIAGRAM

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

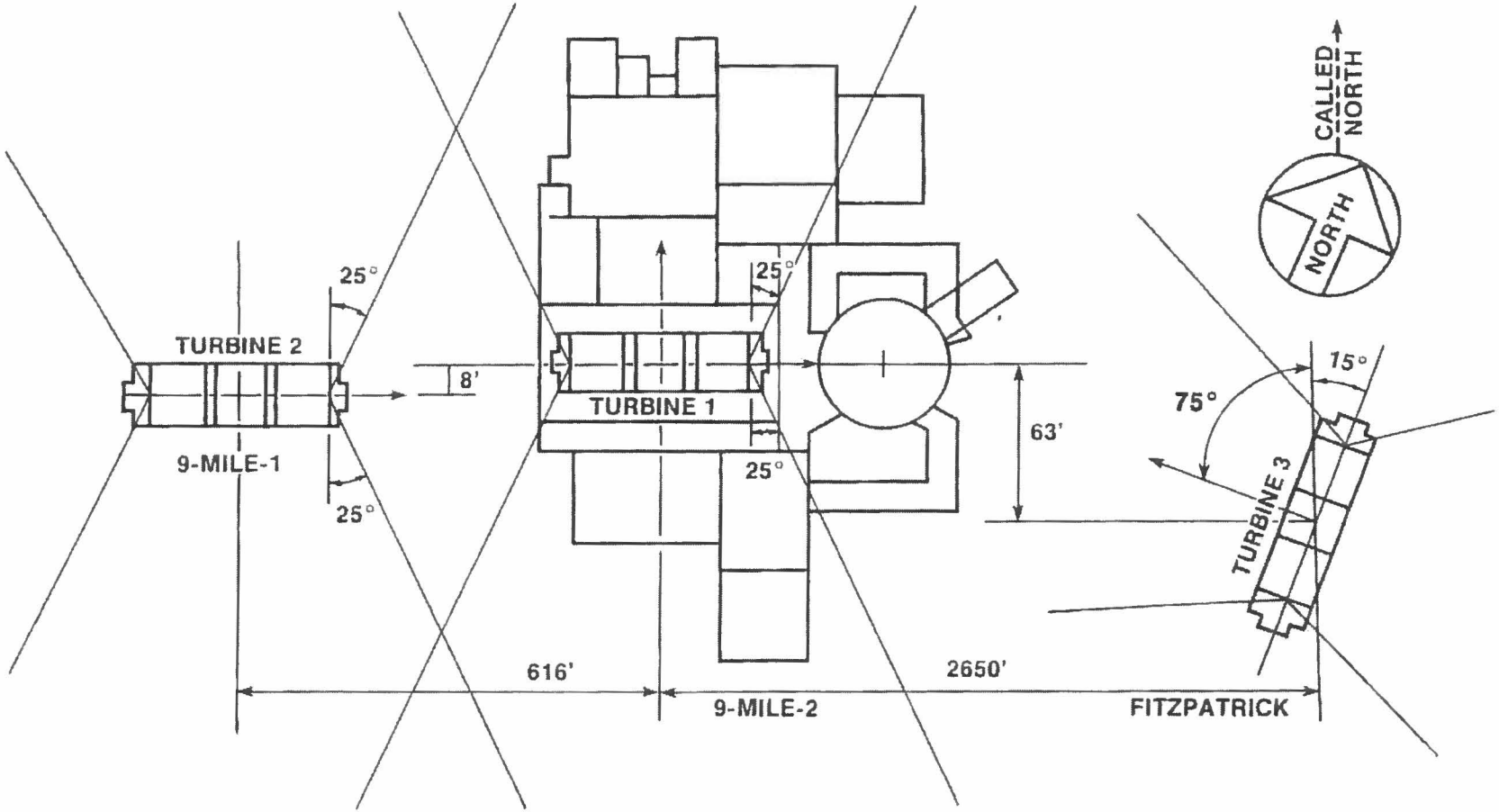
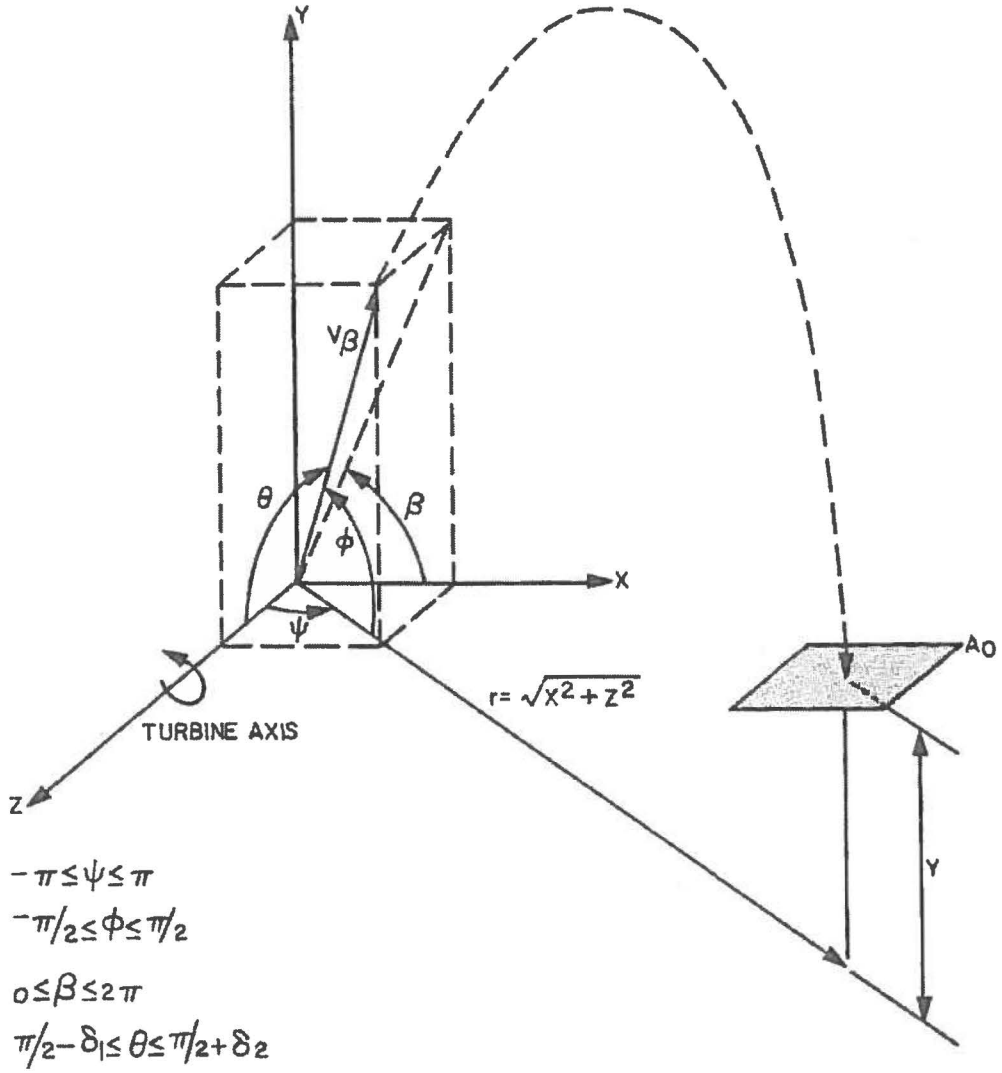


FIGURE 3.5-1

TURBINE PLACEMENT AND ORIENTATION

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT



$-\pi \leq \psi \leq \pi$

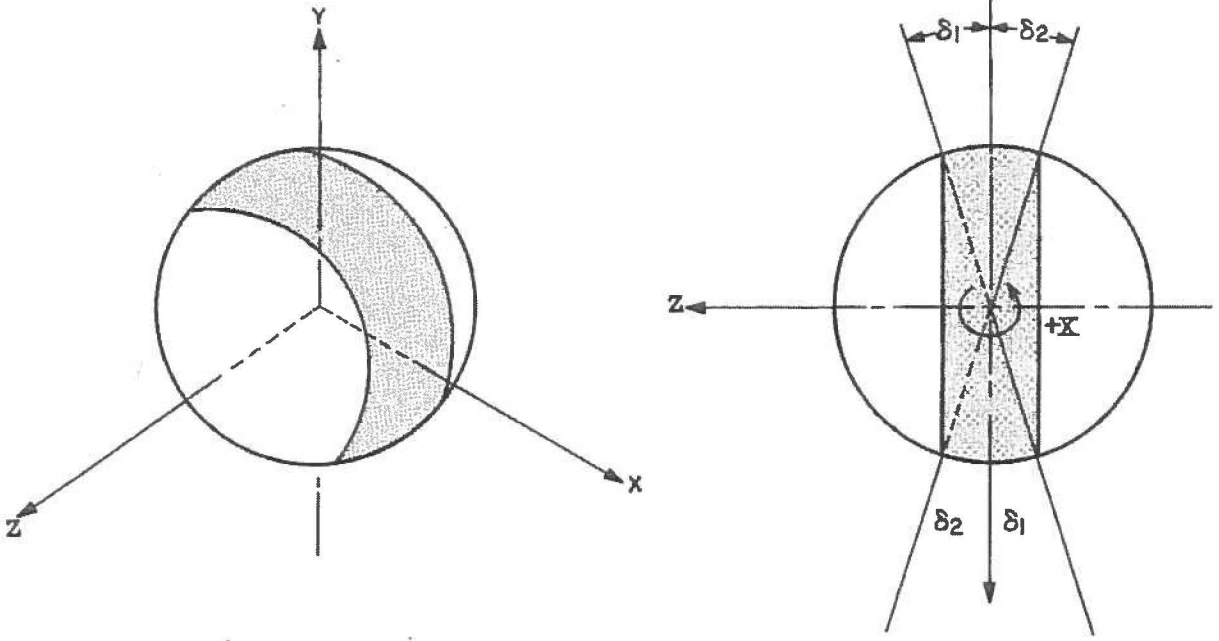
$-\pi/2 \leq \phi \leq \pi/2$

$0 \leq \beta \leq 2\pi$

$\pi/2 - \delta_1 \leq \theta \leq \pi/2 + \delta_2$

FIGURE 3.5-2

TURBINE MISSILE
REFERENCED COORDINATE SYSTEM



δ_1, δ_2 = DEFLECTION ANGLES

(SHADED AREA SHOWS REGION OF POSSIBLE VELOCITY VECTOR PENETRATION)

FIGURE 3.5-3

SOLID ANGLE ON A UNIT SPHERE

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

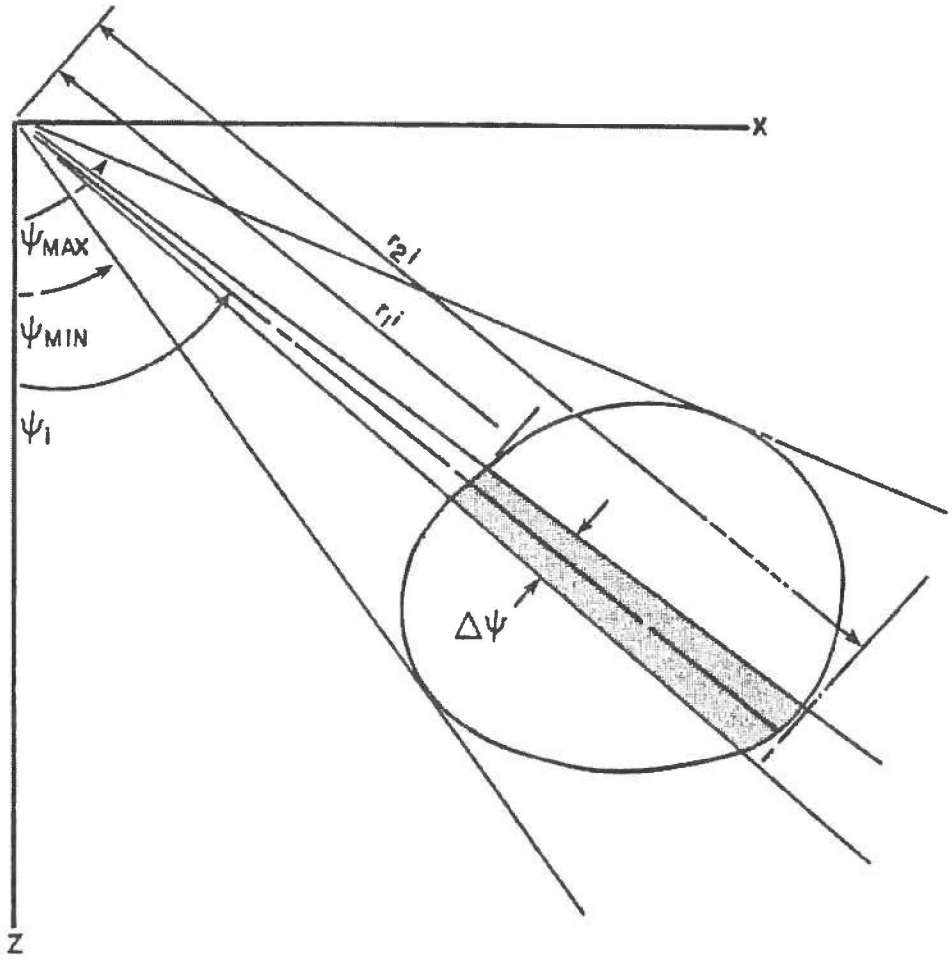


FIGURE 3.5-4

TOP VIEW OF IDEALIZED TARGET

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

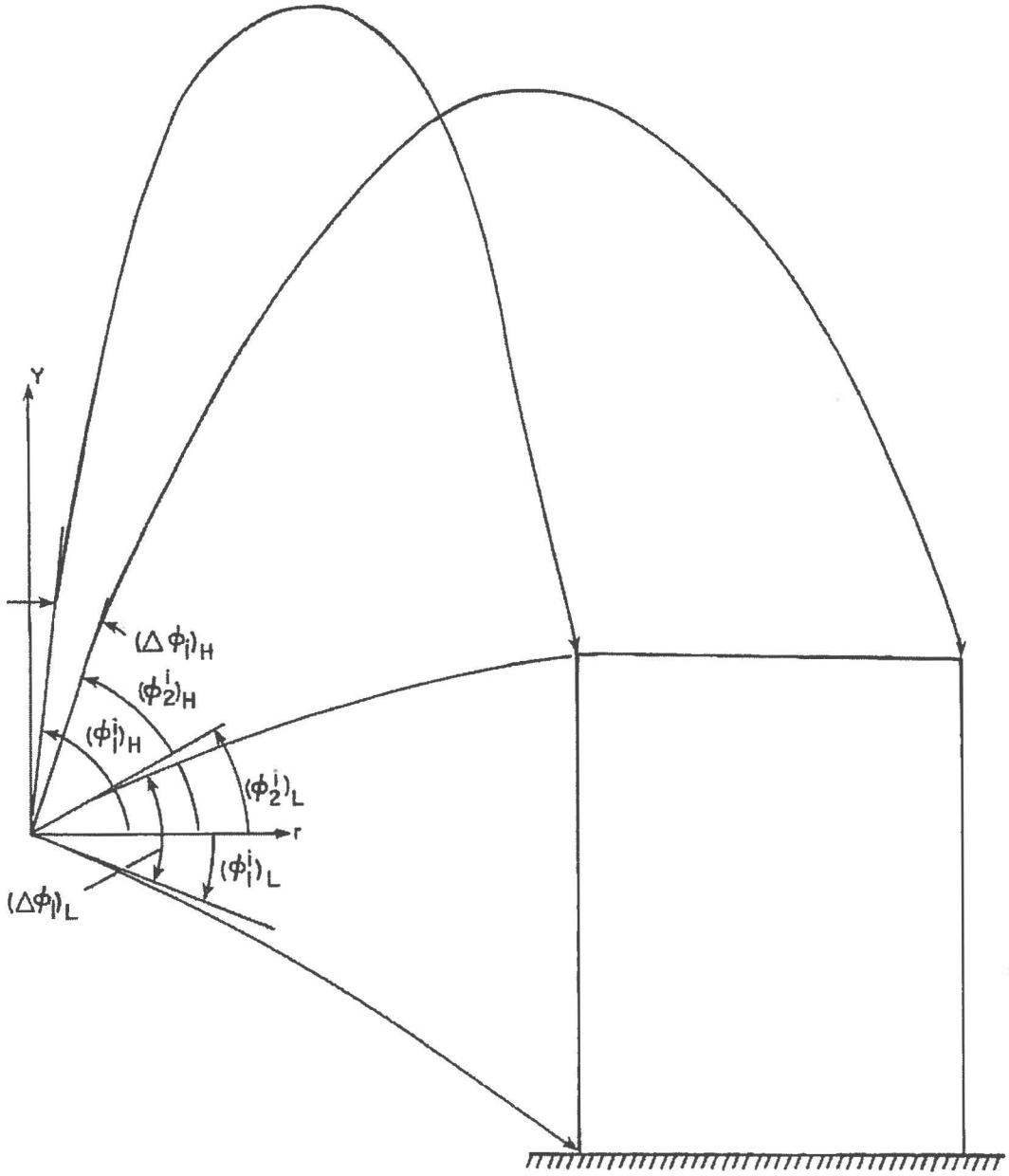


FIGURE 3.5-5

SIDE VIEW OF IDEALIZED TARGET

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

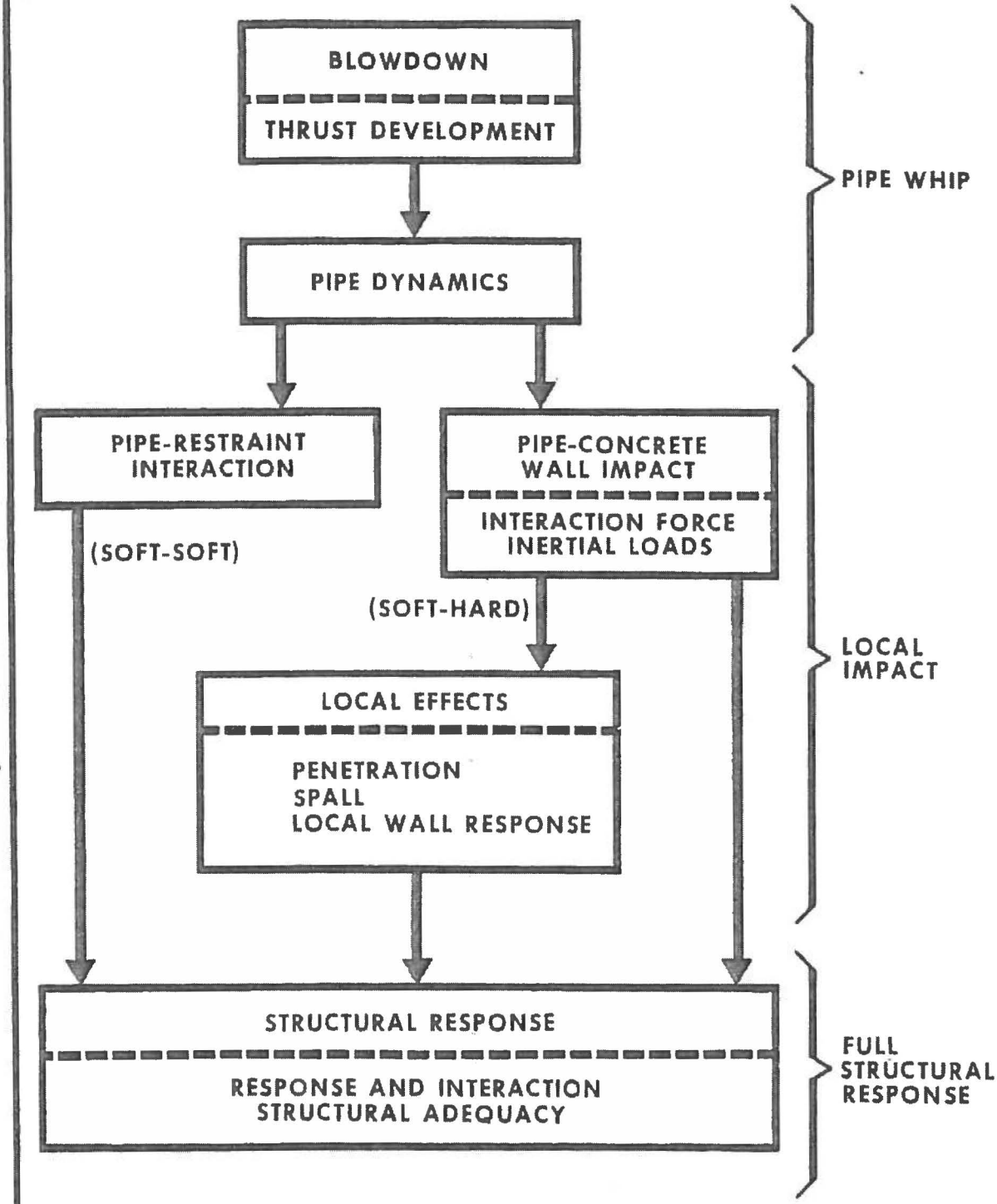
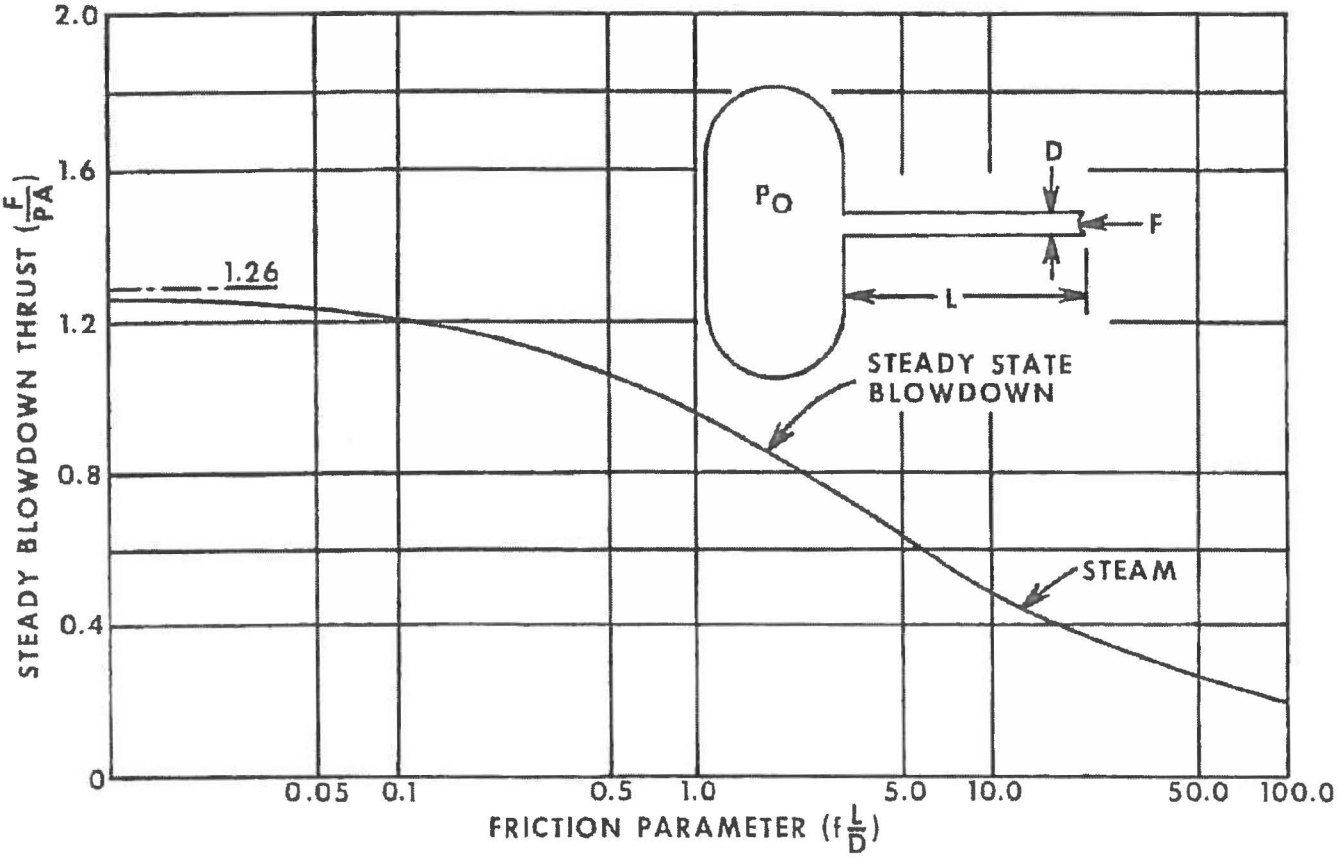


FIGURE 3.6A-1

AREAS OF ANALYSIS

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT



SOURCE:
MOODY J.F.
TIME-DEPENDENT PIPE FORCES CAUSED
BY BLOWDOWN AND FLOW STOPPAGE
ASME PAPER 73-FE-23, 1973 (REFERENCE 2)

FIGURE 3.6A-2

STEADY STATE BLOWDOWN
FORCES VS FRICTION PARAMETER

NINE MILE POINT
NUCLEAR STATION - UNIT 2
SCRIBA, N.Y.

UPDATED SAFETY ANALYSIS REPORT

JOINT	X (IN.)	Y (IN.)
1	0.0	0.0
2	- 12.0	0.0
3	- 33.21	8.79
4	- 42.0	30.0
5	- 42.0	54.0
6	- 42.0	72.75
7	- 42.0	96.25
8	- 42.0	119.75
9	- 42.0	151.87
10	- 42.0	181.87
11	- 72.0	181.87
12	- 17.0	96.25
13	-143.82	54.0
14	-243.82	54.0

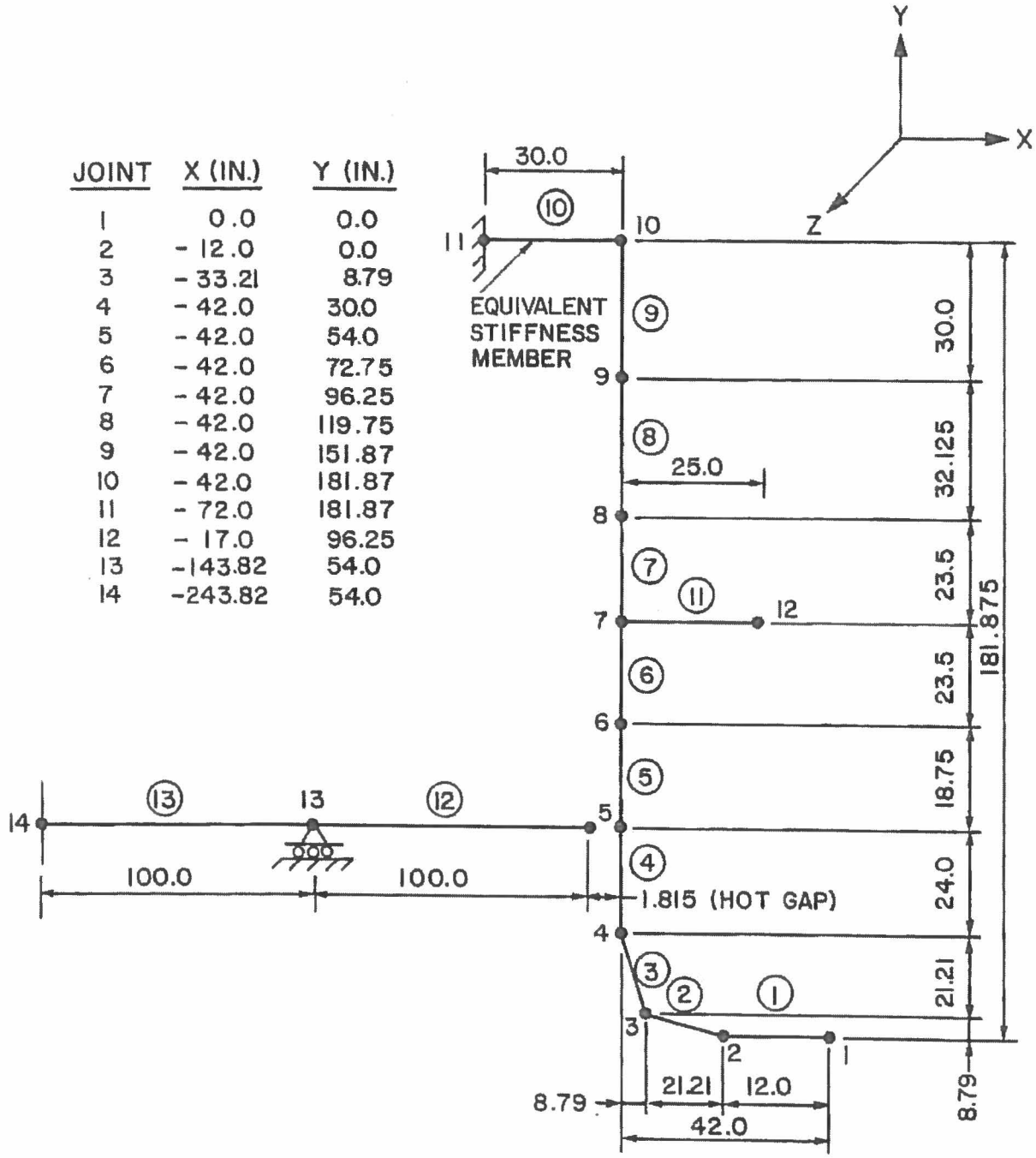
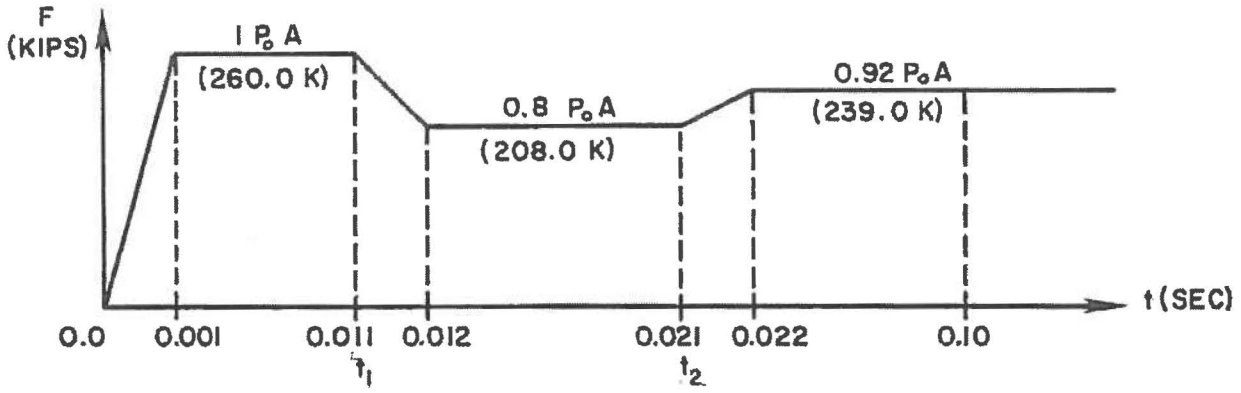


FIGURE 3.6A-3

DYNAMIC ANALYSIS MODEL RHS
(LPCI) RESTRAINT 2RHS*PRR004

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT



P_o = 1028 PSIA

A = 252.7 IN^2

t_1 = APPROX. TIME FOR DECOMPRESSED WAVE TO REACH ELBOW (0.011 SEC)

t_2 = APPROX. TIME TO REACH STEADY STATE FORCING FUNCTION (0.021 SEC)

FIGURE 3.6A-4

FLUID BLOWDOWN FORCES USED FOR 2RHS*PRR004 RESTRAINT ANALYSIS

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

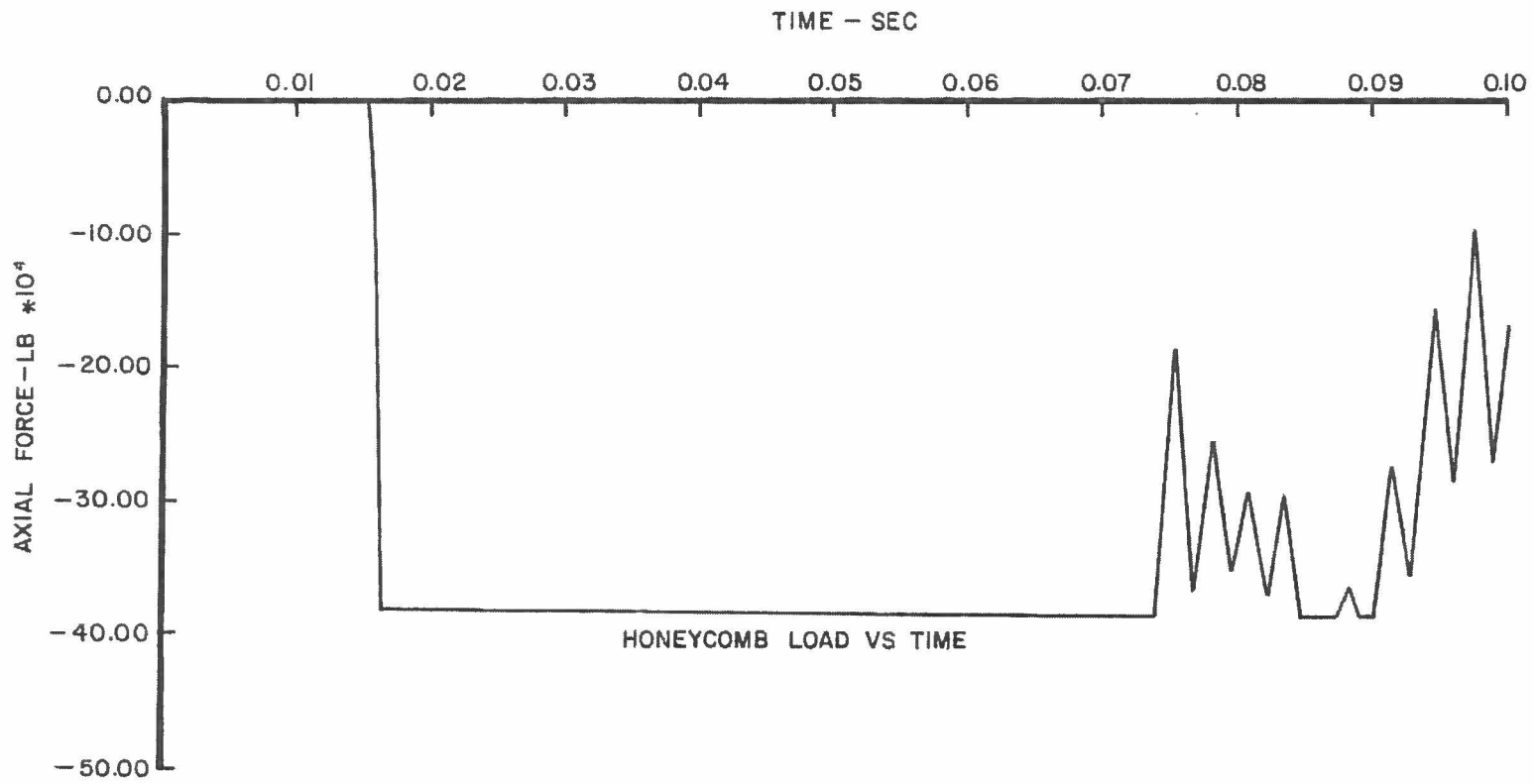


FIGURE 3.6A-5

RESTRAINT (2RHS* PRR004)
REACTION LOAD

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

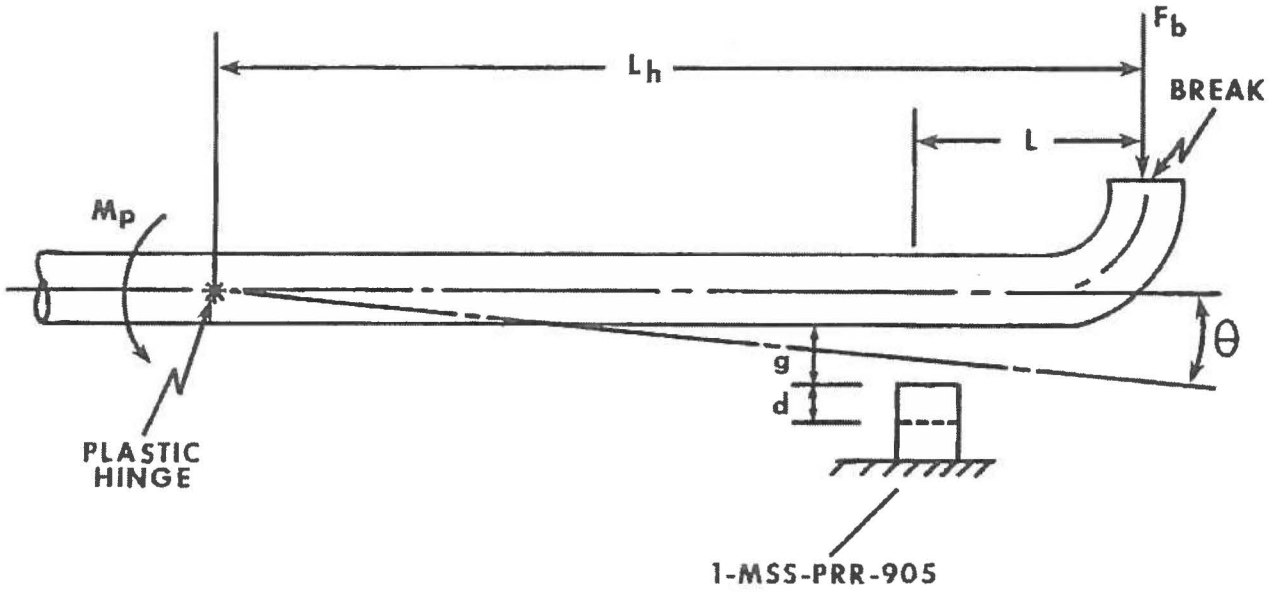
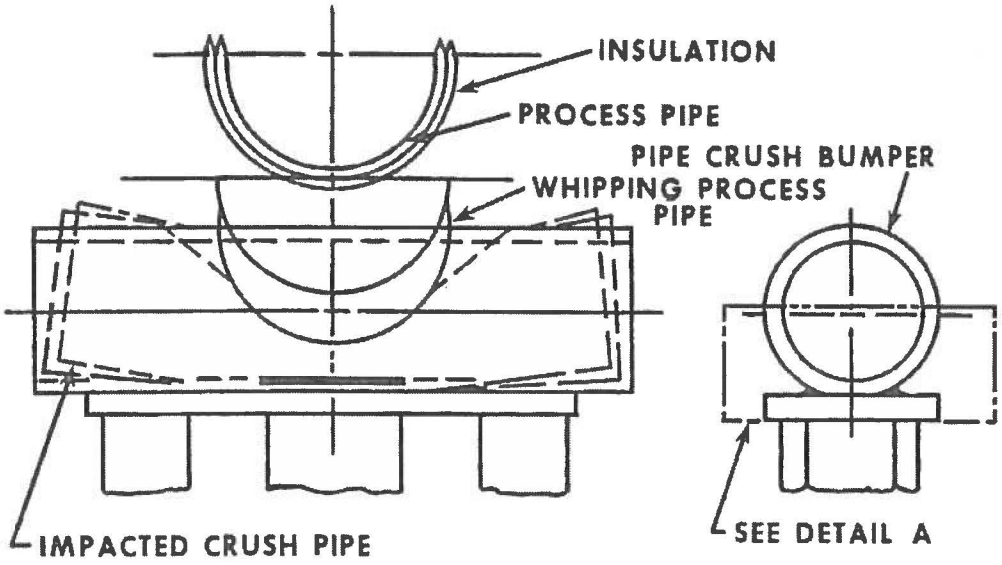


FIGURE 3.6A-6

ENERGY BALANCE SAMPLE PROBLEM

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT



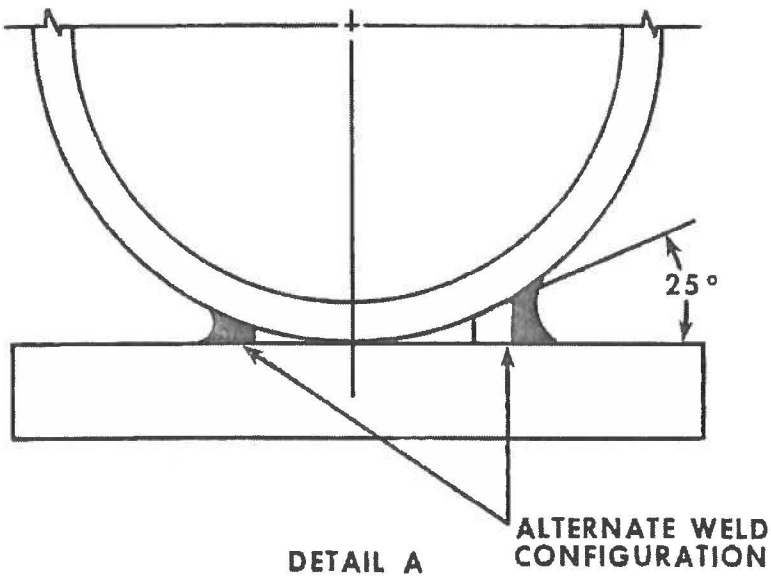


FIGURE 3.6A-7

PIPE CRUSH BUMPER

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

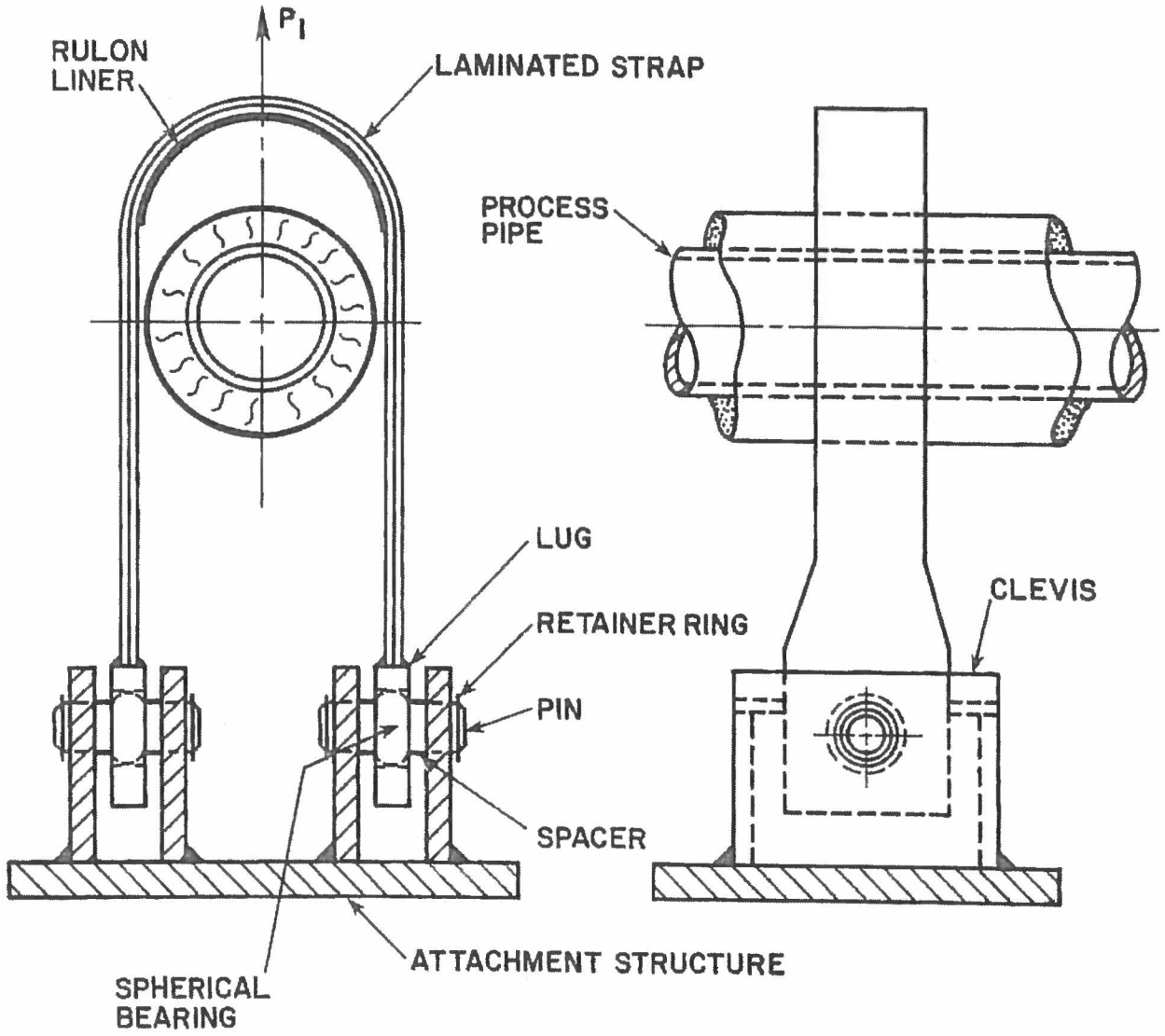


FIGURE 3.6A-8

TWO-PIN LAMINATED
PIPE RUPTURE RESTRAINT
(SMALL LINES)

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

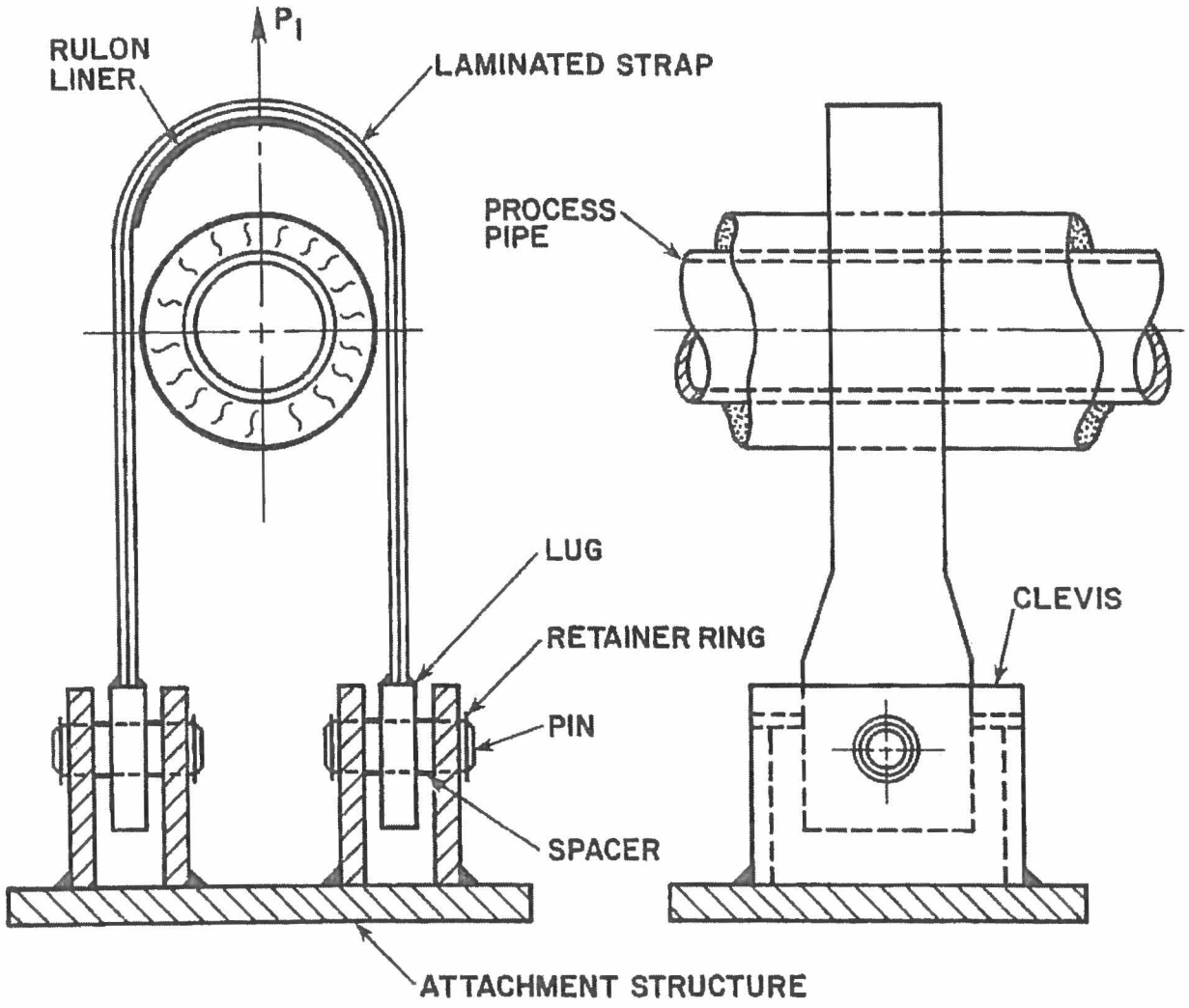


FIGURE 3.6A-9

TWO-PIN LAMINATED
PIPE RUPTURE RESTRAINT
(LARGE LINES)

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

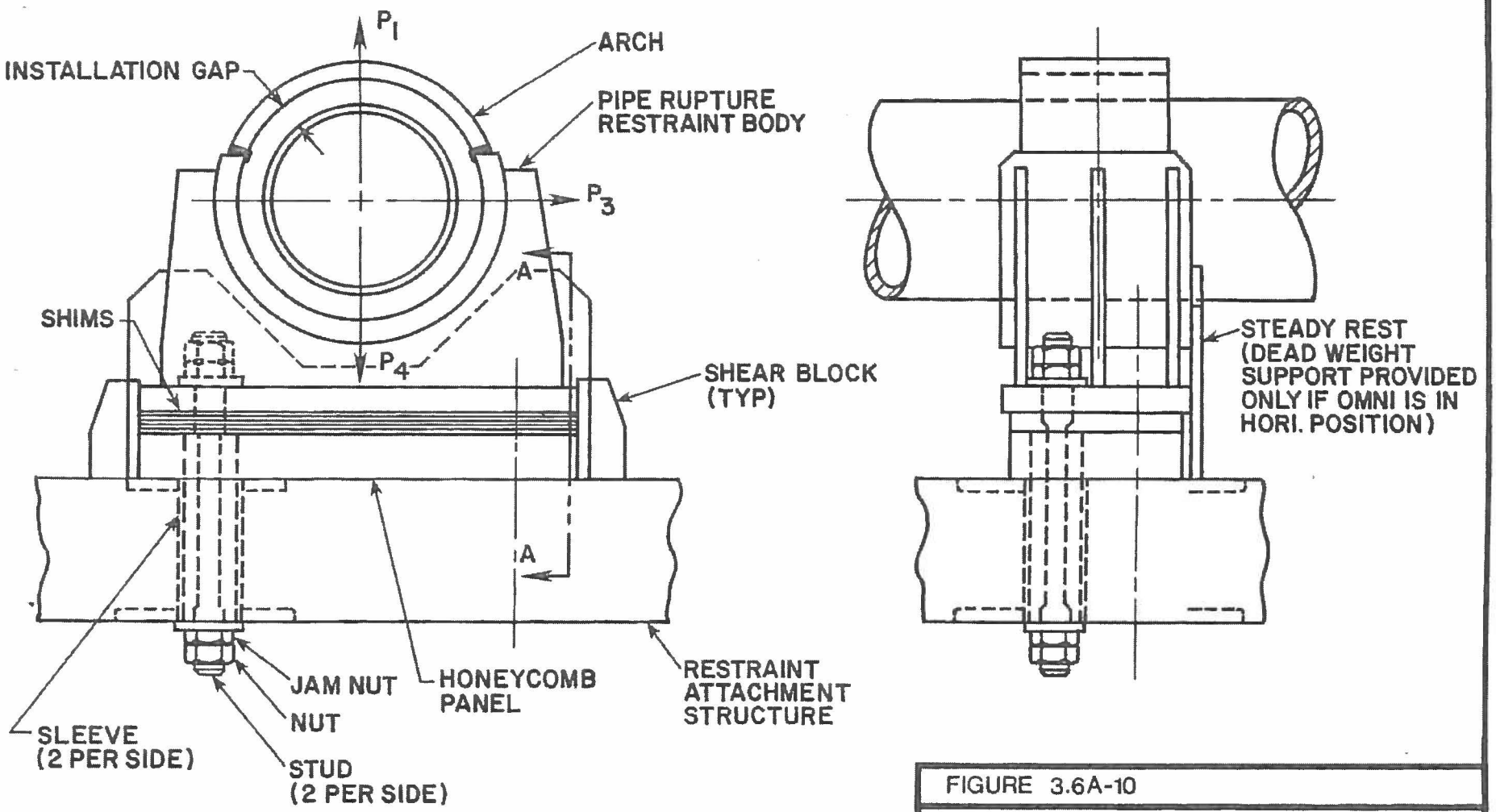


FIGURE 3.6A-10

OMNI-DIRECTIONAL
PIPE RUPTURE RESTRAINT

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

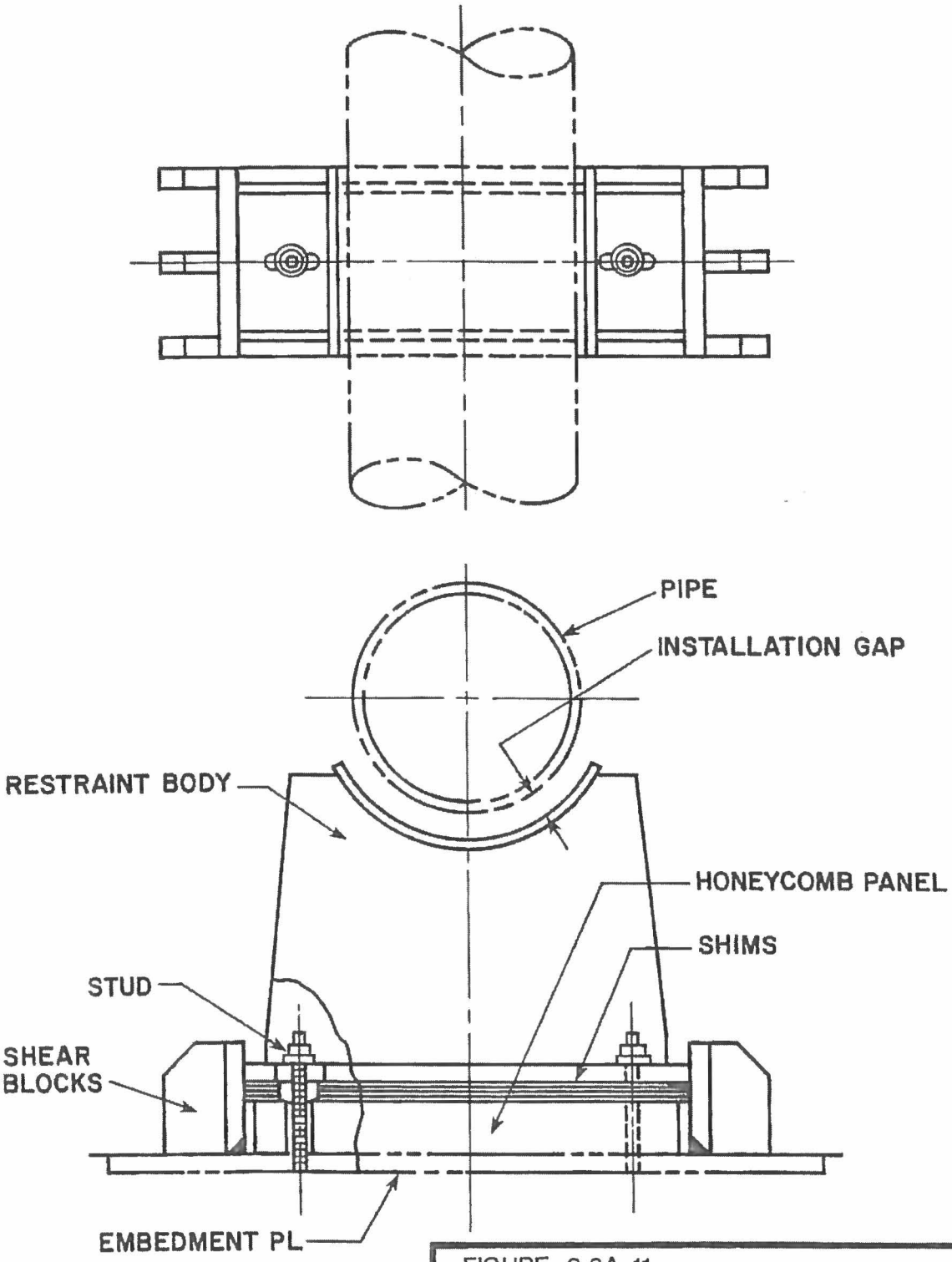


FIGURE 3.6A-11

LIMIT STOP RESTRAINT

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

FIGURES 3.6A-12 THROUGH 3.6A-49 HAVE BEEN DELETED.

THIS FIGURE HAS BEEN DELETED

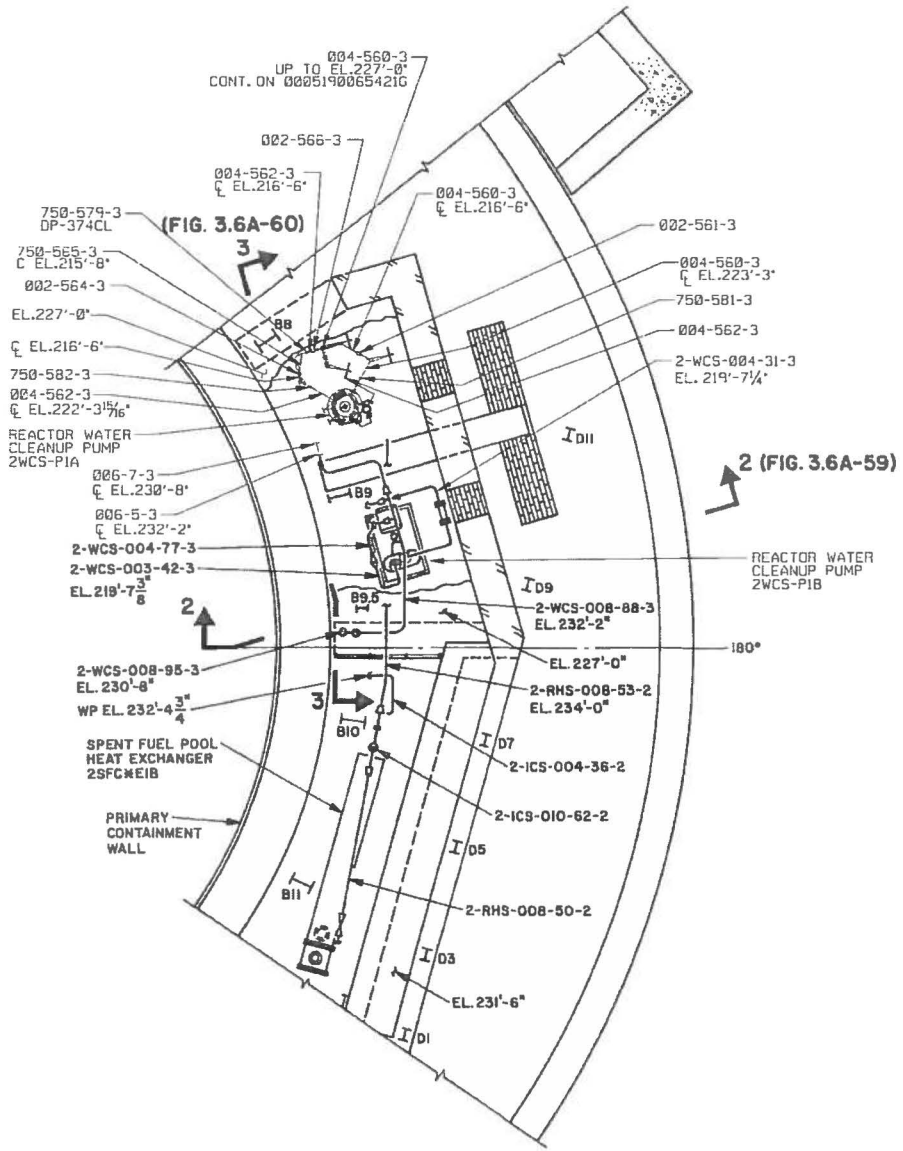
FIGURE 3.6A-50

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

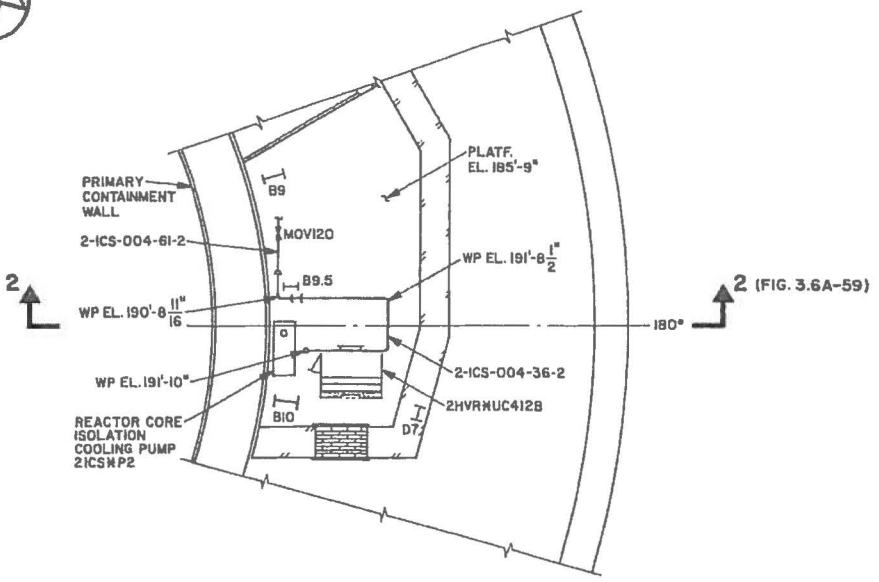
THIS FIGURE HAS BEEN DELETED

FIGURE 3.6A-51

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT



PARTIAL PLAN EL. 215'-0"



PARTIAL PLAN EL. 175'-0"

SOURCE:

FIGURE 3.6a-52

HIGH ENERGY PIPING COMPOSITE
PLAN EL. 175'-0" AND 215'-0"

NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

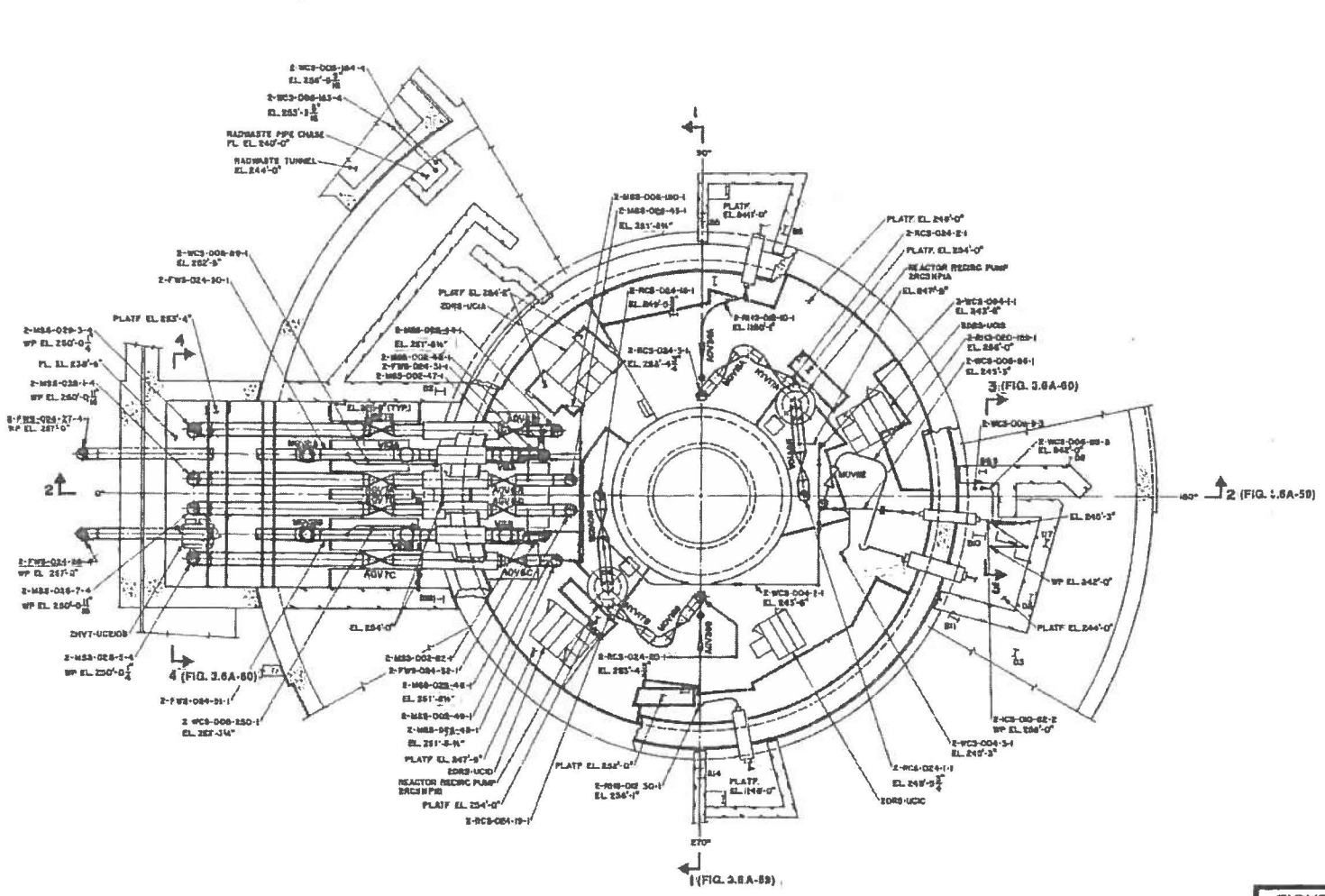
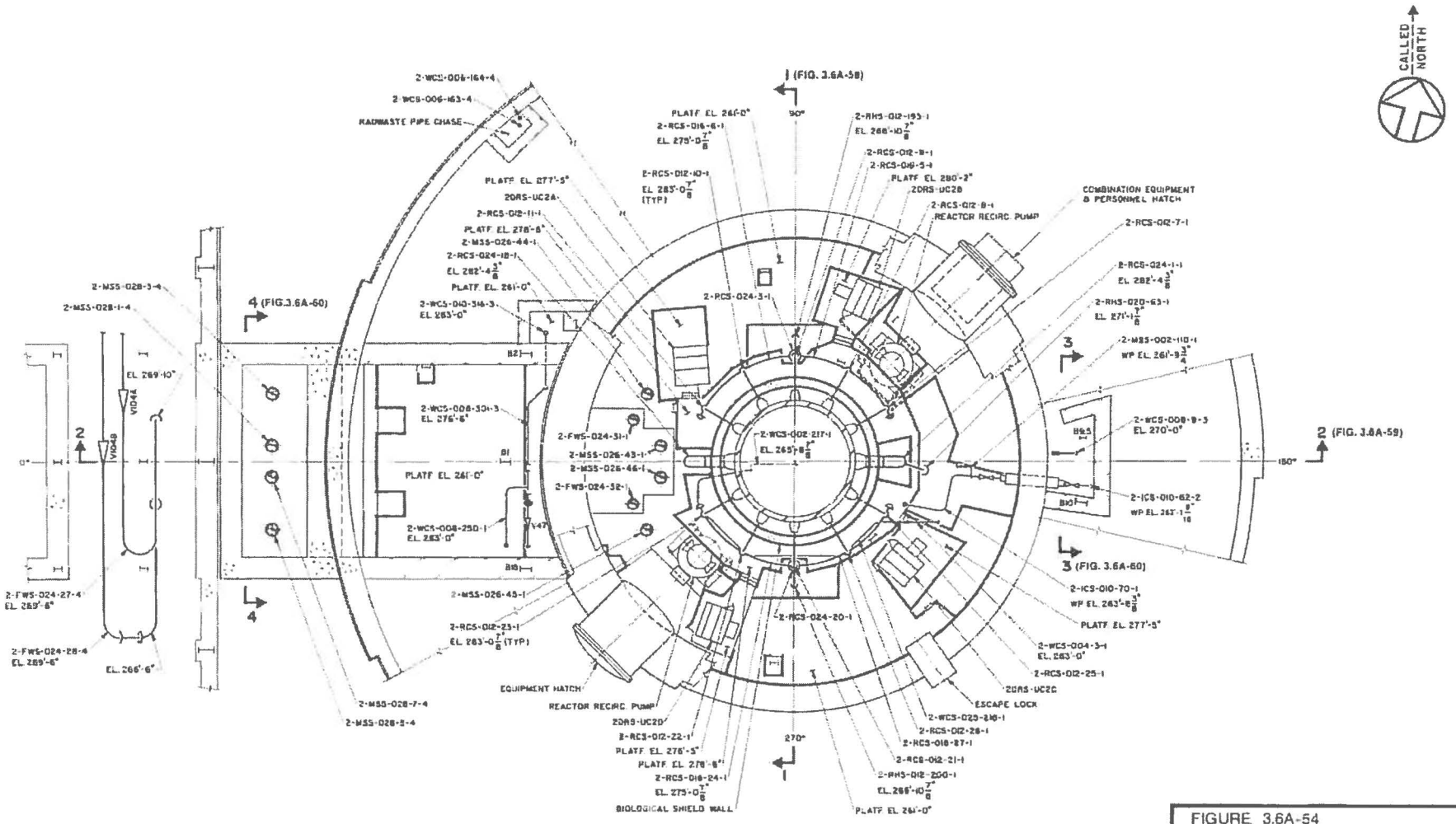


FIGURE 3.6A-53

HIGH ENERGY PIPING COMPOSITE
PLAN EL. 240'-0"

NINE MILE POINT
NUCLEAR STATION–UNIT 2
SCRIBA, NY
UPDATED SAFETY ANALYSIS REPORT

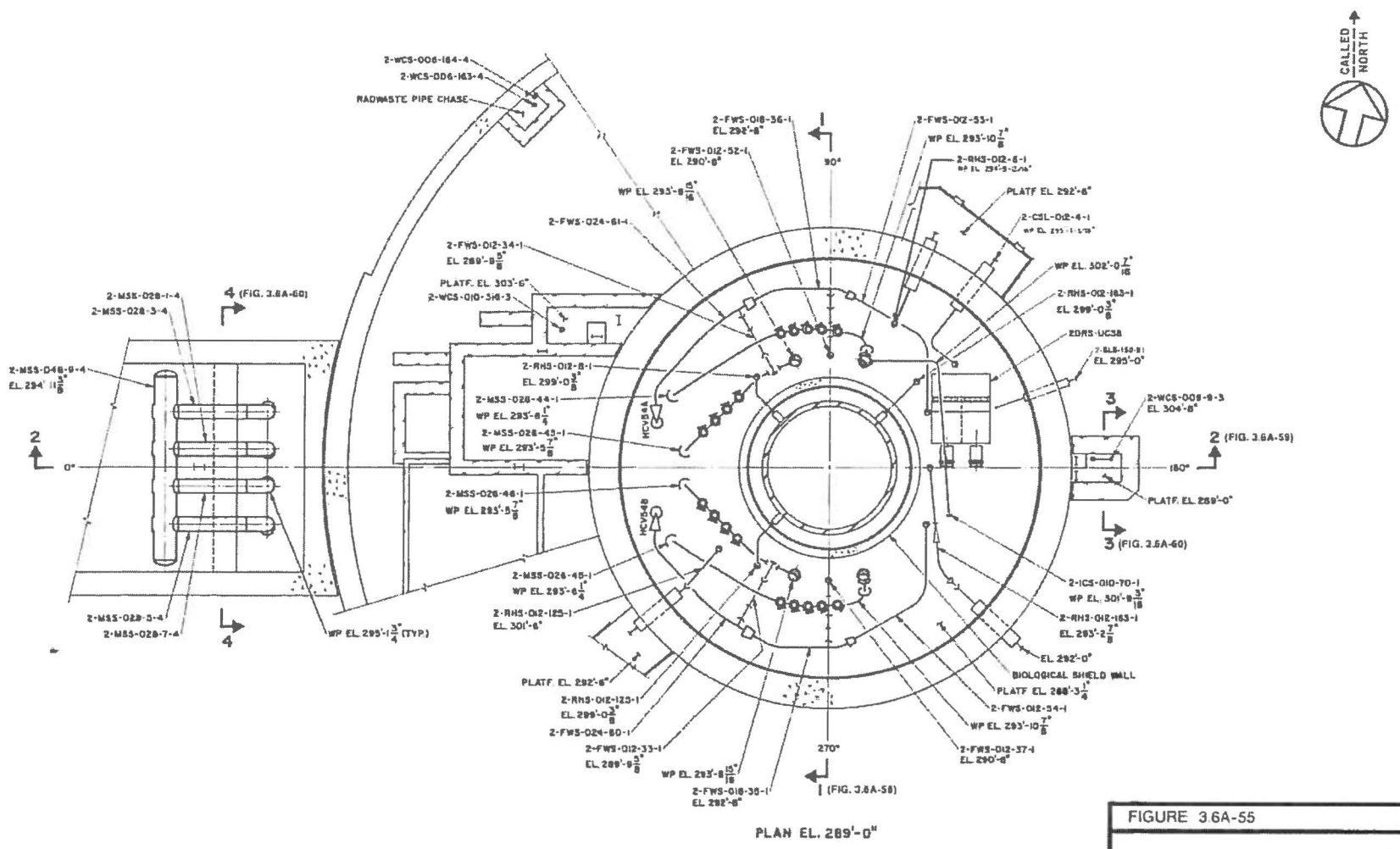


PLAN EL. 261'-0"

FIGURE 3.6A-54

HIGH ENERGY PIPING COMPOSITE
PLAN EL. 261'-0"

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

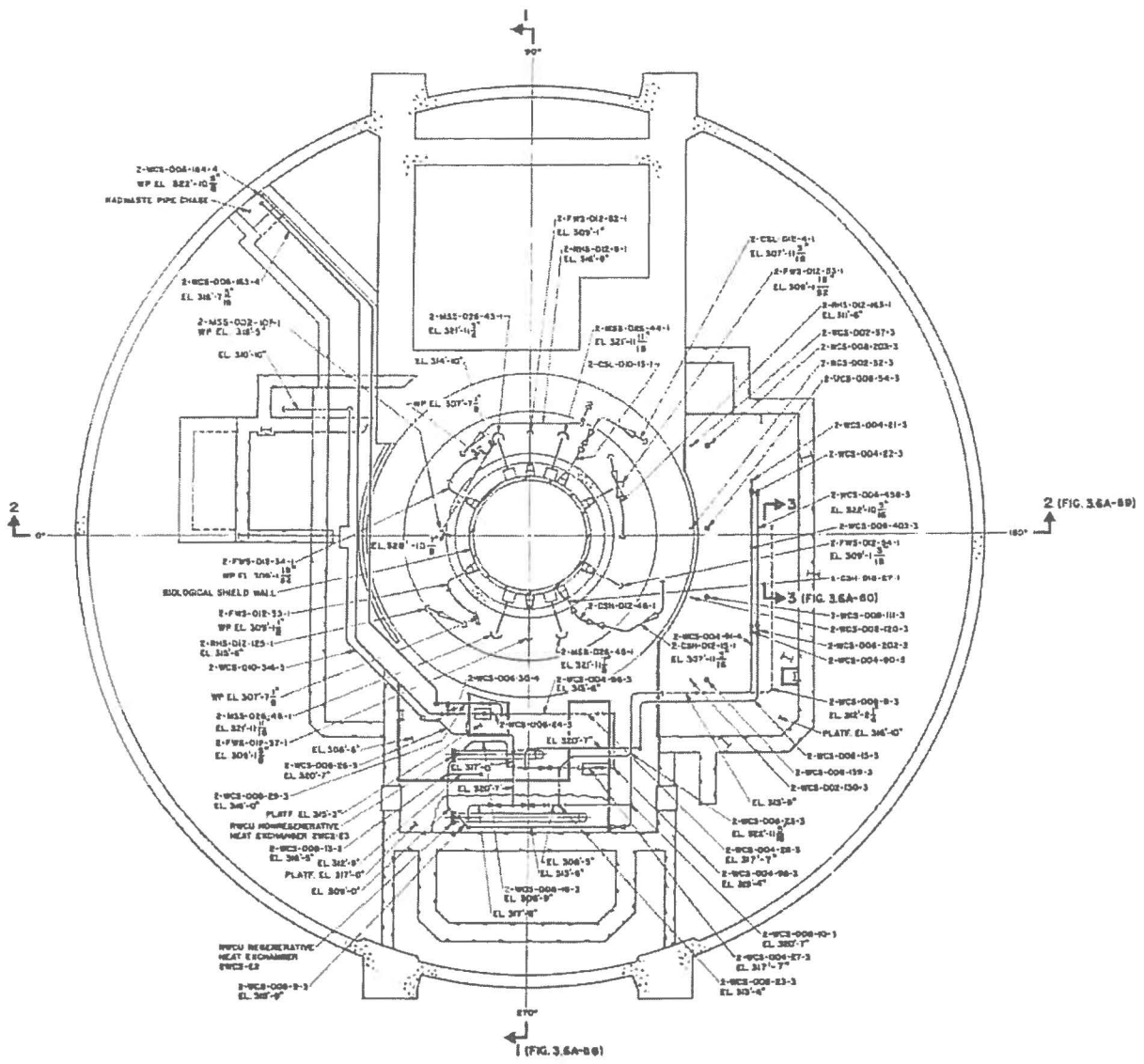


PLAN EL. 289'-0"

FIGURE 3.6A-55

HIGH ENERGY PIPING COMPOSITE
PLAN EL. 289'-0"

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

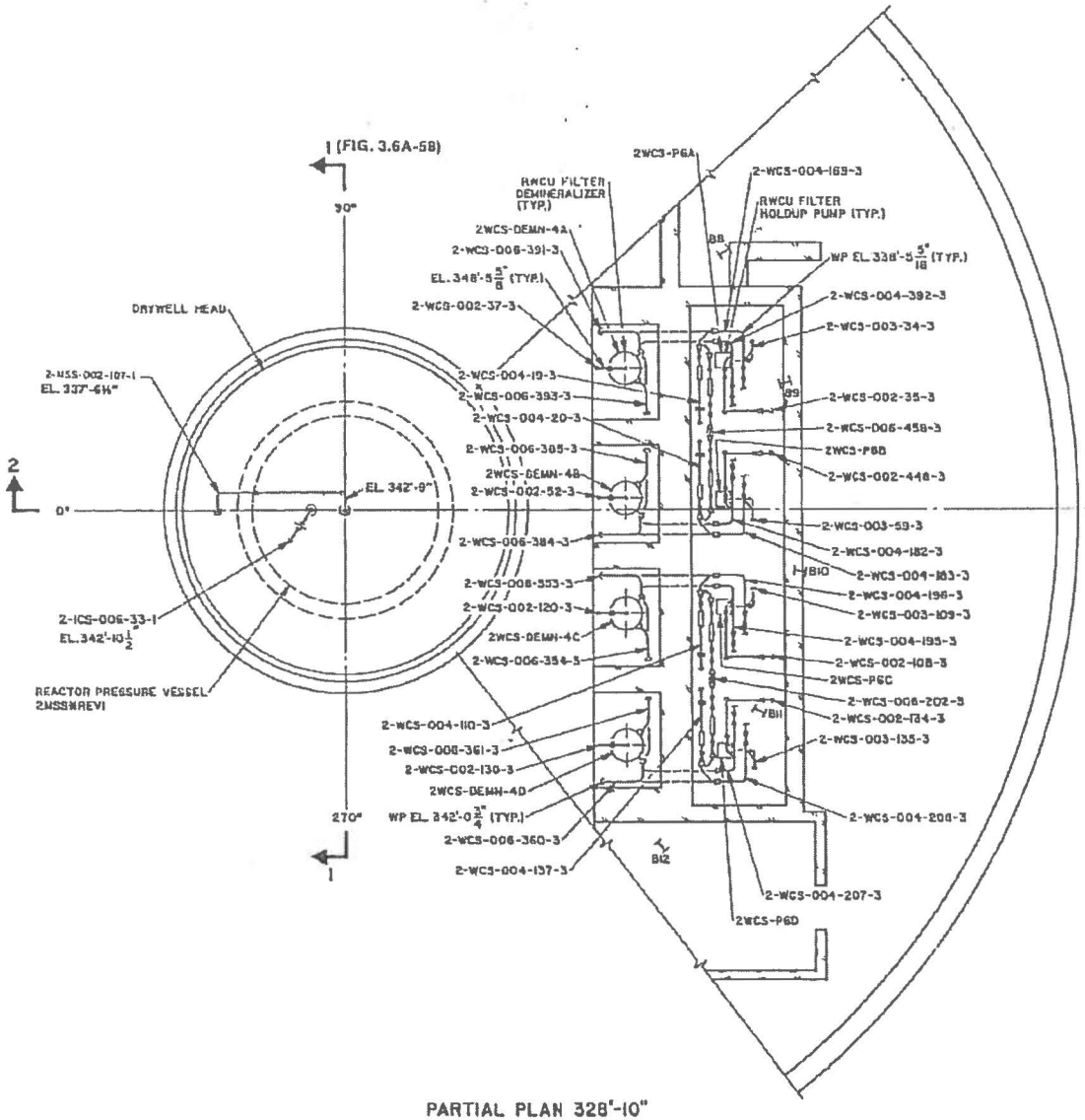


PLAN EL. 306'-6"

FIGURE 3.6A-56

HIGH ENERGY PIPING COMPOSITE
PLAN EL. 306'-6"

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT



SOURCE: EP-002A, REV.13
EP-076C, REV.11
EP-074F, REV.10

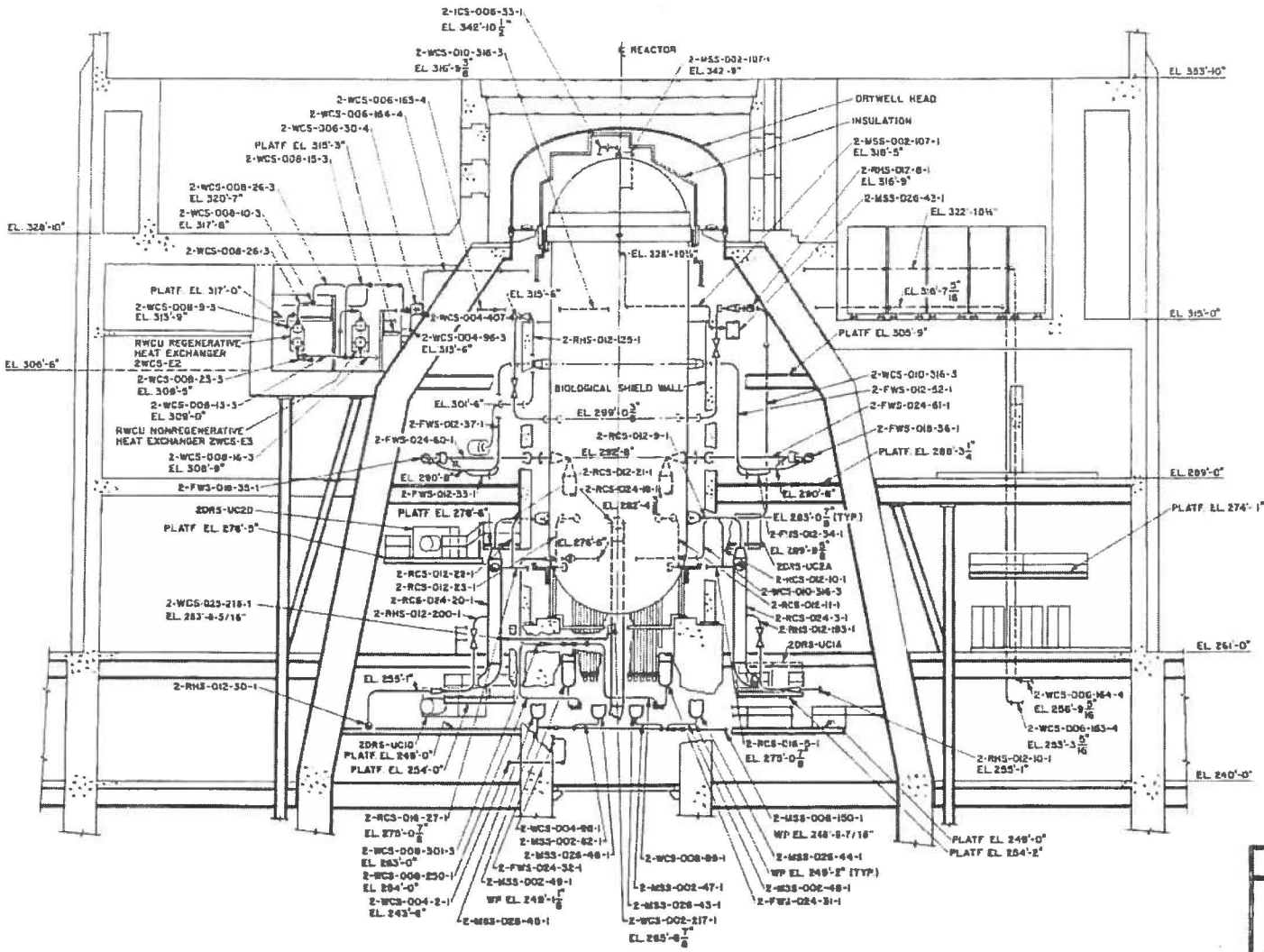
THIS DRAWING WAS PRODUCED ELECTRONICALLY. DO NOT MAKE ANY CHANGES MANUALLY.

FIGURE 3.6A-57

HIGH ENERGY PIPING COMPOSITE PLAN EL.328'-10"

NINE MILE POINT
NUCLEAR STATION - UNIT 2
SCRIBA, N.Y.

UPDATED SAFETY ANALYSIS REPORT

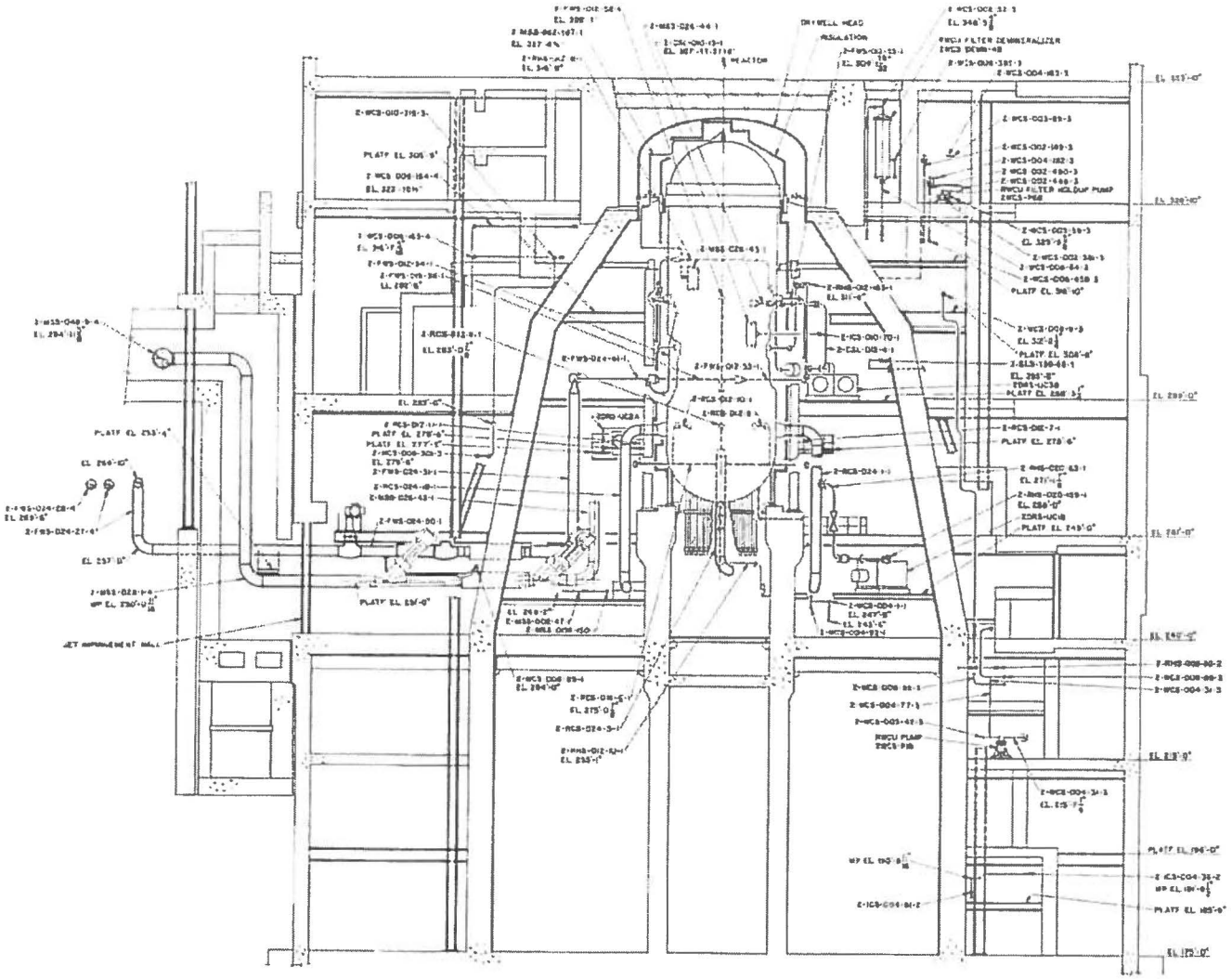


I-1

FIGURE 3.6A-58

HIGH ENERGY PIPING COMPOSITE SECTION 1-1

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

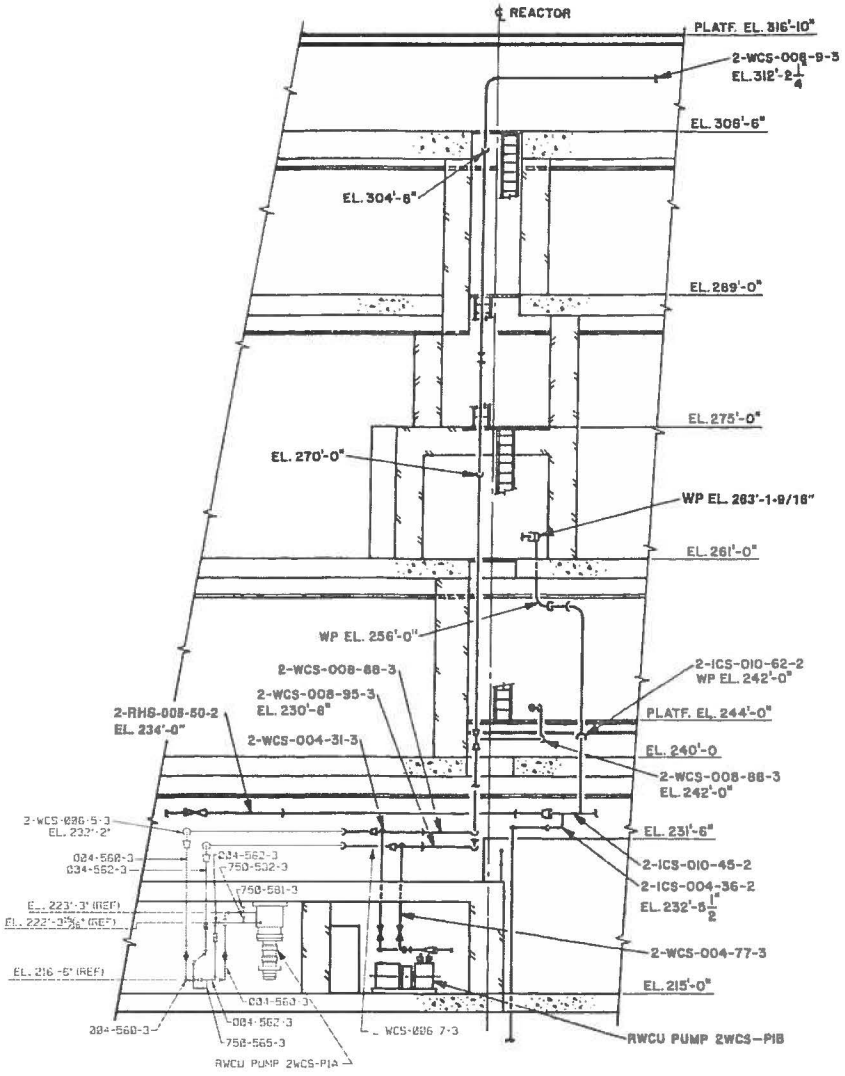


2-2

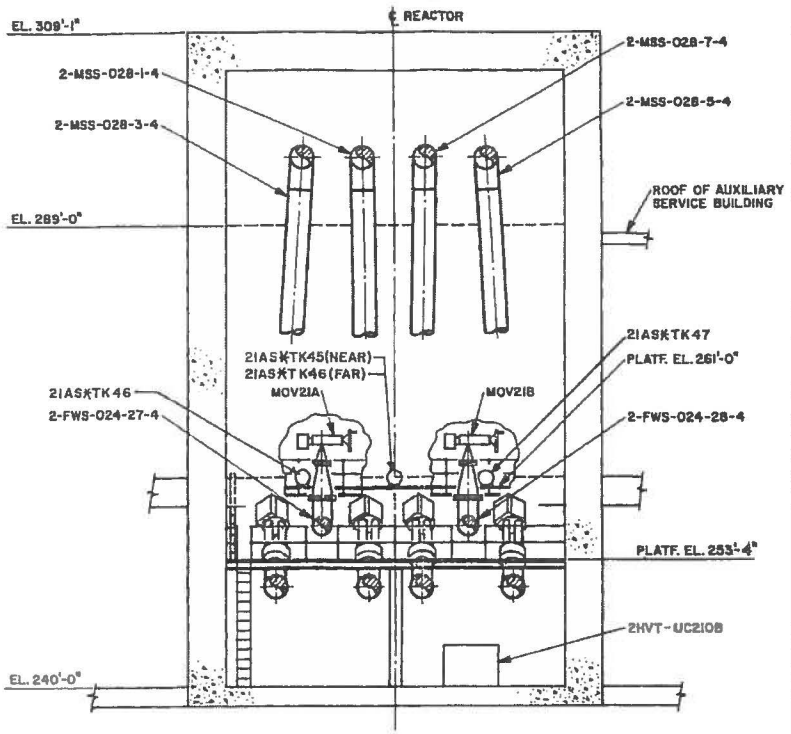
FIGURE 3.6A-59

HIGH ENERGY PIPING COMPOSITE
SECTION 2-2

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT



3-3



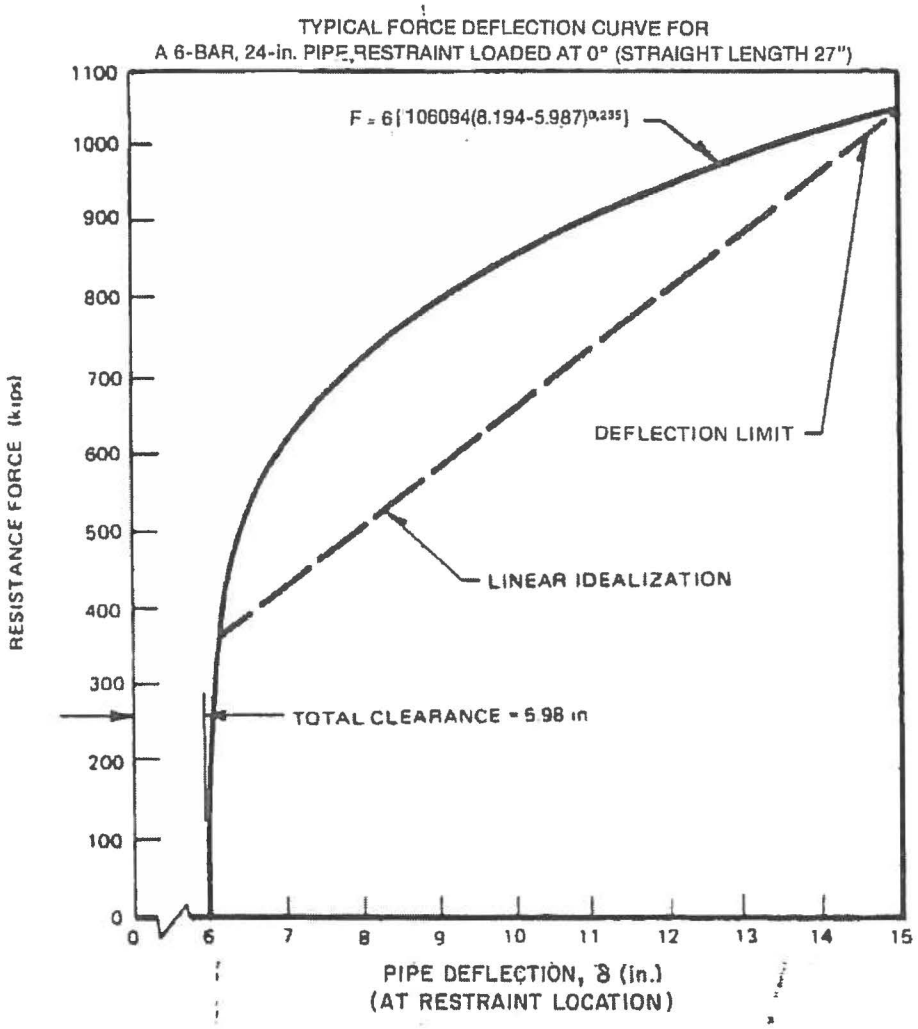
4-4

SOURCE:

FIGURE 3.6a-60

HIGH ENERGY PIPING COMPOSITE SECTION "3-3" AND "4-4"

NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT



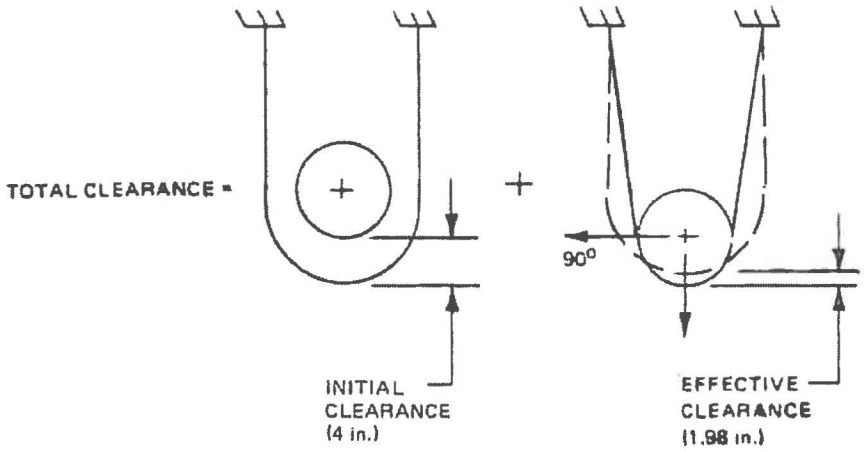


FIGURE 3.6B-1

TYPICAL RESTRAINT FORCE-DEFLECTION CURVE

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

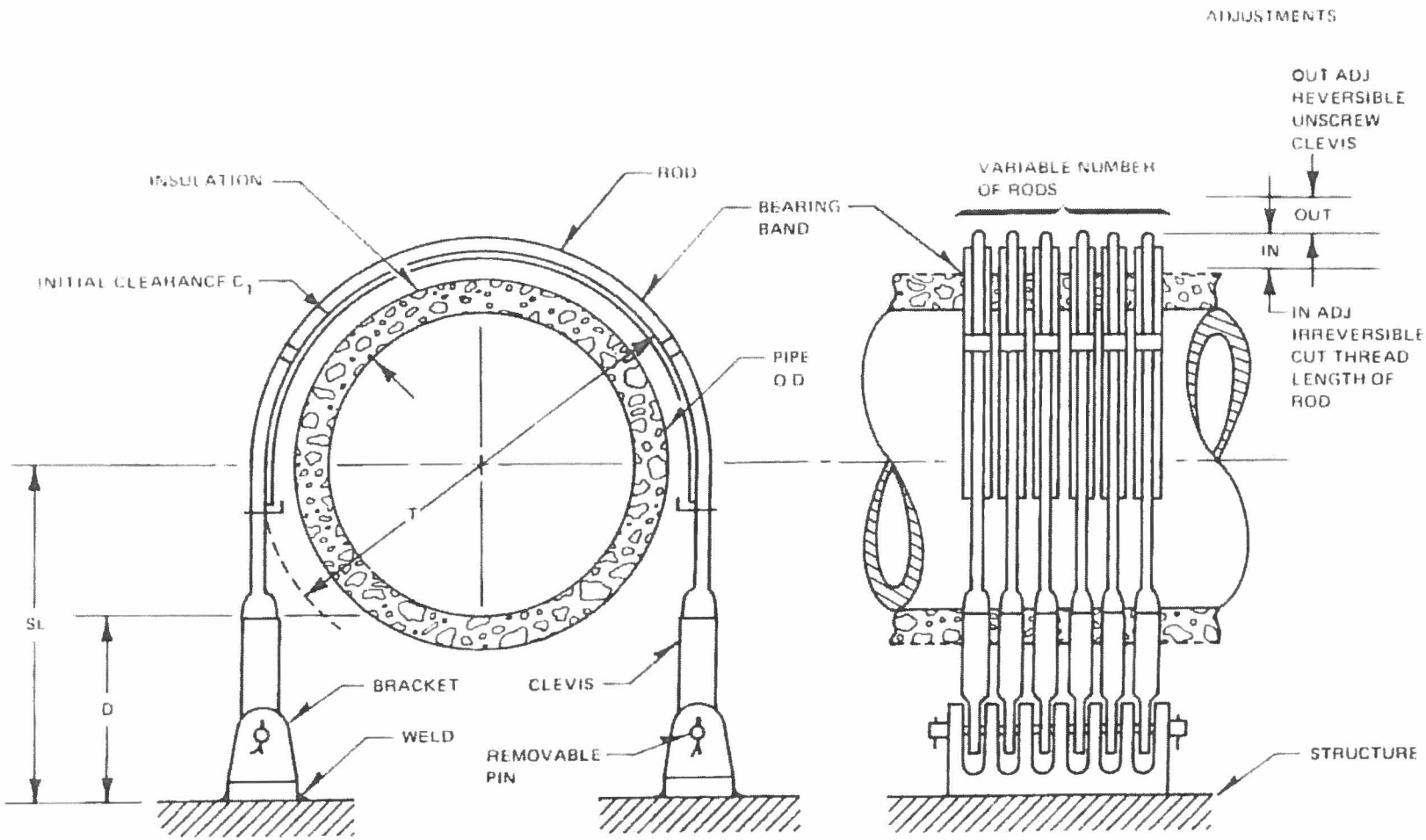


FIGURE 3.6B-2

TYPICAL PIPE WHIP RESTRAINT CONFIGURATION

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

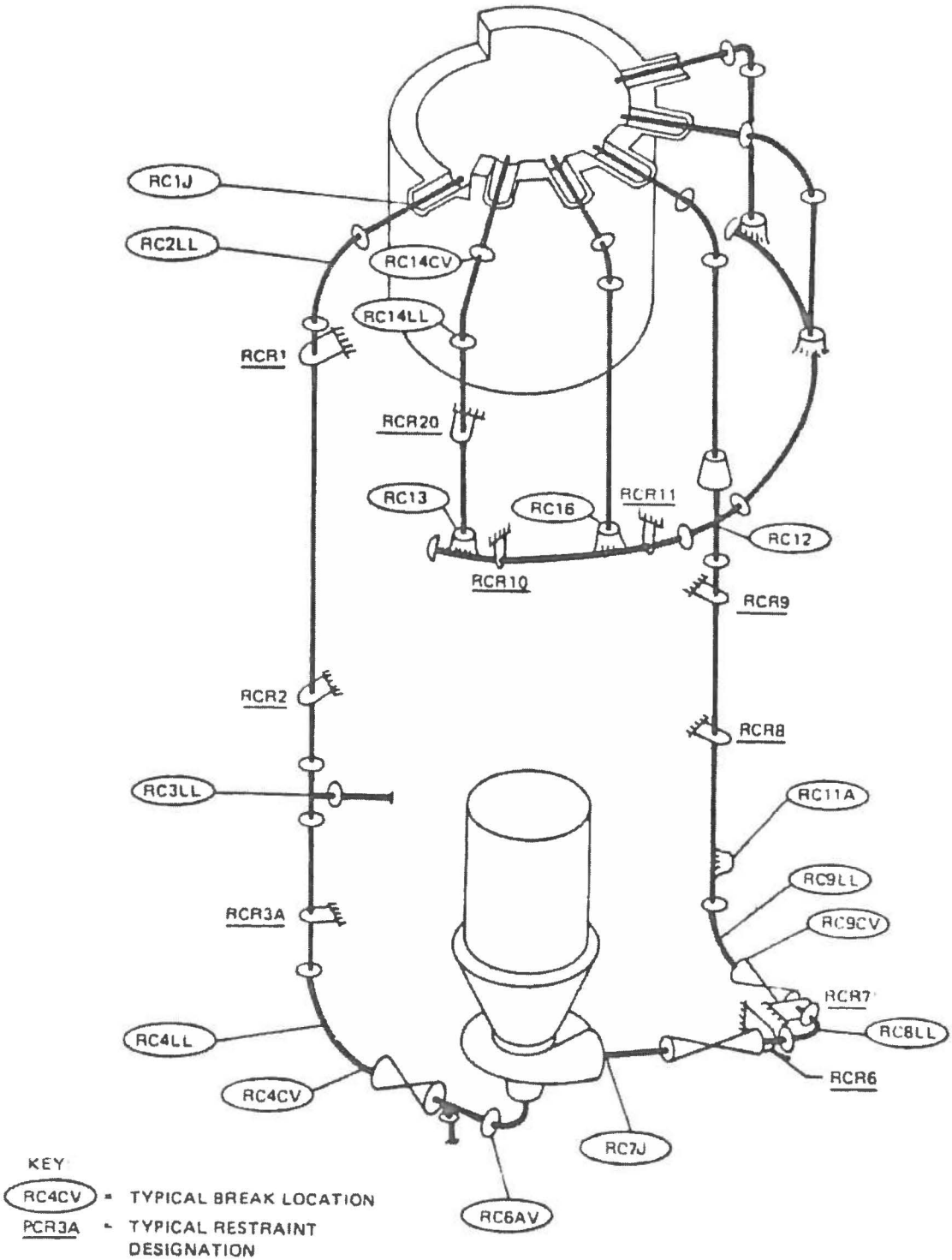


FIGURE 3.6B-3

BREAK LOCATIONS AND RESTRAINTS ANALYZED, PDA VERIFICATION PROGRAM

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

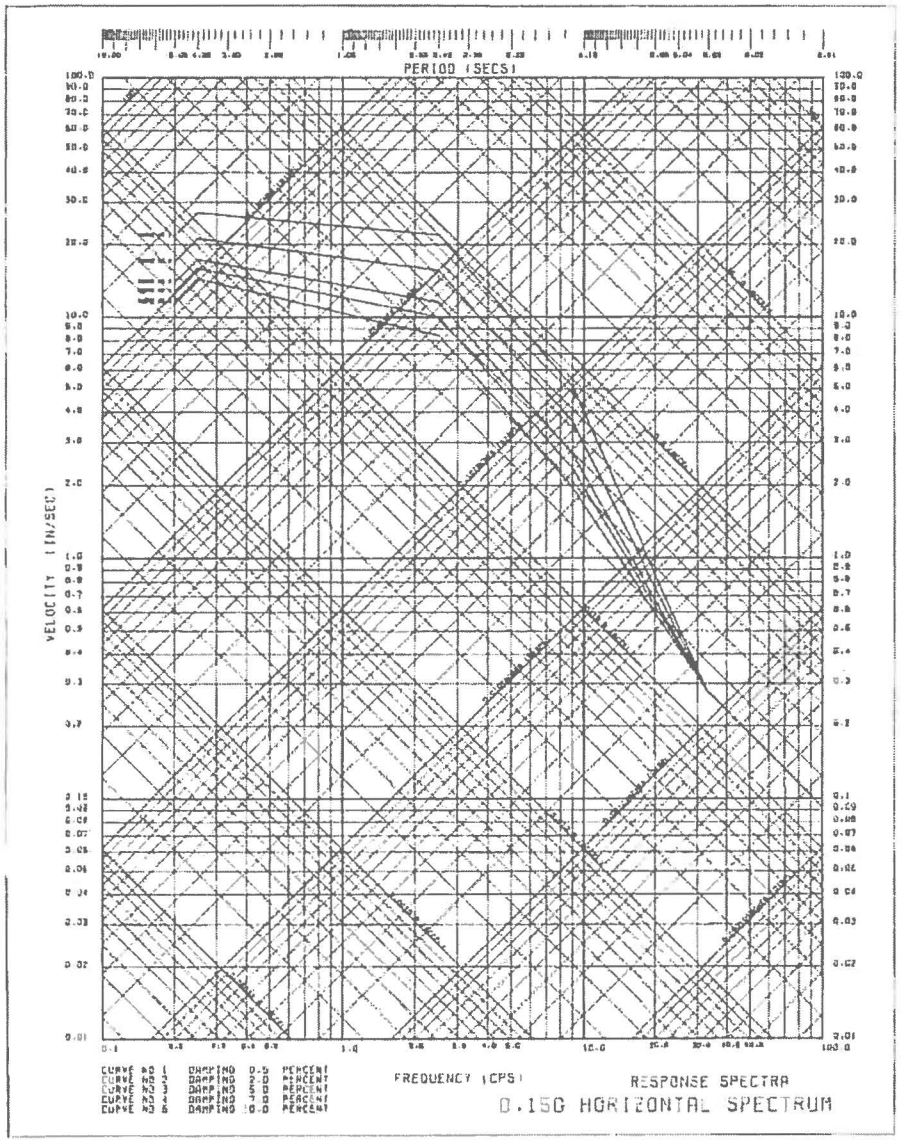


FIGURE 3.7A-1

HORIZONTAL SSE DESIGN RESPONSE SPECTRA NORMALIZED TO 0.15 G

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

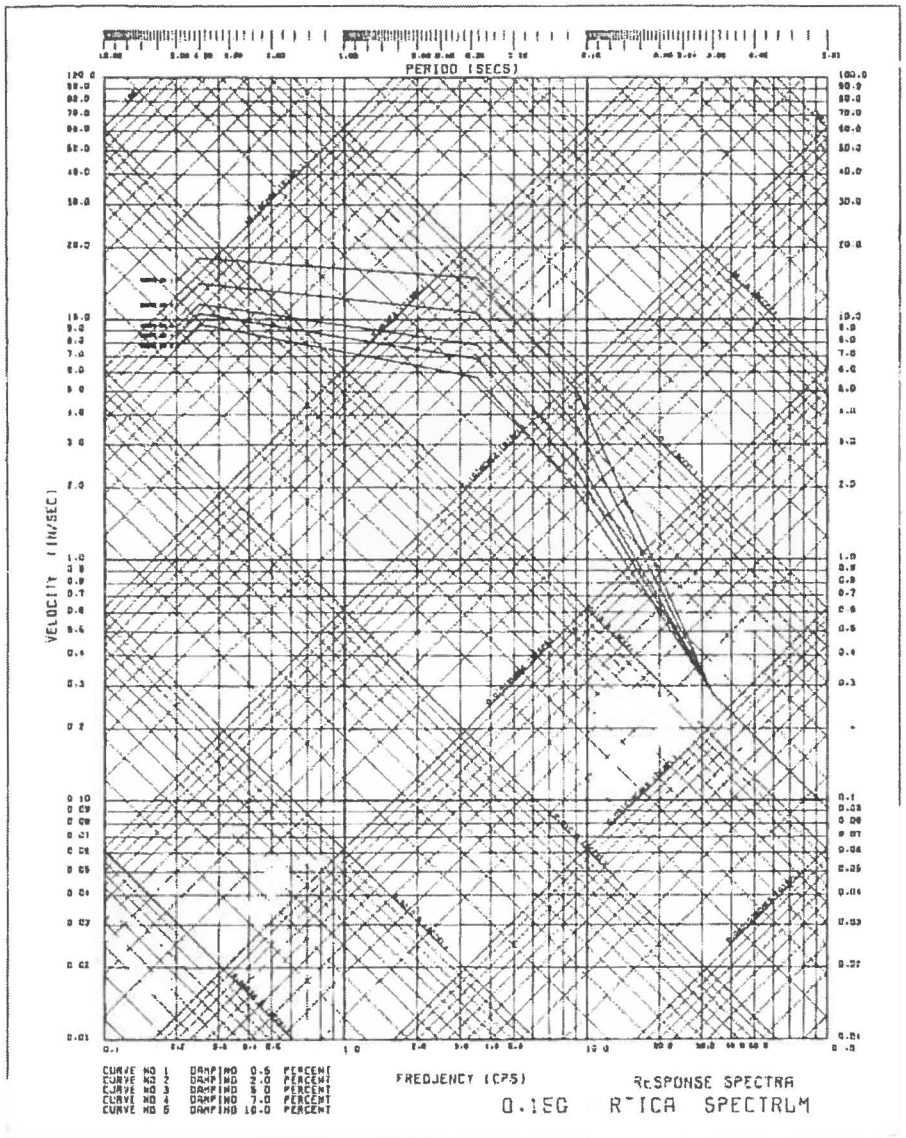


FIGURE 3.7A-2

VERTICAL SSE DESIGN RESPONSE SPECTRA NORMALIZED TO 0.15 G

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

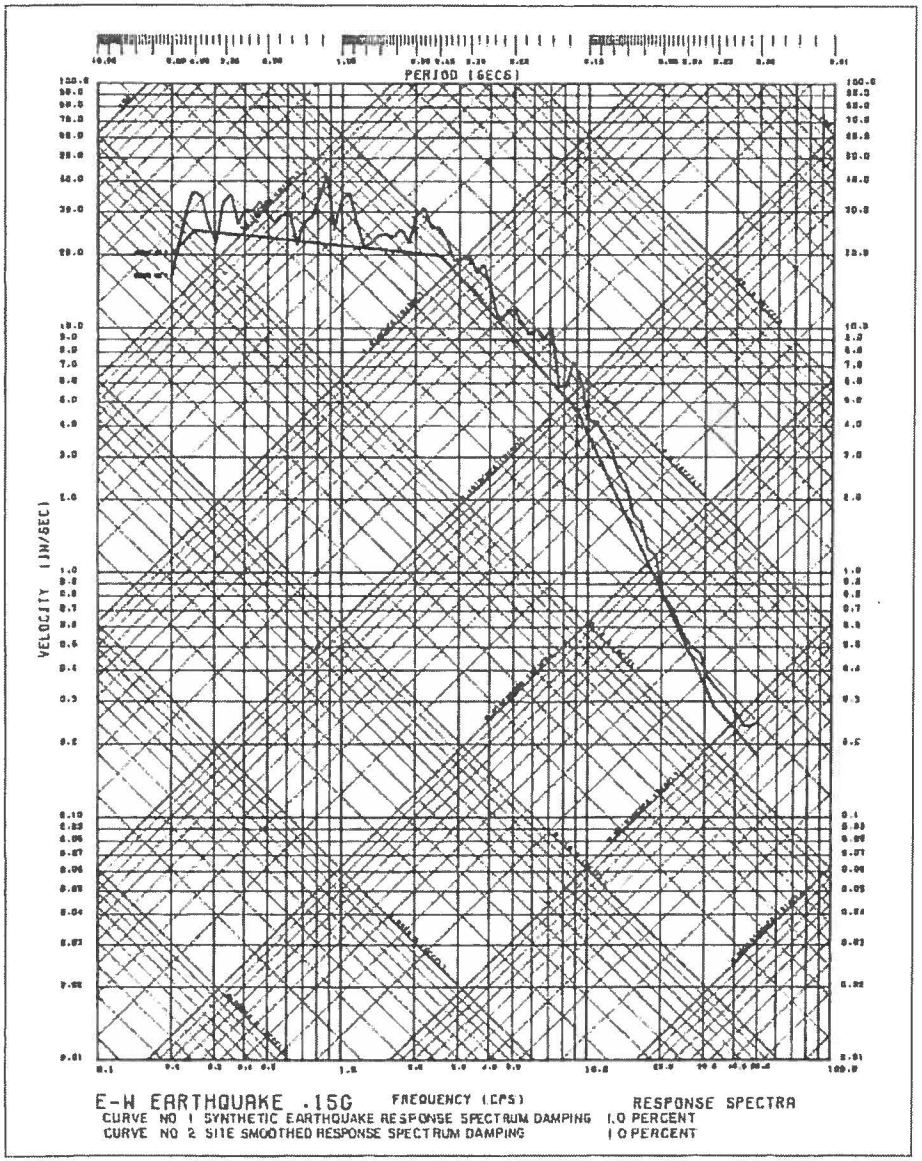


FIGURE 3.7A-3

HORIZONTAL SSE DESIGN RESPONSE SPECTRUM AND RESPONSE SPECTRUM DERIVED FROM HORIZONTAL SSE SYNTHETIC TIME HISTORY (EAST-WEST EARTHQUAKE) BASED ON 1.0 PERCENT DAMPING RATIO

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

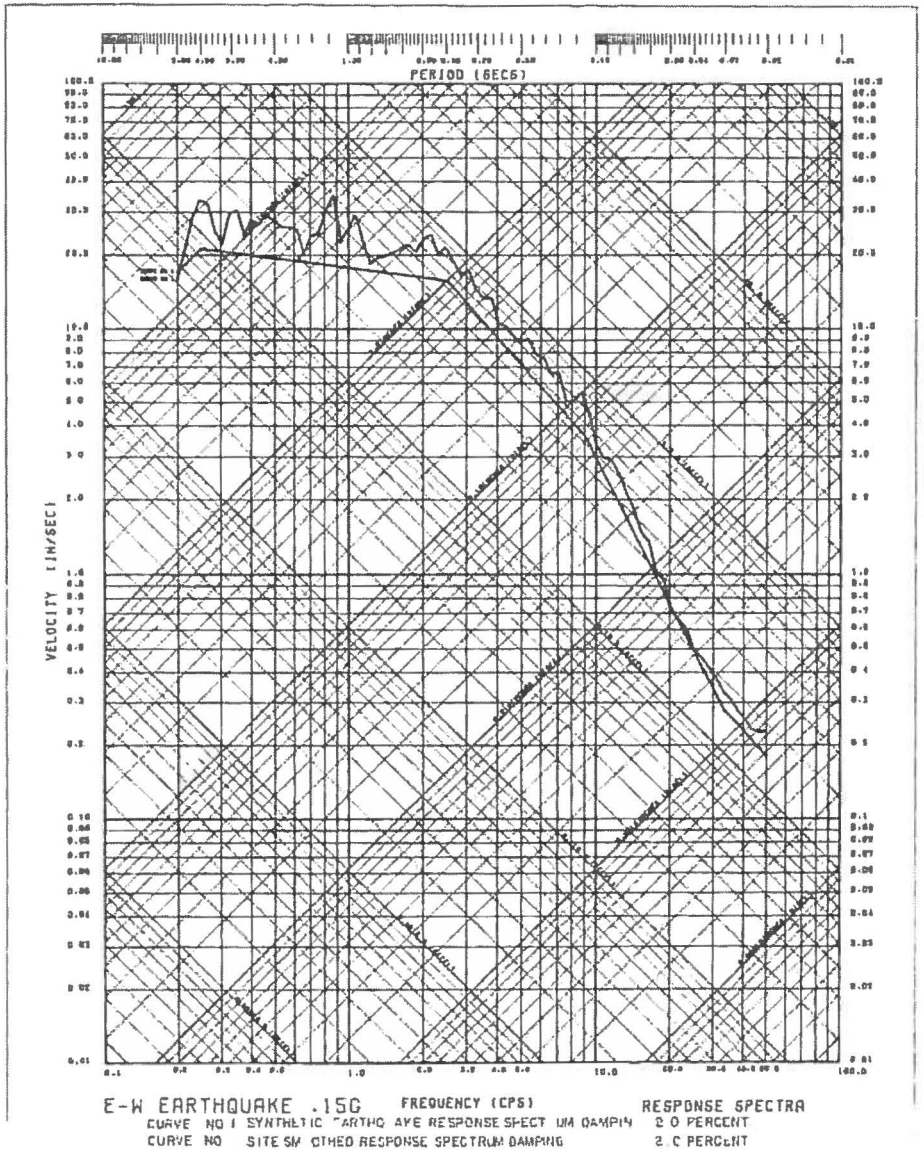


FIGURE 3.7A-4

HORIZONTAL SSE DESIGN RESPONSE SPECTRUM AND RESPONSE SPECTRUM DERIVED FROM HORIZONTAL SSE SYNTHETIC TIME HISTORY (EAST-WEST EARTHQUAKE) BASED ON 2.0 PERCENT DAMPING RATIO

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

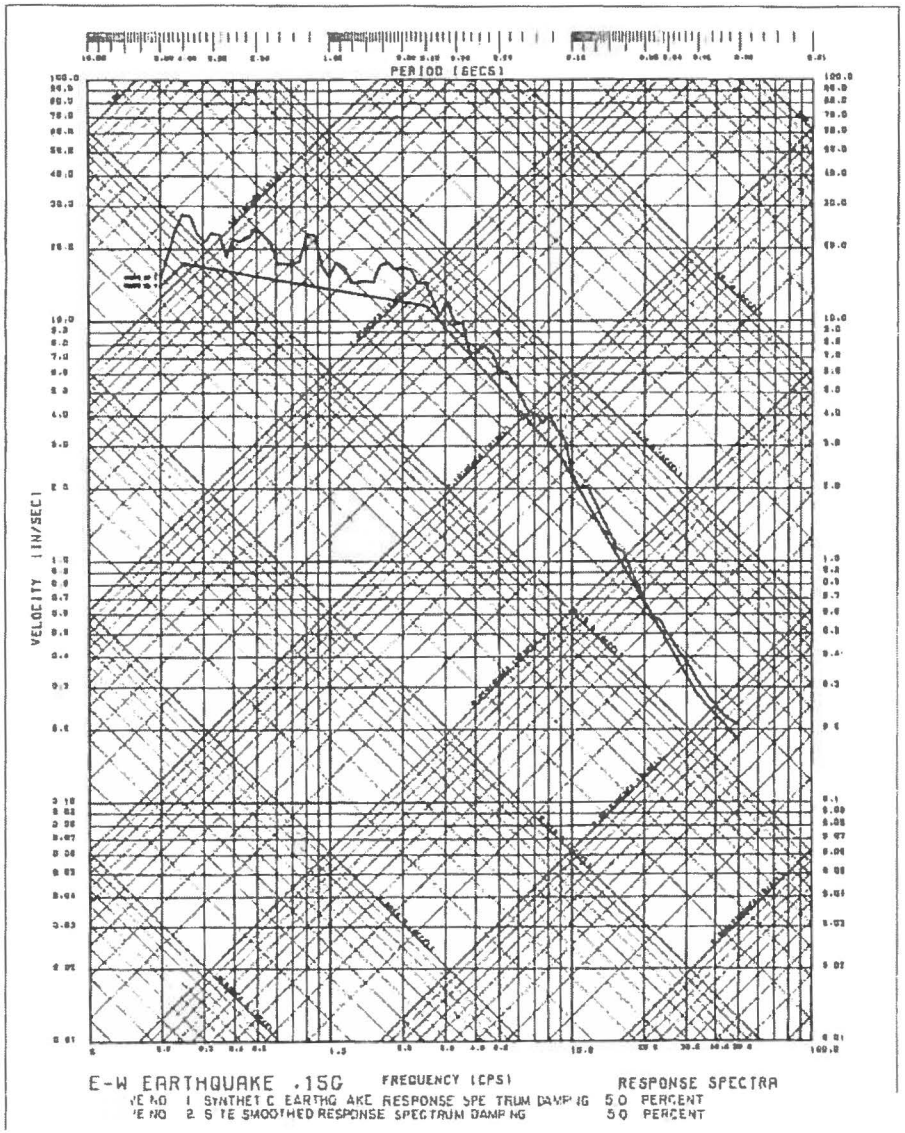


FIGURE 3.7A-5

HORIZONTAL SSE DESIGN RESPONSE SPECTRUM AND RESPONSE SPECTRUM DERIVED FROM HORIZONTAL SSE SYNTHETIC TIME HISTORY (EAST-WEST EARTHQUAKE) BASED ON 5.0 PERCENT DAMPING RATIO

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

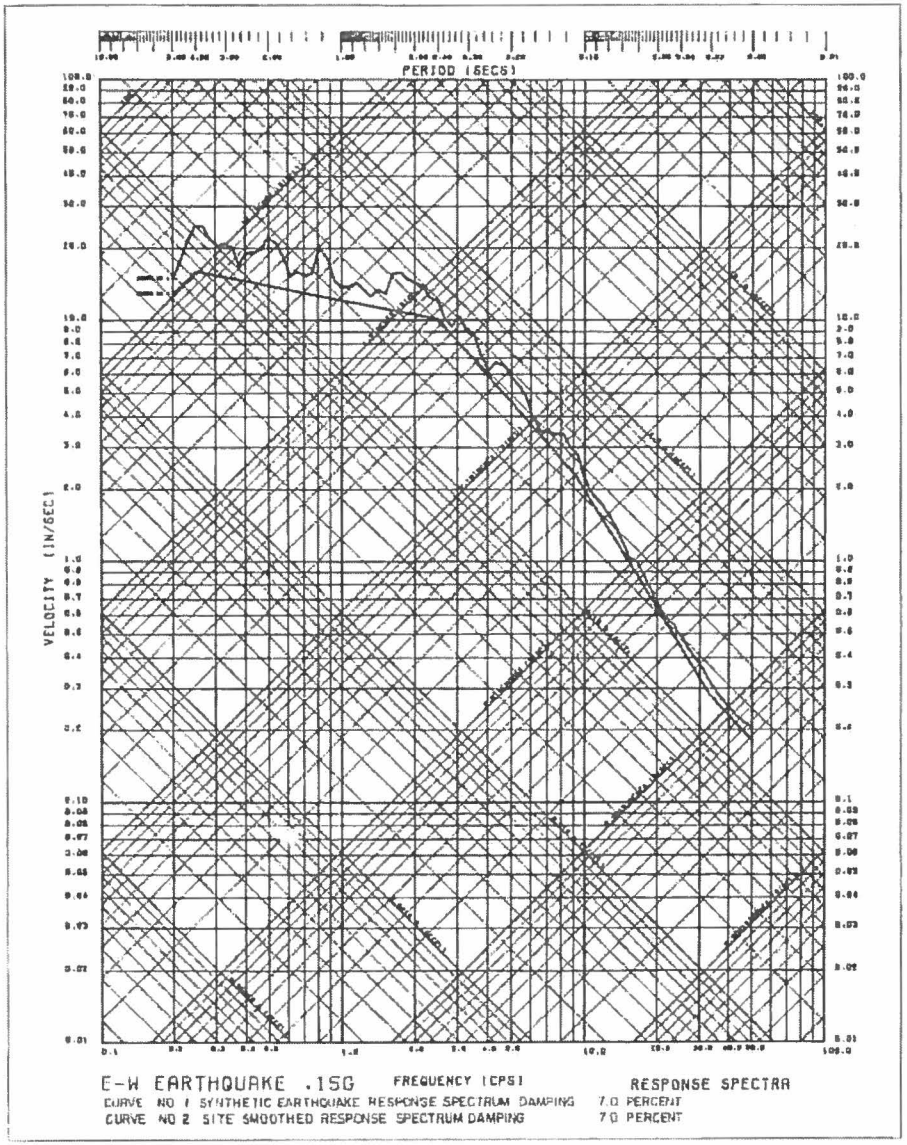


FIGURE 3.7A-6

HORIZONTAL SSE DESIGN RESPONSE SPECTRUM AND RESPONSE SPECTRUM DERIVED FROM HORIZONTAL SSE SYNTHETIC TIME HISTORY (EAST-WEST EARTHQUAKE) BASED ON 7.0 PERCENT DAMPING RATIO

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

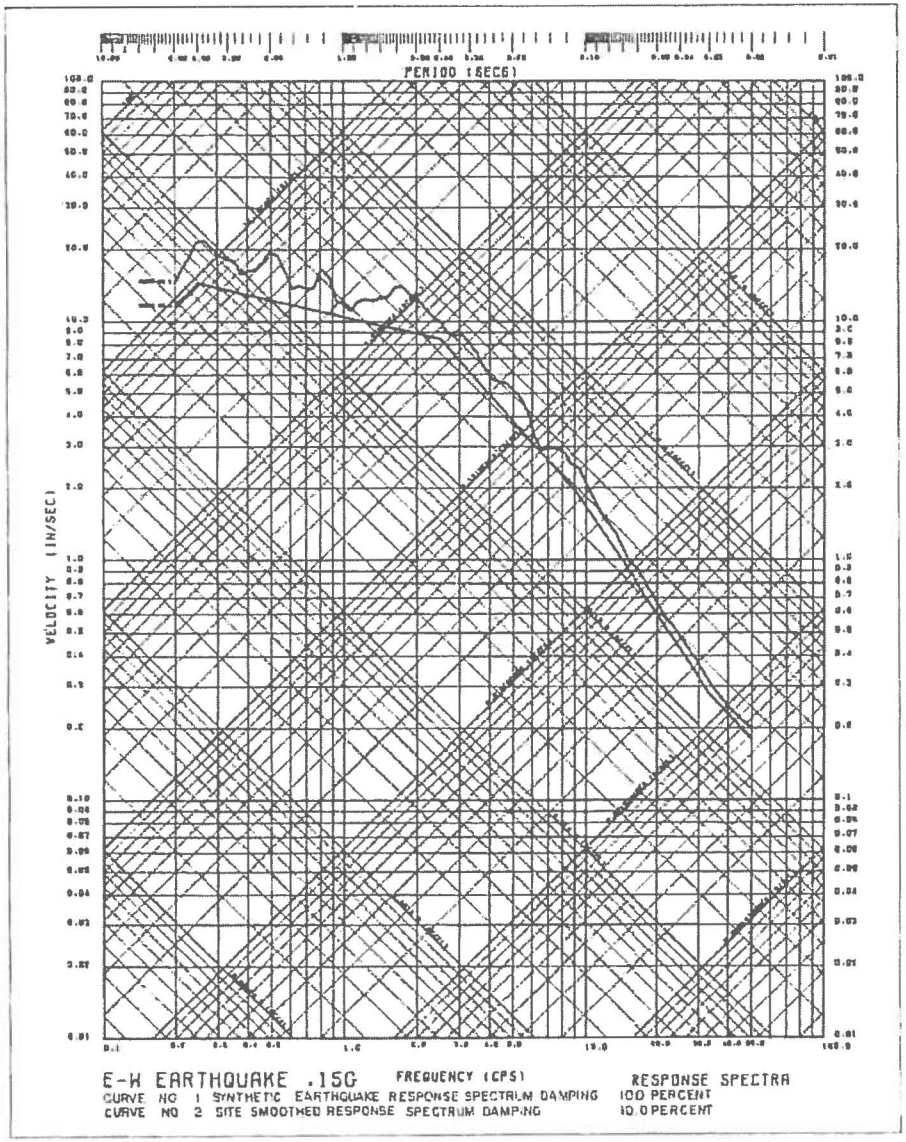


FIGURE 3.7A-7

HORIZONTAL SSE DESIGN RESPONSE SPECTRUM AND RESPONSE SPECTRUM DERIVED FROM HORIZONTAL SSE SYNTHETIC TIME HISTORY (EAST-WEST EARTHQUAKE) BASED ON 10.0 PERCENT DAMPING RATIO

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

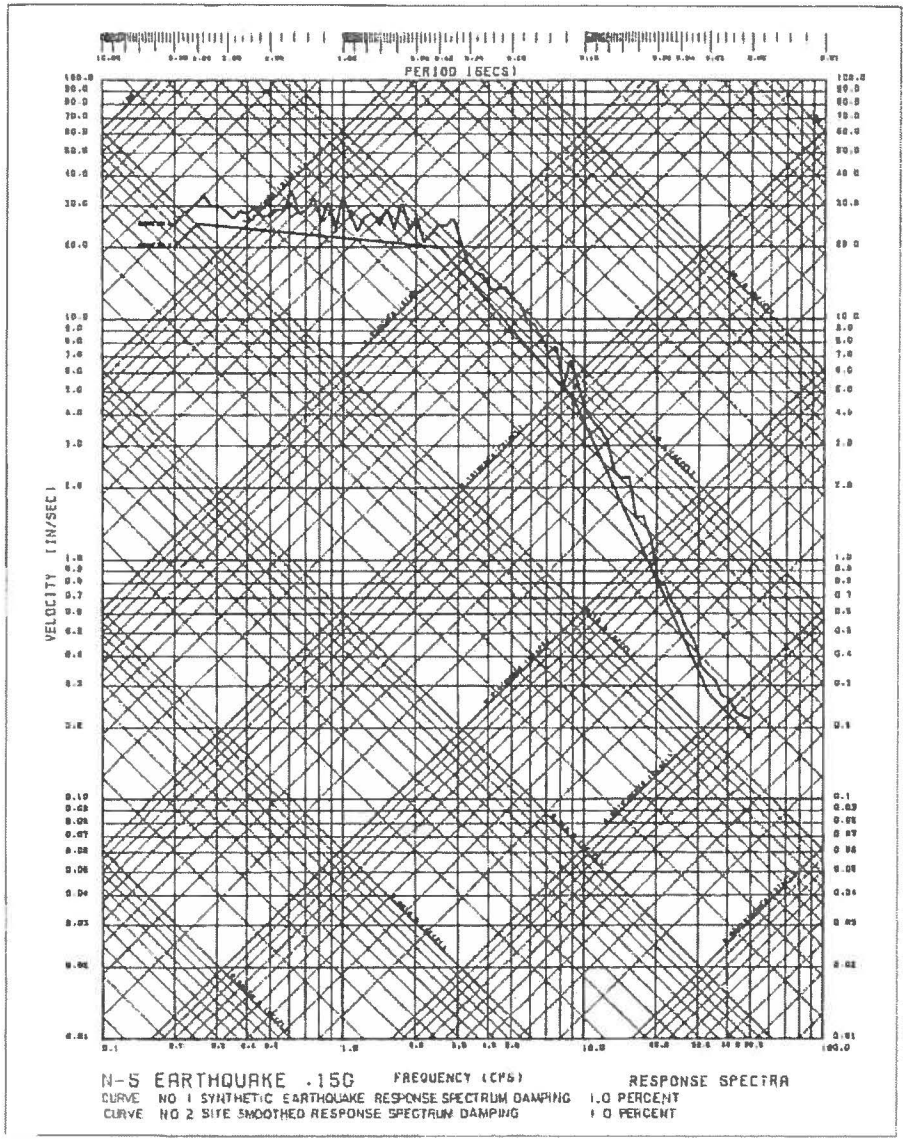


FIGURE 3.7A-8

HORIZONTAL SSE DESIGN RESPONSE SPECTRUM AND RESPONSE SPECTRUM DERIVED FROM HORIZONTAL SSE SYNTHETIC TIME HISTORY (NORTH-SOUTH EARTHQUAKE) BASED ON 1.0 PERCENT DAMPING RATIO

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

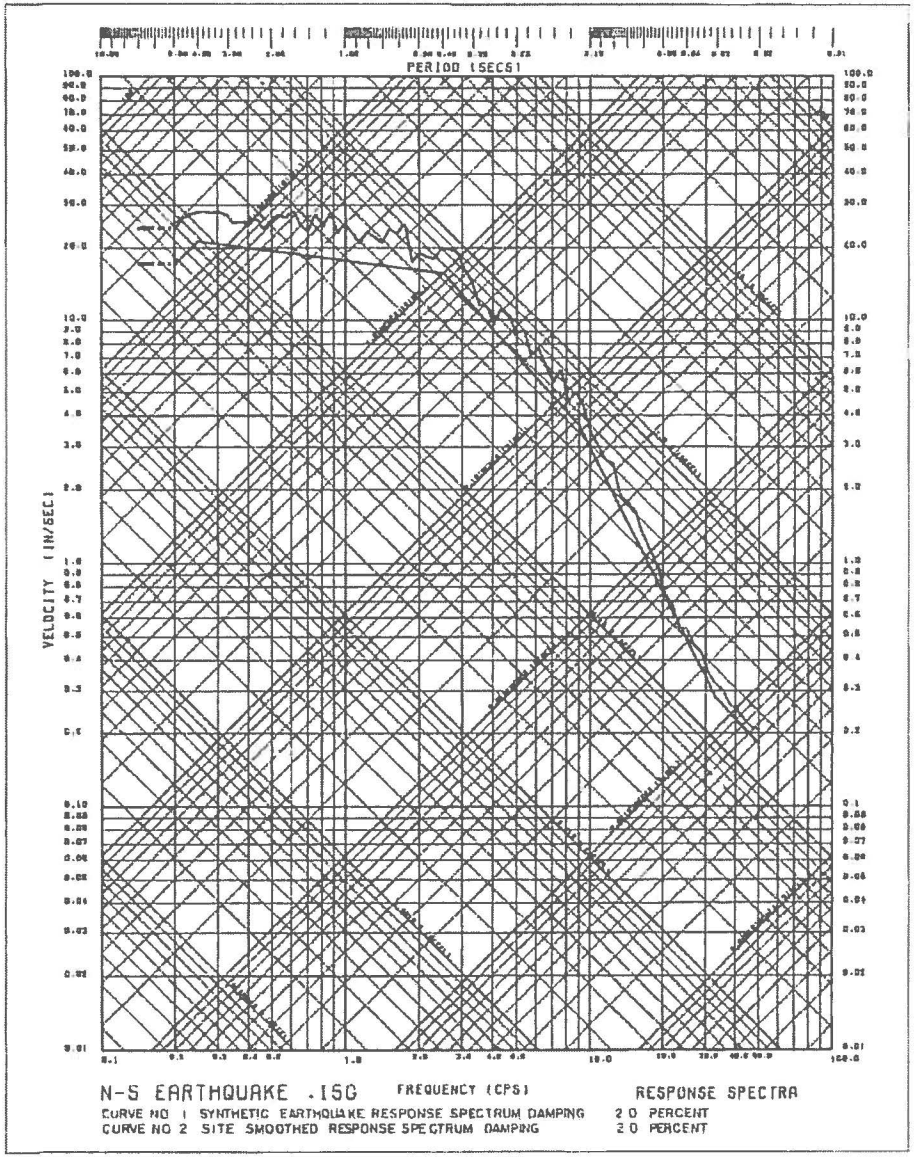


FIGURE 3.7A-9

HORIZONTAL SSE DESIGN RESPONSE SPECTRUM AND RESPONSE SPECTRUM DERIVED FROM HORIZONTAL SSE SYNTHETIC TIME HISTORY (NORTH-SOUTH EARTHQUAKE) BASED ON 2.0 PERCENT DAMPING RATIO

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

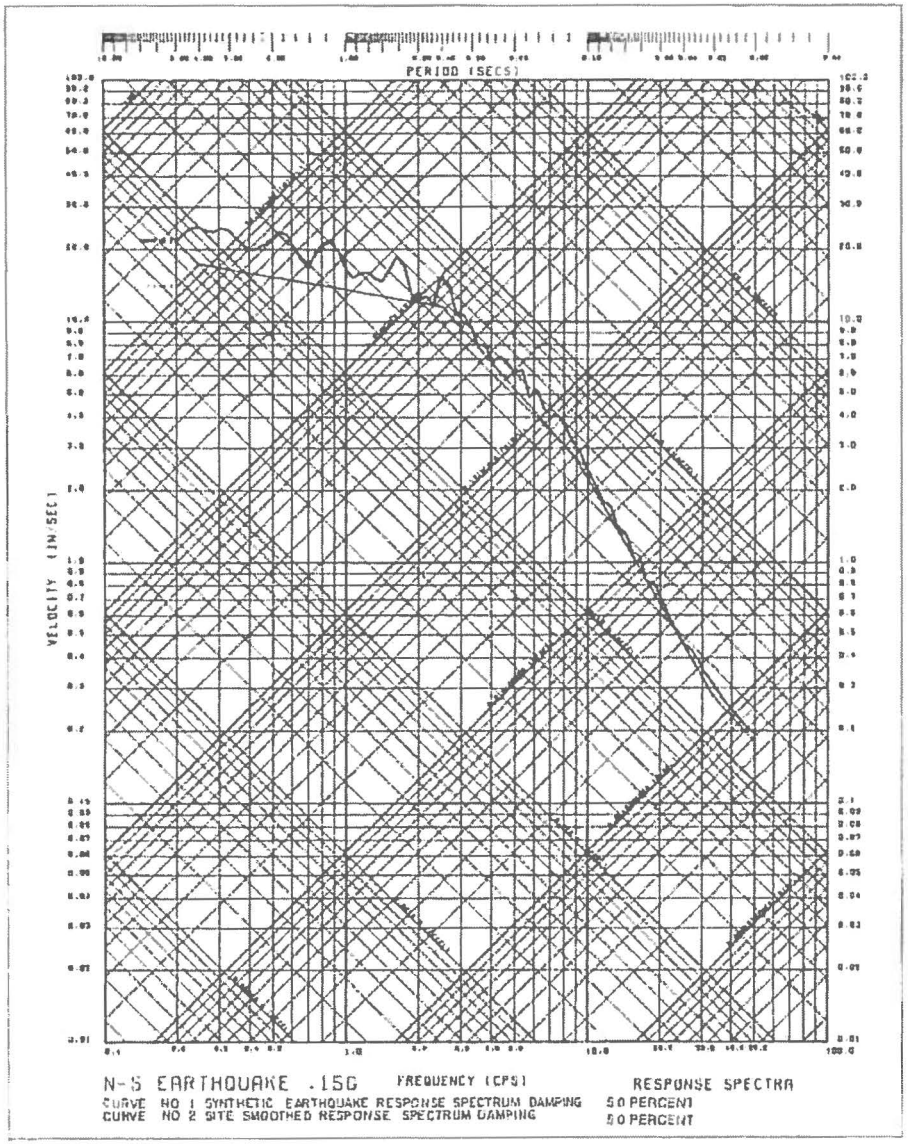


FIGURE 3.7A-10

HORIZONTAL SSE DESIGN RESPONSE SPECTRUM AND RESPONSE SPECTRUM DERIVED FROM HORIZONTAL SSE SYNTHETIC TIME HISTORY (NORTH-SOUTH EARTHQUAKE) BASED ON 5.0 PERCENT DAMPING RATIO

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

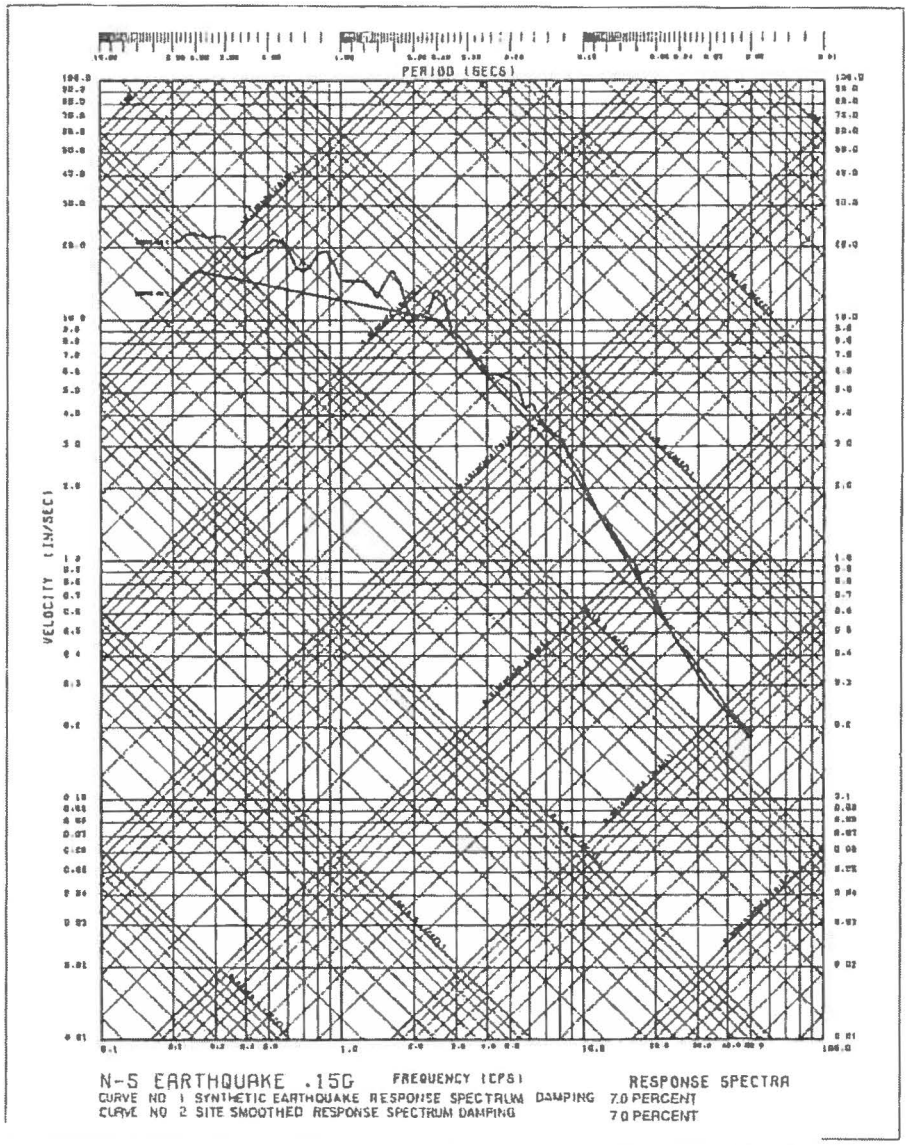


FIGURE 3.7A-11

HORIZONTAL SSE DESIGN RESPONSE SPECTRUM AND RESPONSE SPECTRUM DERIVED FROM HORIZONTAL SSE SYNTHETIC TIME HISTORY (NORTH-SOUTH EARTHQUAKE) BASED ON 7.0 PERCENT DAMPING RATIO

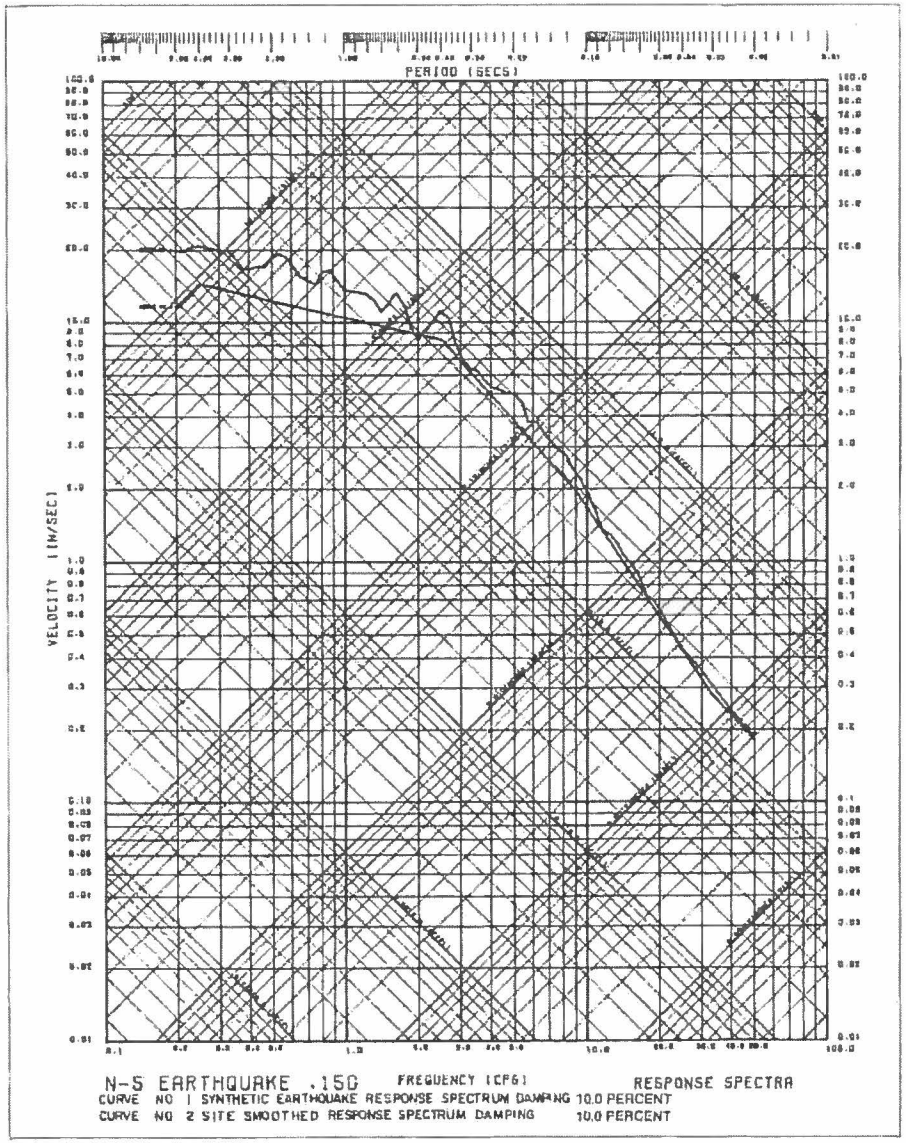


FIGURE 3.7A-12

HORIZONTAL SSE DESIGN RESPONSE SPECTRUM AND RESPONSE SPECTRUM DERIVED FROM HORIZONTAL SSE SYNTHETIC TIME HISTORY (NORTH-SOUTH EARTHQUAKE) BASED ON 10.0 PERCENT DAMPING RATIO

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

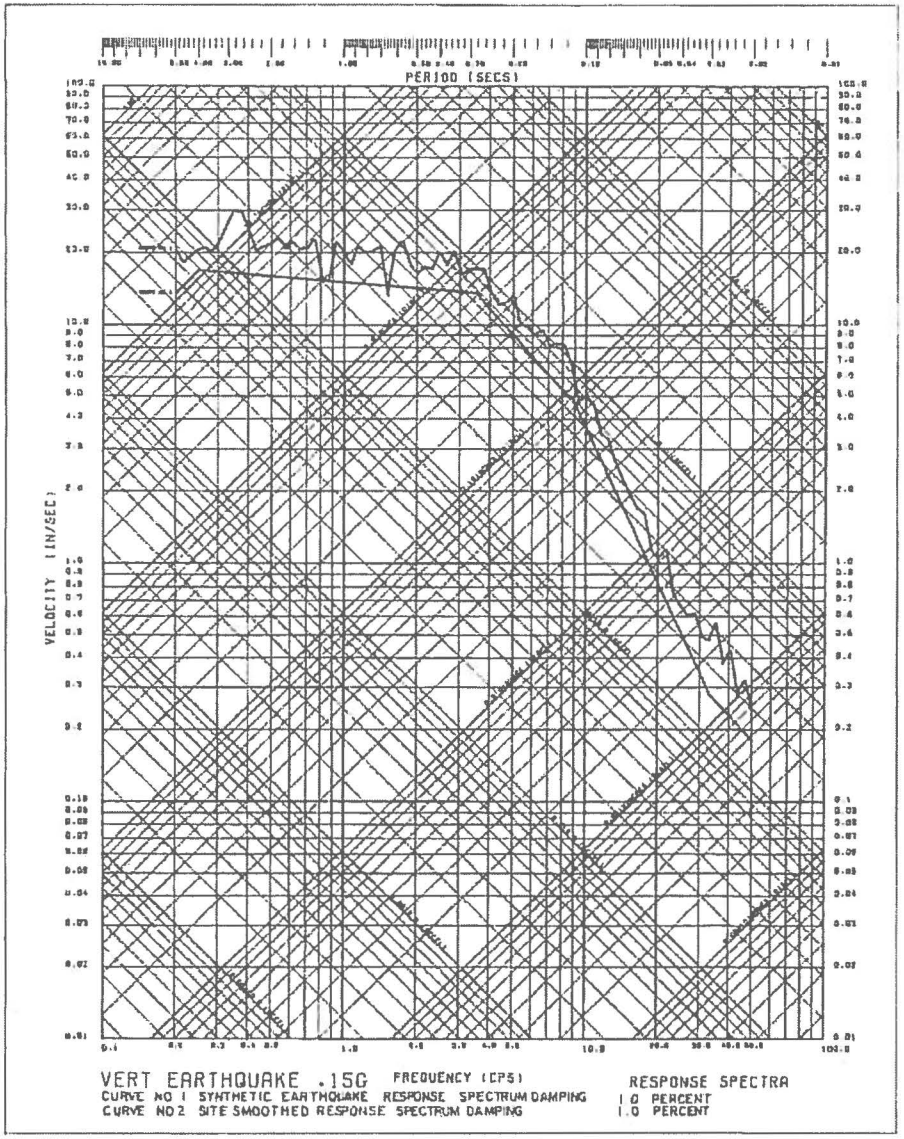


FIGURE 3.7A-13

VERTICAL SSE DESIGN RESPONSE SPECTRUM AND RESPONSE SPECTRUM DERIVED FROM VERTICAL SSE SYNTHETIC TIME HISTORY BASED ON 1.0 PERCENT DAMPING RATIO

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

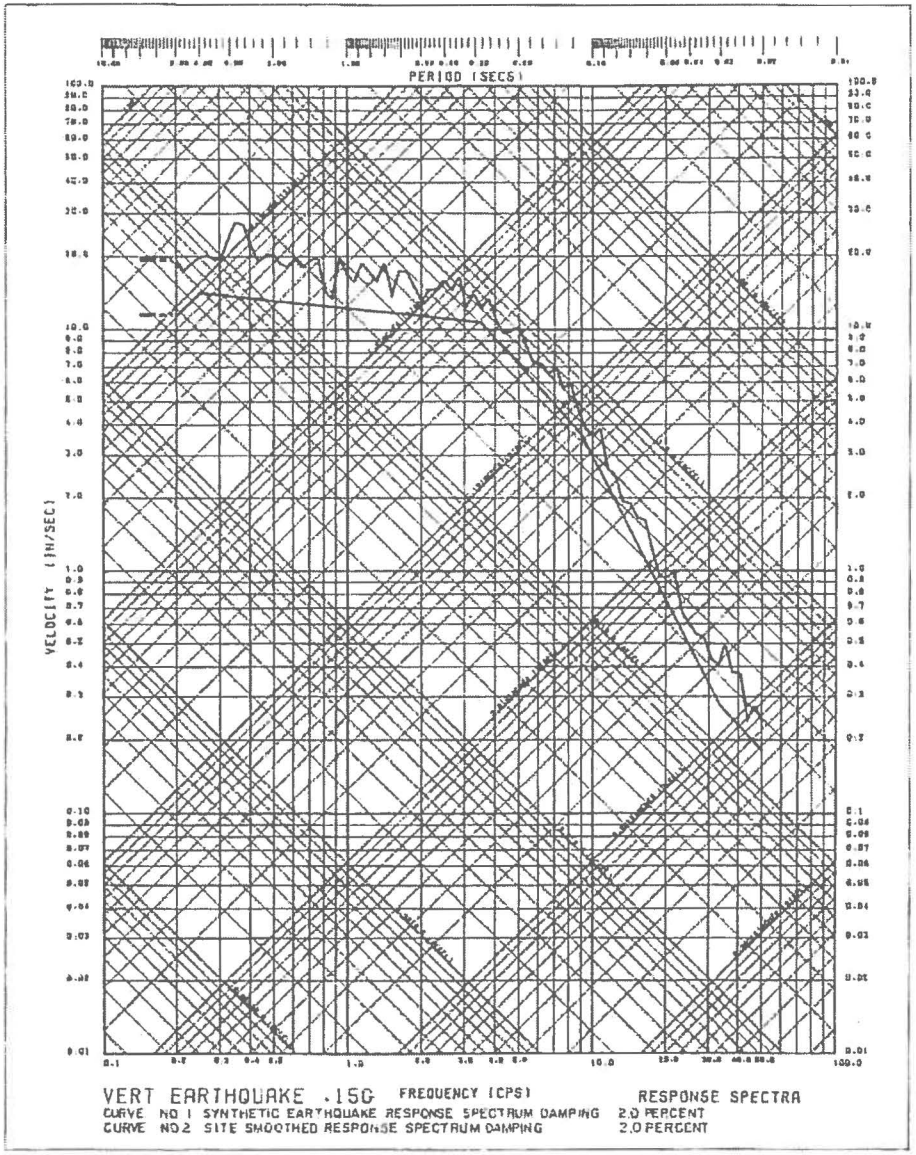


FIGURE 3.7A-14

VERTICAL SSE DESIGN RESPONSE SPECTRUM AND RESPONSE SPECTRUM DERIVED FROM VERTICAL SSE SYNTHETIC TIME HISTORY BASED ON 2.0 PERCENT DAMPING RATIO

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

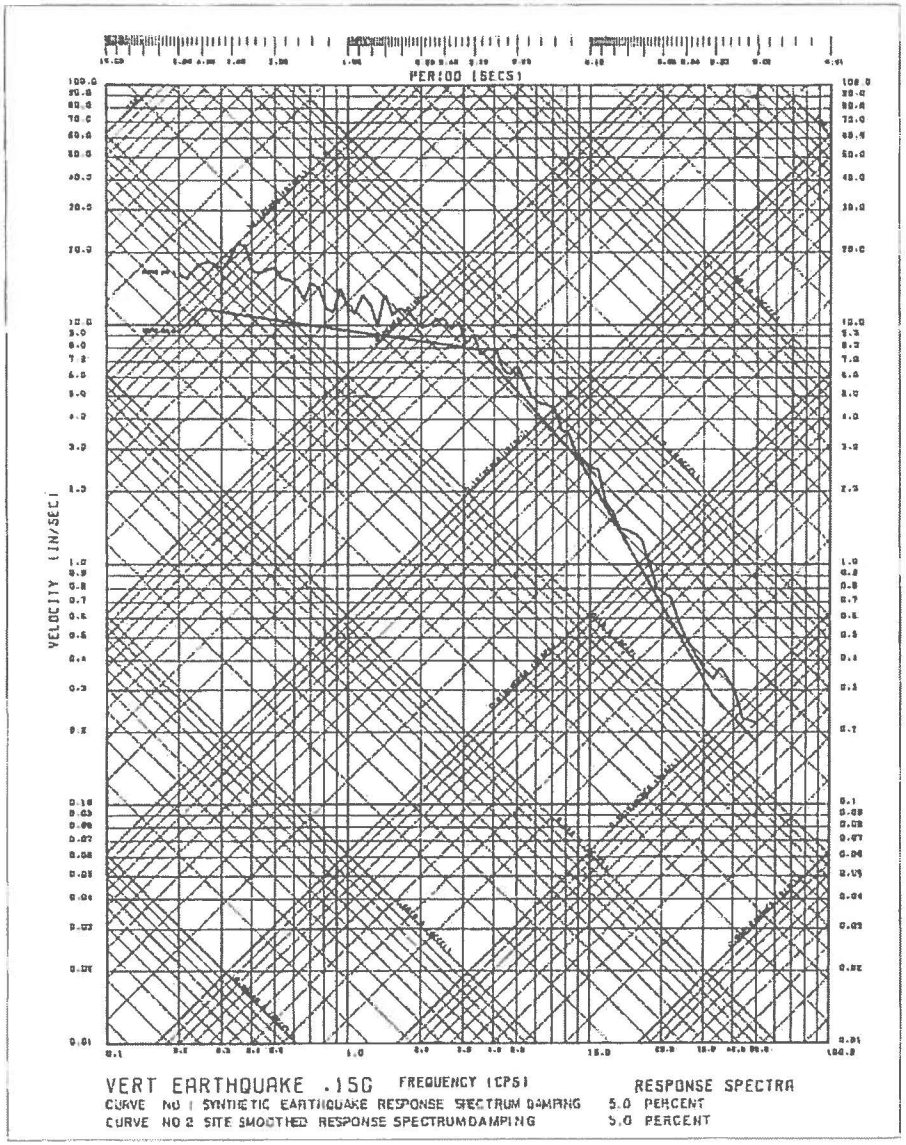


FIGURE 3.7A-15

VERTICAL SSE DESIGN RESPONSE SPECTRUM AND RESPONSE SPECTRUM DERIVED FROM VERTICAL SSE SYNTHETIC TIME HISTORY BASED ON 5.0 PERCENT DAMPING RATIO

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

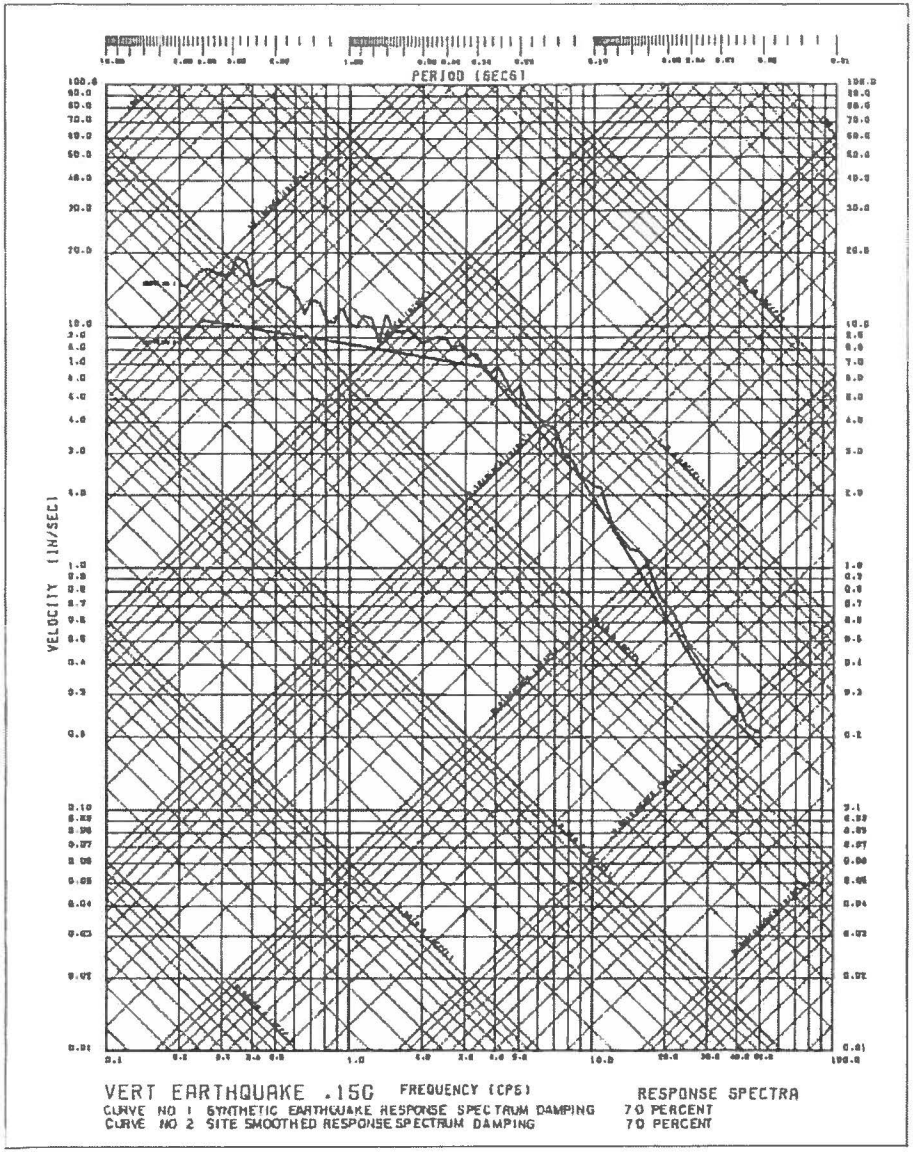


FIGURE 3.7A-16

VERTICAL SSE DESIGN RESPONSE SPECTRUM AND RESPONSE SPECTRUM DERIVED FROM VERTICAL SSE SYNTHETIC TIME HISTORY BASED ON 7.0 PERCENT DAMPING RATIO

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

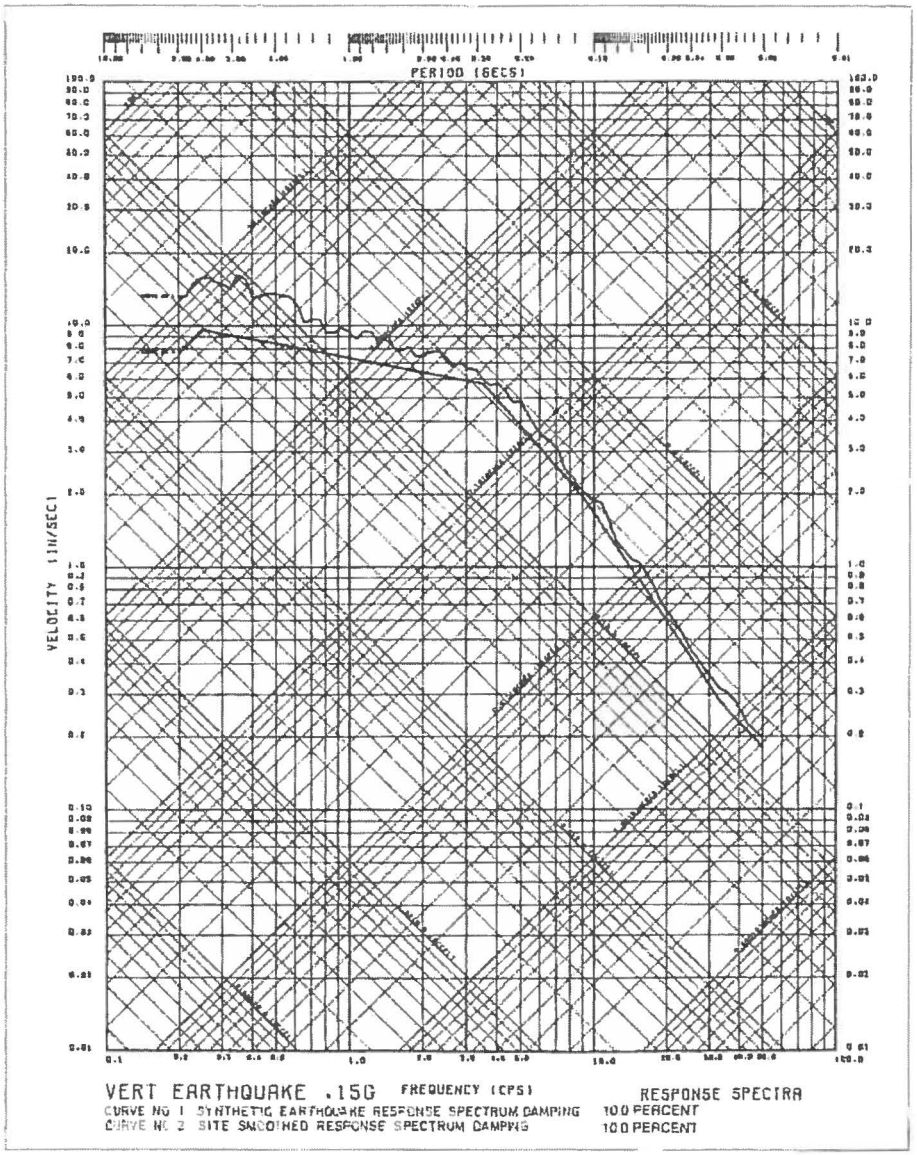


FIGURE 3.7A-17

VERTICAL SSE DESIGN RESPONSE SPECTRUM AND RESPONSE SPECTRUM DERIVED FROM VERTICAL SSE SYNTHETIC TIME HISTORY BASED ON 10.0 PERCENT DAMPING RATIO

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

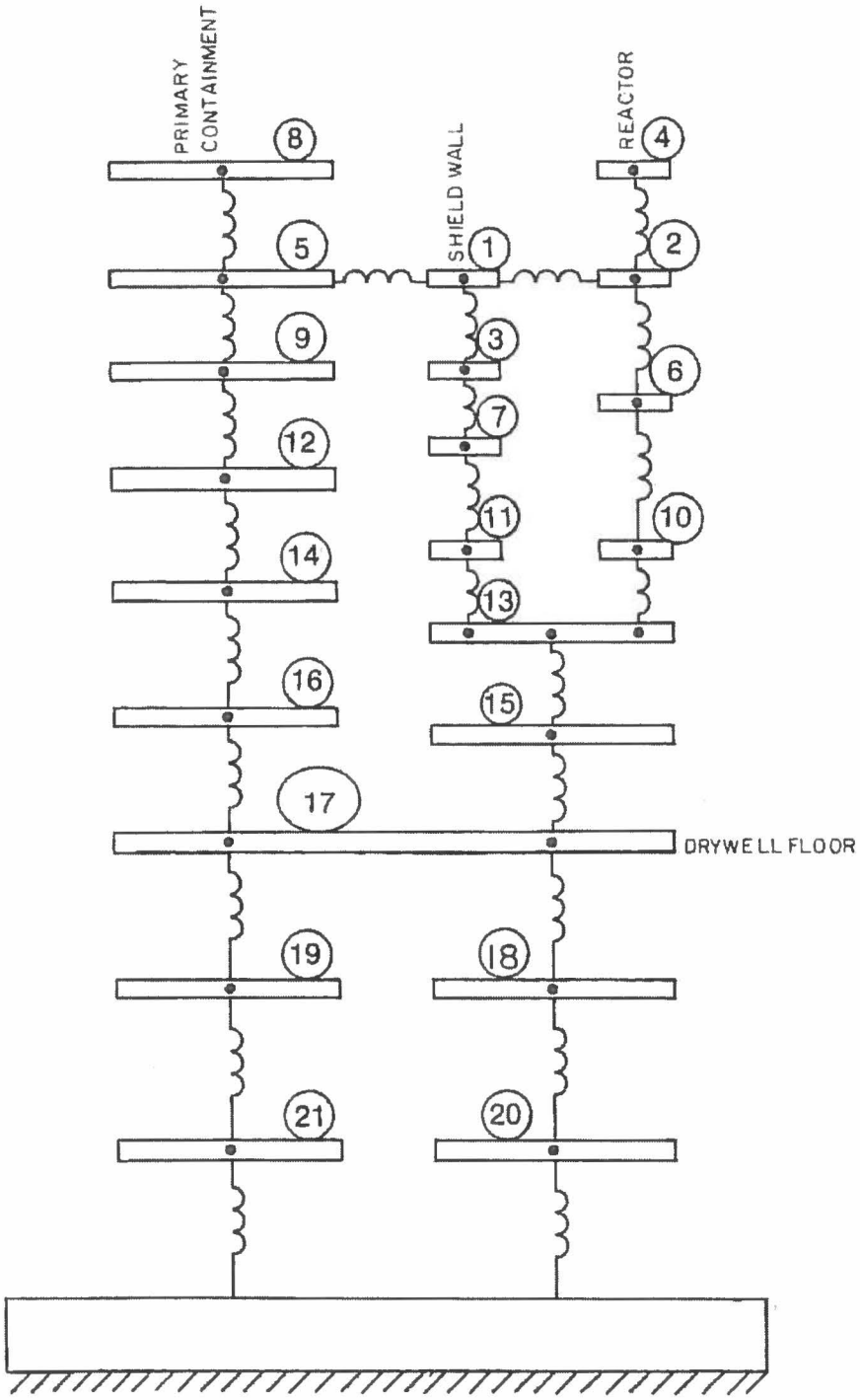


FIGURE 3.7A-18

DYNAMIC MODEL FOR SEISMIC ANALYSIS OF PRIMARY CONTAINMENT

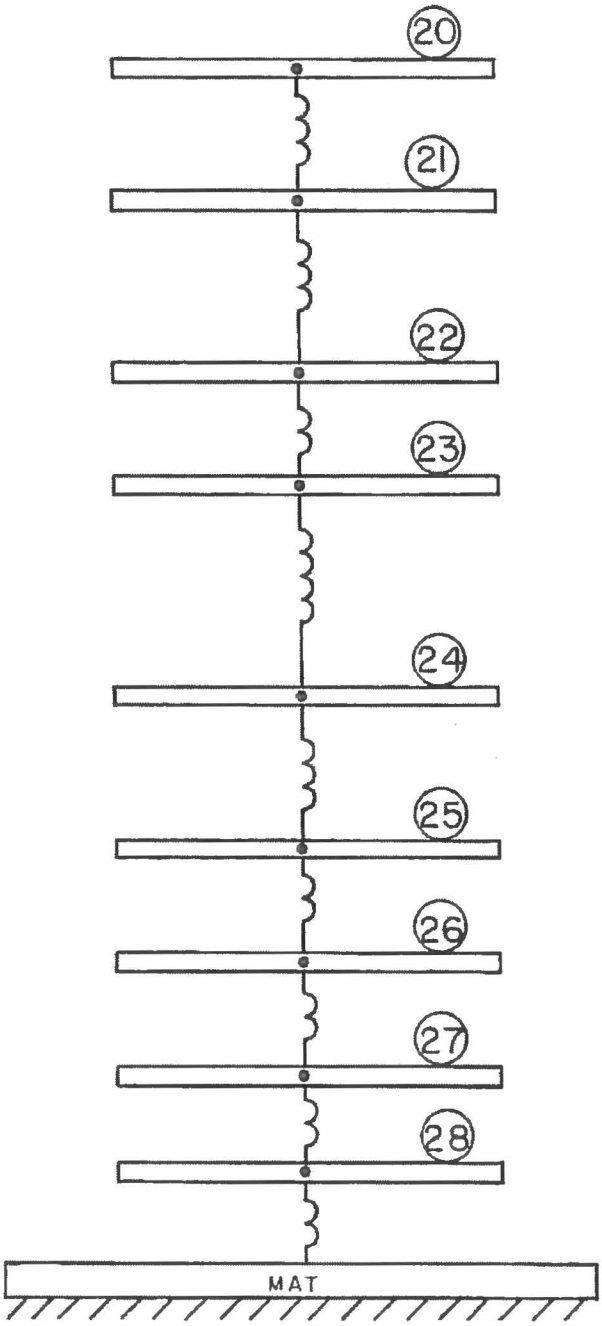


FIGURE 3.7A-19

DYNAMIC MODEL FOR SEISMIC ANALYSIS OF REACTOR BUILDING WALL

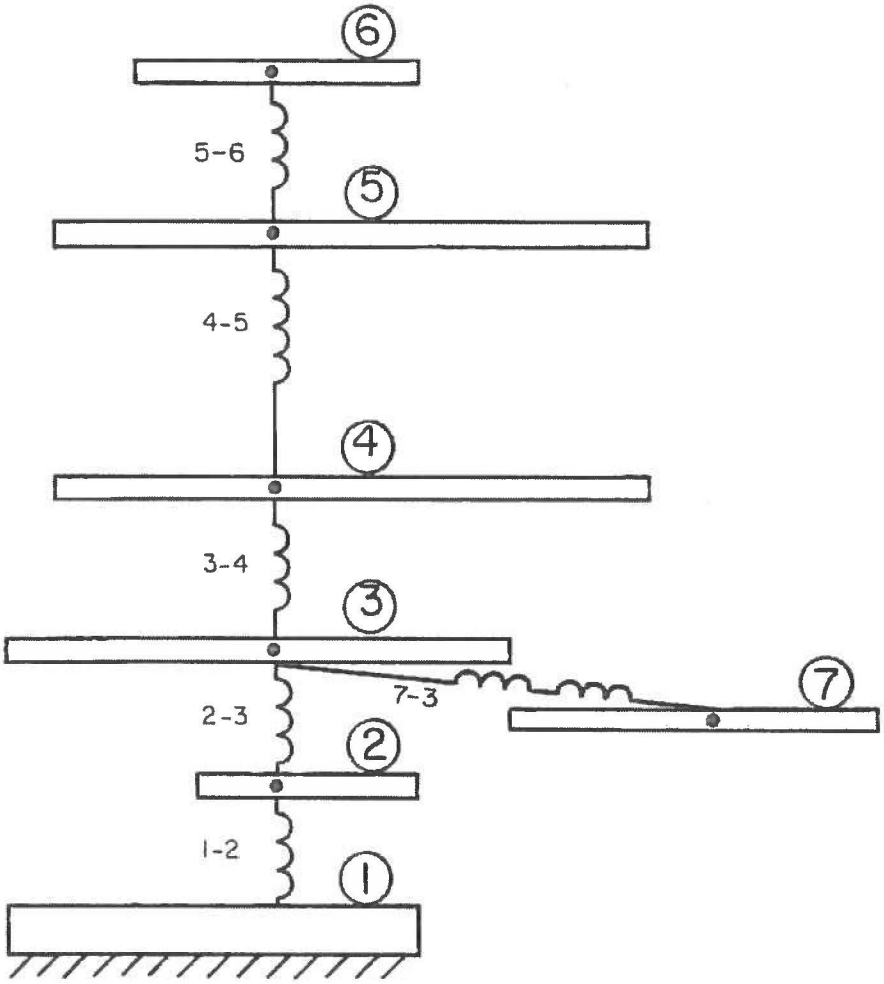


FIGURE 3.7A-20

DYNAMIC MODEL FOR SEISMIC ANALYSIS OF THE CONTROL AND DIESEL GENERATOR BUILDINGS

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

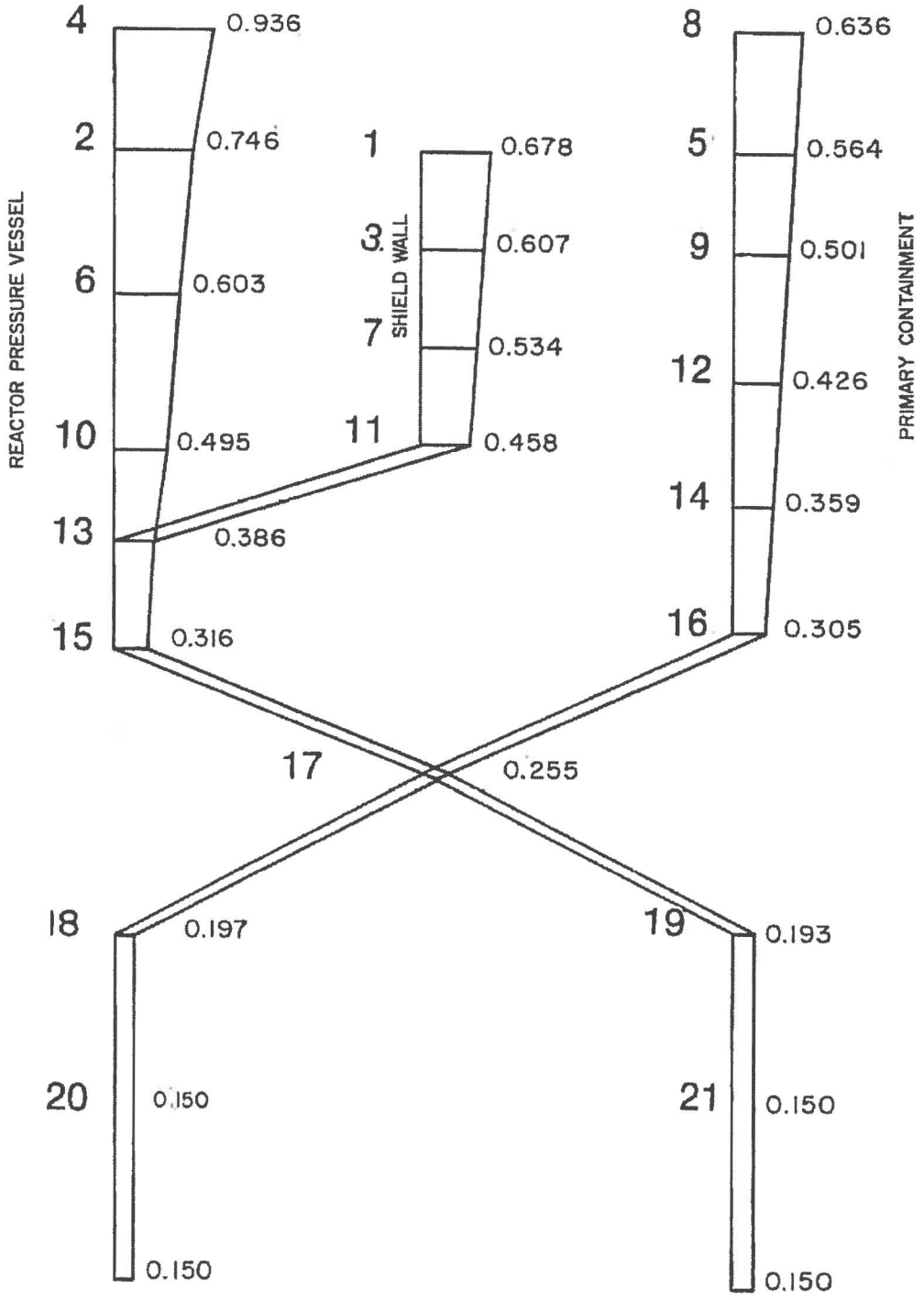


FIGURE 3.7A-21

SSE PRIMARY CONTAINMENT
CRACKED CONDITION
ACCELERATION PROFILE (G)
EAST-WEST DIRECTION

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

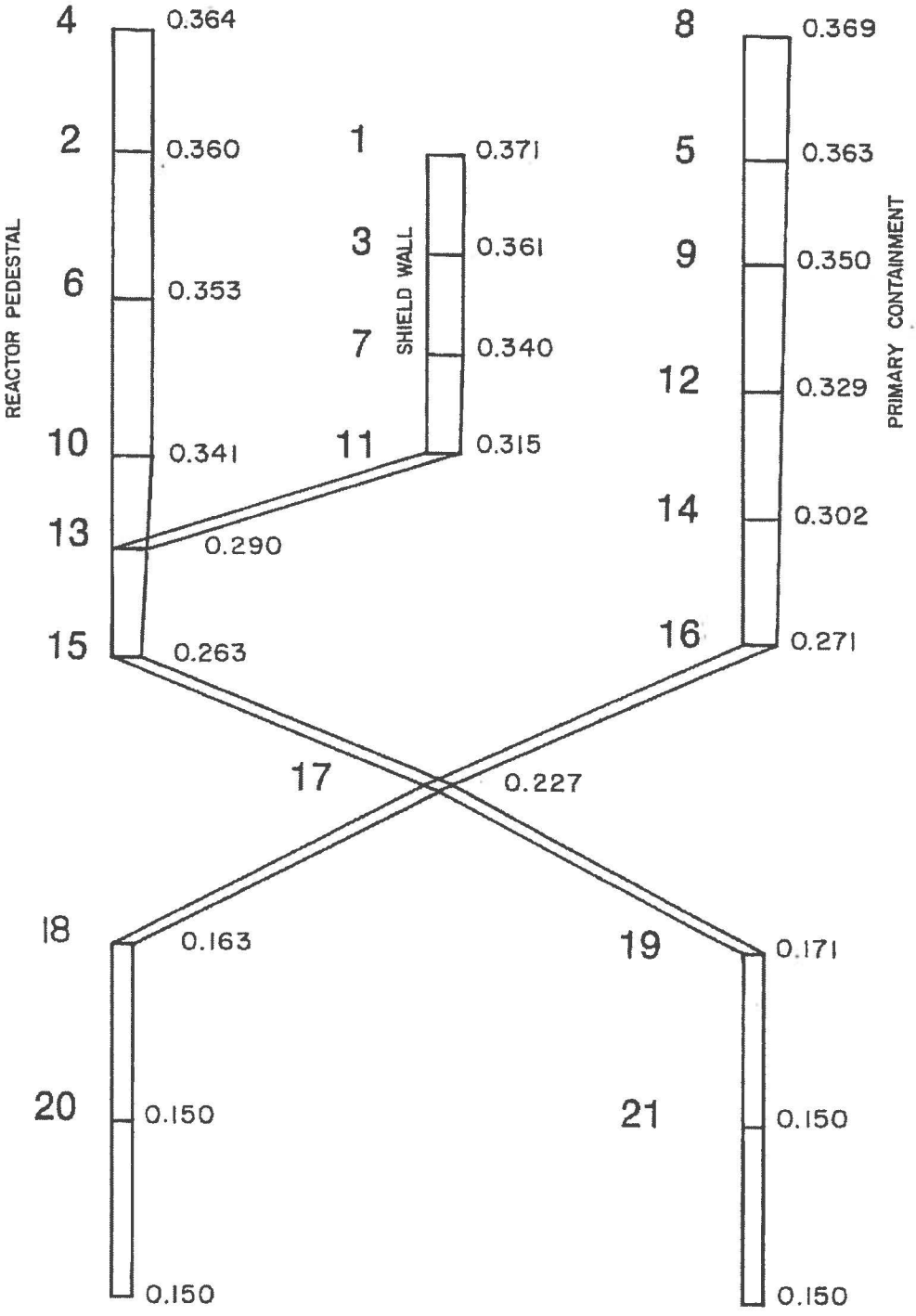


FIGURE 3.7A-22

SSE PRIMARY CONTAINMENT
CRACKED CONDITION
ACCELERATION PROFILE (Gs)
VERTICAL DIRECTION

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

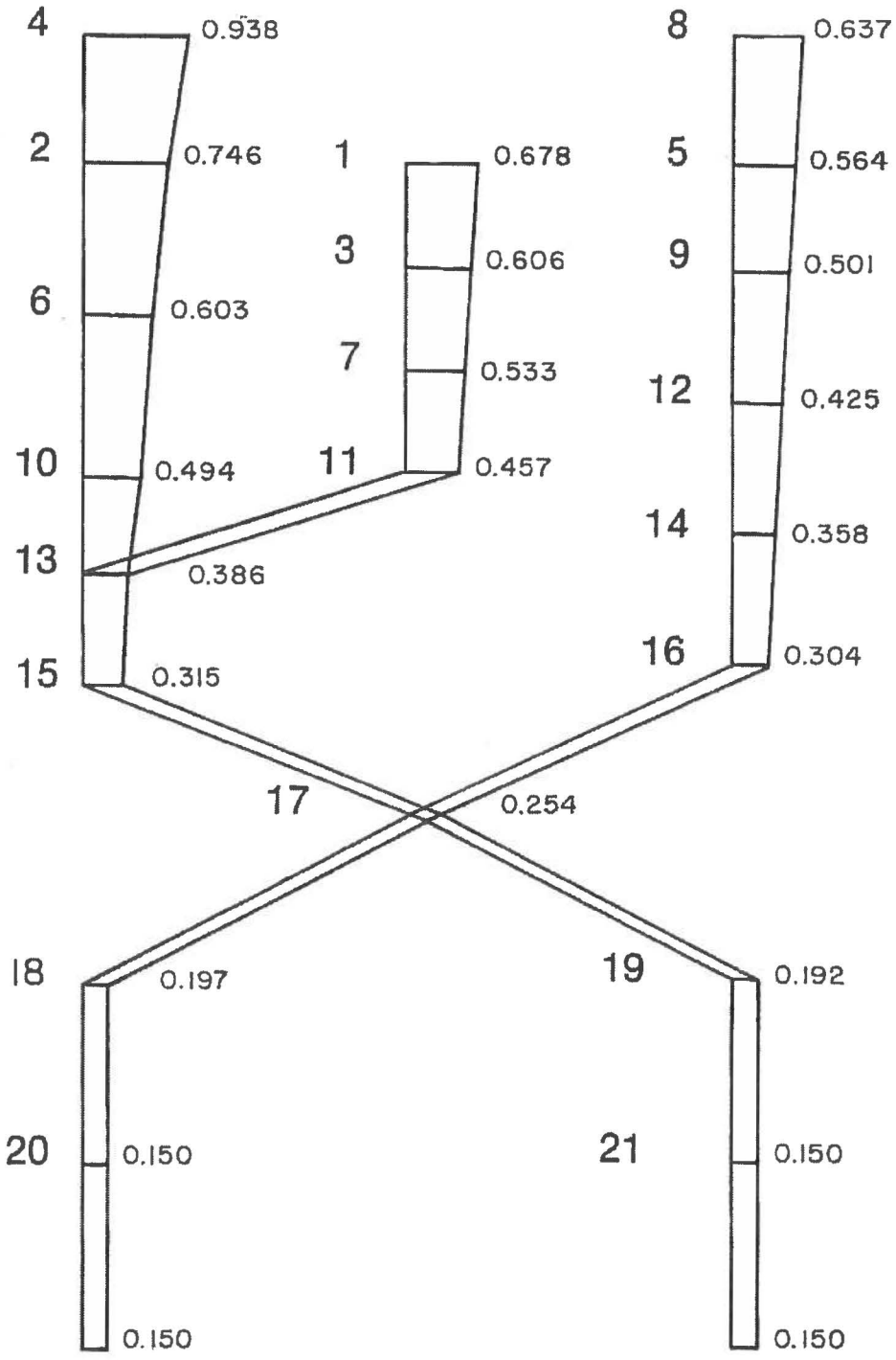


FIGURE 3.7A-23

SSE PRIMARY CONTAINMENT
CRACKED CONDITION
ACCELERATION PROFILE (Gs)
NORTH-SOUTH DIRECTION

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

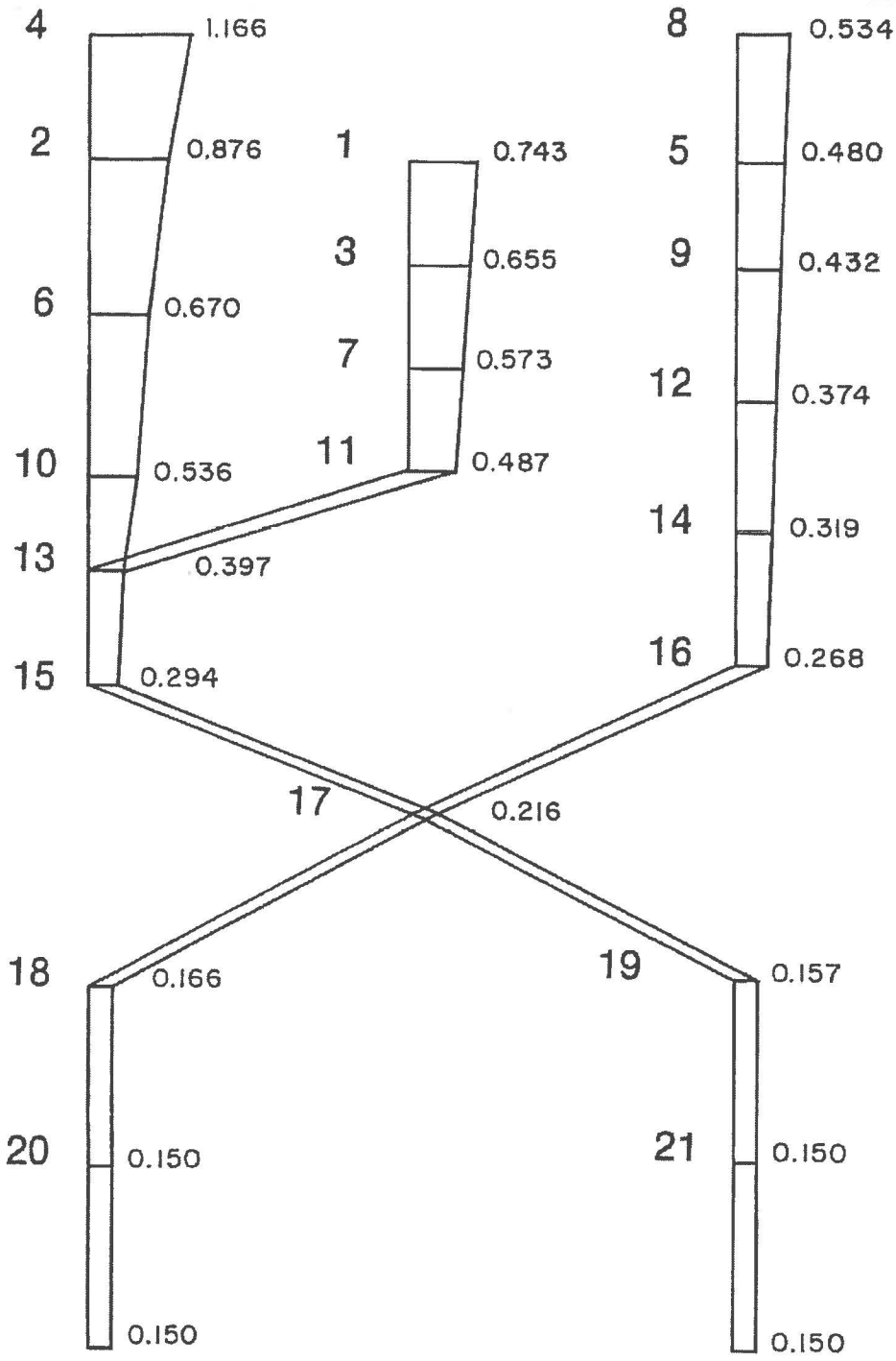


FIGURE 3.7A-24

SSE PRIMARY CONTAINMENT
UNCRACKED CONDITION
ACCELERATION PROFILE (Gs)
EAST-WEST DIRECTION

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

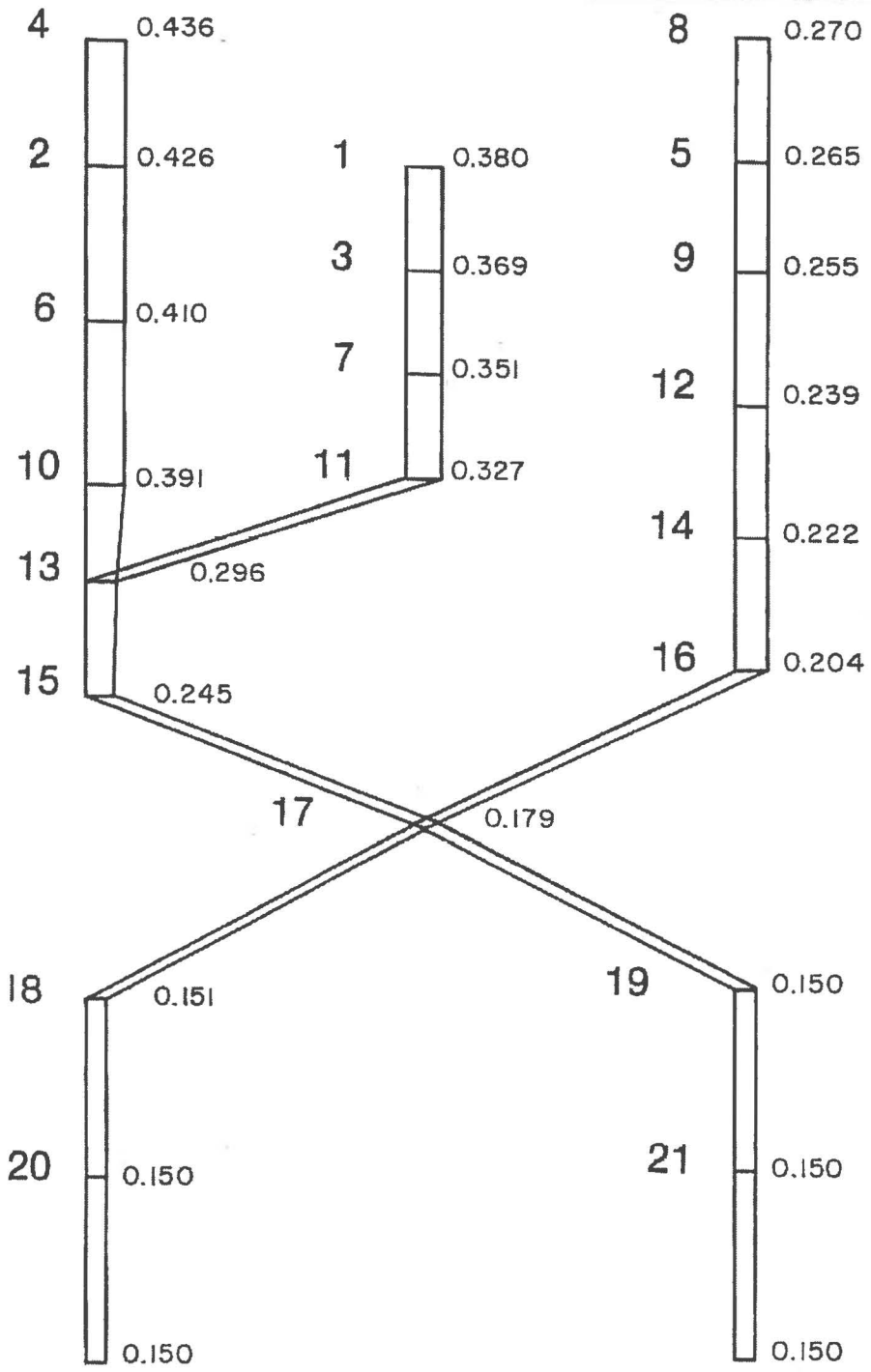


FIGURE 3.7A-25

SSE PRIMARY CONTAINMENT
UNCRACKED CONDITION
ACCELERATION PROFILE (Gs)
VERTICAL DIRECTION

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

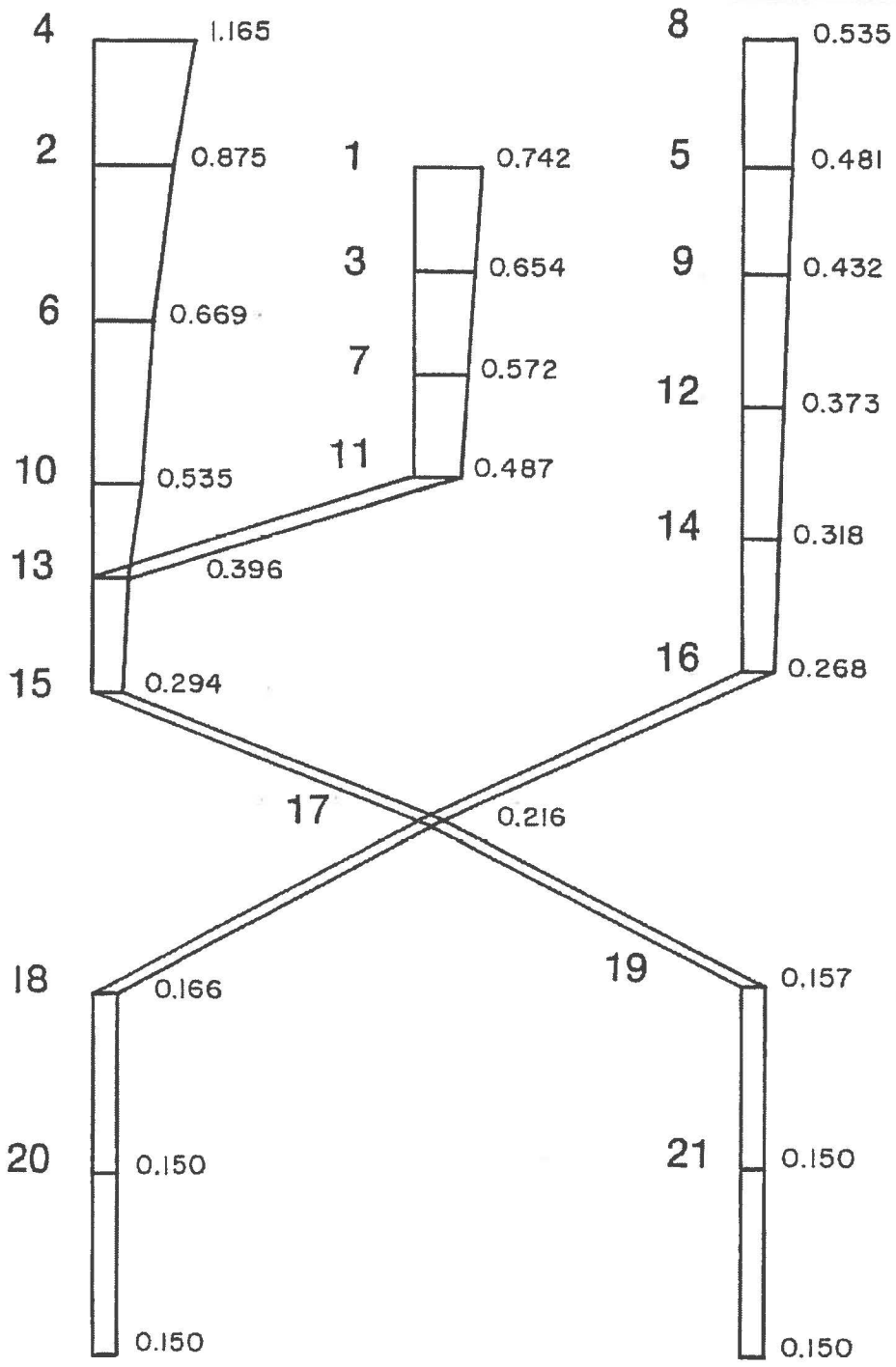


FIGURE 3.7A-26

SSE PRIMARY CONTAINMENT
UNCRACKED CONDITION
ACCELERATION PROFILE (Gs)
NORTH-SOUTH DIRECTION

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

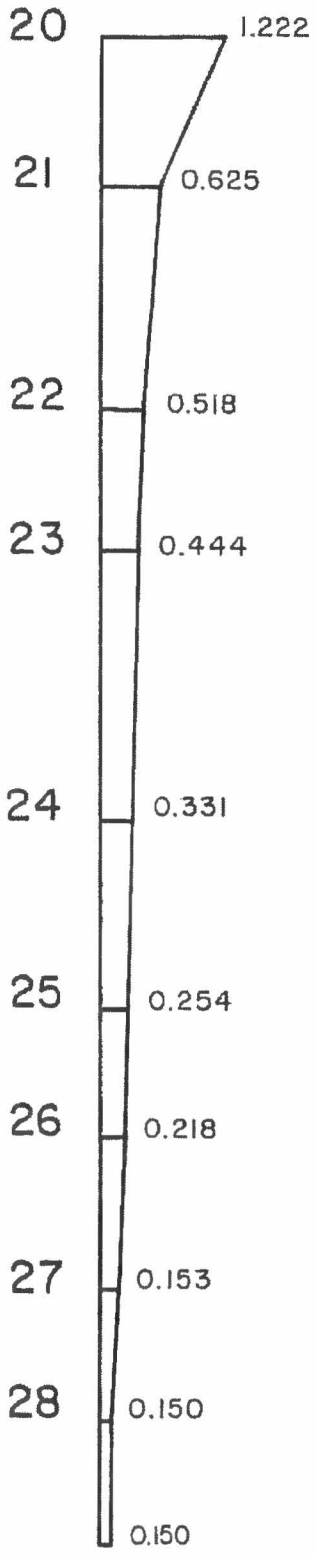


FIGURE 3.7A-27

SSE REACTOR BUILDING WALL
ACCELERATION PROFILE (Gs)
EAST-WEST DIRECTION

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

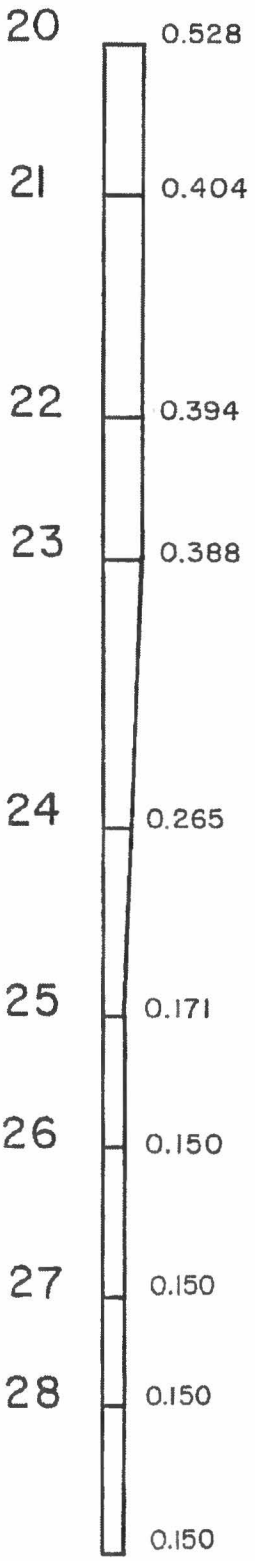


FIGURE 3.7A-28

SSE REACTOR BUILDING WALL
ACCELERATION PROFILE (Gs)
VERTICAL DIRECTION

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

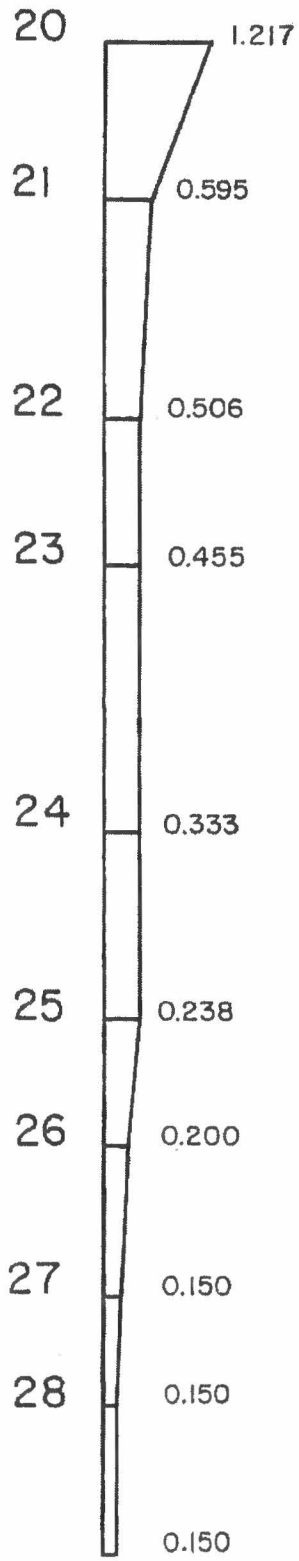


FIGURE 3.7A-29

SSE REACTOR BUILDING WALL
ACCELERATION PROFILE (Gs)
NORTH-SOUTH DIRECTION

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

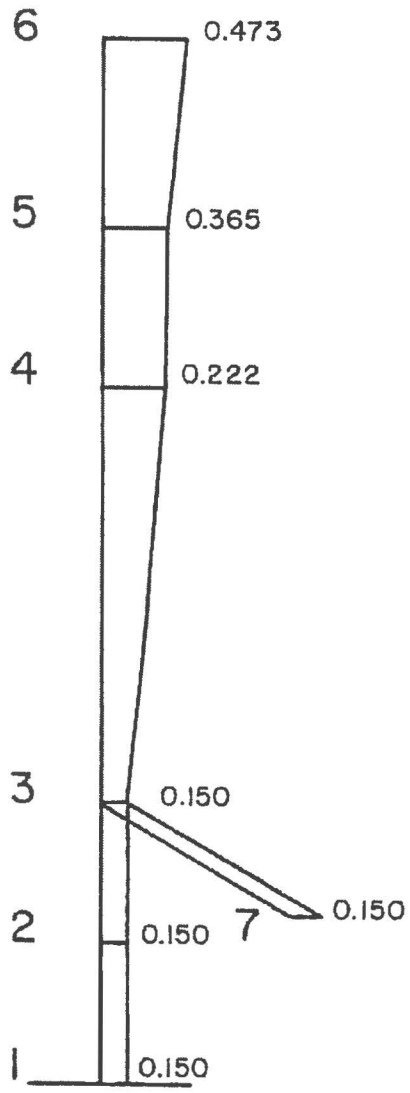


FIGURE 3.7A-30

SSE CONTROL AND DIESEL GENERATOR BUILDINGS ACCELERATION PROFILE (Gs) EAST-WEST DIRECTION

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

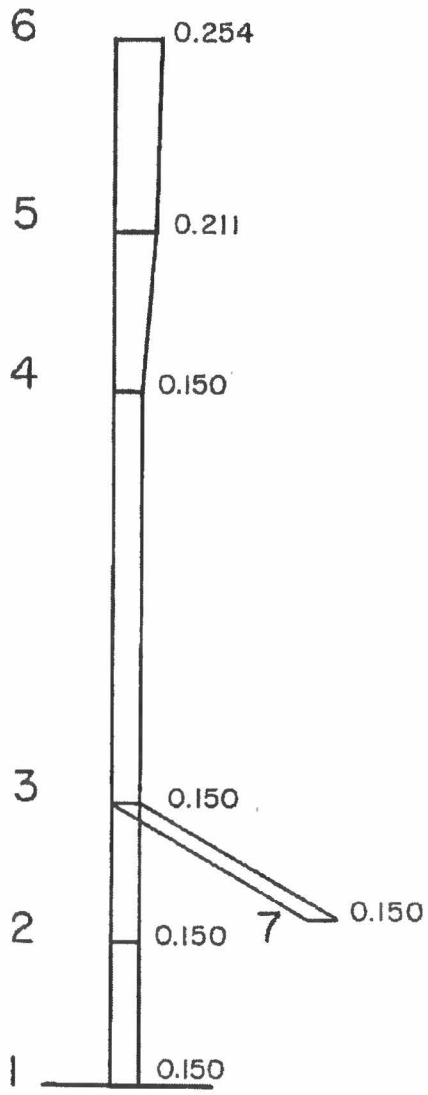


FIGURE 3.7A-31

SSE CONTROL AND DIESEL GENERATOR BUILDINGS ACCELERATION PROFILE (Gs) VERTICAL DIRECTION

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

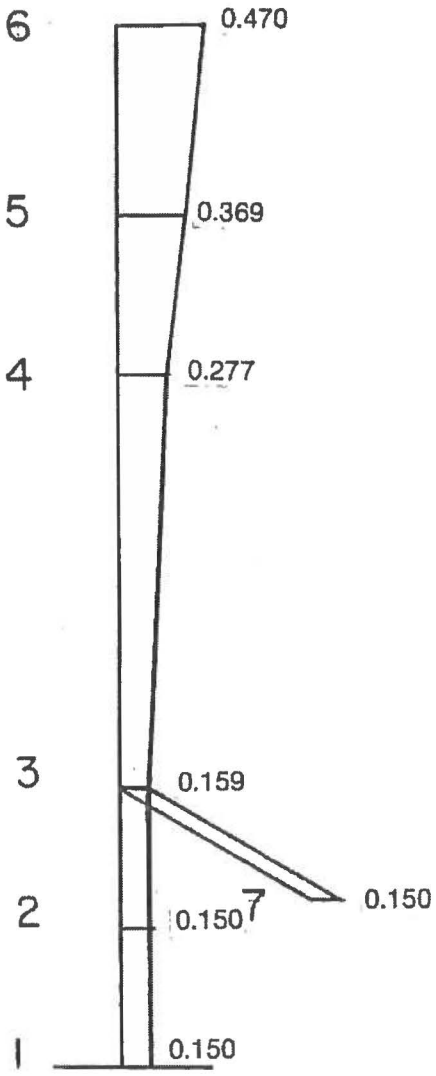


FIGURE 3.7A-32

SSE CONTROL AND DIESEL GENERATOR BUILDINGS ACCELERATION PROFILE (Gs) NORTH-SOUTH DIRECTION

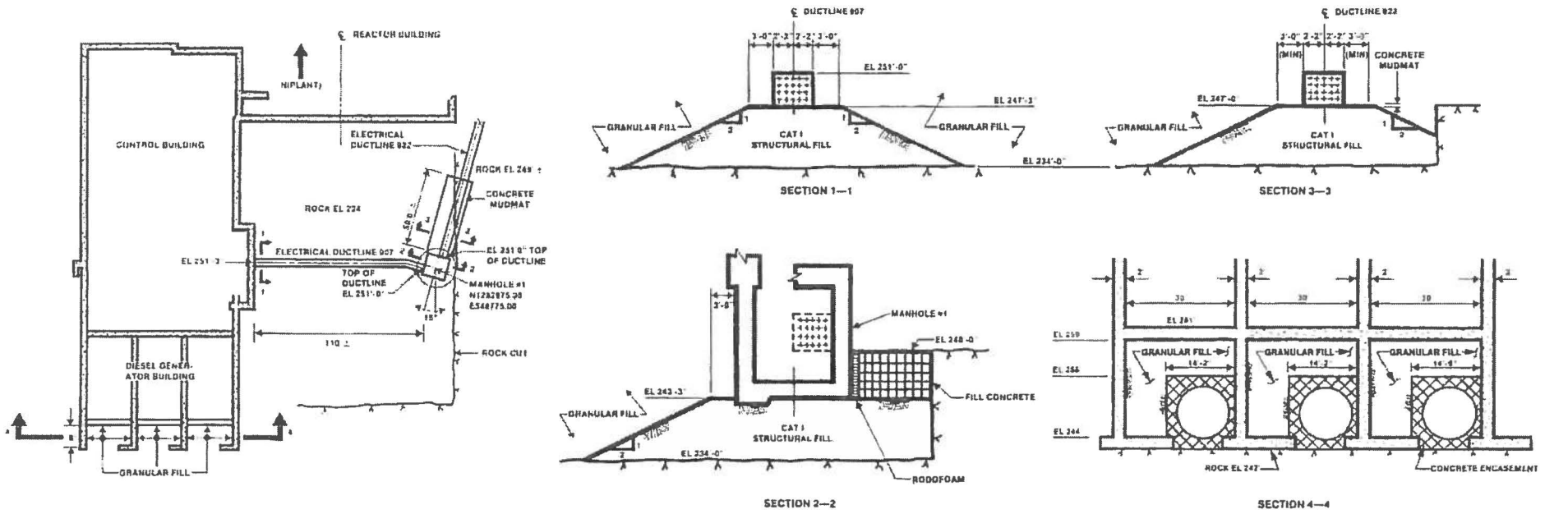
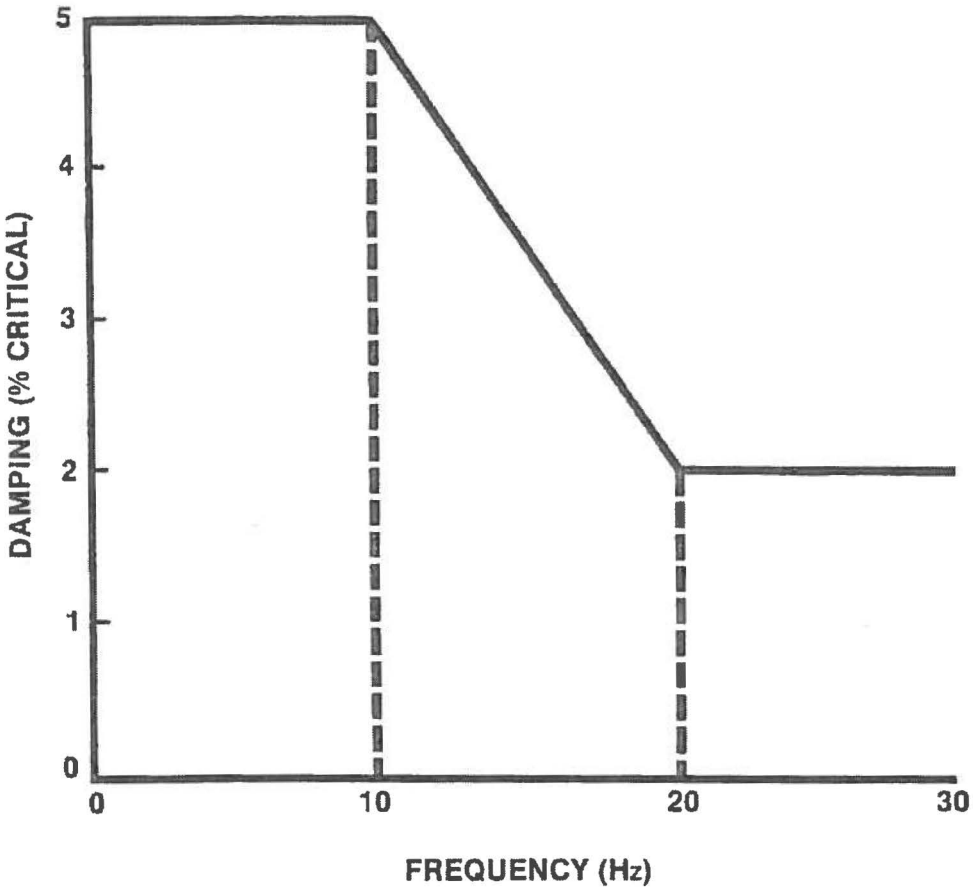


FIGURE 3.7A-33

PLAN AND SECTIONS FOR DUCTLINES 907, 922, ELECTRICAL MANHOLE #1, AND DIESEL GENERATOR BUILDING FLOOR SLABS

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

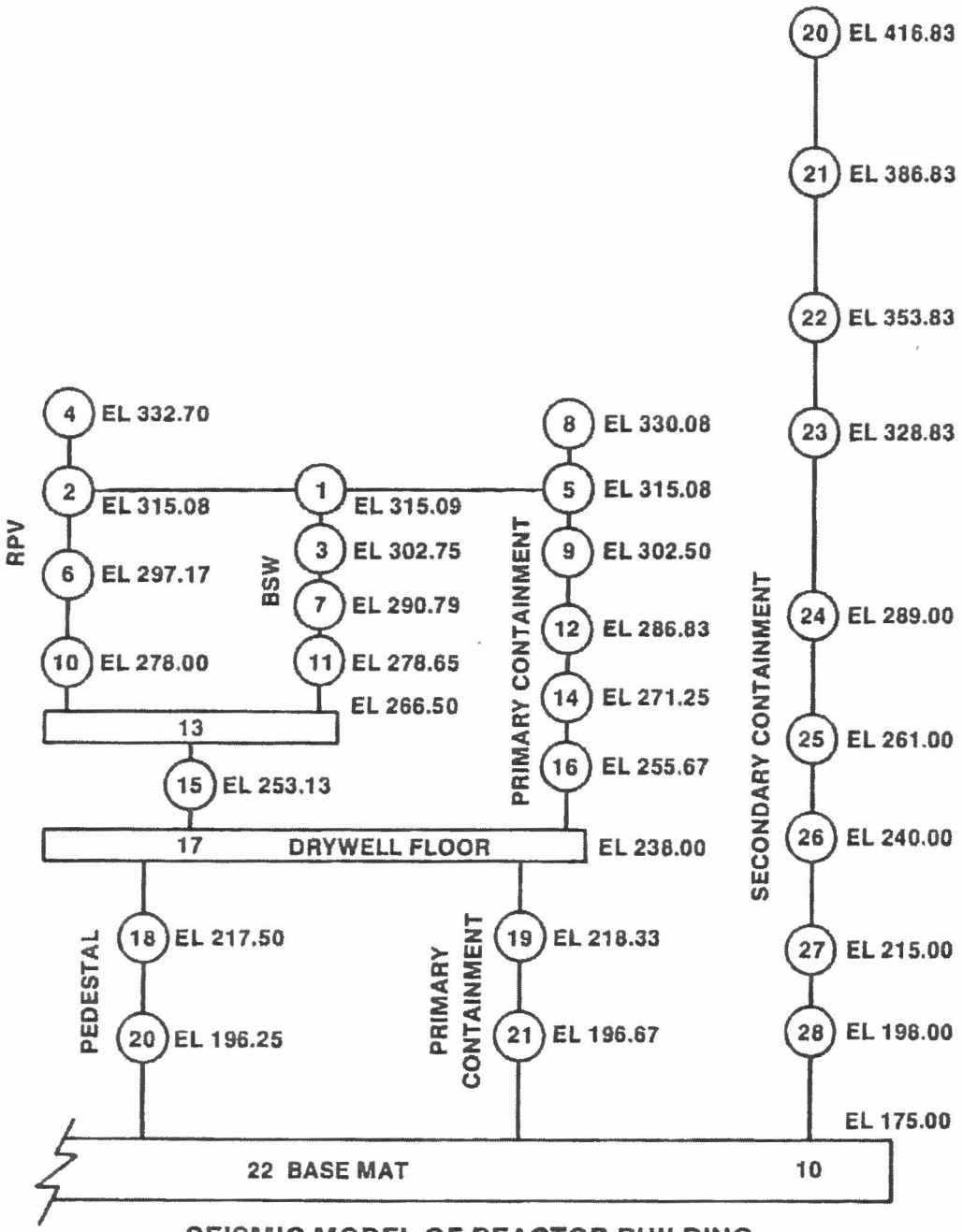


DAMPING VALUE FOR SEISMIC ANALYSIS OF PIPING
(APPLICABLE TO BOTH OBE & SSE, INDEPENDENT OF PIPE DIAMETER)

FIGURE 3.7A-34

ALTERNATIVE DAMPING
VALUES PER ASME CODE
CASE N-411

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT



SEISMIC MODEL OF REACTOR BUILDING

OBE DISPLACEMENT RELATIVE TO BASE MAT (RESPONSE SPECTRA METHOD)

AT NODE PT	E-W INCHES	VERT INCHES	N-S INCHES
12	0.178	0.012	0.177
24	0.123	0.018	0.129
16	0.123	0.010	0.150
25	0.074	0.010	0.063

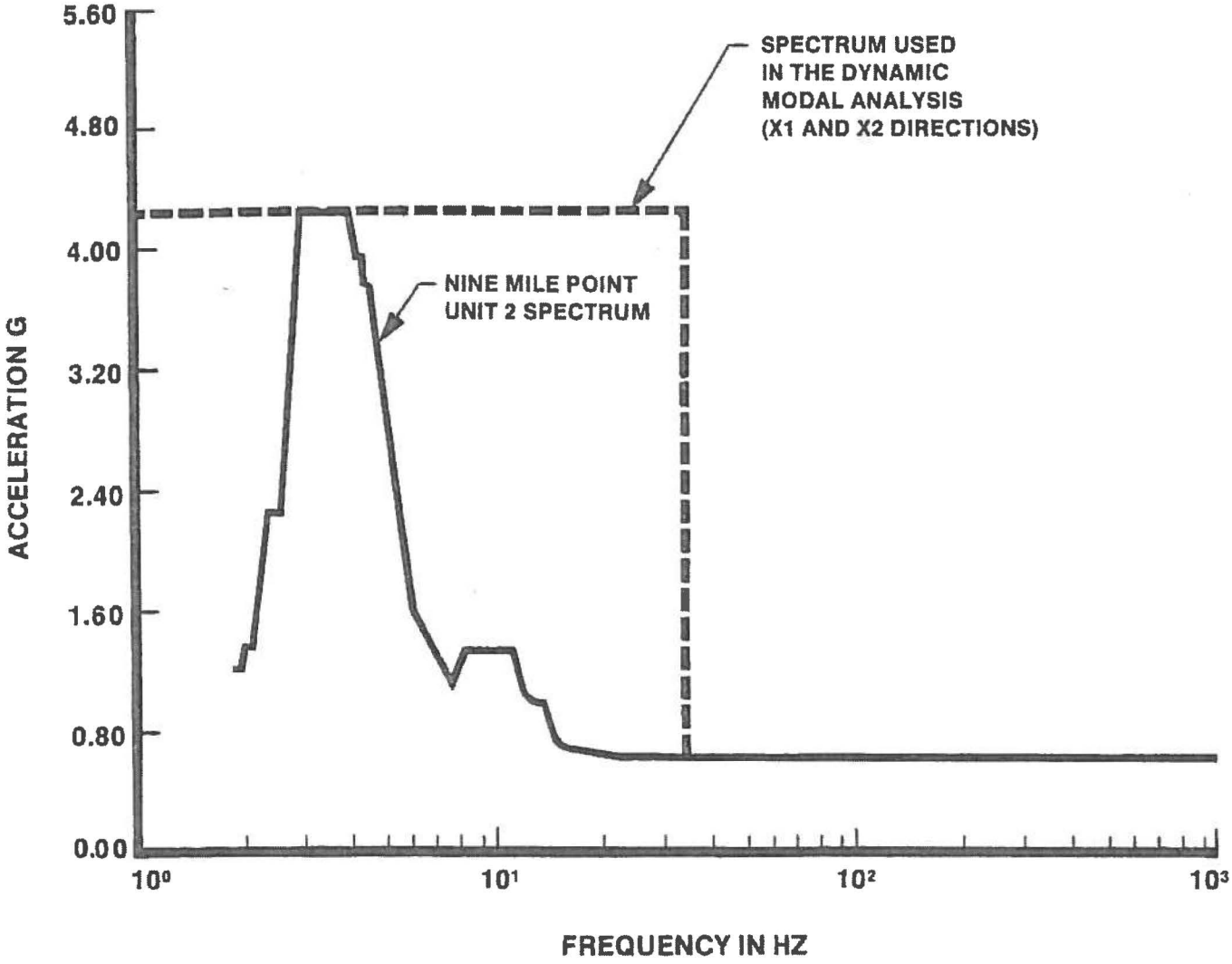
OBE RELATIVE DISPLACEMENT BETWEEN NODES (TIME HISTORY METHOD)

BETWEEN NODES	E-W (MAX) INCHES	VERT (MAX) INCHES	N-S (MAX) INCHES
12 – 24	0.214	0.018	0.234
16 – 25	0.147	0.013	0.162
16 – 24	0.173	0.018	0.177

FIGURE 3.7A-35

RELATIVE DISPLACEMENT BETWEEN REACTOR BUILDING AND PRIMARY CONTAINMENT

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

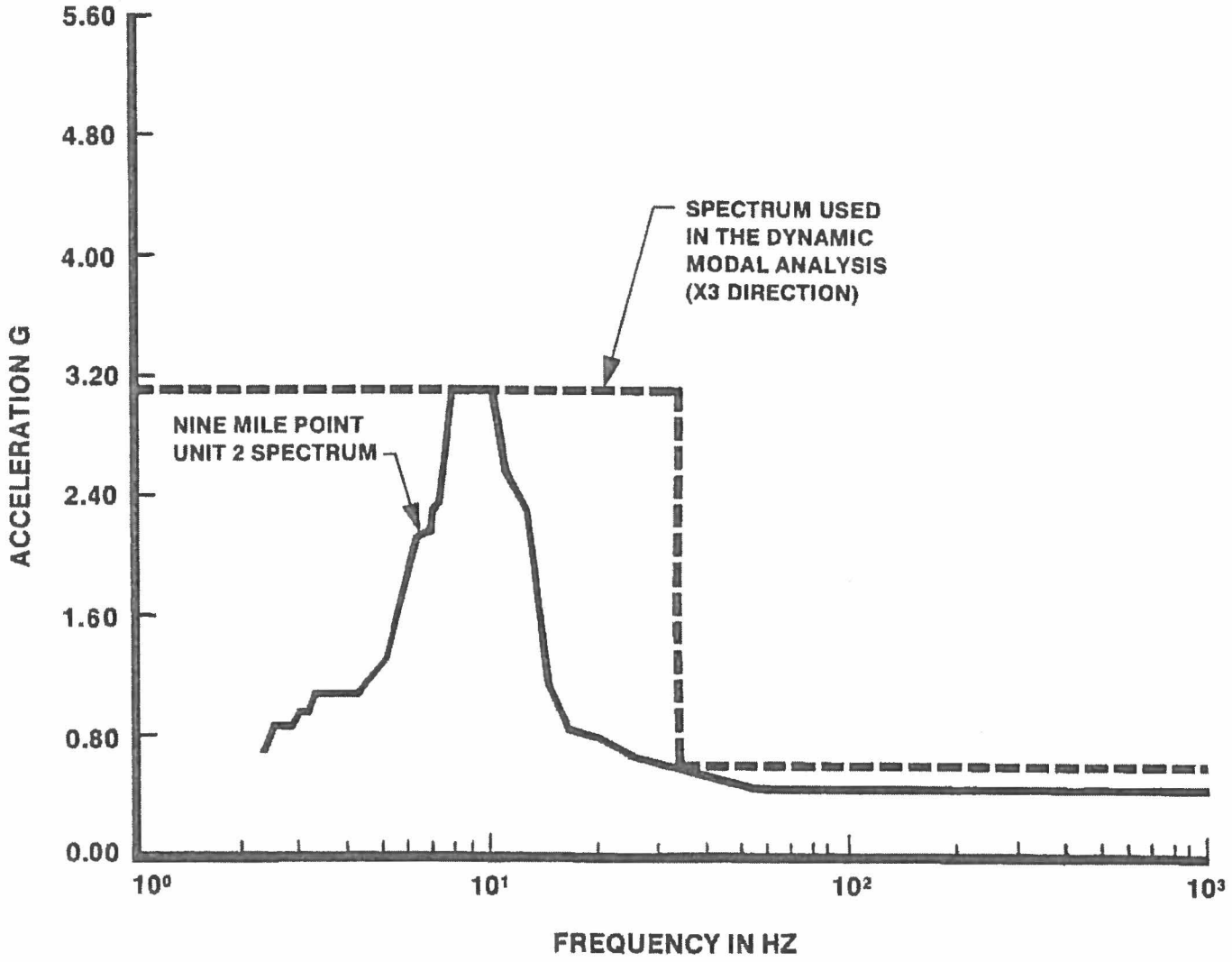


NOTES:
1. RRS OF ACCELERATION SECONDARY CONT. (ELEV. 353.83 FT)
2. FAULTED CONDITION, HORIZONTAL DIRECTION
3. DAMPING VALUE = 0.03

FIGURE 3.7A-36 (SHEET 1 OF 2)

JUSTIFICATION OF STATIC
COEFFICIENT OF 1.3

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

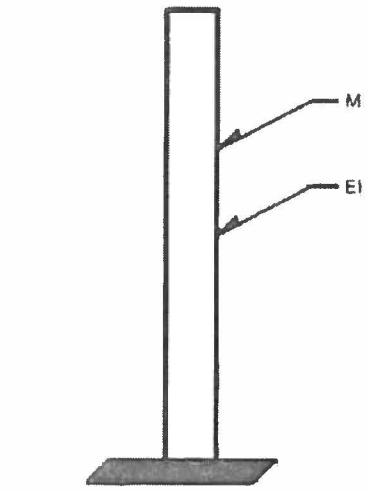


NOTES:
1. RRS OF ACCELERATION SECONDARY CONT. (ELEV. 353.83 FT)
2. FAULTED CONDITION, VERTICAL DIRECTION
3. DAMPING VALUE = 0.03

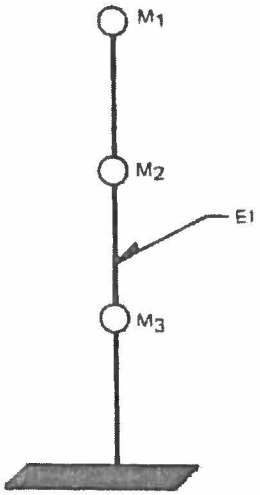
FIGURE 3.7A-36 (SHEET 2 OF 2)

JUSTIFICATION OF STATIC COEFFICIENT OF 1.3

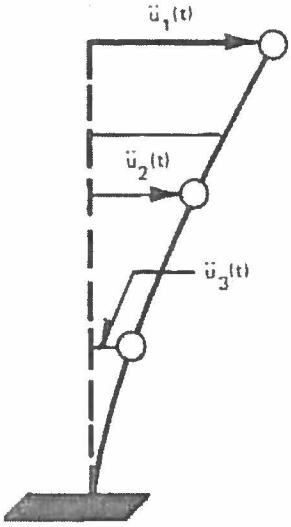
NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT



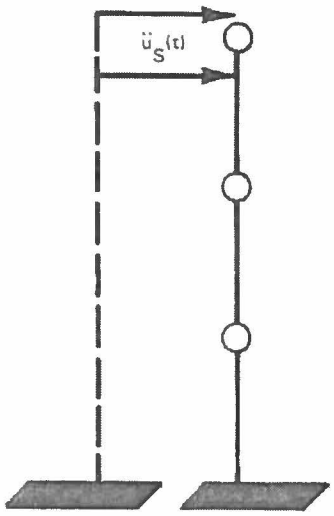
DISTRIBUTED MASS
DISTRIBUTED STIFFNESS SYSTEM



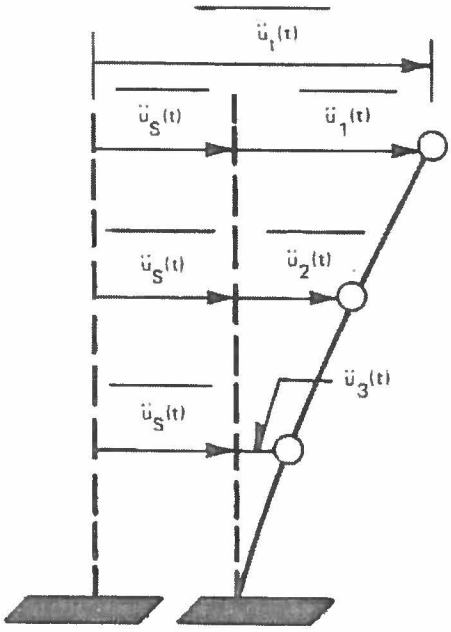
LUMPED MASS
DISTRIBUTED STIFFNESS SYSTEM



RELATIVE
ACCELERATION



SUPPORT
ACCELERATION



TOTAL
ACCELERATION

FIGURE 3.7B-1

SEISMIC ANALYTICAL MODEL FOR NSSS COMPONENTS

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

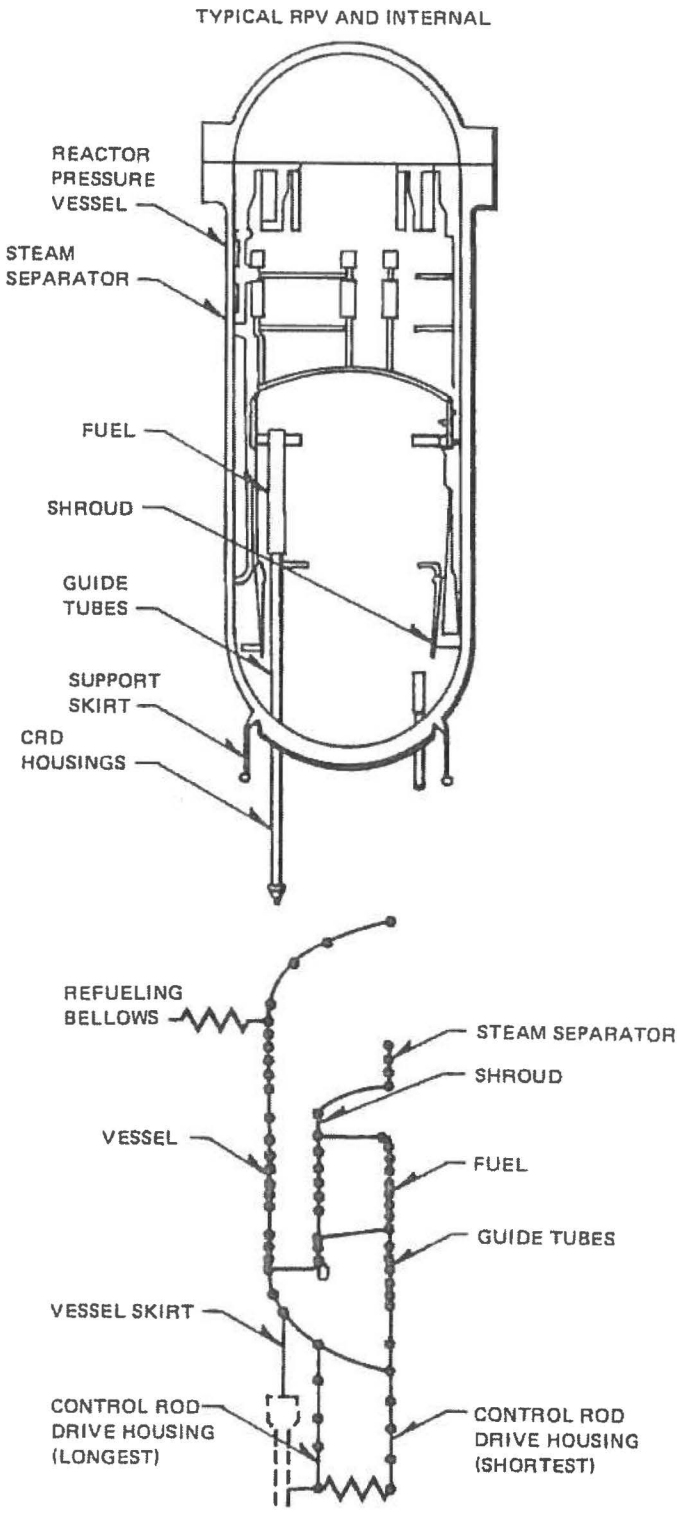
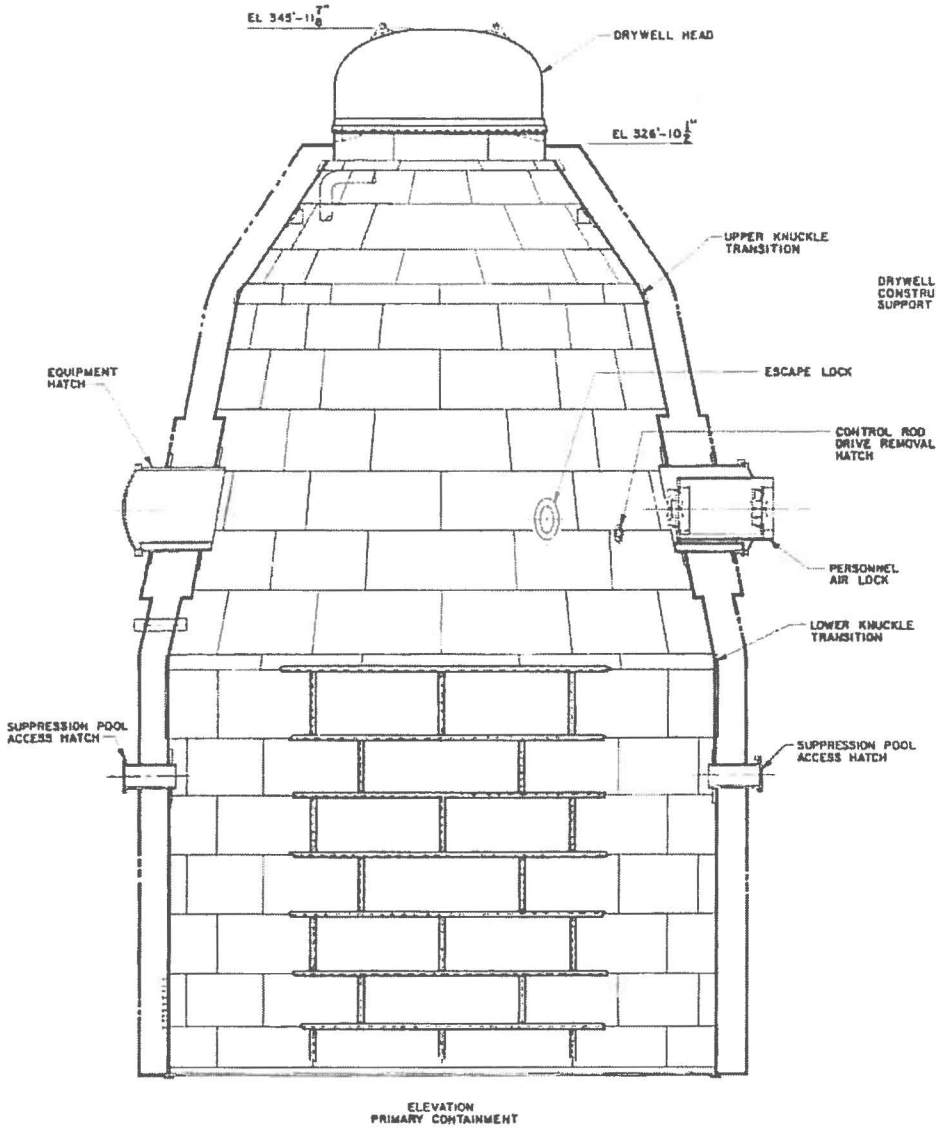


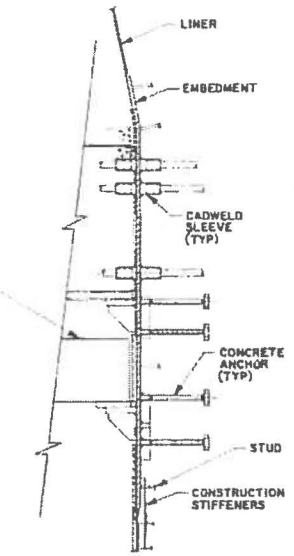
FIGURE 3.7B-2

REACTOR PRESSURE VESSEL AND INTERNALS SEISMIC MODEL

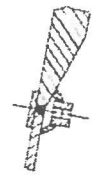
NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT



ELEVATION
PRIMARY CONTAINMENT

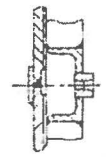


TYPICAL LINER ELEVATION
DETAILS @ DRYWELL FLOOR

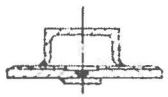


EMBEDMENT PLATE
TO LINER
PLATE CONNECTION

VERTICAL SEAM
AT KNUCKLE PLATE



LEAK TEST CHANNEL
TYPICAL DETAIL AT
HORIZONTAL SEAM



LEAK TEST CHANNEL
TYPICAL DETAIL AT
VERTICAL SEAM

TYPICAL DETAIL OF
HORIZONTAL SEAM

TYPICAL DETAIL OF
VERTICAL SEAM

FIGURE 3.8-1

PRIMARY CONTAINMENT
LINER ELEVATION AND DETAILS

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

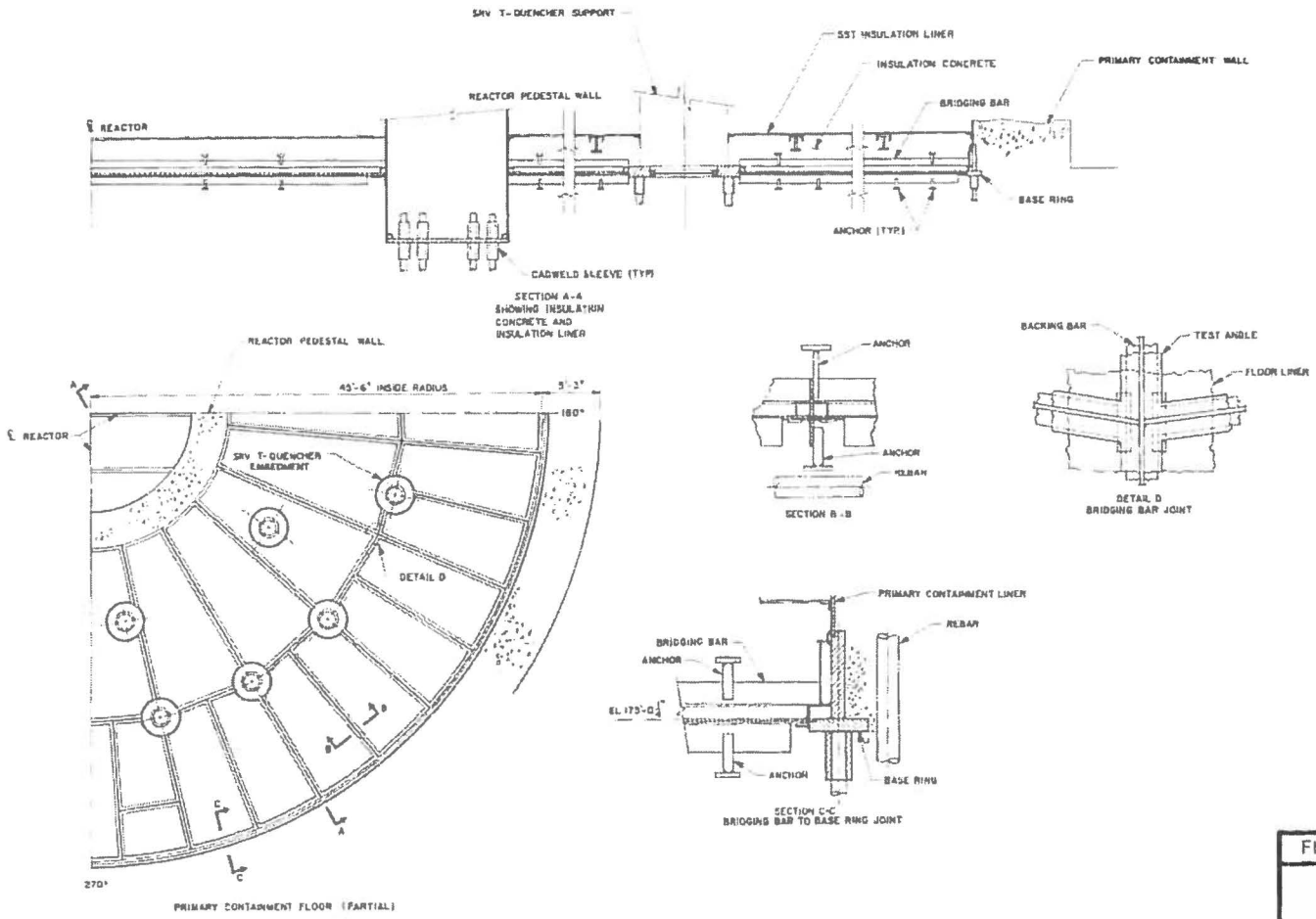
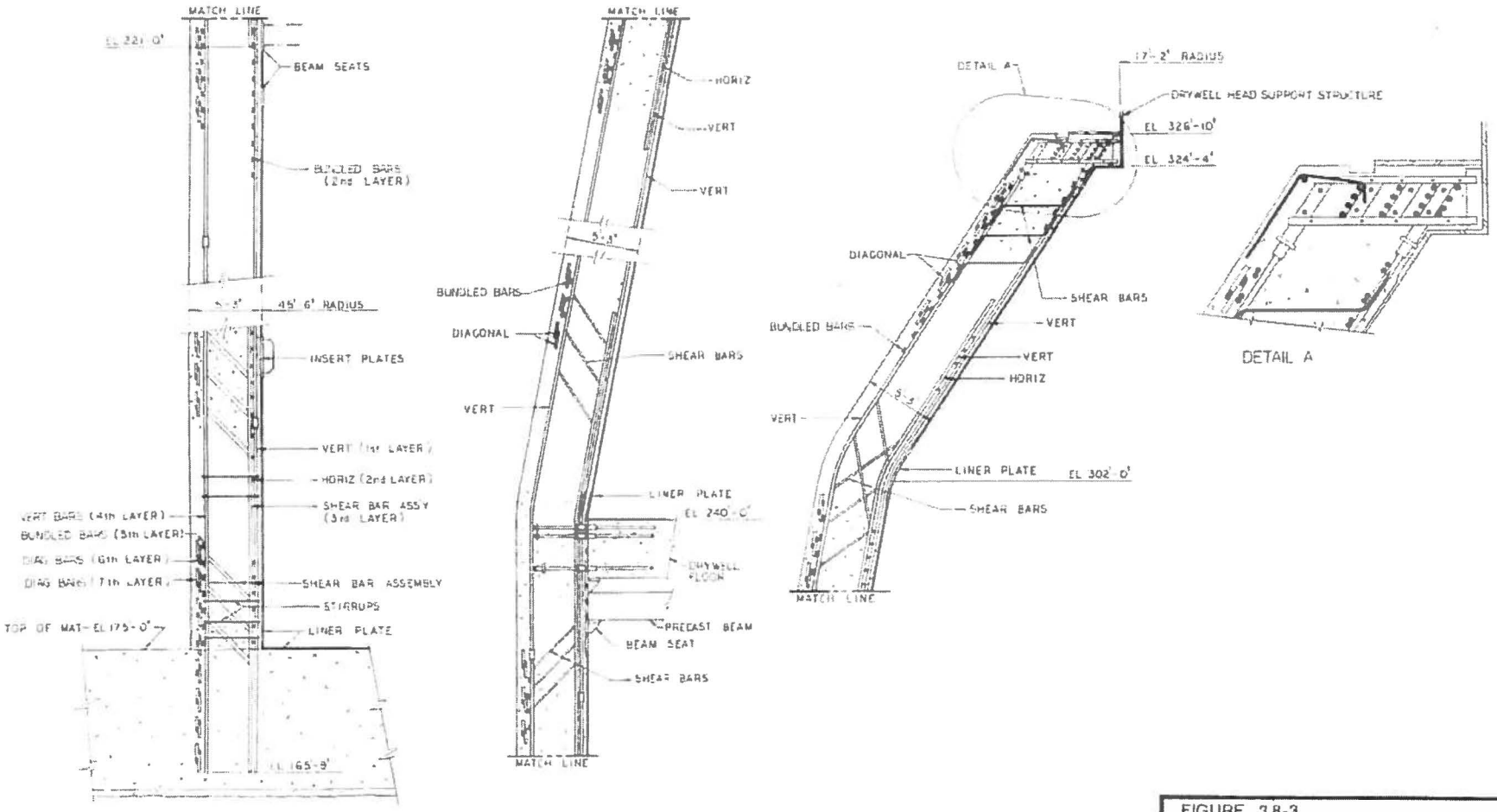


FIGURE 3.8-2

PRIMARY CONTAINMENT
LINER FLOOR

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

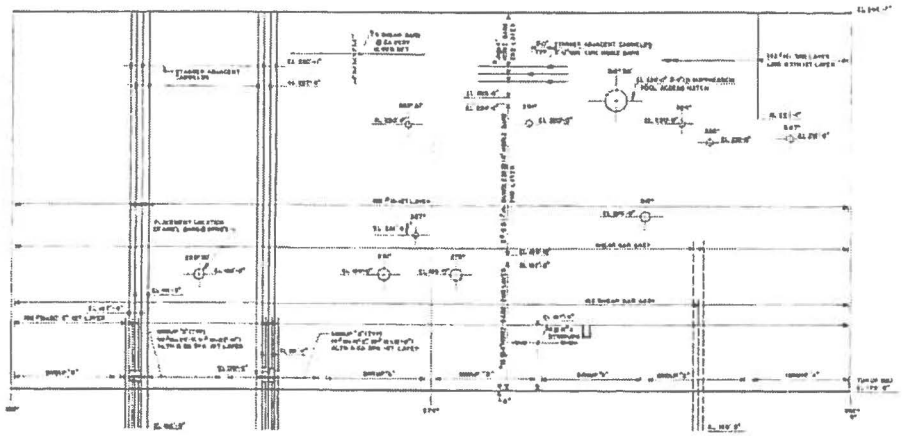


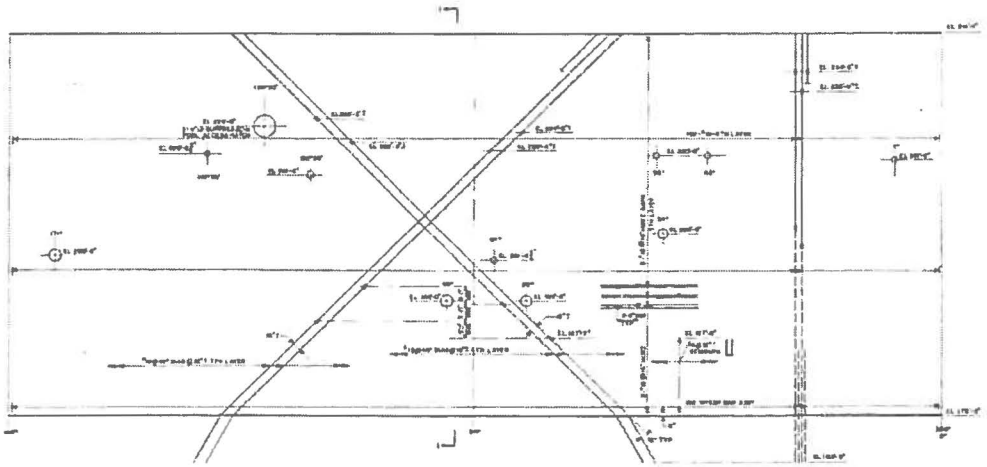
PRIMARY CONTAINMENT SECTION

FIGURE 3.8-3

PRIMARY CONTAINMENT WALL
SECTION VIEW

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT



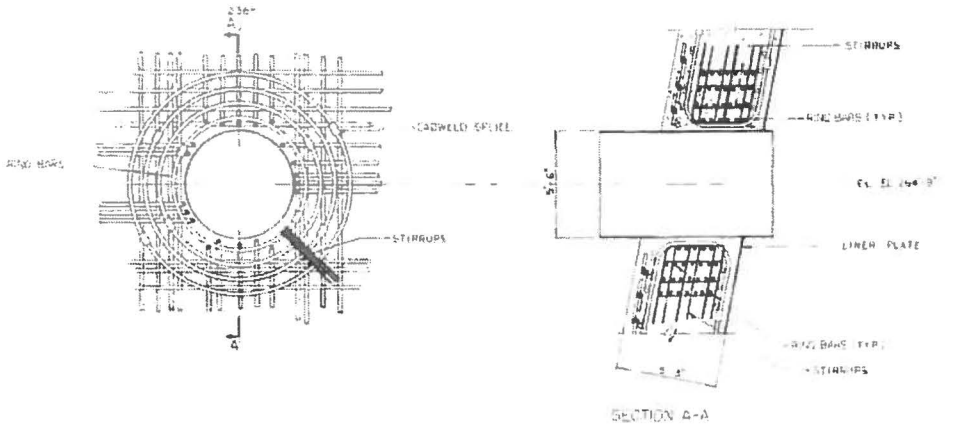


SOURCE: EC-38C / EC-38D

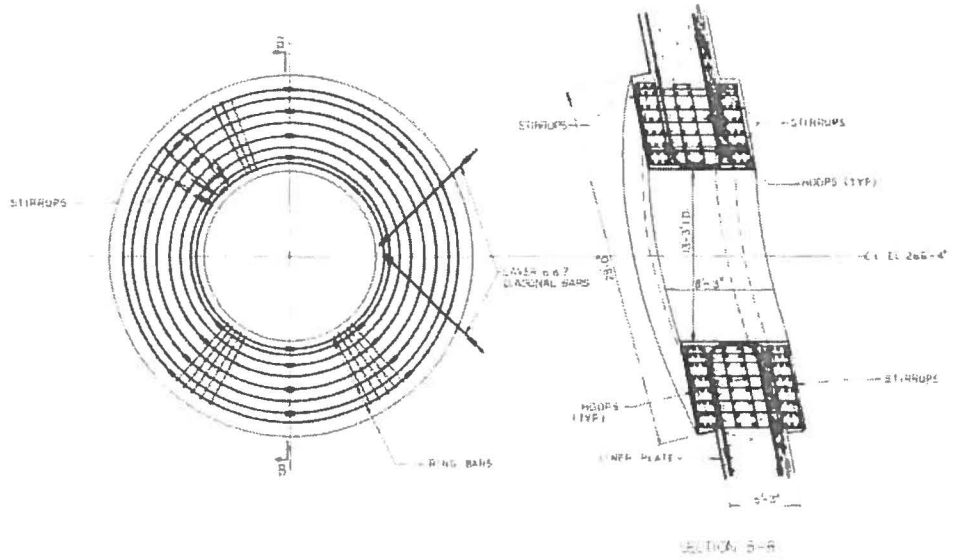
FIGURE 3.8-3a

PRIMARY CONTAINMENT WALL
REINFORCING DETAILS EL. 175'-0"
TO 241'-1" AZIMUTH 180° TO 360°

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT



ESCAPE AIR LOCK OPENING
@ AZIMUTH 236°

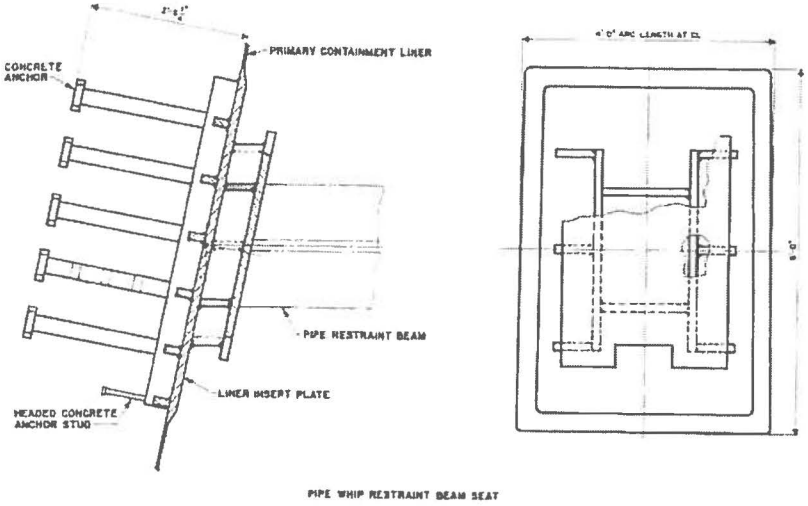


EQUIPMENT HATCH OPENING
@ AZIMUTHS 135° & 315°

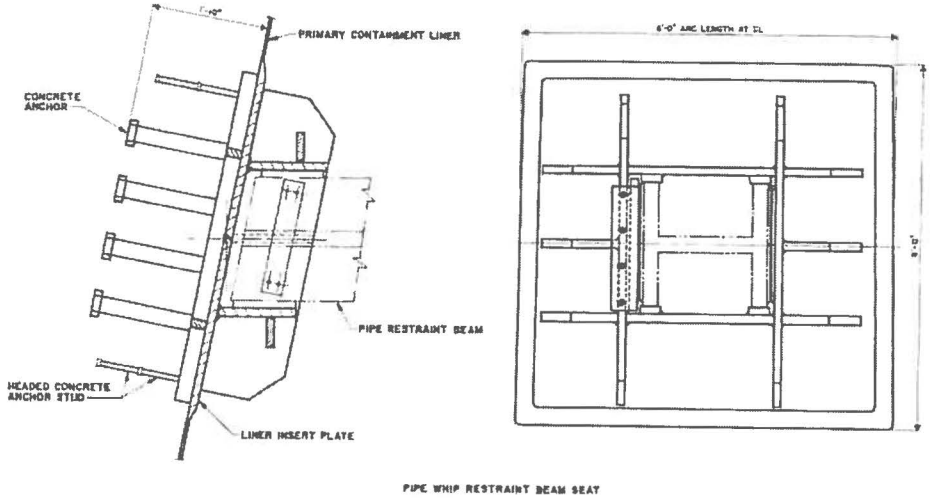
FIGURE 3.8-4

PRIMARY CONTAINMENT WALL
STRUCTURAL DETAILS AROUND
DRYWELL ACCESS HATCHES

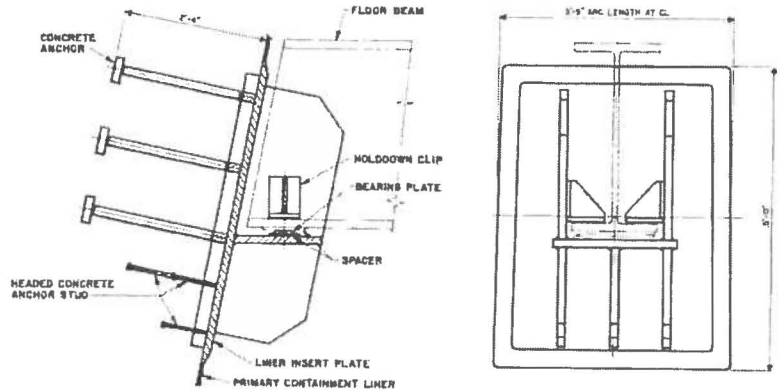
NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT



PIPE WHIP RESTRAINT BEAM SEAT



PIPE WHIP RESTRAINT BEAM SEAT



RADIAL AND NON-RADIAL FLOOR BEAM SEAT

FIGURE 3.8-5

PRIMARY CONTAINMENT
TYPICAL BEAM SEAT DETAILS

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

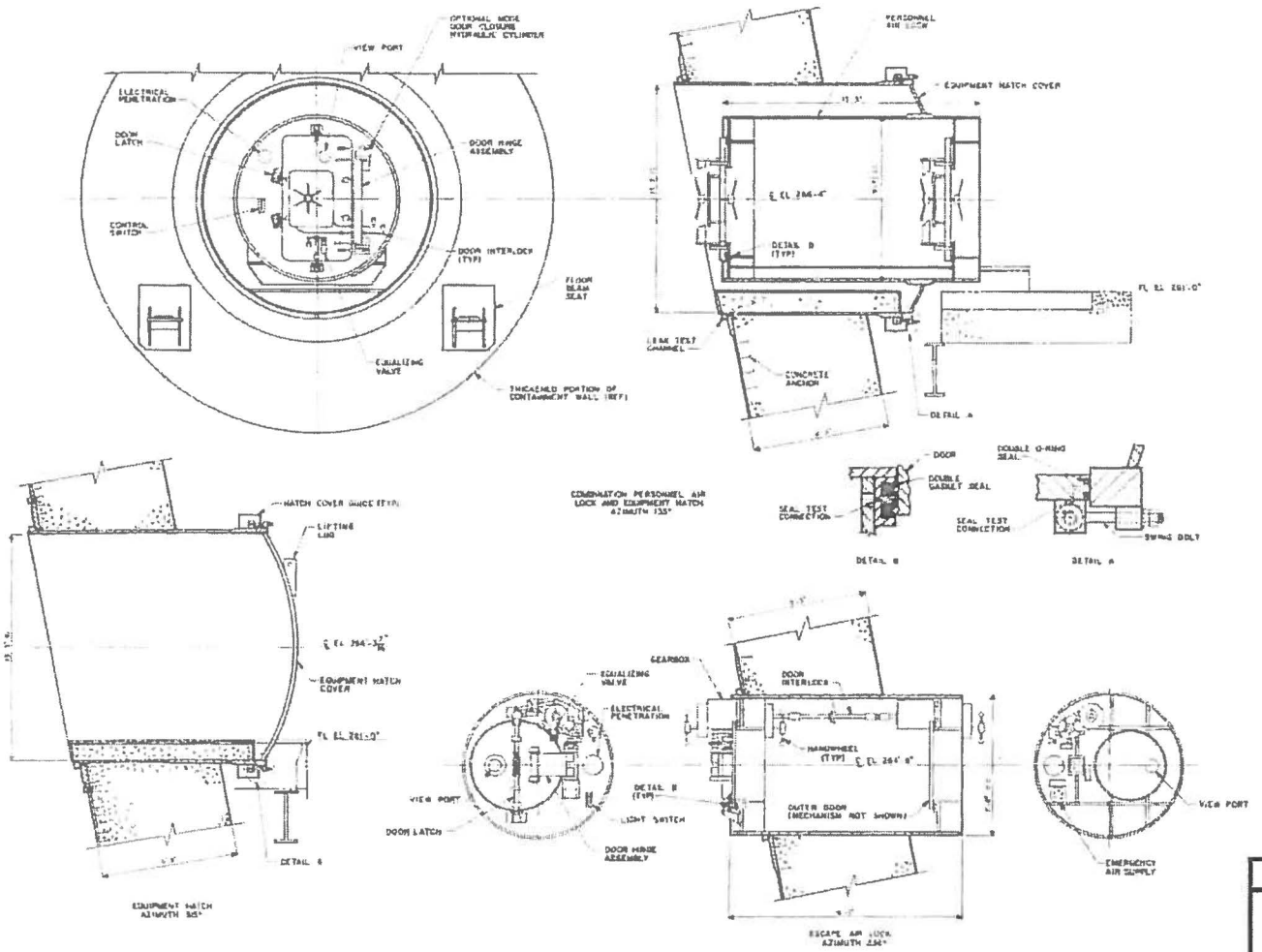


FIGURE 3.8-6

COMBINATION EQUIPMENT HATCH AND PERSONAL AIRLOCK AND ESCAPE AIRLOCK — PRIMARY CONTAINMENT

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

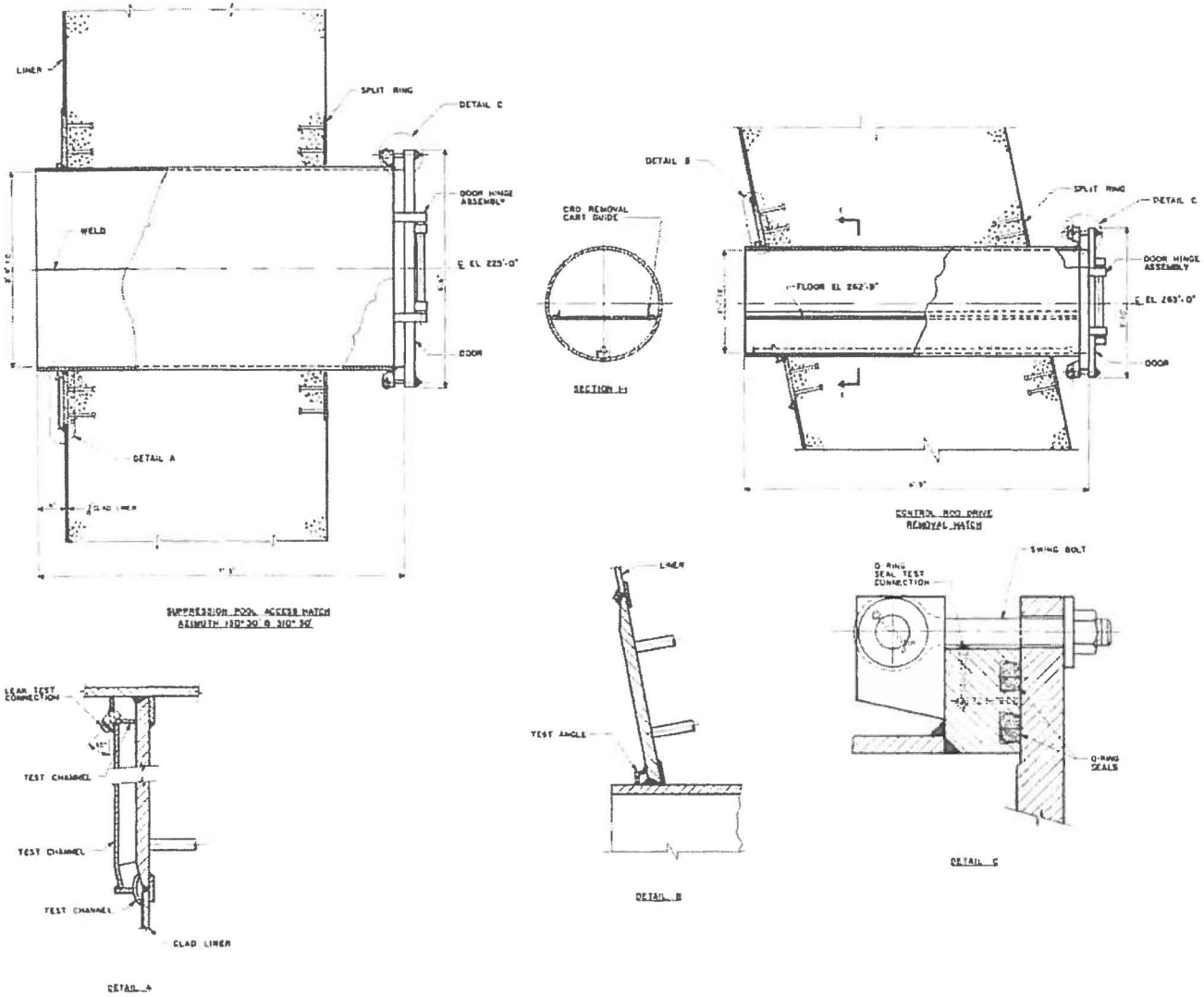


FIGURE 3.8-7

CONTROL ROD DRIVE REMOVAL HATCH AND SUPPRESSION POOL ACCESS HATCH

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

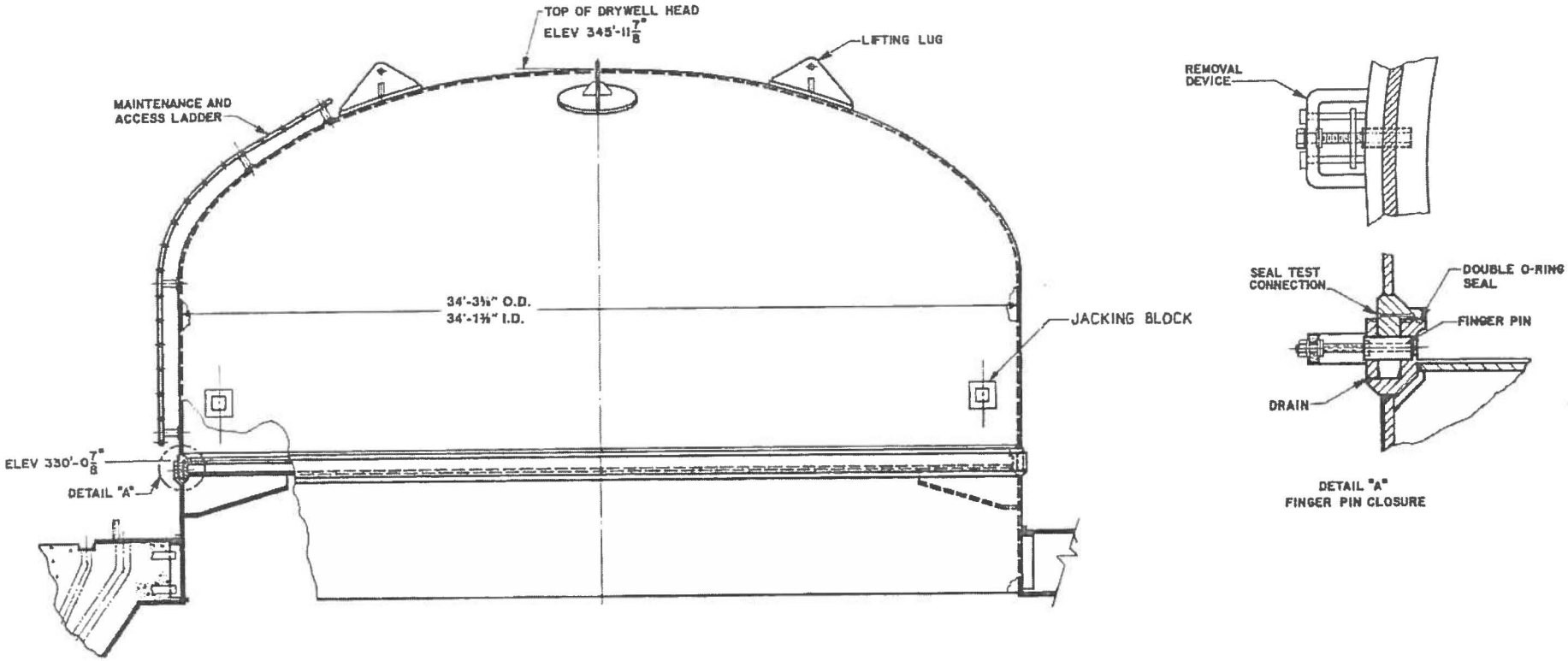
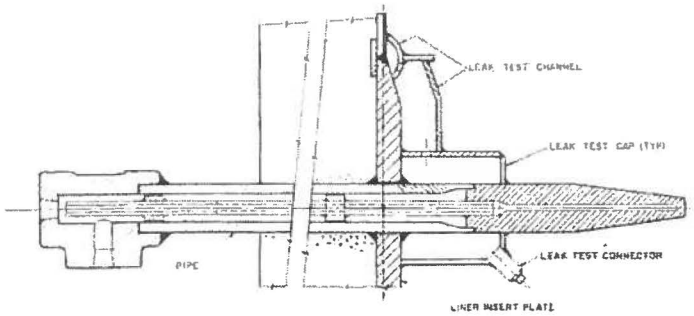


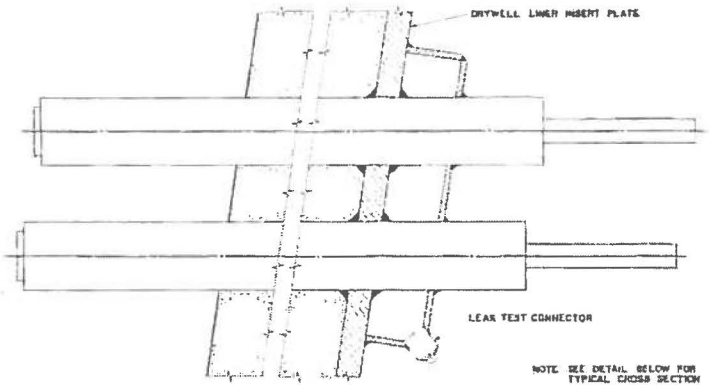
FIGURE 3.8-8

DRYWELL HEAD AND FINGER PIN CLOSURE DETAILS

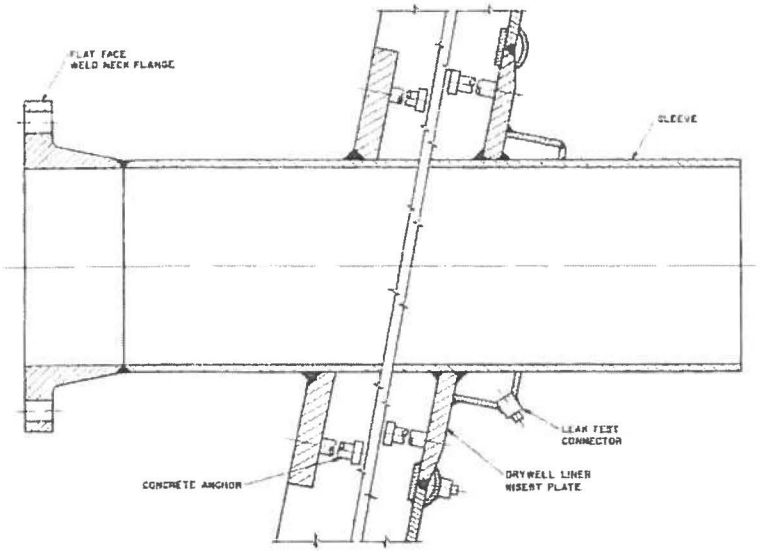
NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALSIS REPORT



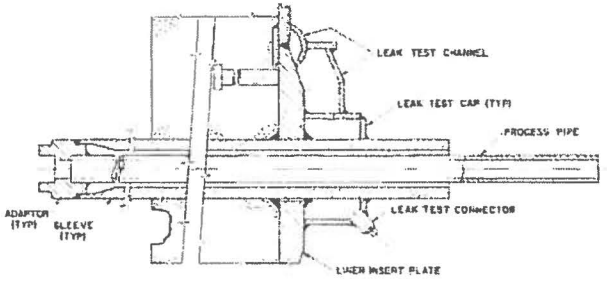
SUPPRESSION POOL TEMPERATURE MONITORING PENETRATION



CONTROL ROD DRIVE PENETRATION



ELECTRICAL PENETRATION SLEEVE

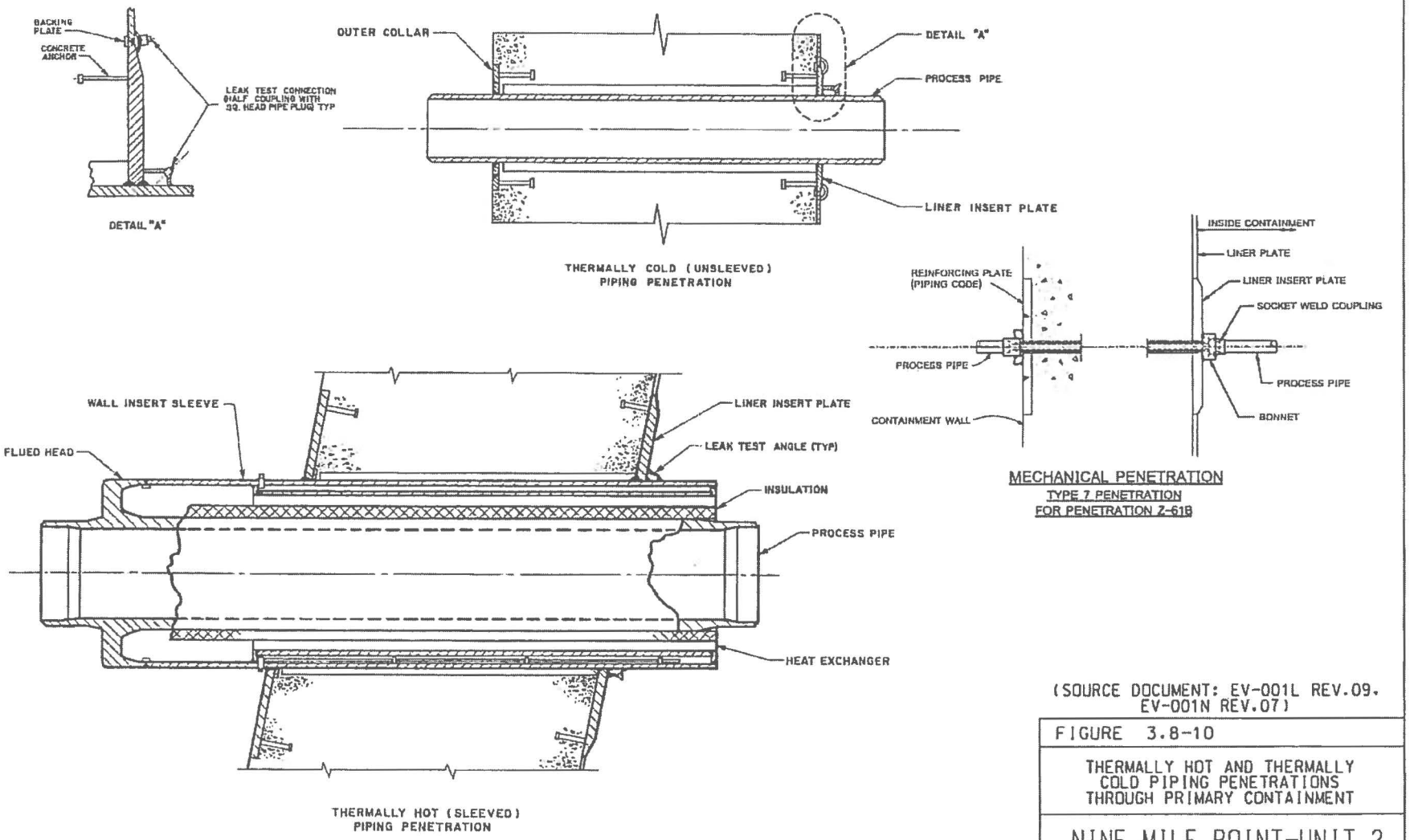


INSTRUMENT PENETRATION
NEUTRON MONITORING PENETRATION

FIGURE 3.8-9

OTHER PIPING AND INSTRUMENT PENETRATIONS THROUGH PRIMARY CONTAINMENT

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT



(SOURCE DOCUMENT: EV-001L REV.09, EV-001N REV.07)

FIGURE 3.8-10

THERMALLY HOT AND THERMALLY COLD PIPING PENETRATIONS THROUGH PRIMARY CONTAINMENT

NINE MILE POINT-UNIT 2

UPDATED SAFETY ANALYSIS REPORT

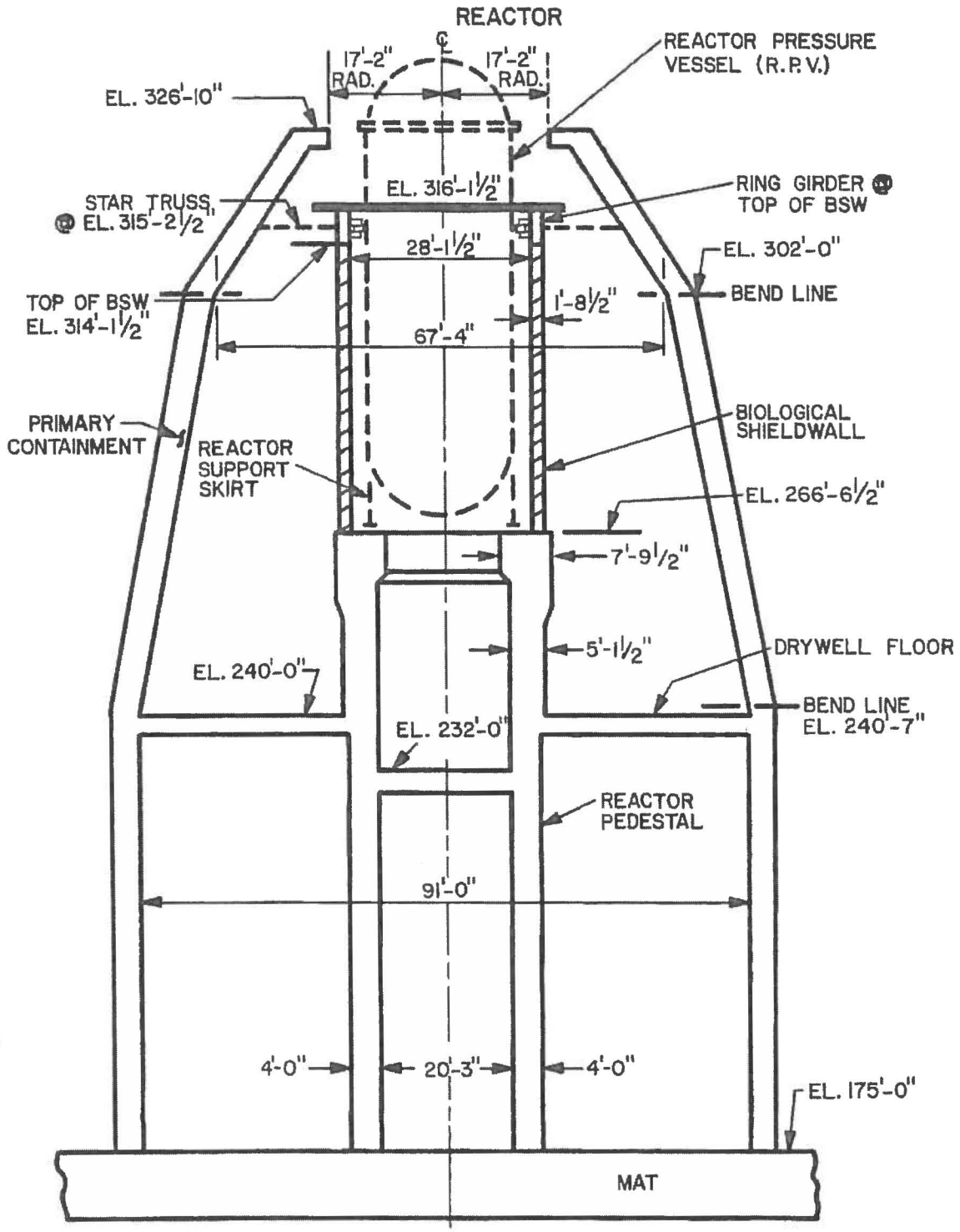


FIGURE 3.8-11

PRIMARY CONTAINMENT AND INTERNAL STRUCTURES

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

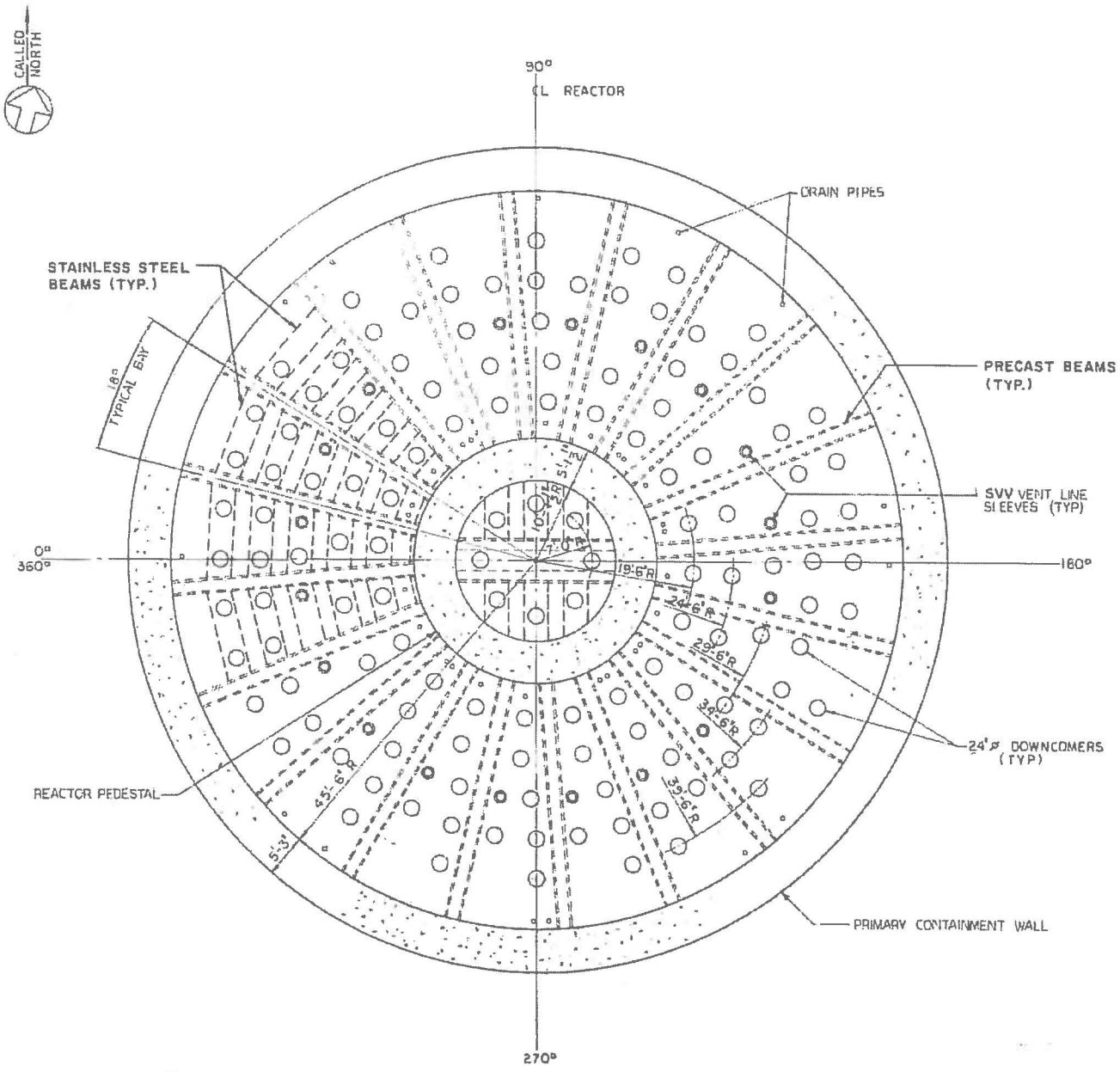
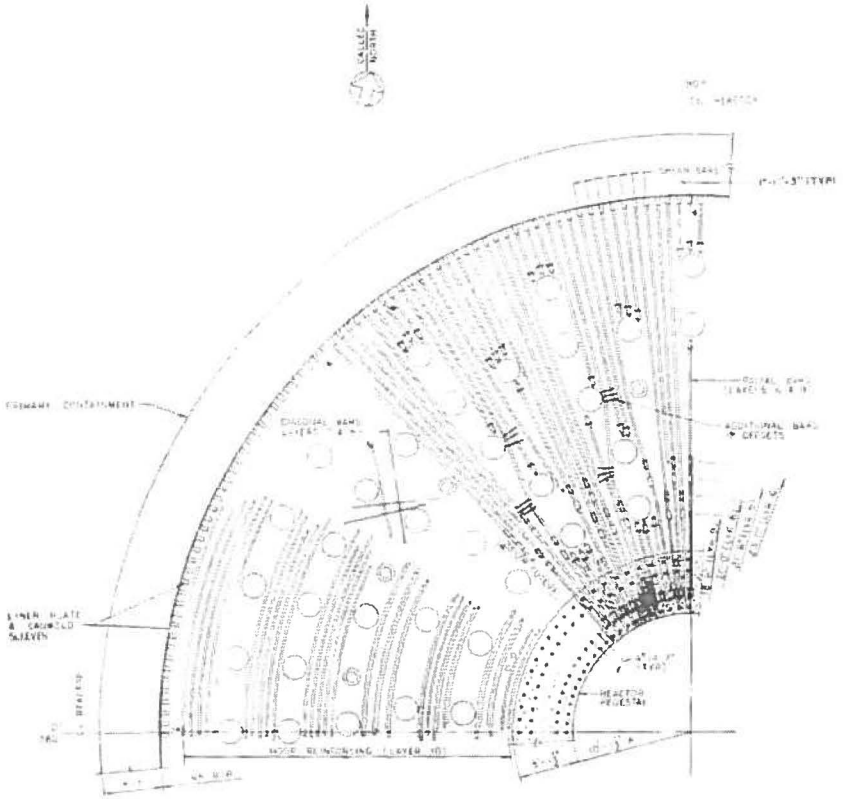


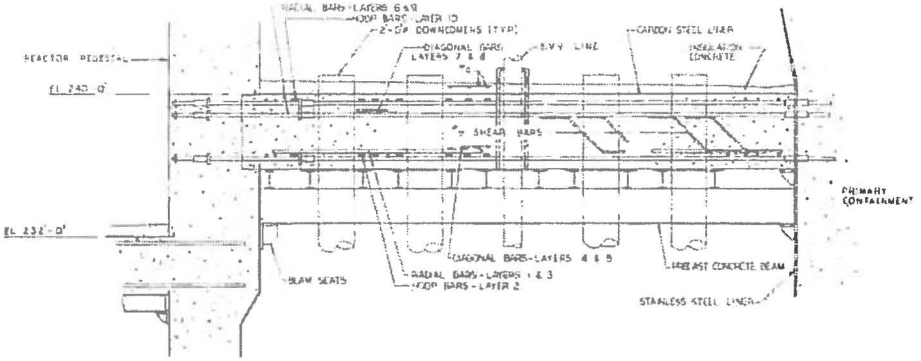
FIGURE 3.8-12

ARRANGEMENT OF PENETRATIONS THROUGH DRYWELL FLOOR

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT



TYPICAL REINFORCING PLAN
DRYWELL FLOOR
(ONE QUADRANT ONLY)

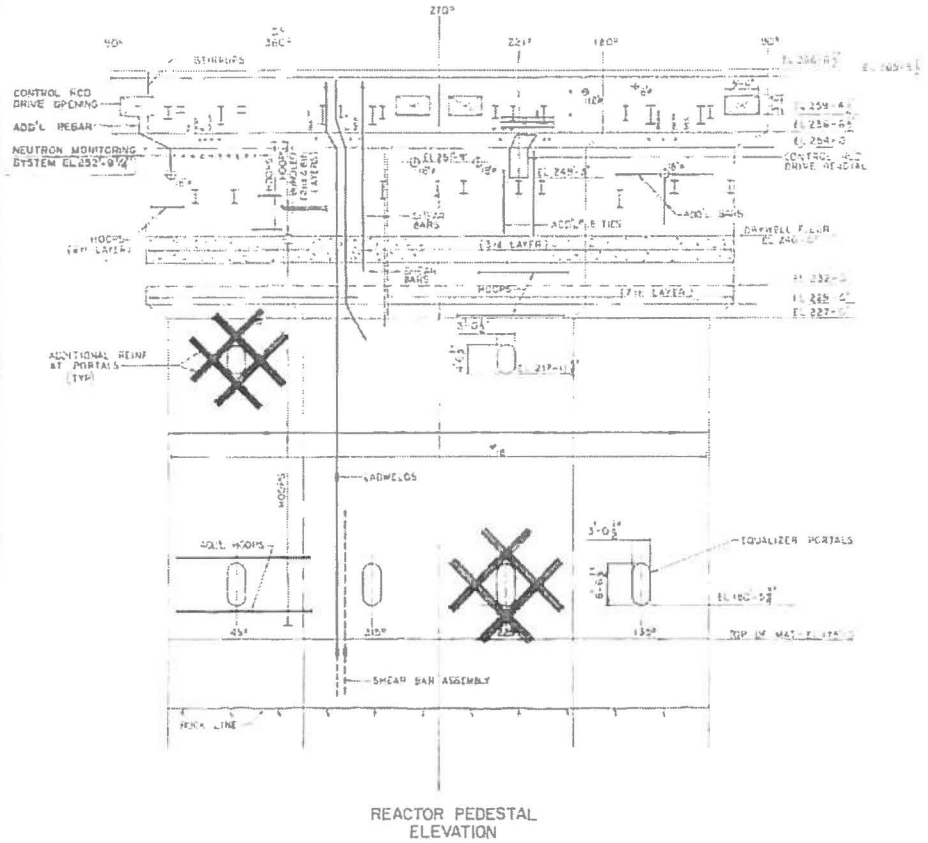


TYPICAL SECTION OF DRYWELL FLOOR
BETWEEN REV PEDESTAL & PRIMARY CONTAINMENT

FIGURE 3.8-13

TYPICAL REINFORCING BAR DETAILS
FOR DRYWELL FLOOR

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT



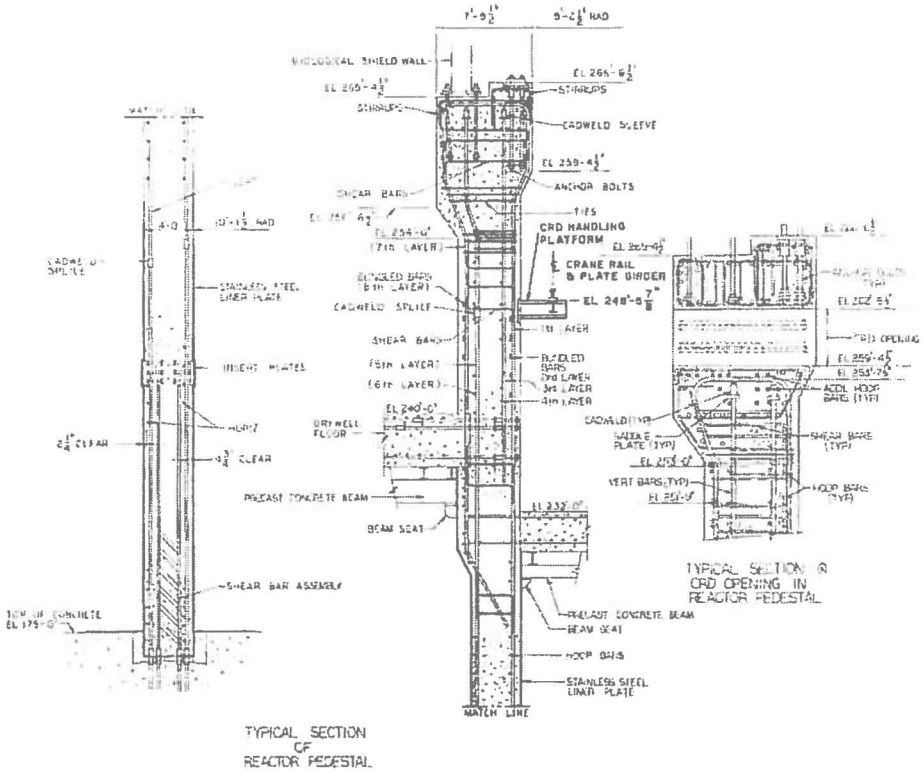
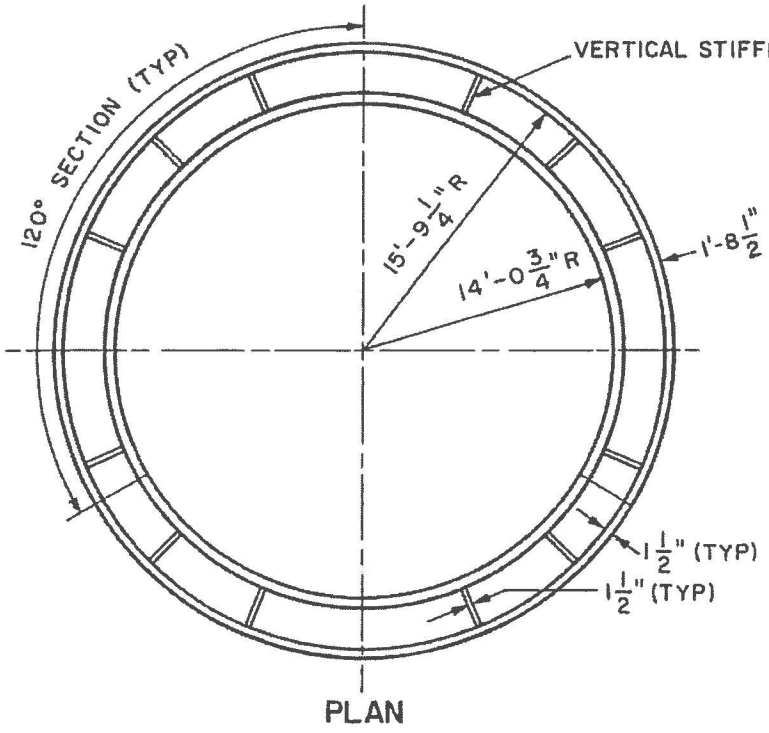


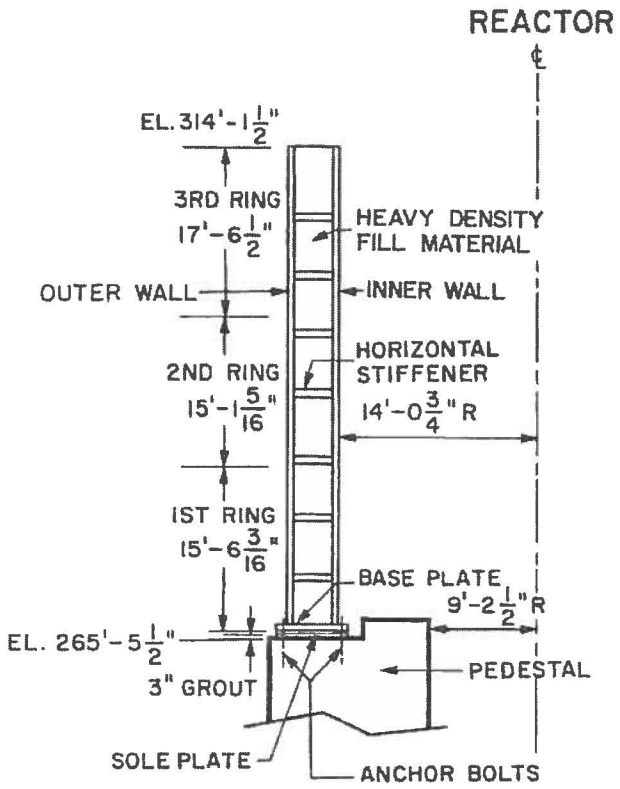
FIGURE 3.8-14

TYPICAL REINFORCING BAR DETAILS FOR RPV PEDESTAL

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT



PLAN

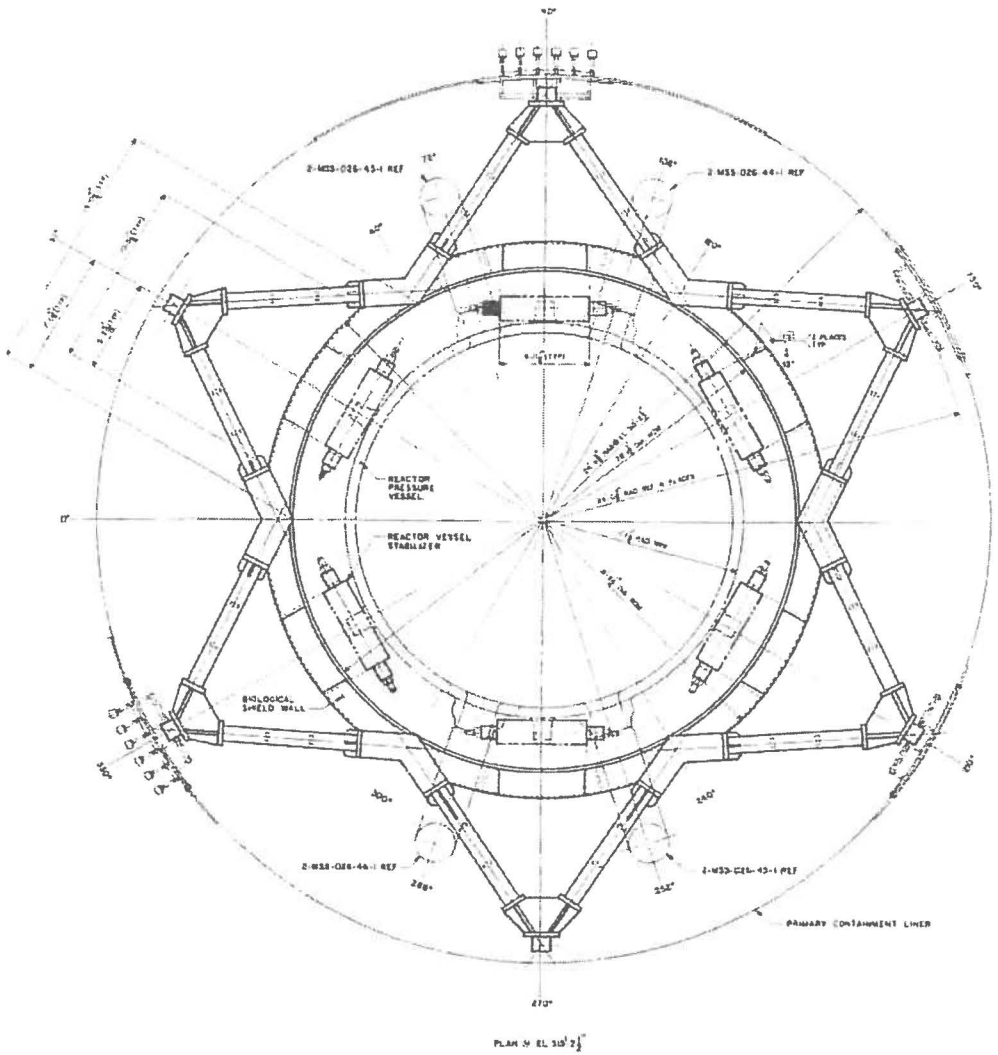


SECTION

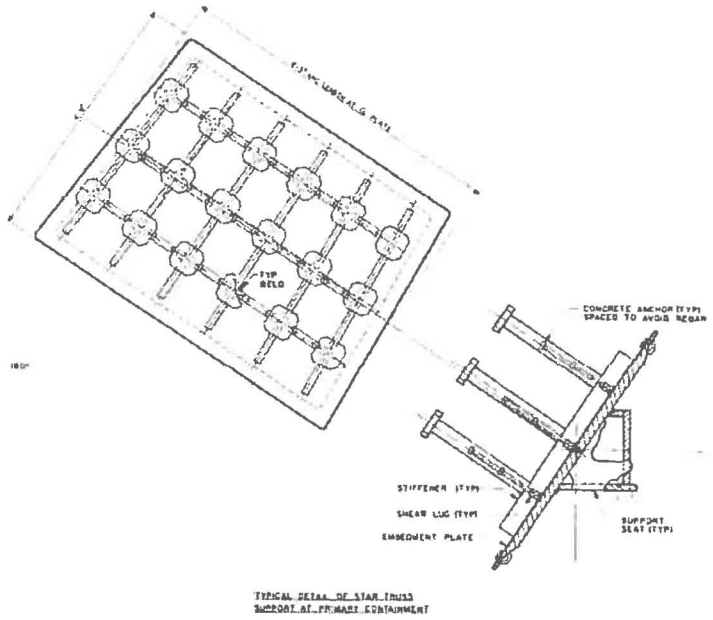
FIGURE 3.8-15

BIOLOGICAL SHIELD WALL-
DETAILS

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT



PLAN @ EL 305'-2½"

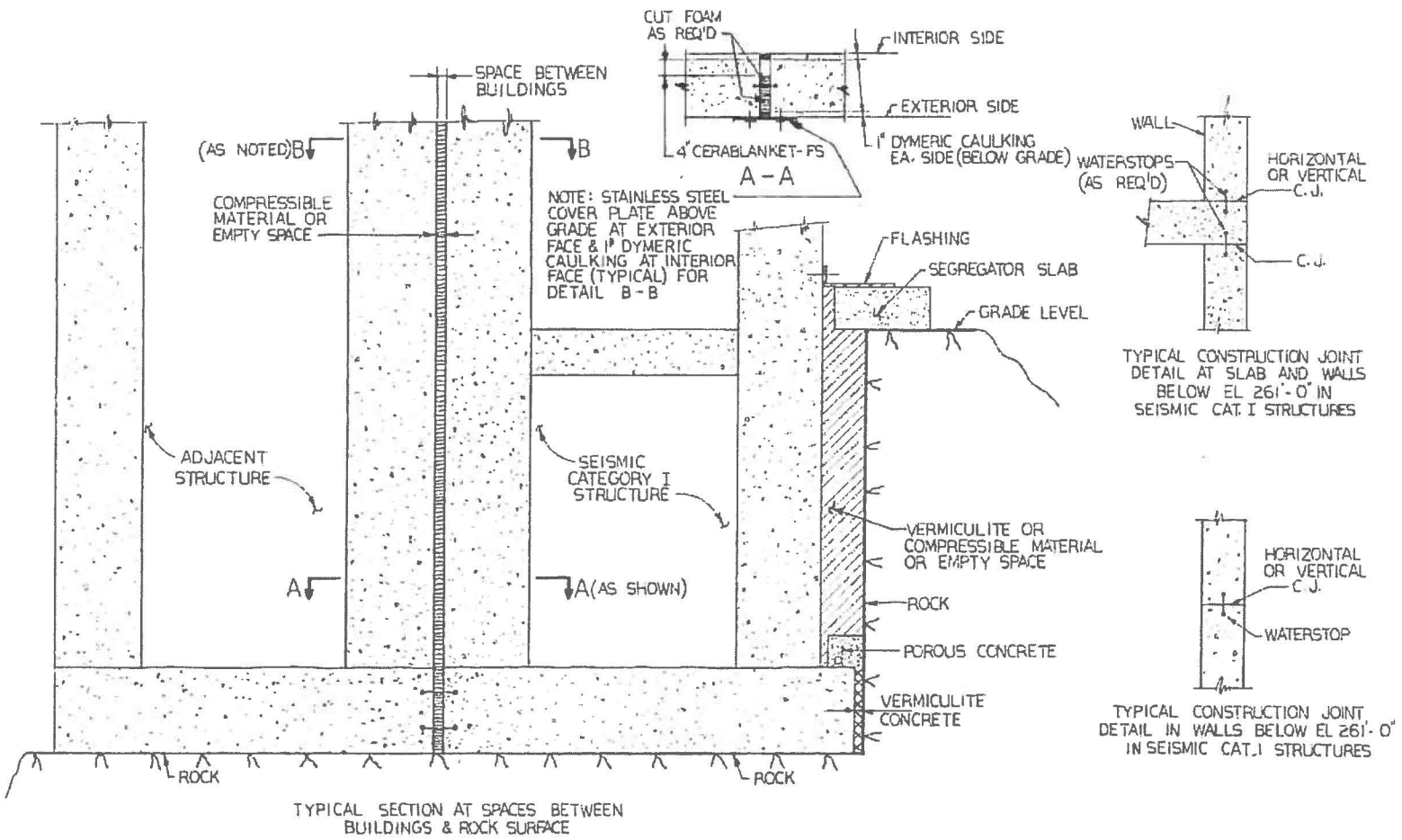


TYPICAL DETAIL OF STAR TRUSS SUPPORT AT PRIMARY CONTAINMENT

FIGURE 3.8-16

RING GIRDER, STAR TRUSS AND STABILIZER ARRANGEMENT

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT



TYPICAL SECTION AT SPACES BETWEEN BUILDINGS & ROCK SURFACE

TYPICAL CONSTRUCTION JOINT DETAIL AT SLAB AND WALLS BELOW EL 261'-0" IN SEISMIC CAT. I STRUCTURES

TYPICAL CONSTRUCTION JOINT DETAIL IN WALLS BELOW EL 261'-0" IN SEISMIC CAT. I STRUCTURES

FIGURE 3.8-17

TYPICAL DETAILS AT CONSTRUCTION JOINTS AND SPACES BETWEEN BUILDING AND ROCK SURFACE

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

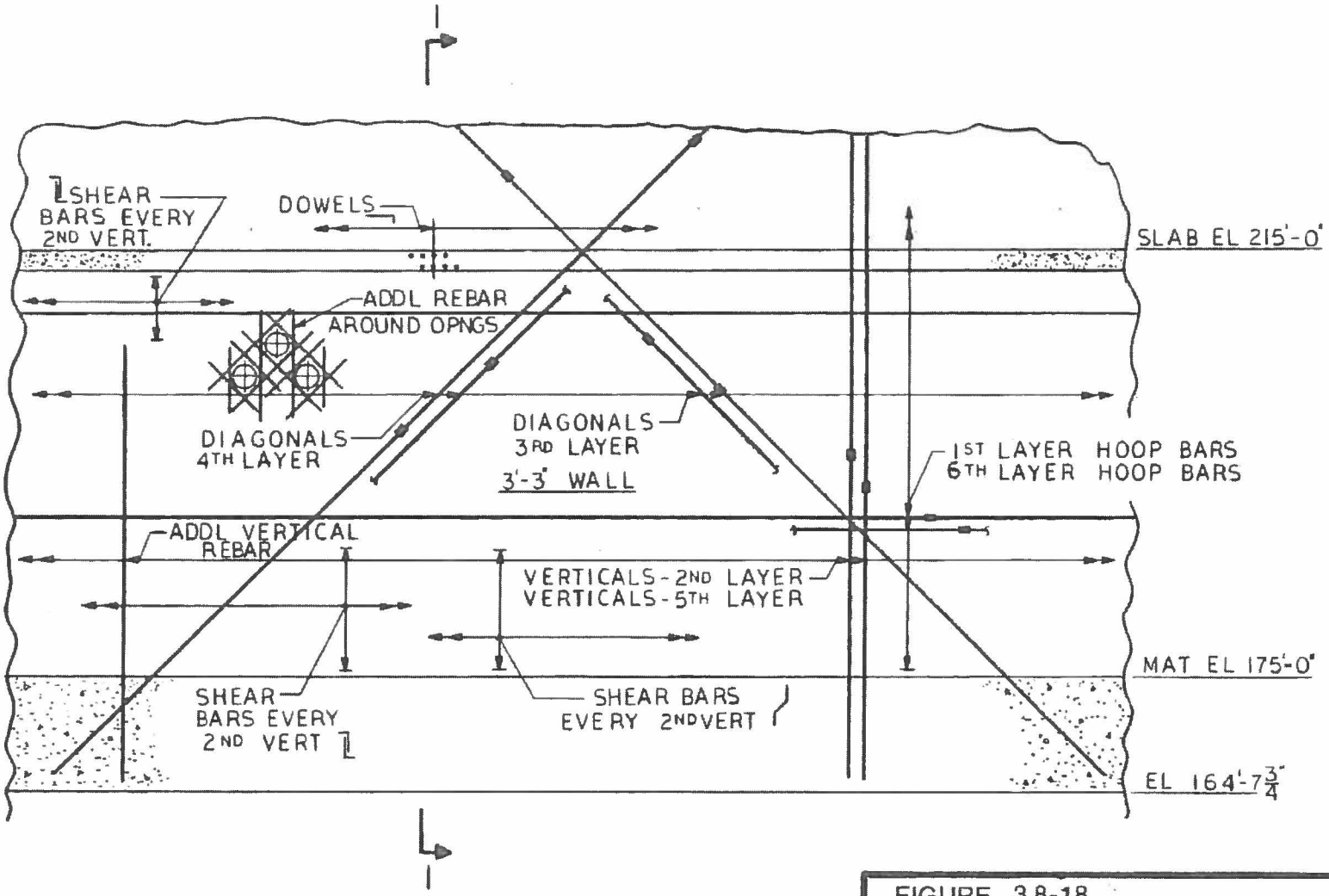


FIGURE 3.8-18

EXTERIOR REACTOR BUILDING WALL
TYPICAL REINFORCING ARRANGEMENT
SHEET 1 OF 2

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

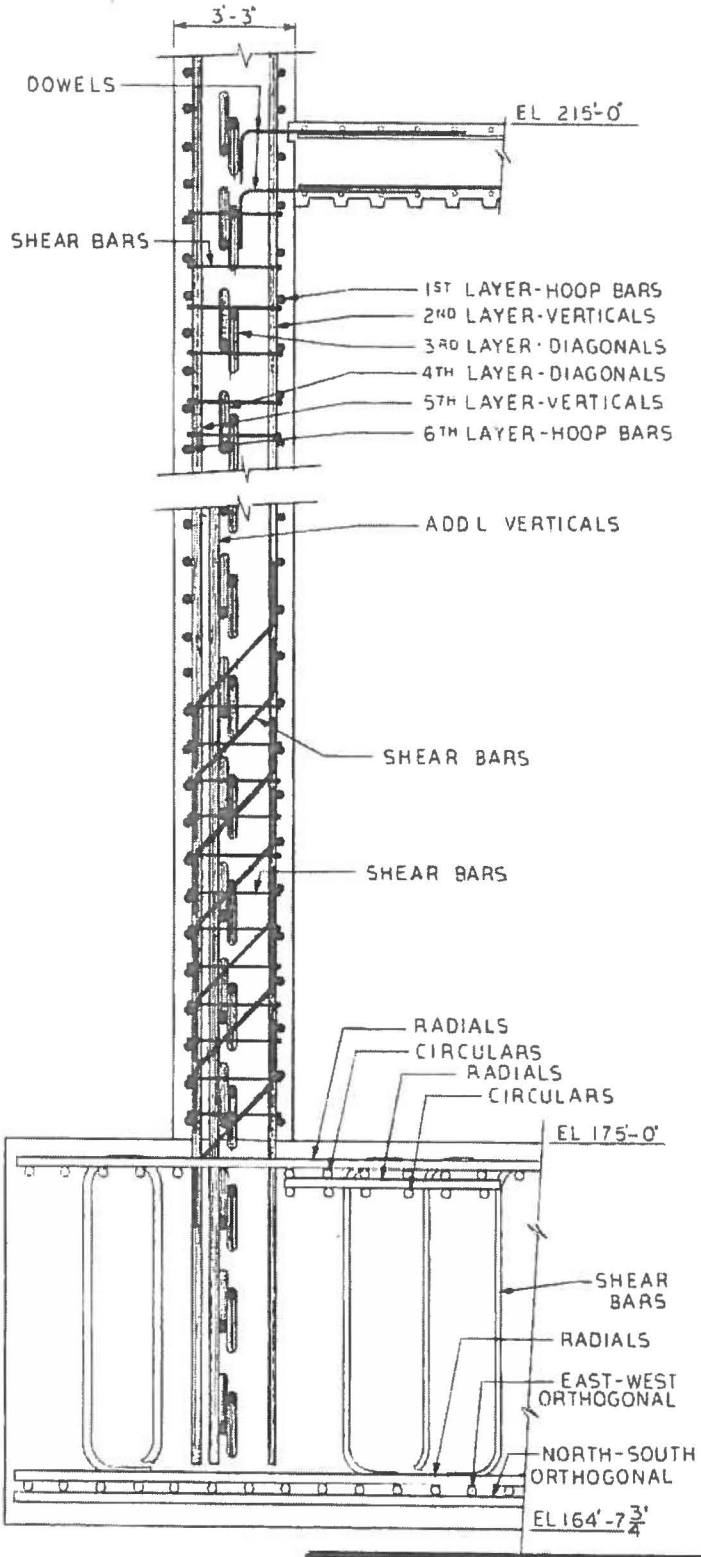


FIGURE 3.8-18

EXTERIOR REACTOR BUILDING WALL
TYPICAL REINFORCING ARRANGEMENT
SHEET 2 OF 2

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

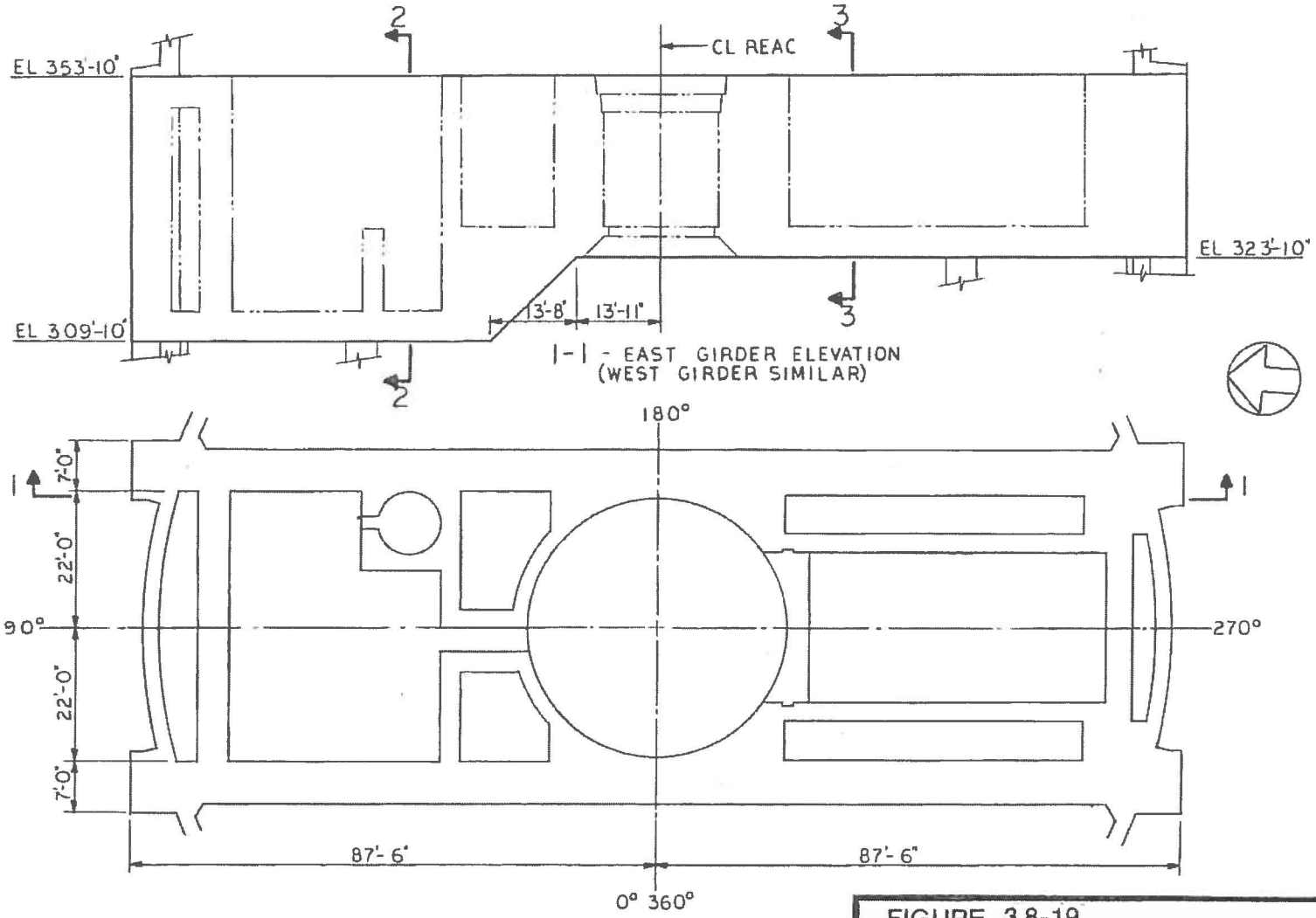
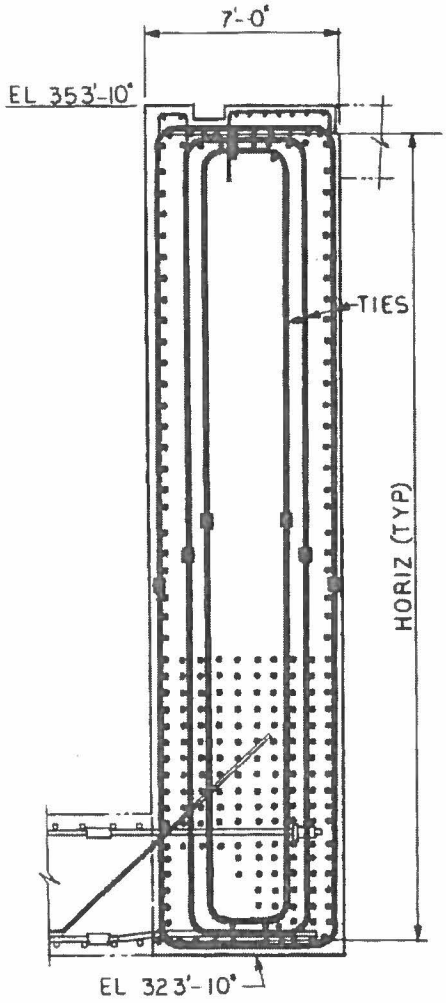


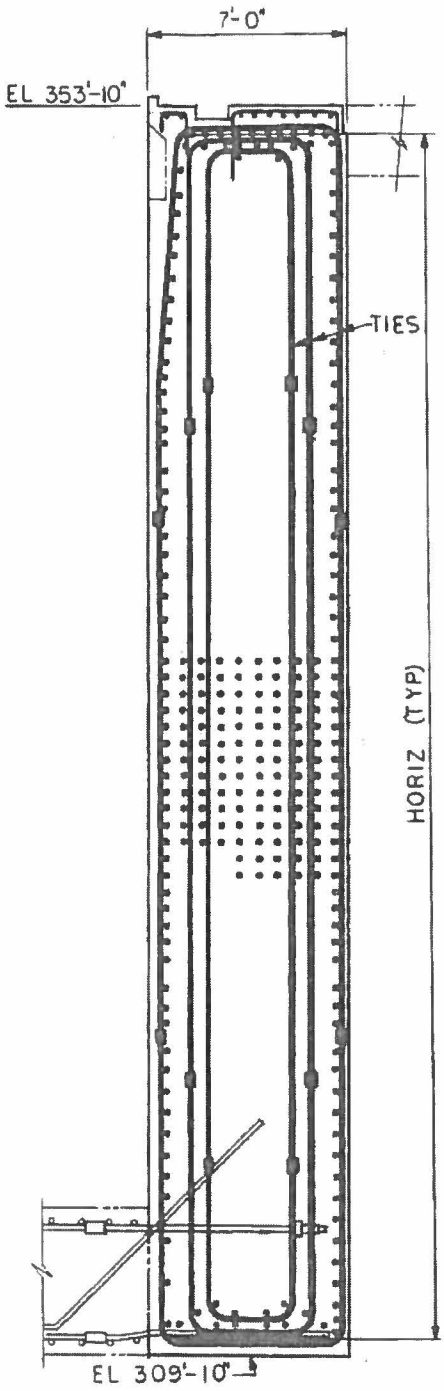
FIGURE 3.8-19

SPENT FUEL POOL GIRDERS
PLAN AND ELEVATION
SHEET 1 OF 2

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT



3 - 3



2-2

FIGURE 3.8-19

SPENT FUEL POOL GIRDERS
REINFORCING ARRANGEMENT
SHEET 2 OF 2

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

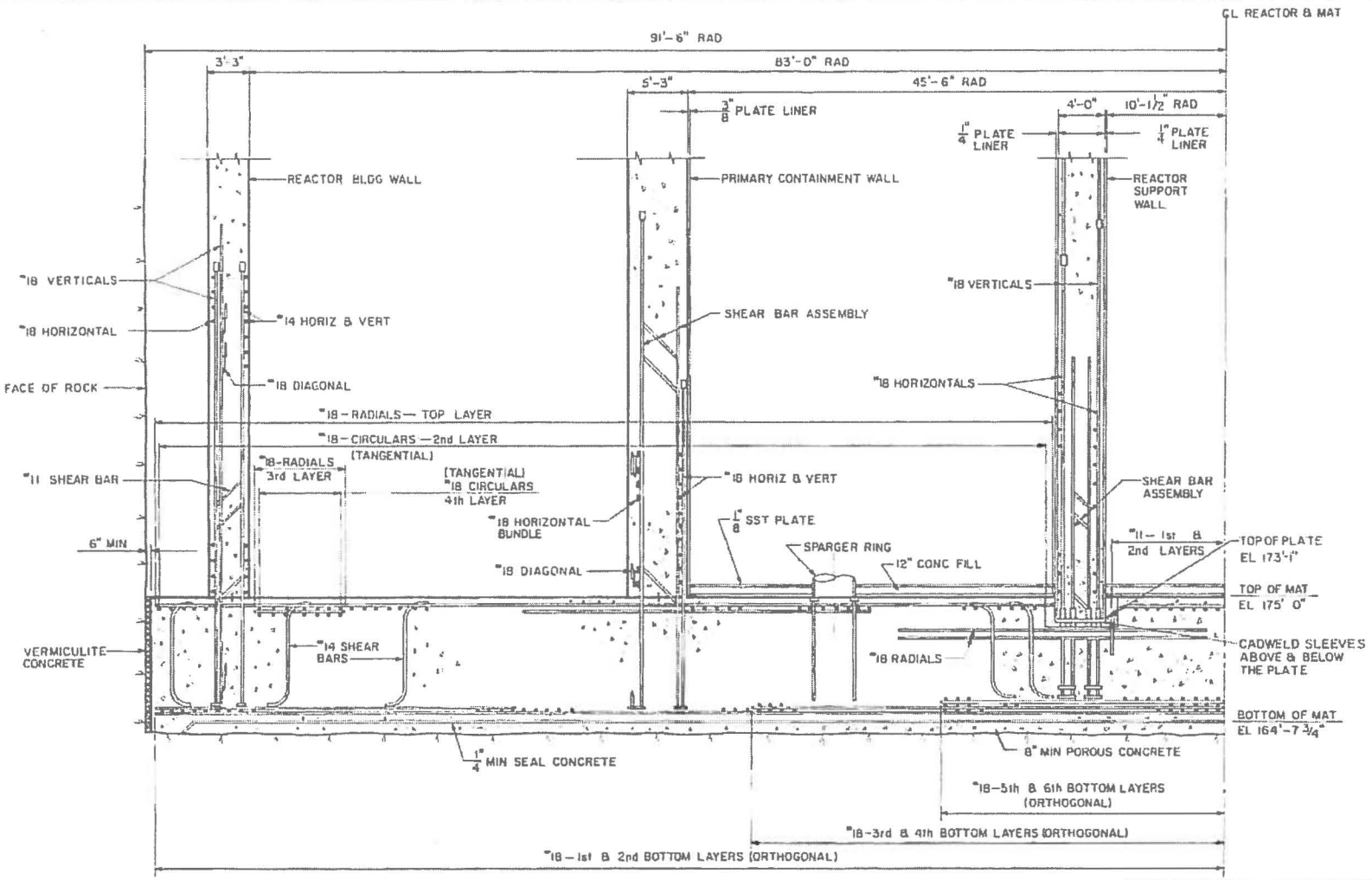
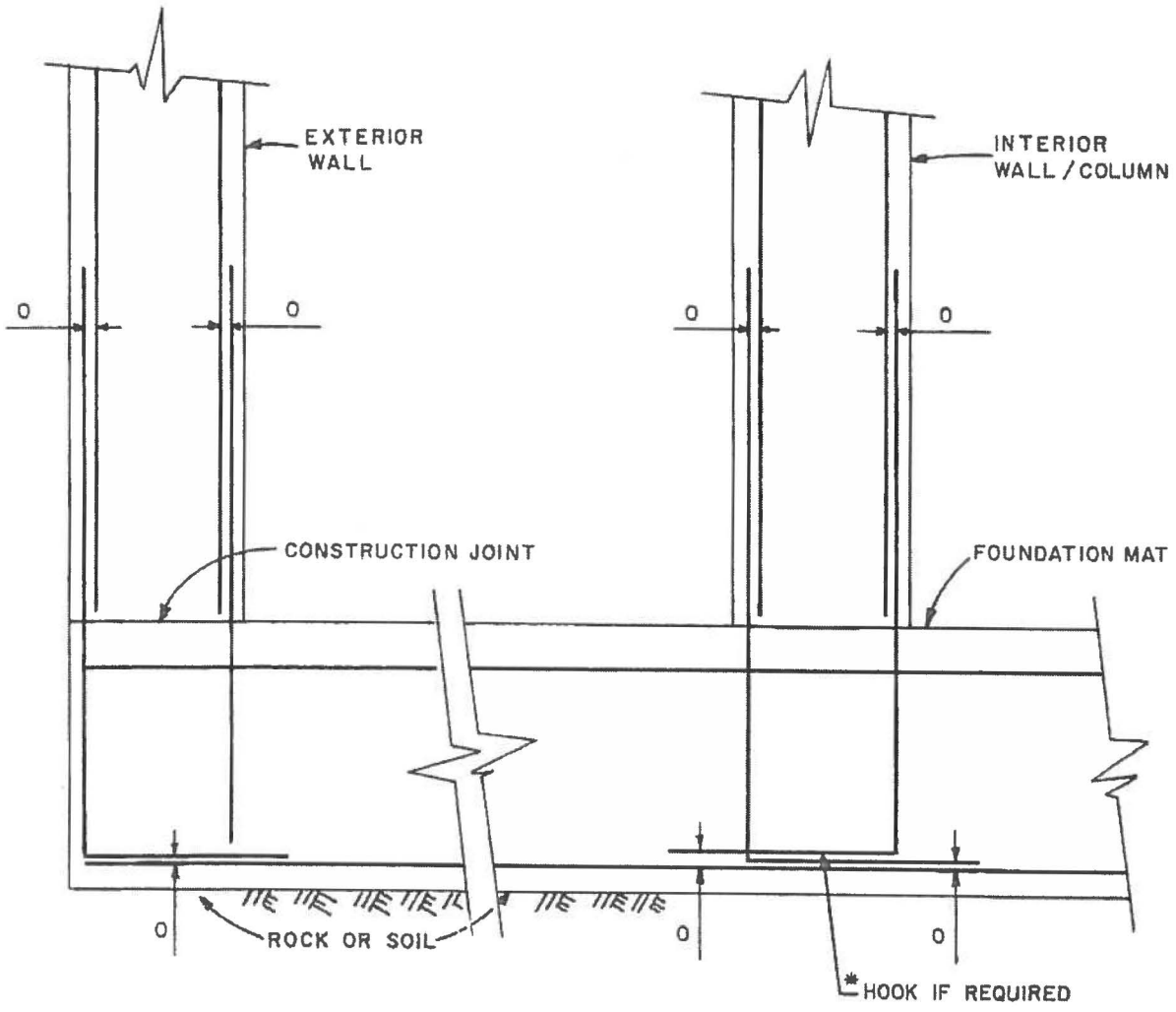


FIGURE 3.8-20

REINFORCEMENT
REACTOR BUILDING MAT

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

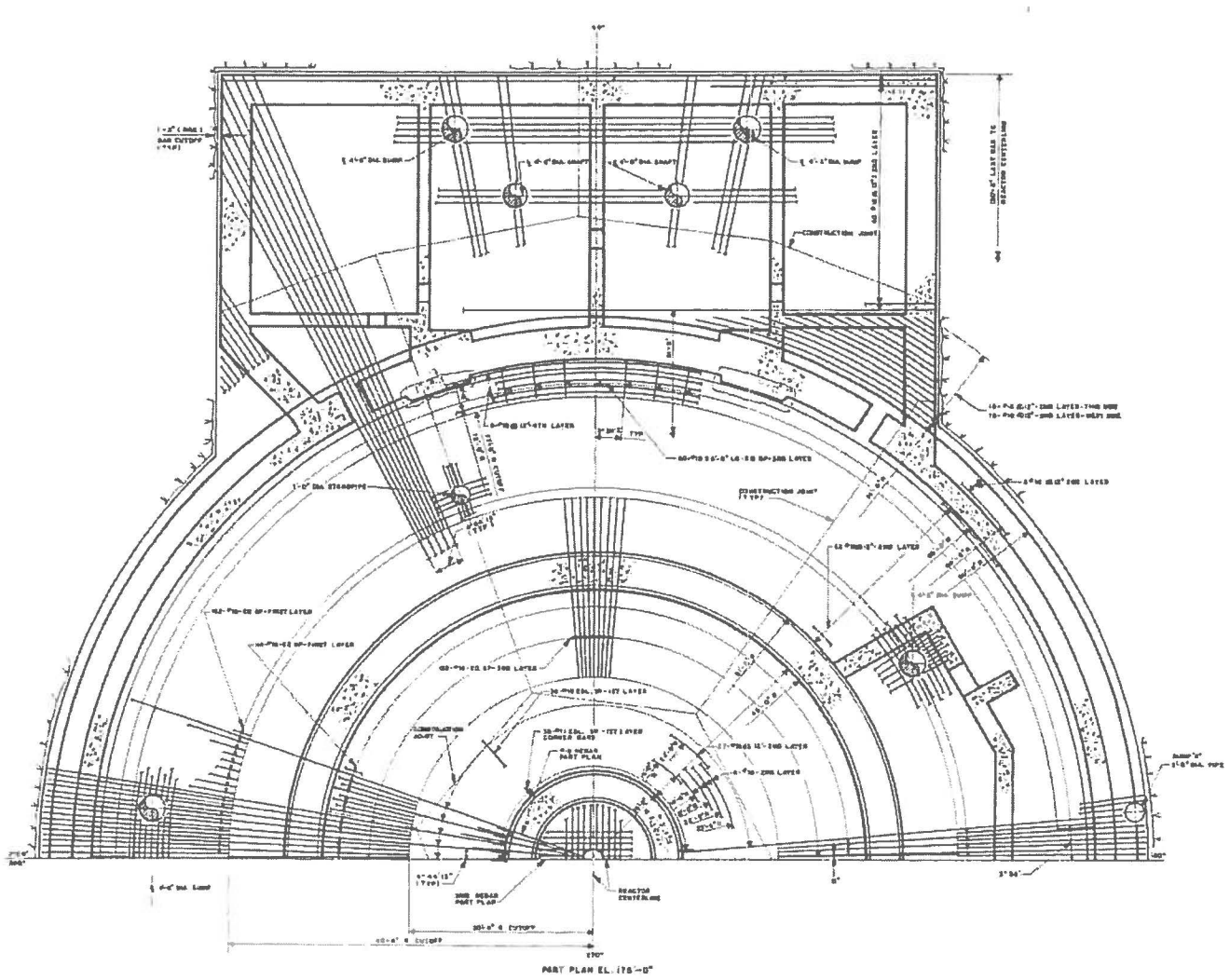


* HOOKS MAY BE TURNED IN EITHER DIRECTION

FIGURE 3.8-21

TYPICAL DETAIL WALL/COLUMN
TO FOUNDATION MAT JUNCTION

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

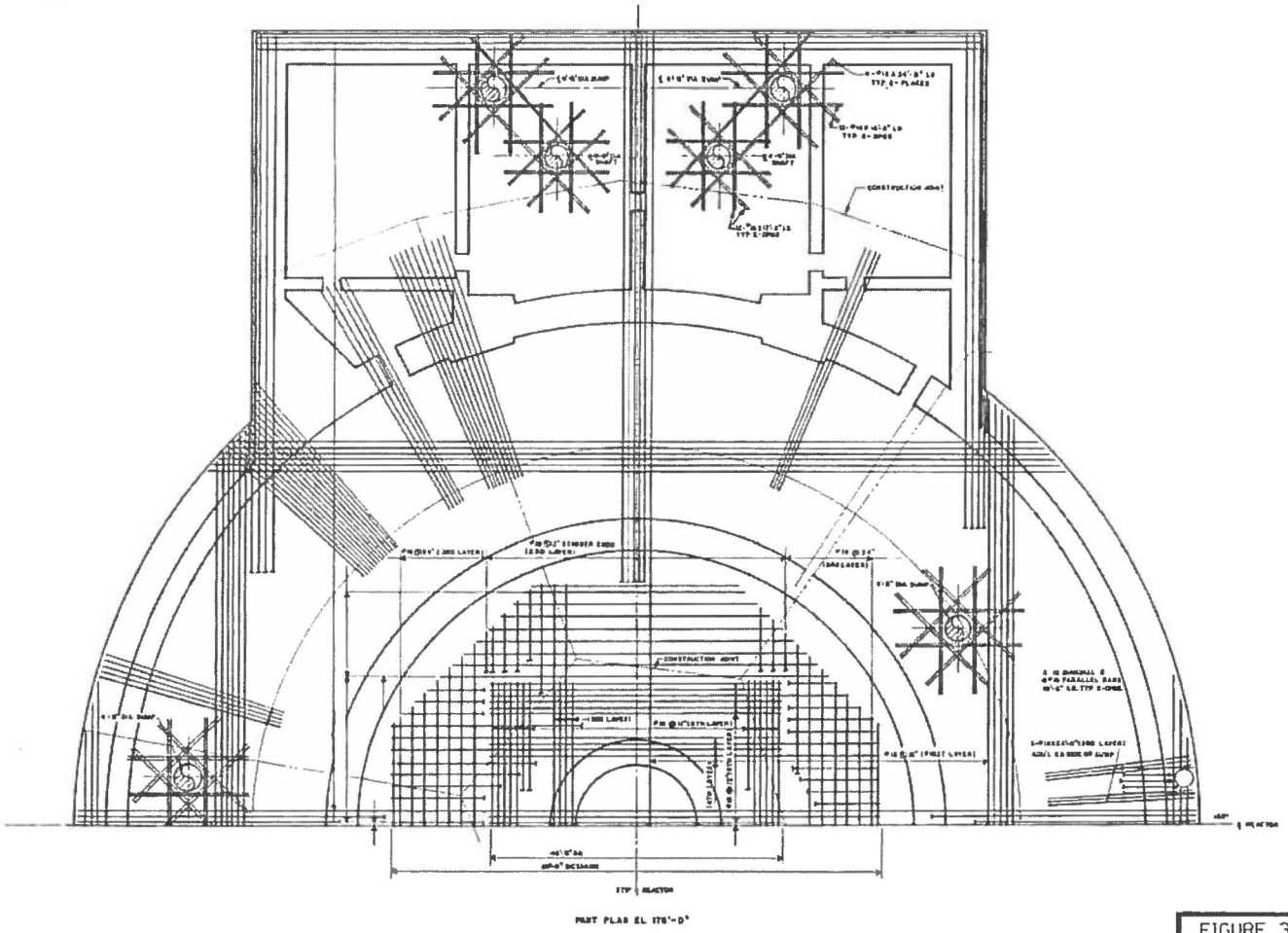


SOURCE: EC-30C

FIGURE 3.8-22

CONTAINMENT MAT-TOP
REINFORCING DETAILS

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT



SOURCE: EC-308

FIGURE 3.8-23

CONTAINMENT MAT-BOTTOM
REINFORCING DETAILS

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

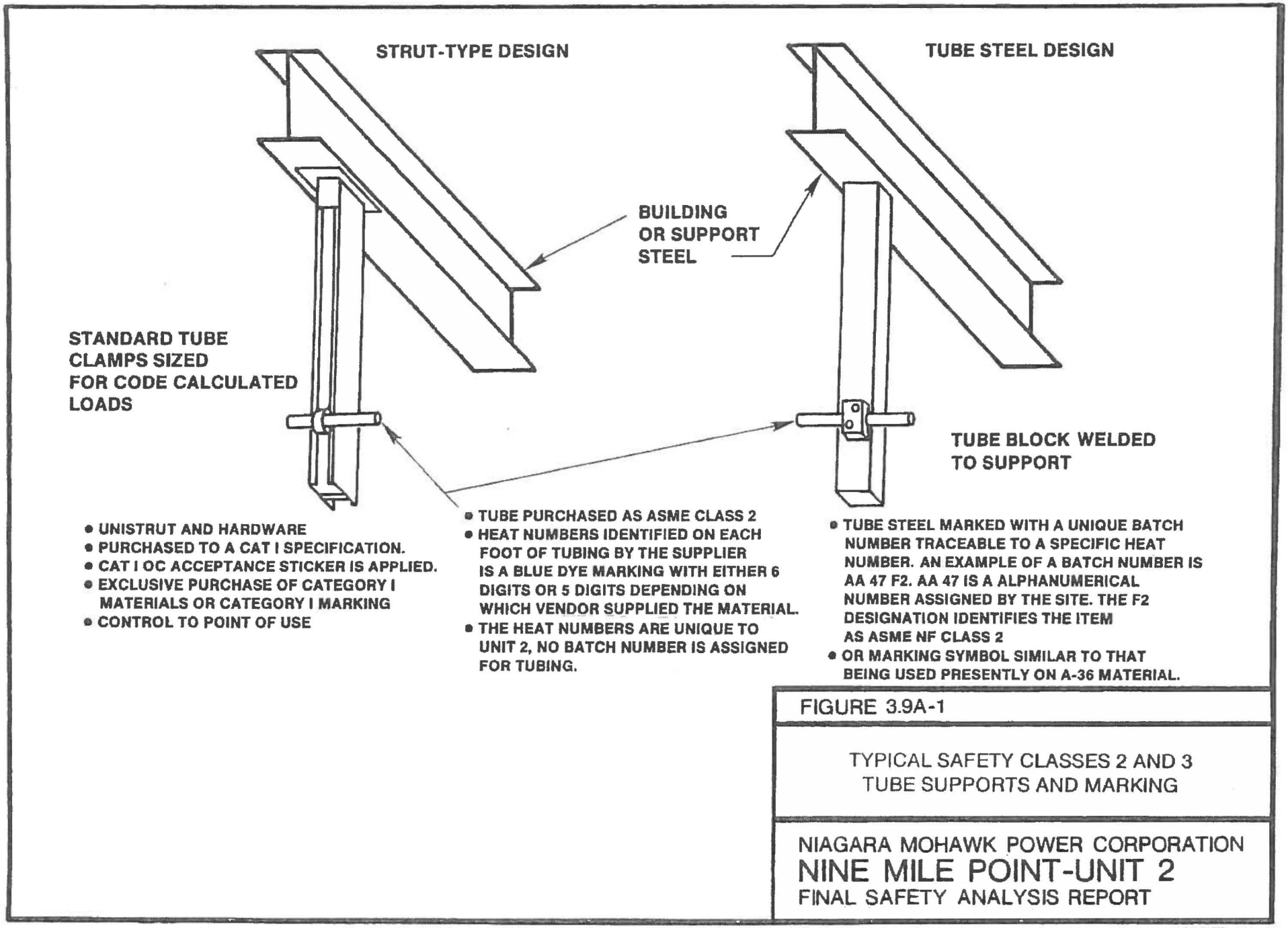


FIGURE 3.9A-1

TYPICAL SAFETY CLASSES 2 AND 3
TUBE SUPPORTS AND MARKING

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

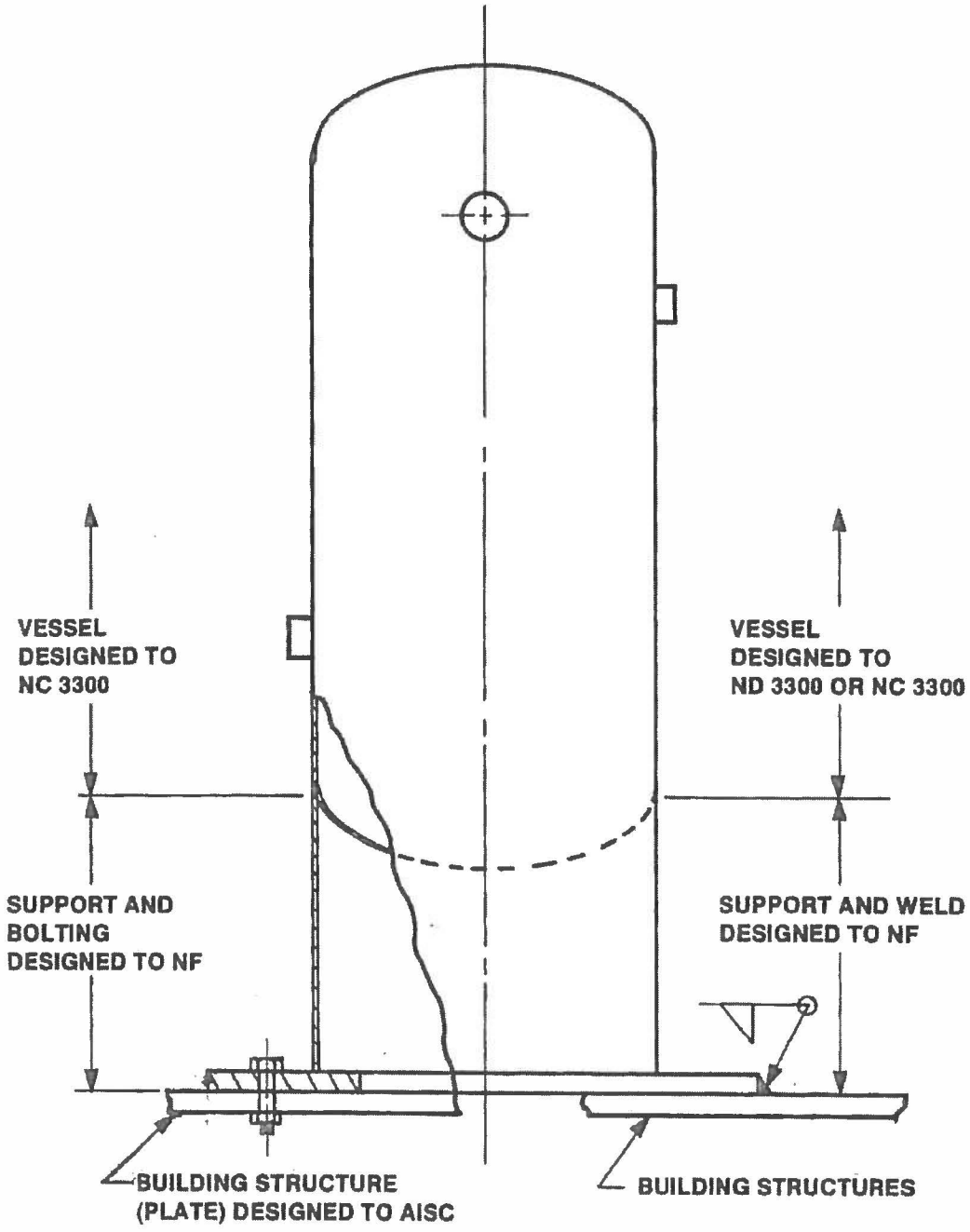


FIGURE 3.9A-2

TYPICAL PLATE & SHELL TYPE SUPPORT
JURISDICTIONAL BOUNDARIES

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

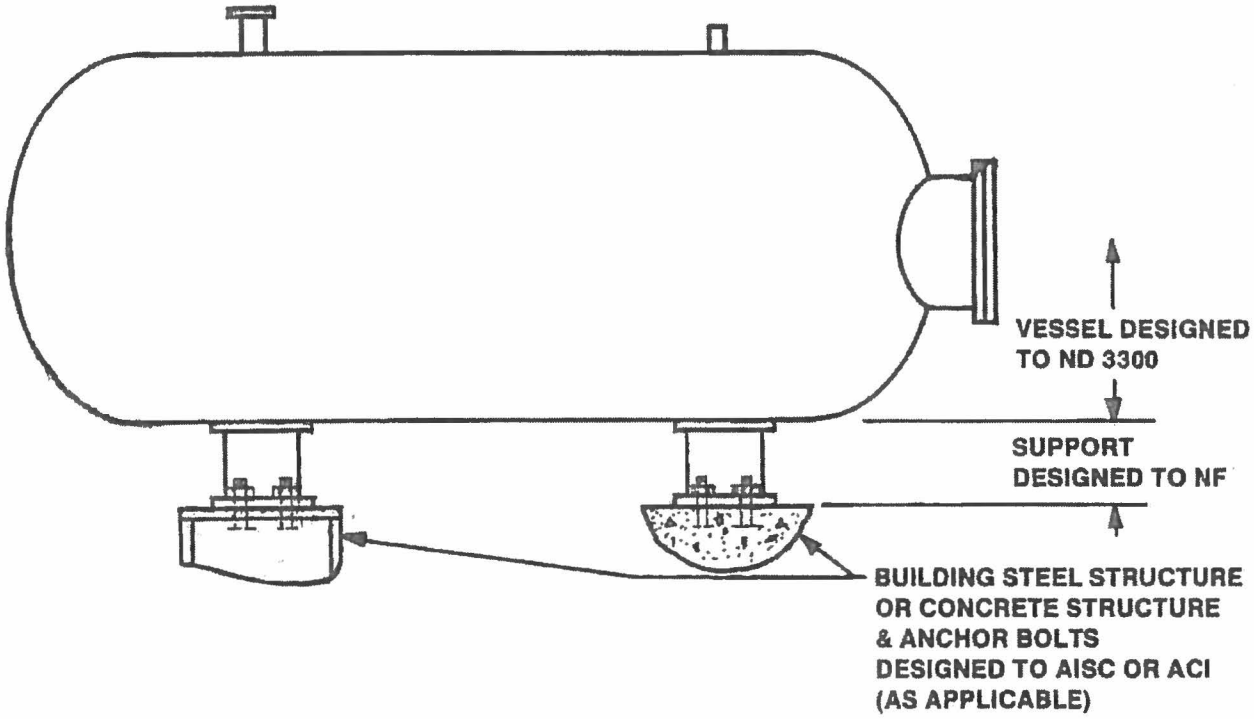


FIGURE 3.9A-3

TYPICAL PLATE & SHELL TYPE SUPPORT
JURISDICTIONAL BOUNDARIES

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

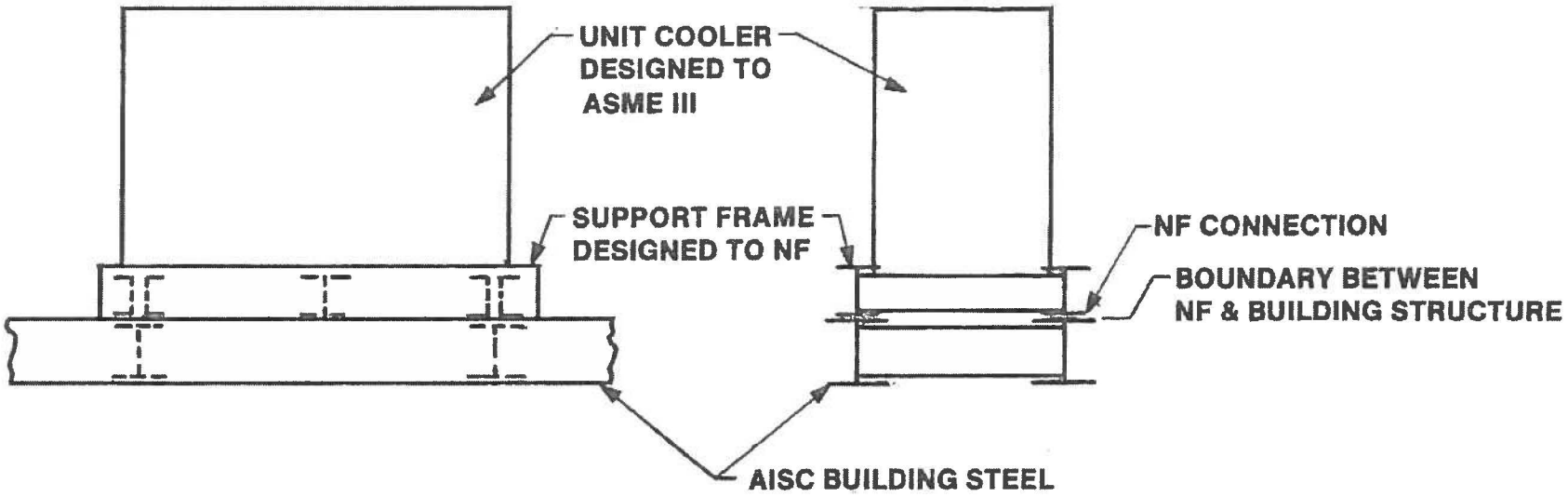


FIGURE 3.9A-4

TYPICAL LINEAR TYPE SUPPORT
JURISDICTIONAL BOUNDARIES

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

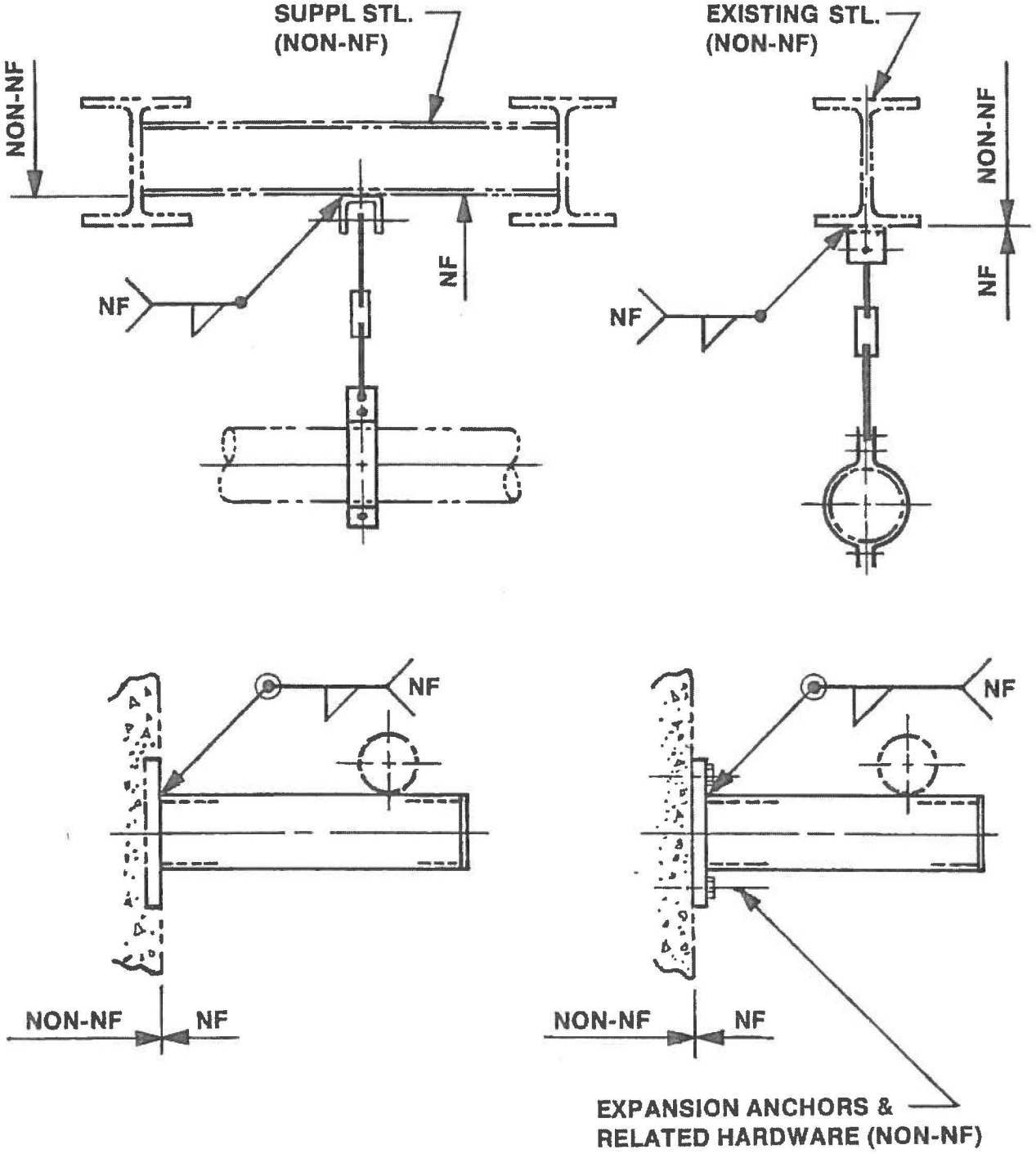


FIGURE 3.9A-5

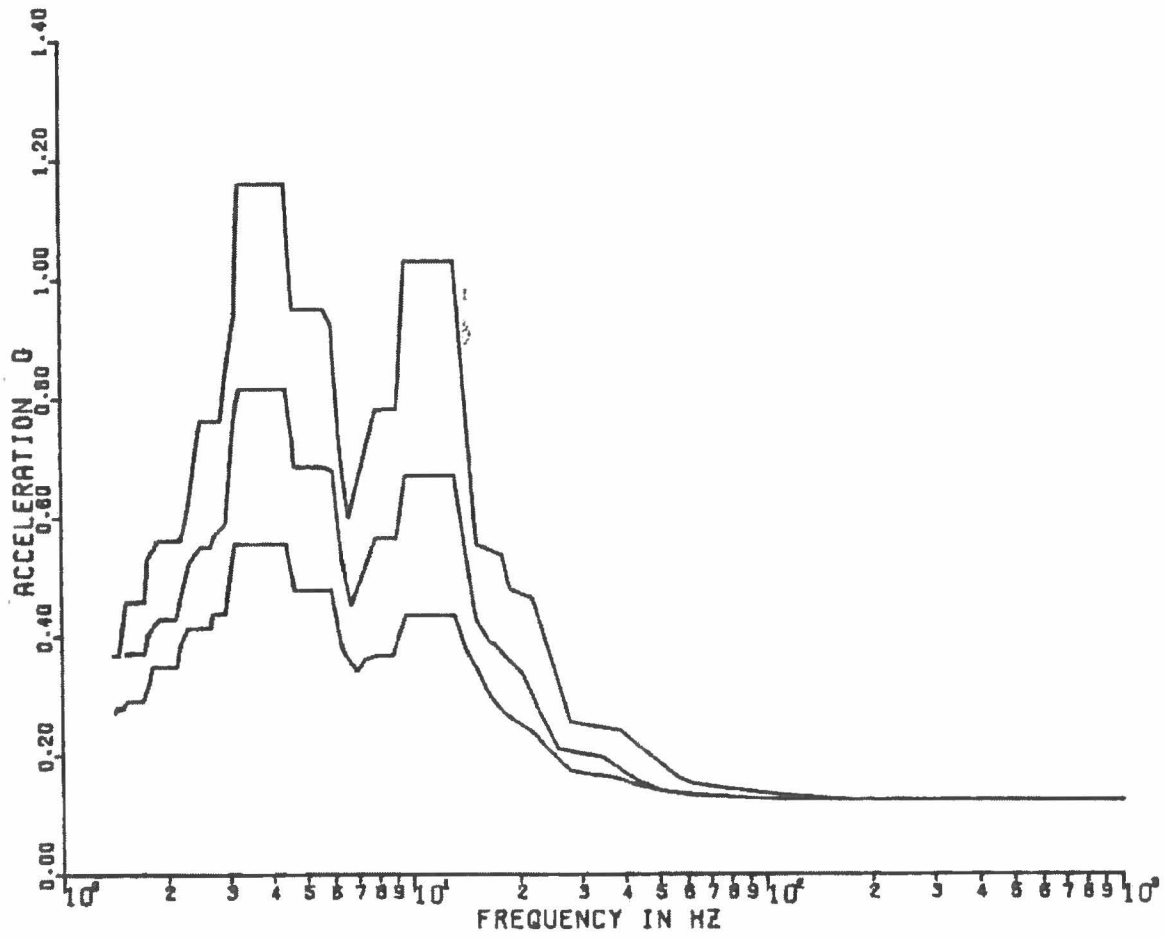
PIPE SUPPORT
JURISDICTIONAL BOUNDARIES

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SEISMIC (OBE)

DAMPING VALUES = 0.010
0.020
0.040

HOR DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

FIGURE 3.~~9A~~-6

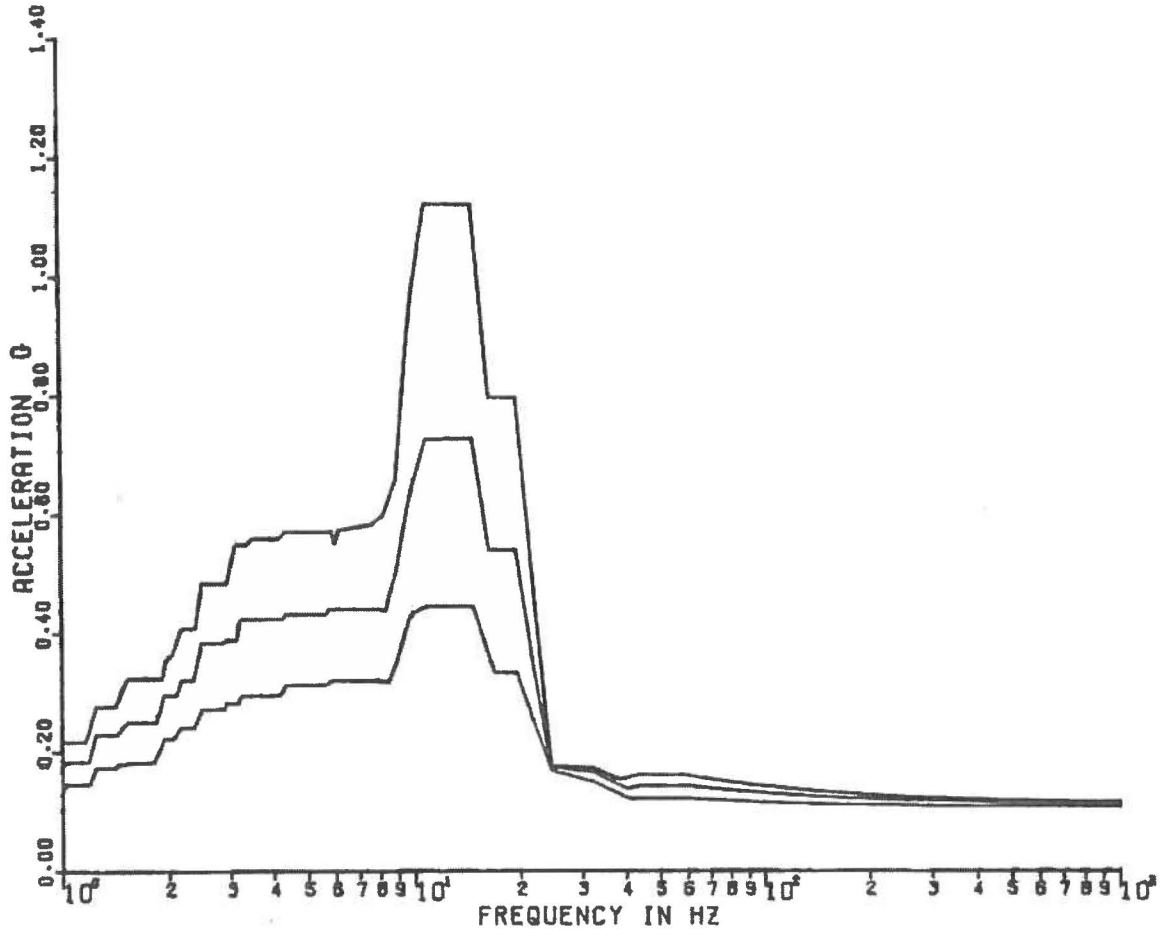
RRS OF ACC. PRIMARY CONT.
(ELEV 196.67 FT)

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SEISMIC (OBE)

DAMPING VALUES = 0.010
0.020
0.040

VER DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

FIGURE 3.9A-7

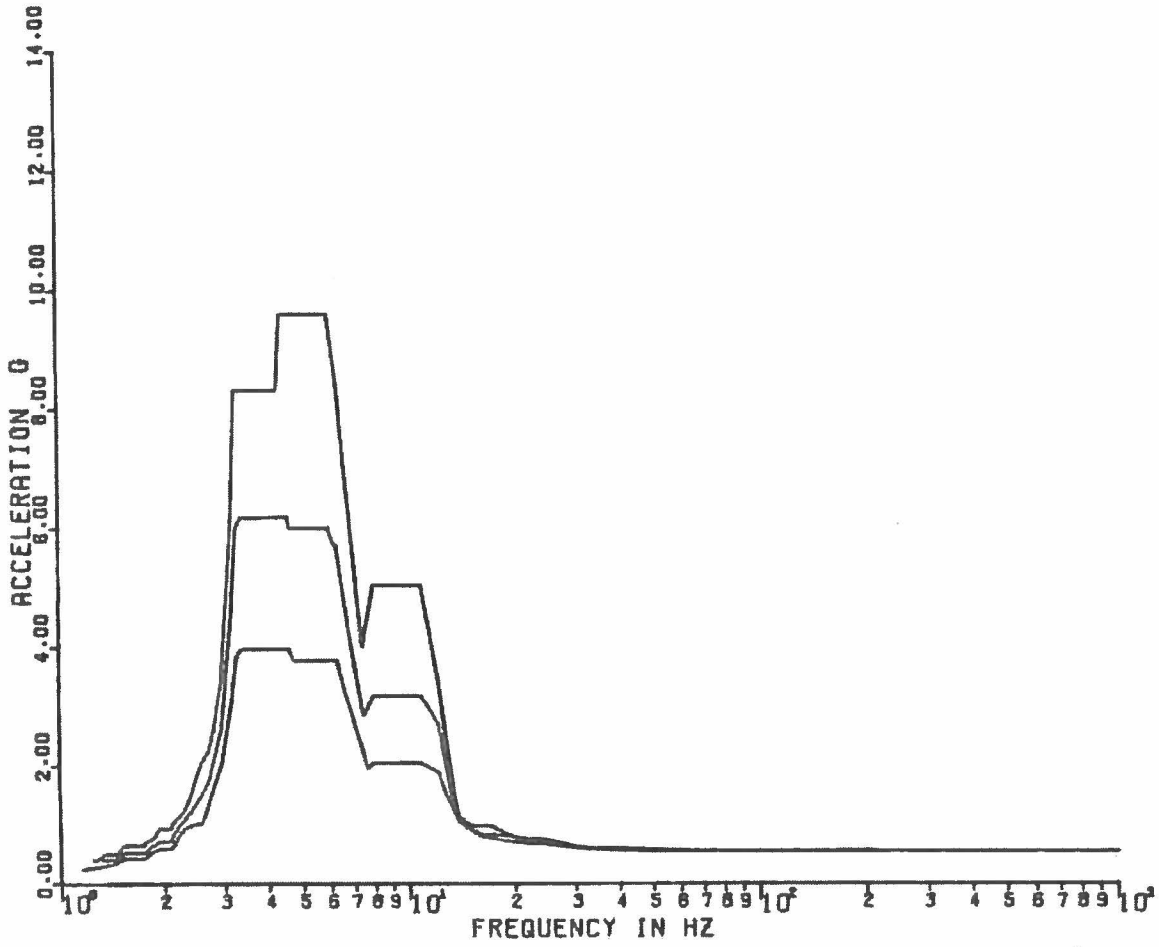
RRS OF ACC. PRIMARY CONT.
(ELEV 196.67 FT)

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SEISMIC (OBE)

DAMPING VALUES = 0.010
0.020
0.040

HOR DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

FIGURE 3.9A-8

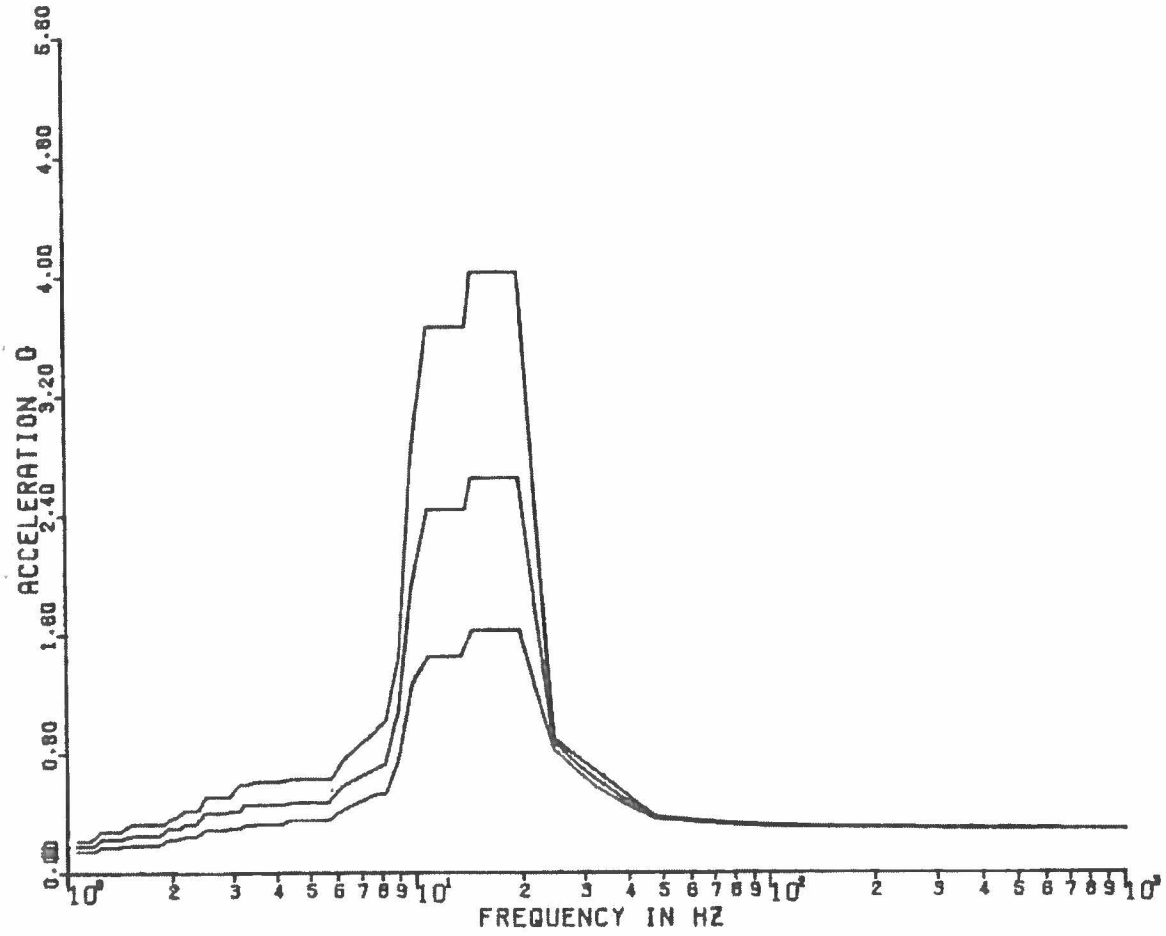
RRS OF ACC. SHIELD WALL
(ELEV 315.08 FT)

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SEISMIC (OBE)

DAMPING VALUES = 0.010
0.020
0.040

VER DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

FIGURE 3.9A-9

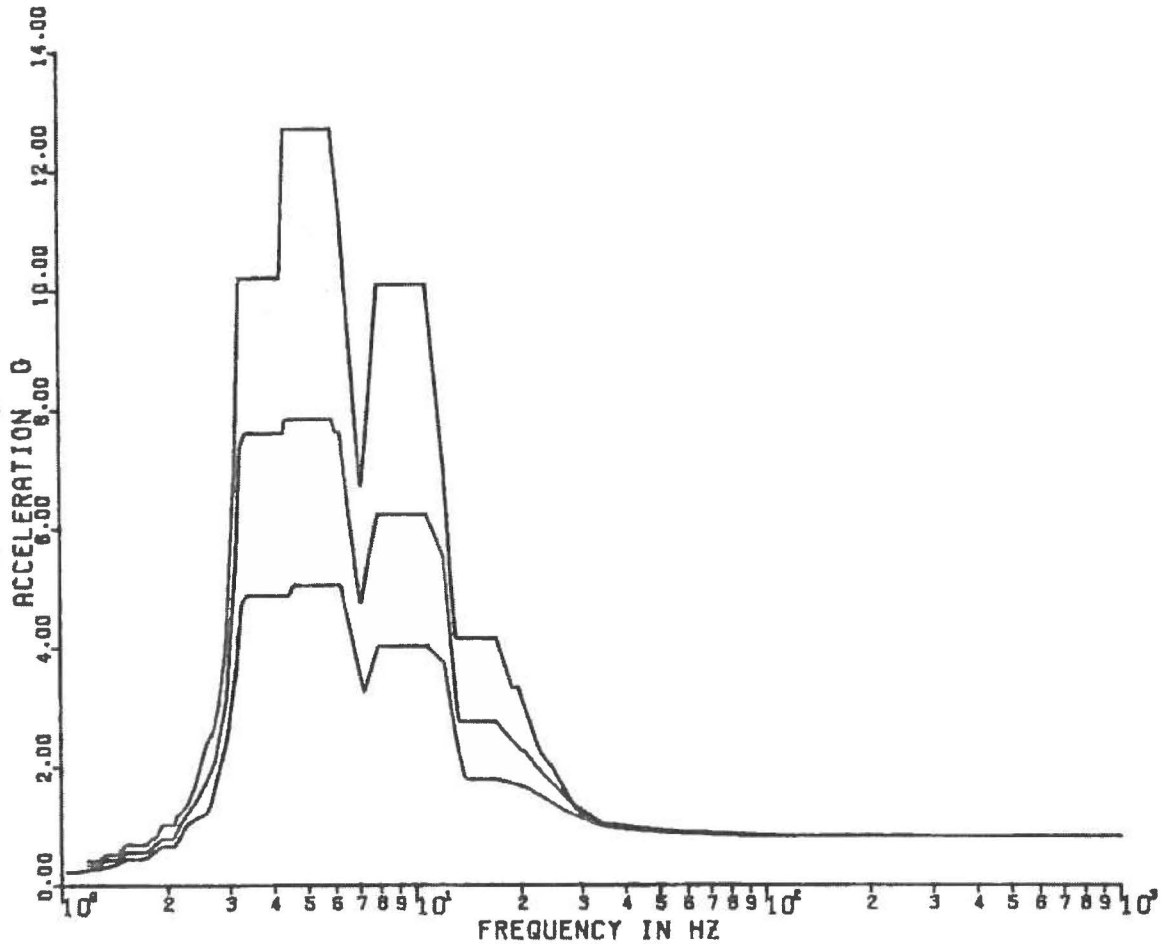
RRS OF ACC. SHIELD WALL
(ELEV 315.08 FT)

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SEISMIC (OBE)

DAMPING VALUES = 0.010
0.020
0.040

HOR DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

FIGURE 3.9A-10

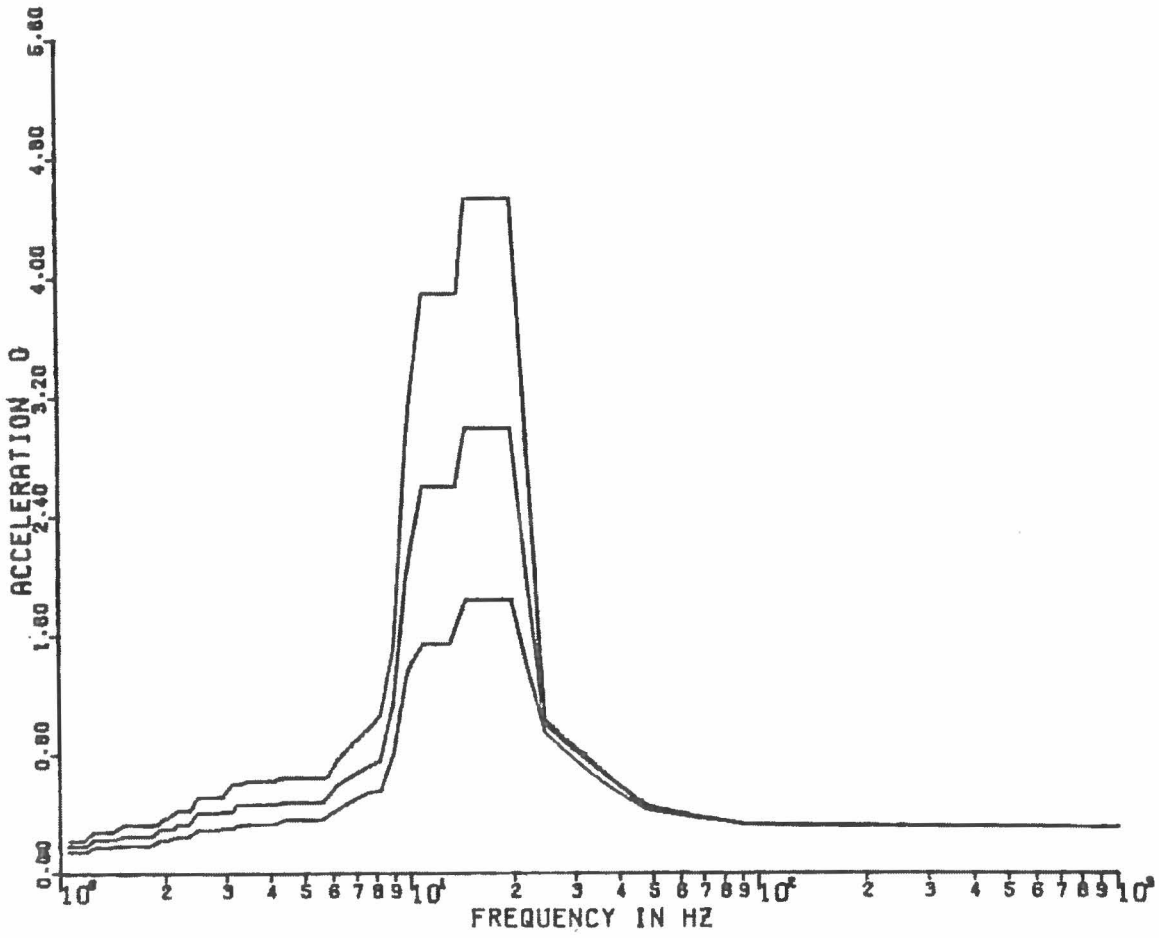
RRS OF ACC. RPV SHELL
(ELEV 332.70 FT)

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SEISMIC (OBE)

DAMPING VALUES = 0.010
0.020
0.040

VER DIRECTION

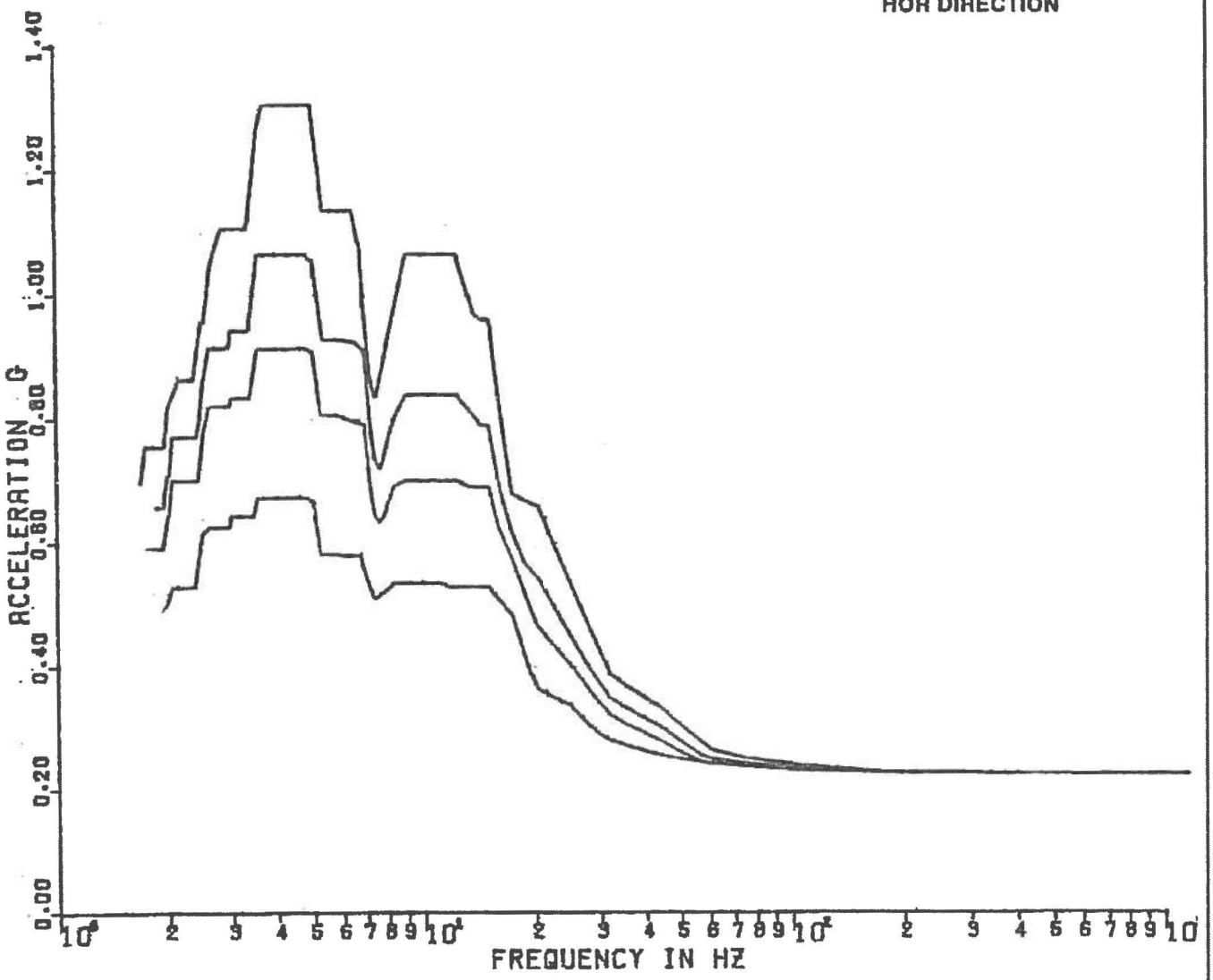


NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

FIGURE 3.9A-11

RRS OF ACC. RPV SHELL
(ELEV 332.70 FT)

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT



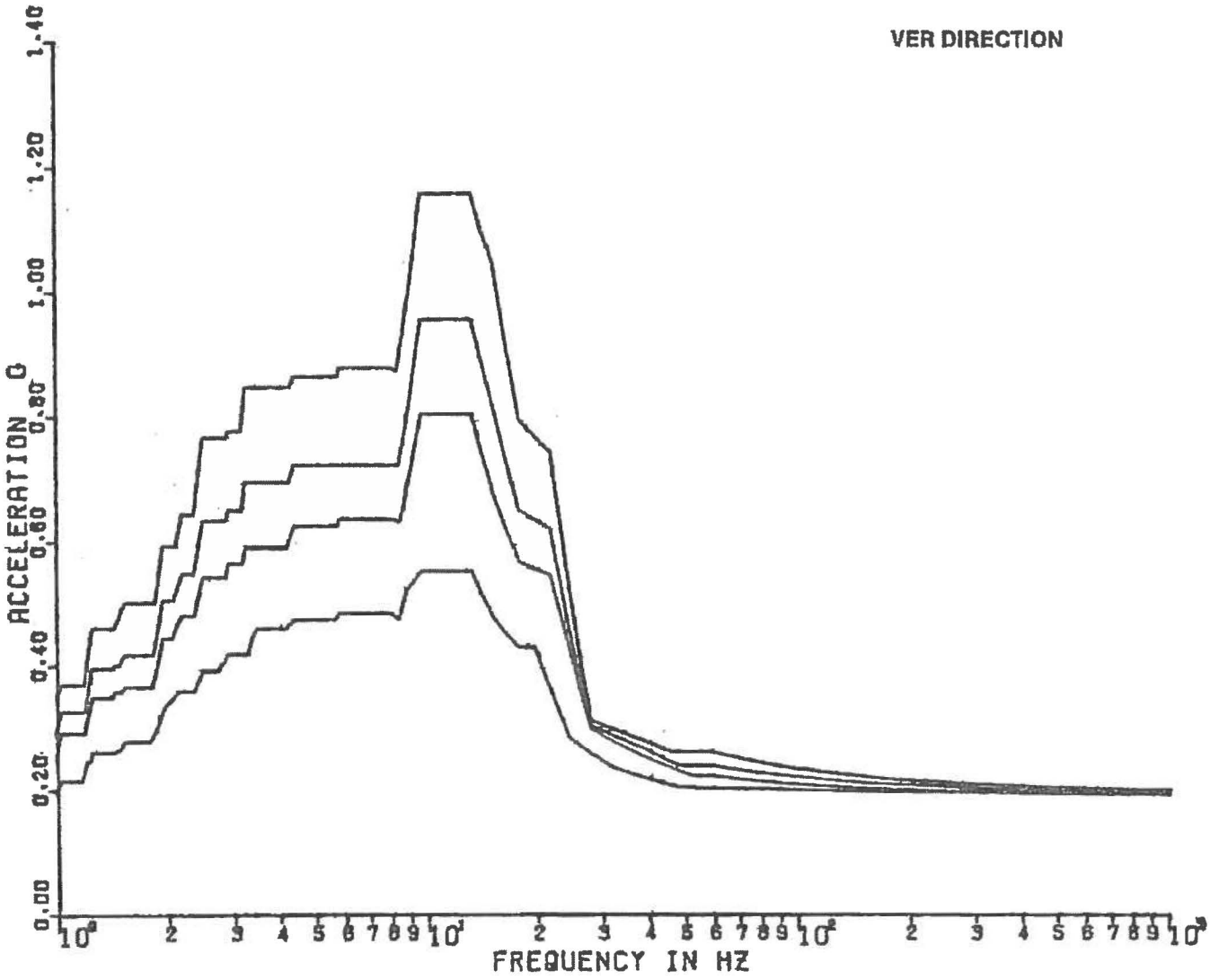
NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

(SOURCE DOCUMENT: MS-1765 REV. 01)

FIGURE 3.9A-12

RRS OF ACC. PRIMARY CONT.
(ELEV 196.67 FT)

NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

(SOURCE DOCUMENT: MS-1765 REV. 01)

FIGURE 3.9A-13

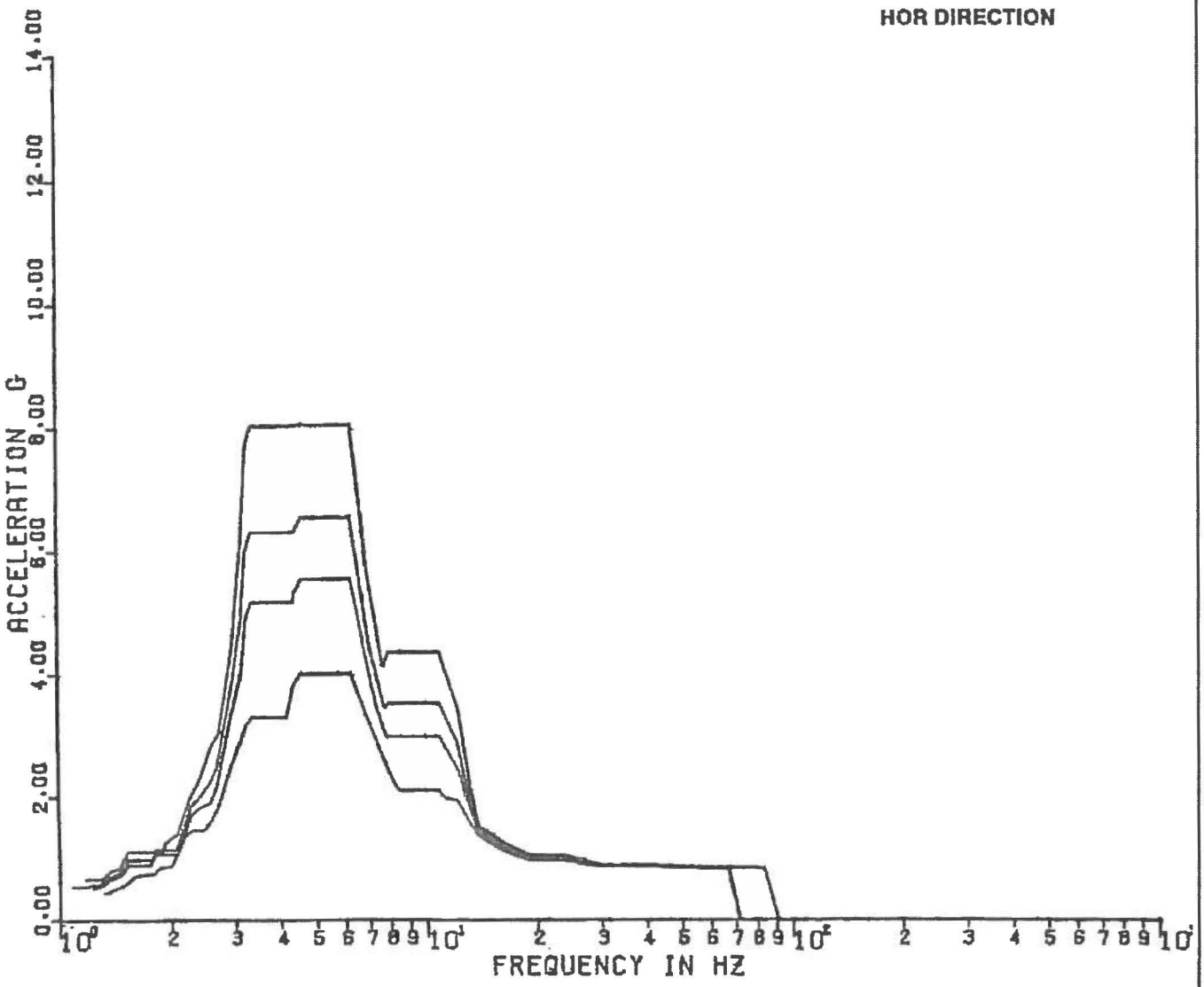
RRS OF ACC. PRIMARY CONT.
(ELEV 196.67 FT)

NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SEISMIC (SSE)

DAMPING VALUES= 0.020
0.030
0.040
0.070

HOR DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

(SOURCE DOCUMENT: MS-1765 REV. 01)

FIGURE 3.9A-14

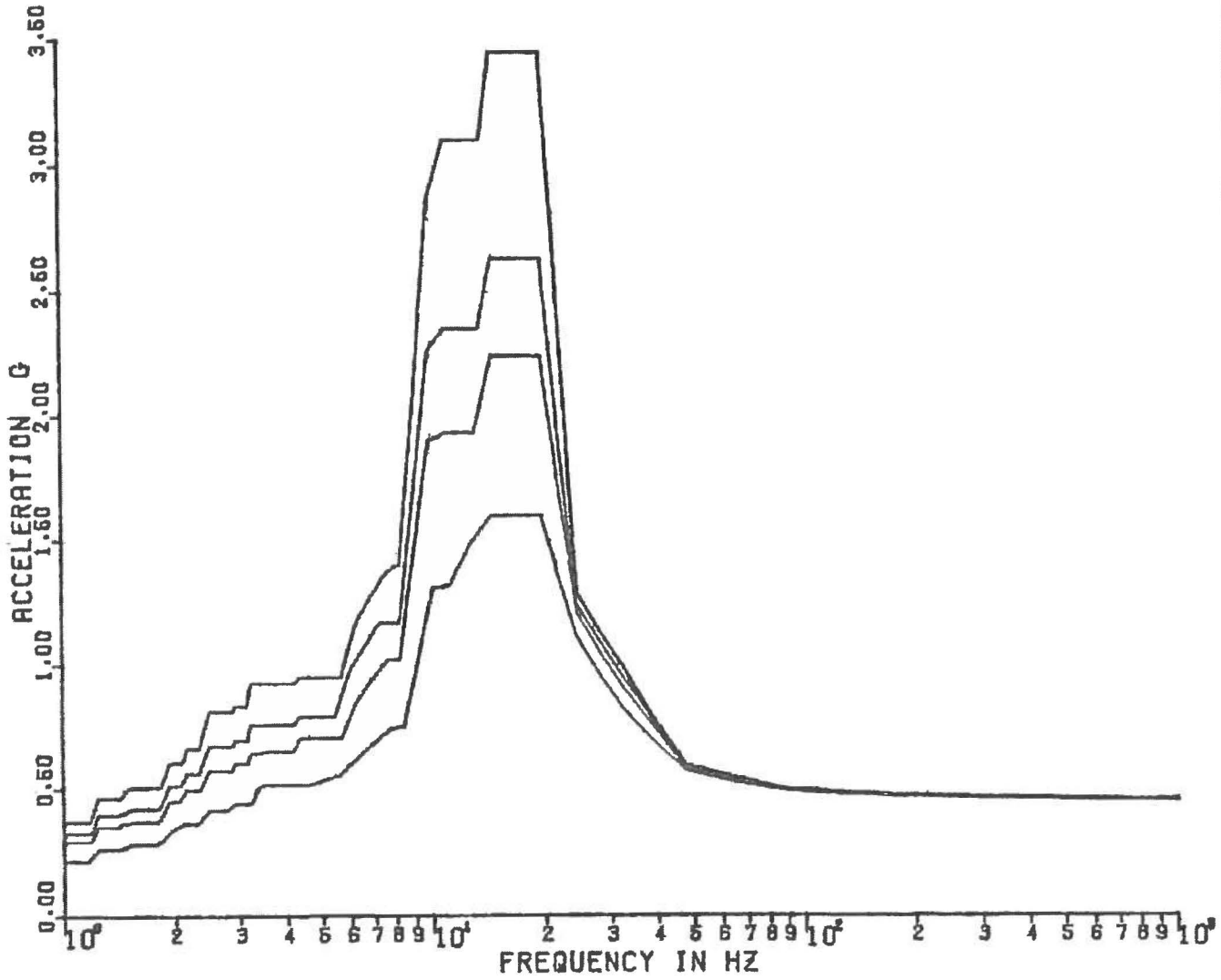
RRS OF ACC. SHIELD WALL
(ELEV 315.08 FT)

NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SEISMIC (SSE)

DAMPING VALUES= 0.020
0.030
0.040
0.070

VER DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

(SOURCE DOCUMENT: MS-1765 REV. 01)

FIGURE 3.9A-15

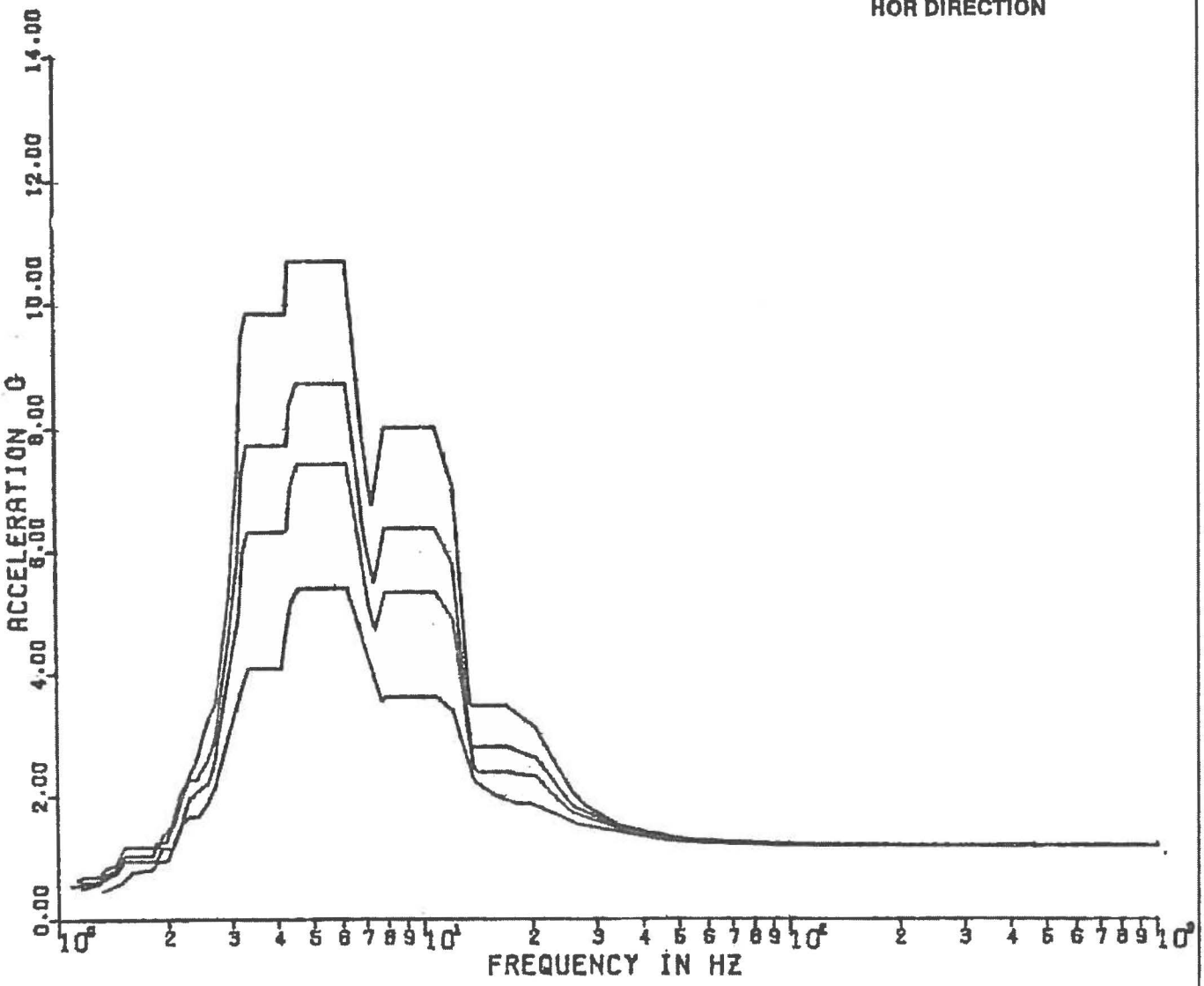
RRS OF ACC. SHIELD WALL
(ELEV 315.08 FT)

NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SEISMIC (SSE)

DAMPING VALUES= 0.020
0.030
0.040
0.070

HOR DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

(SOURCE DOCUMENT: MS-1765 REV. 01)

FIGURE 3.9A-16

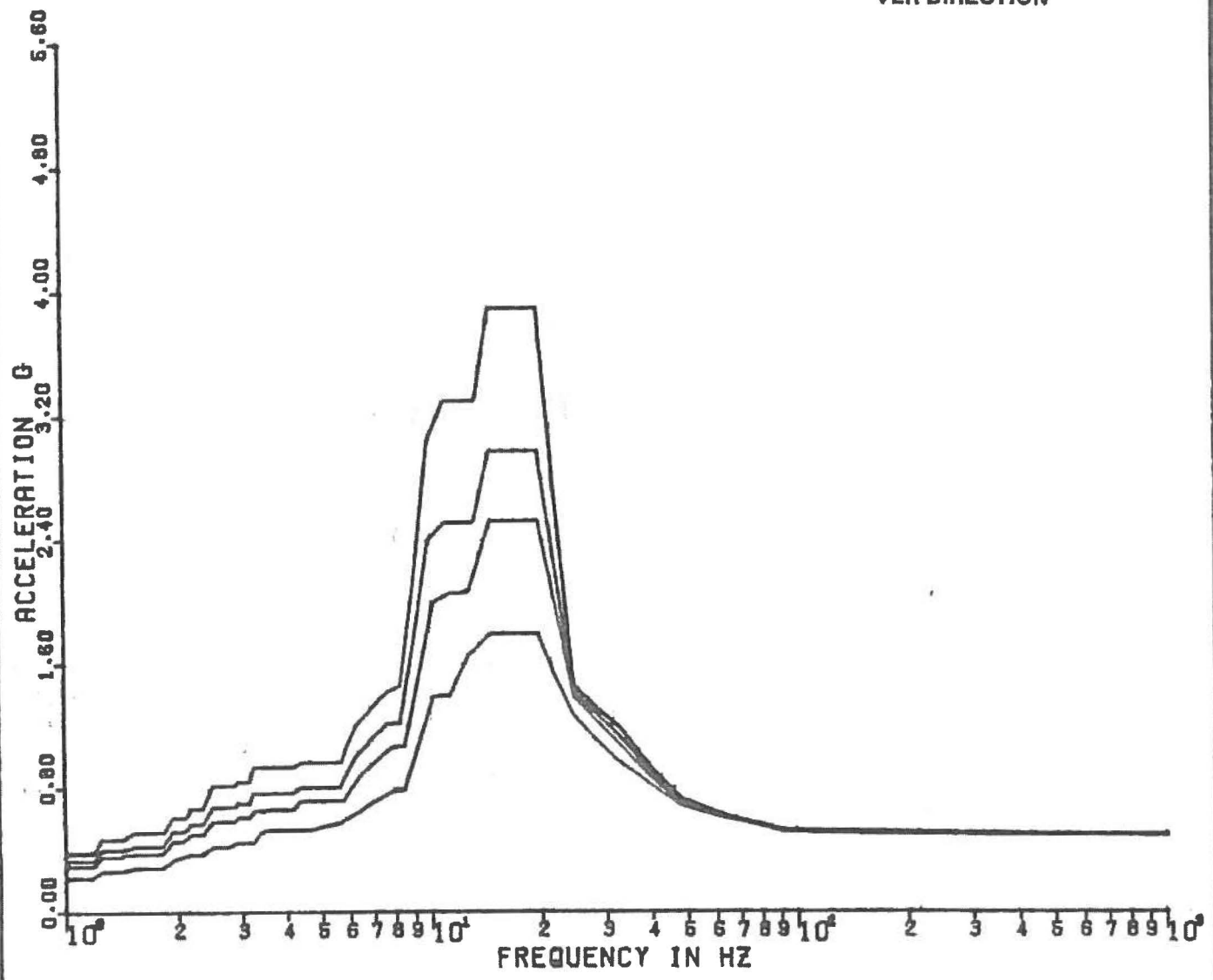
RRS OF ACC. RPV SHELL
(ELEV 332.70 FT)

NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SEISMIC (SSE)

DAMPING VALUES = 0.020
0.030
0.040
0.070

VER DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

FIGURE 3.9A-17

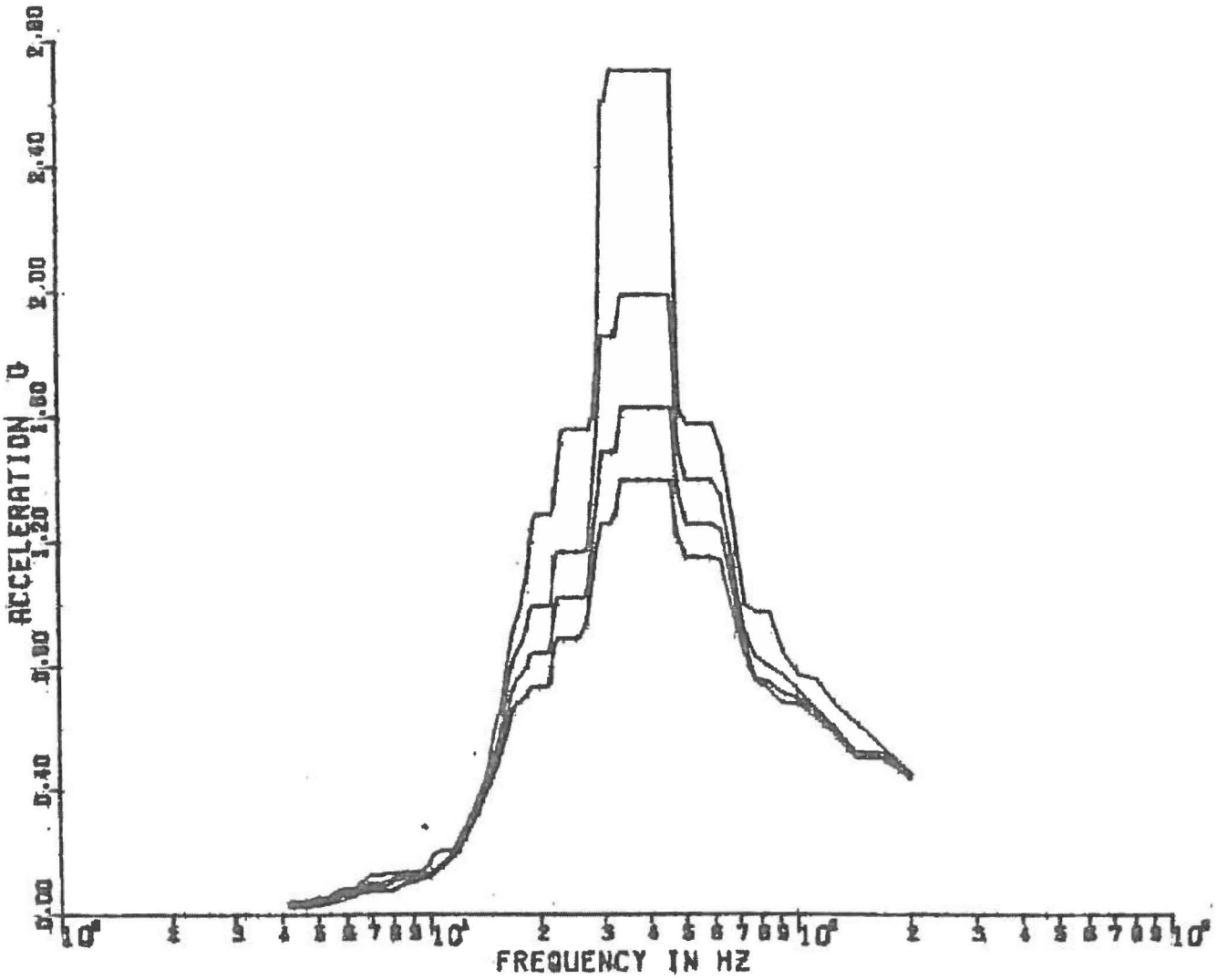
RRS OF ACC. RPV SHELL
(ELEV 332.70 FT)

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SRV(ENV. OF ALL SRV CASES)

DAMPING VALUES= 0.010
0.020
0.030
0.040

HOR DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

(SOURCE DOCUMENT: MS-1748 REV. 00)

FIGURE 3.9A-18

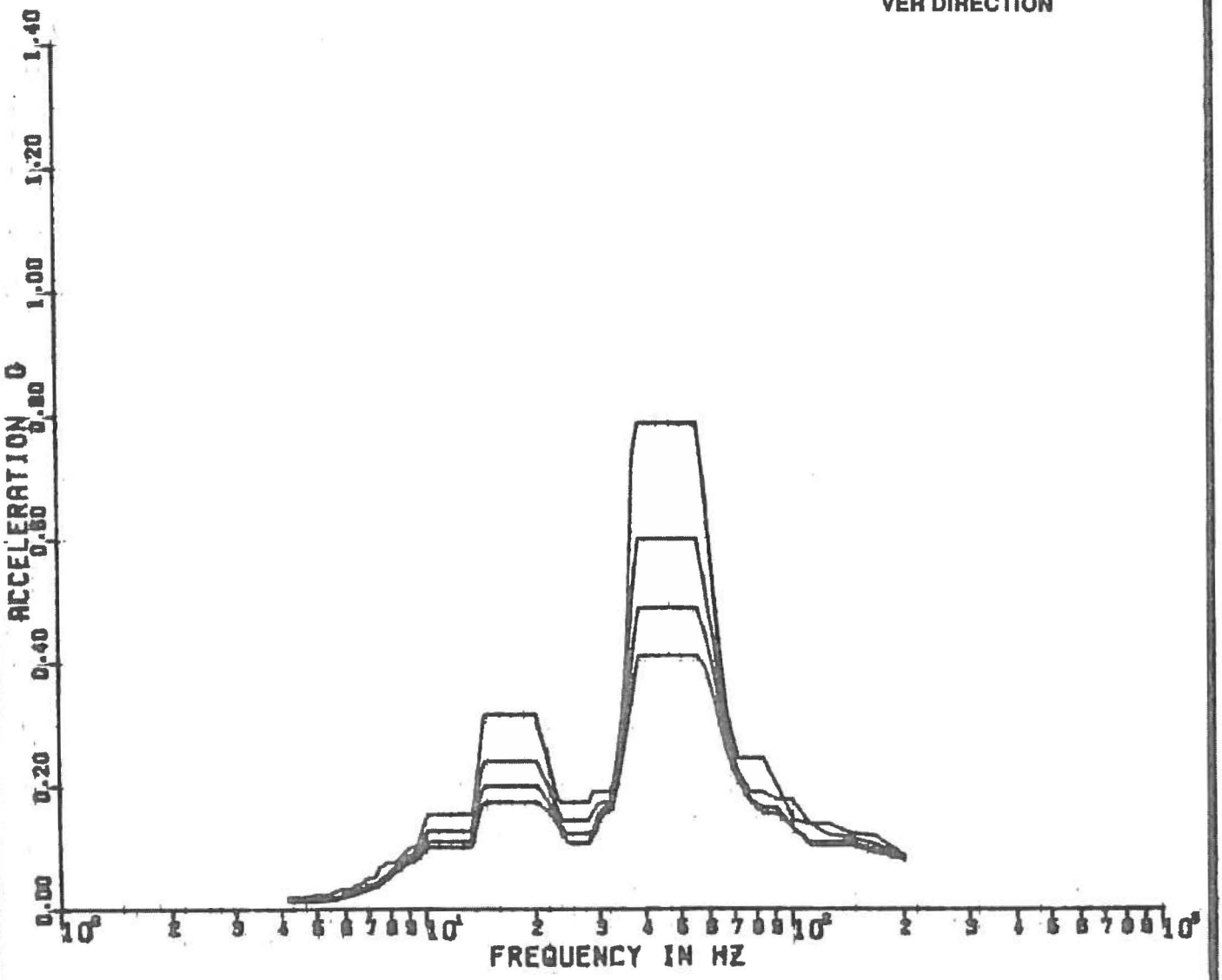
RRS OF ACC. PRIMARY CONT.
(ELEV 206.11 FT)

NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SRV(ENV. OF ALL SRV CASES)

DAMPING VALUES = 0.010
0.020
0.030
0.040

VER DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

FIGURE 3.9A-19

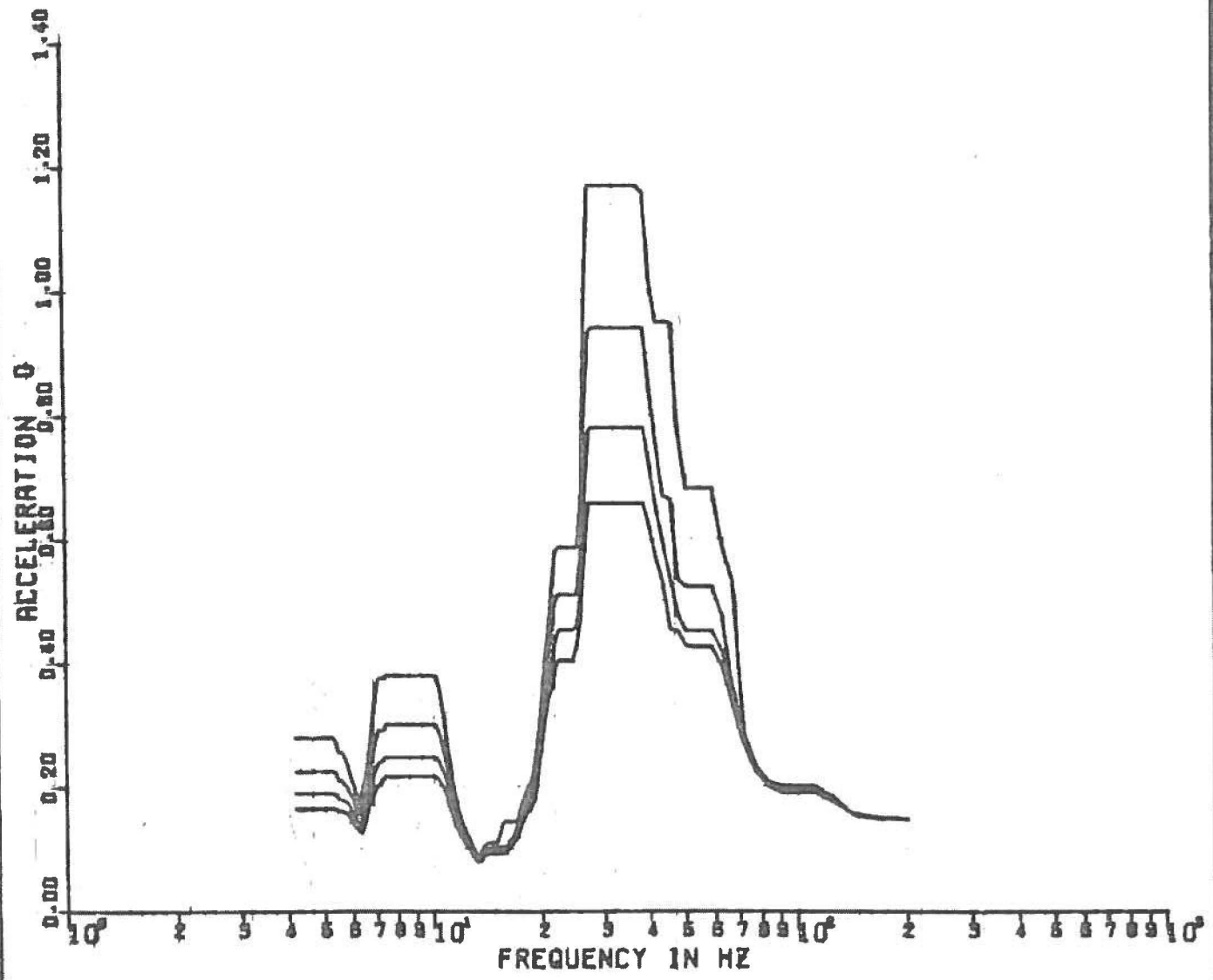
RRS OF ACC. PRIMARY CONT.
(ELEV 206.11 FT)

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SRV(ENV. OF ALL SRV CASES)

DAMPING VALUES = 0.010
0.020
0.030
0.040

HOR DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

FIGURE 3.9A-20

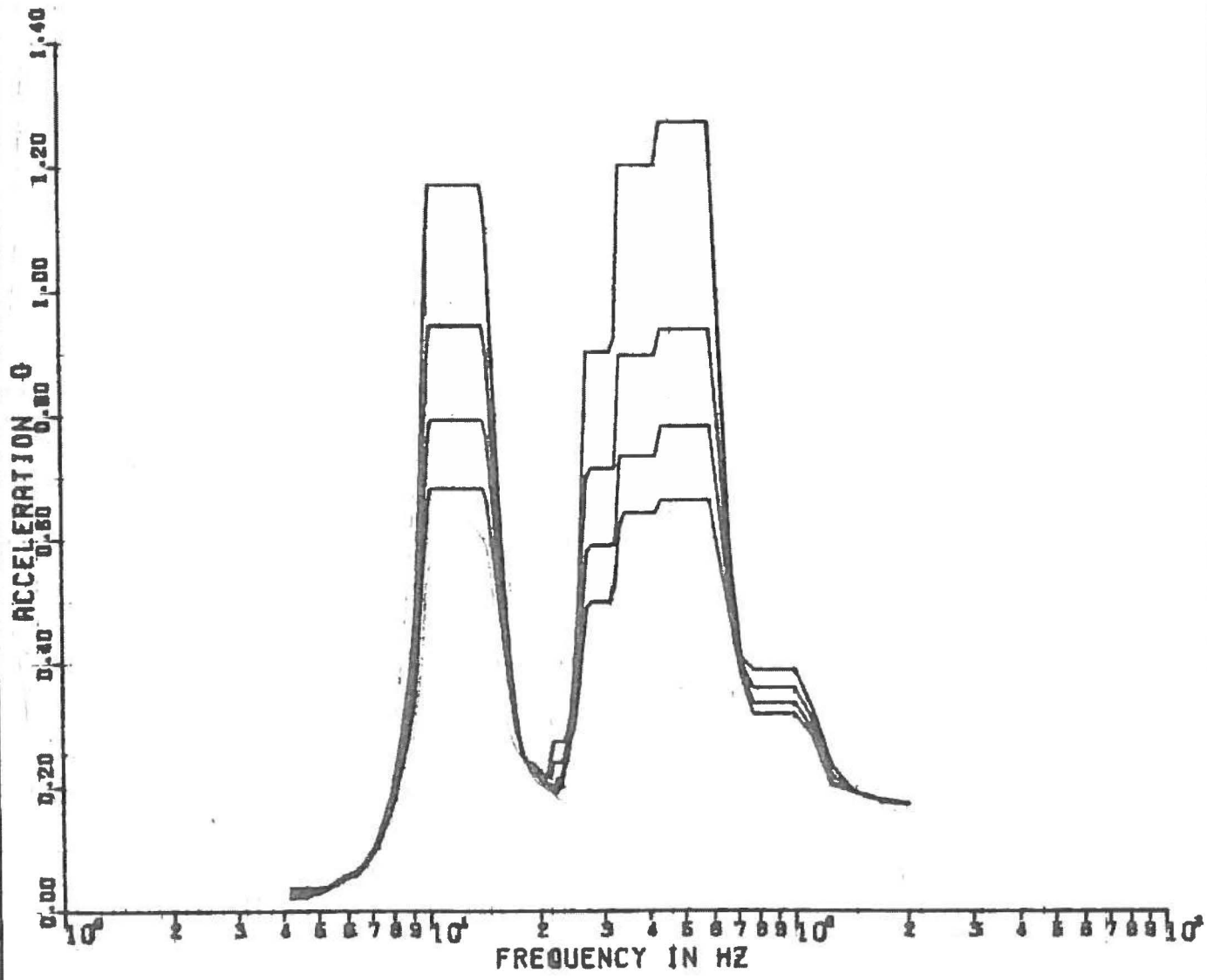
RRS OF ACC. SHIELD WALL OUT
(ELEV 315.23 FT)

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SRV(ENV. OF ALL SRV CASES)

DAMPING VALUES = 0.010
0.020
0.030
0.040

VER DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

FIGURE 3.9A-21

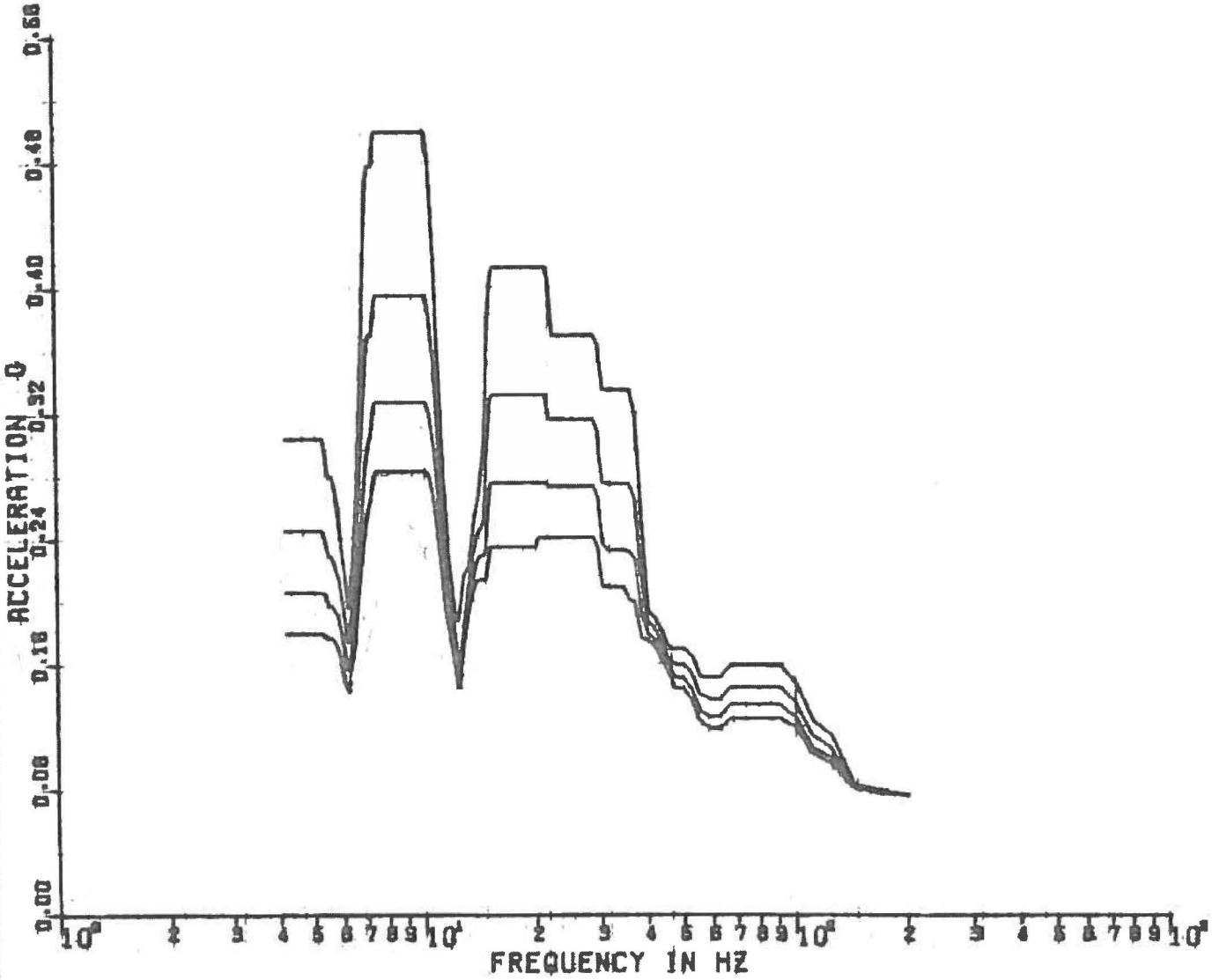
RRS OF ACC. SHIELD WALL OUT
(ELEV 315.23 FT)

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SRV(ENV. OF ALL SRV CASES)

DAMPING VALUES = 0.010
0.020
0.030
0.040

HOR DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

FIGURE 3.9A - 22

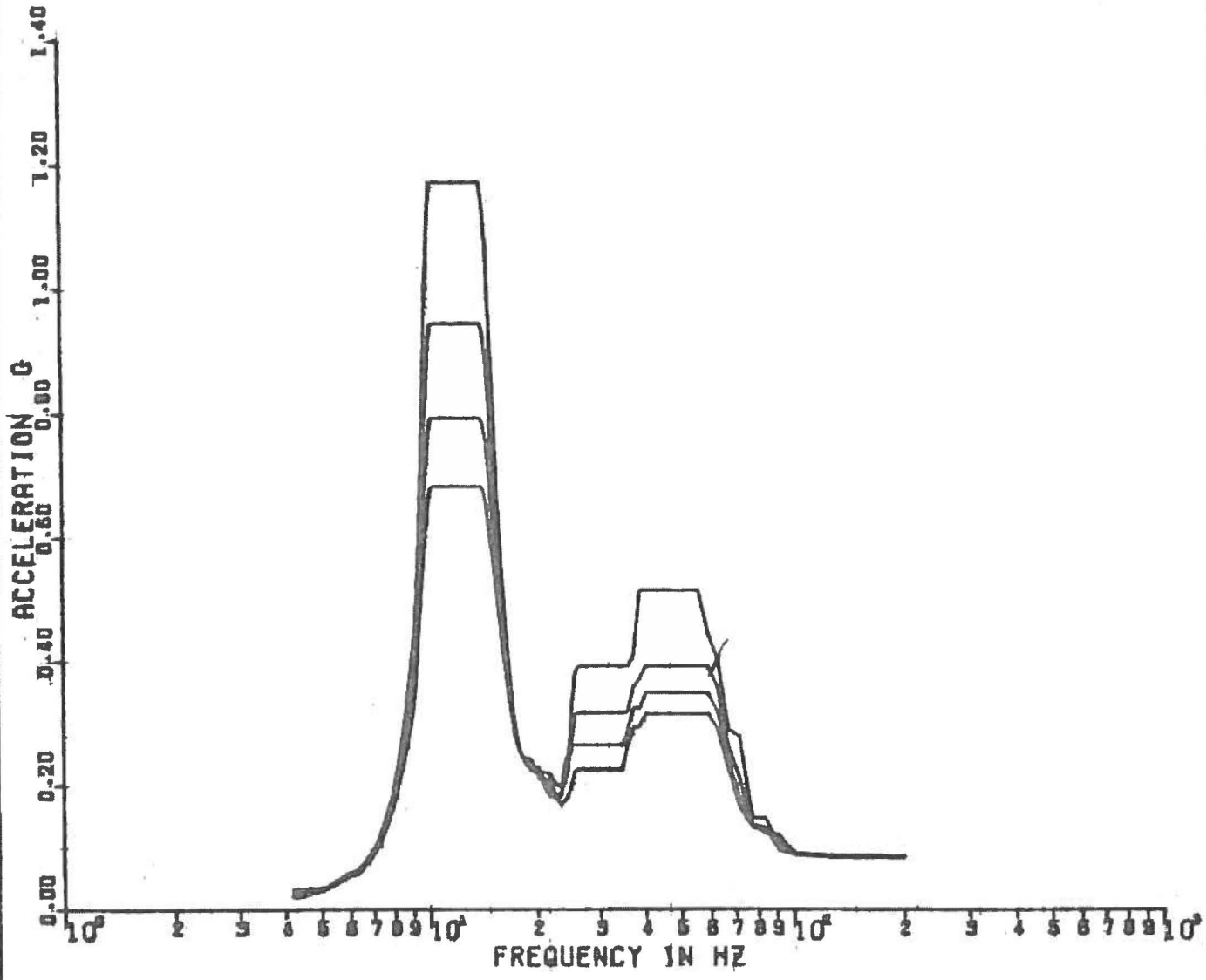
RRS OF ACC. RPV SHELL
(ELEV 315.08 FT)

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SRV(ENV. OF ALL SRV CASES)

DAMPING VALUES = 0.010
0.020
0.030
0.040

VER DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

FIGURE 3.9A-23

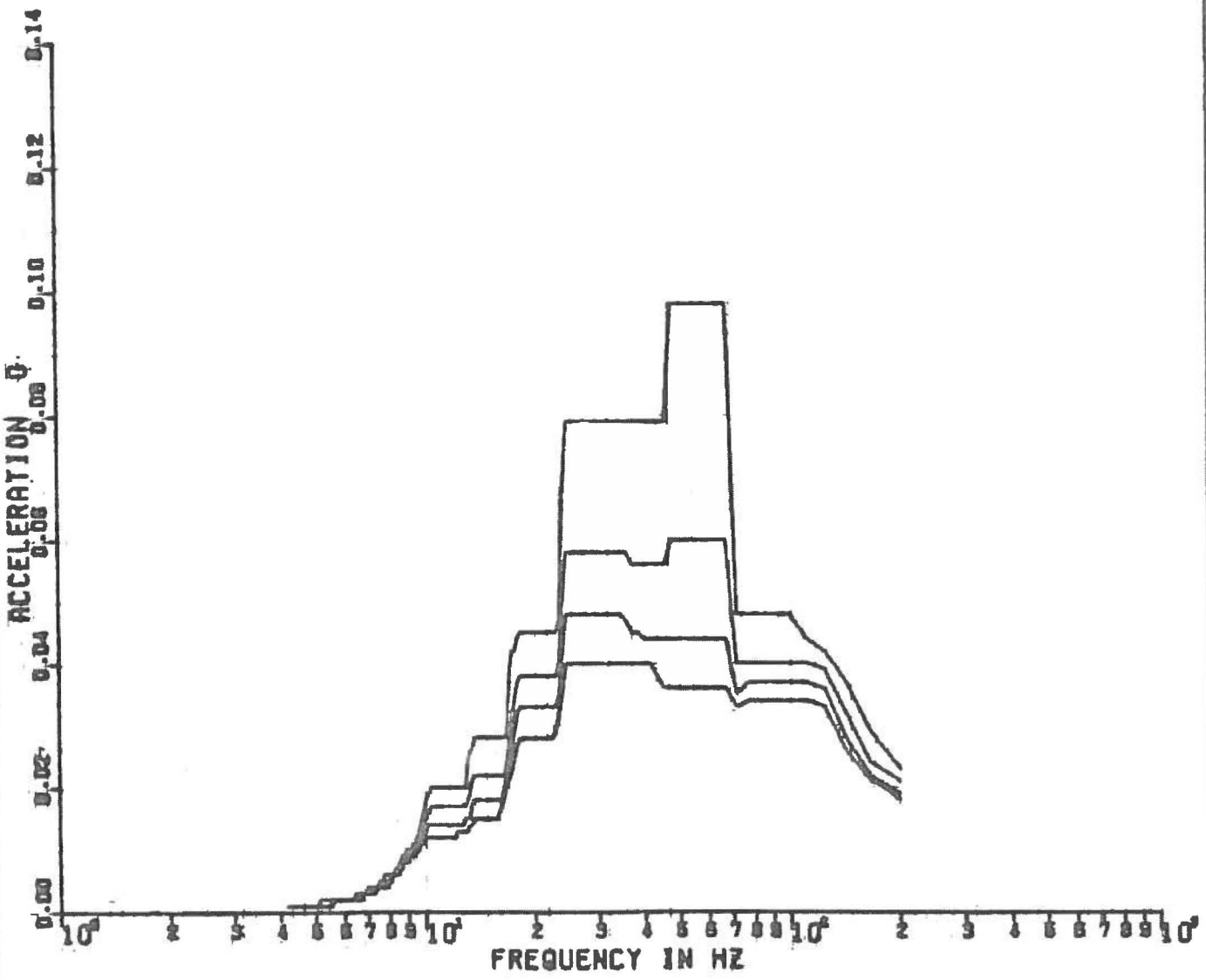
RRS OF ACC. RPV SHELL
(ELEV 315.08 FT)

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SRV(ENV. OF ALL SRV CASES)

DAMPING VALUES = 0.010
0.020
0.030
0.040

HOR DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

FIGURE 3.9A-24

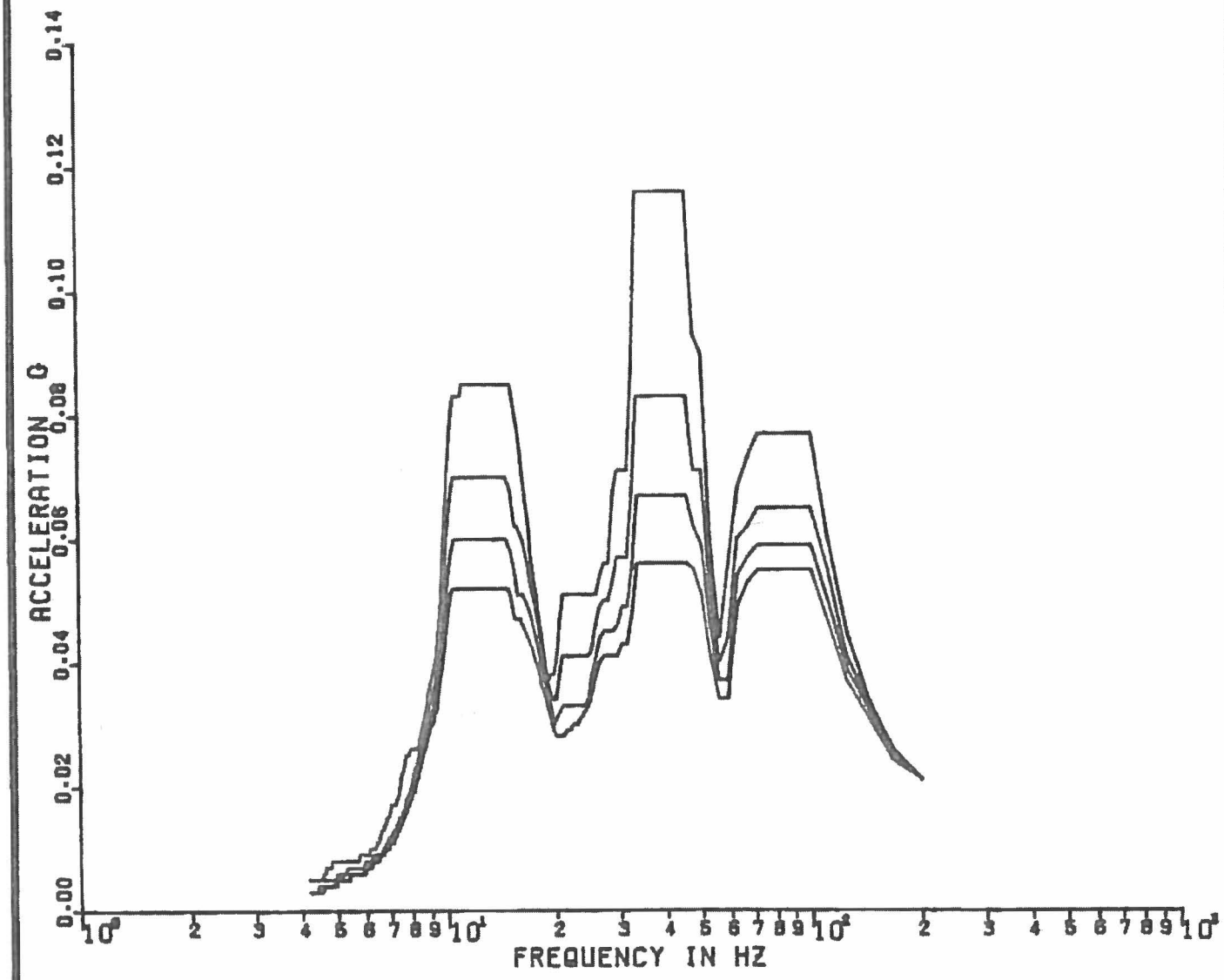
RRS OF ACC. SECONDARY CONT.
(ELEV 175) AT MAT

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SRV(ENV. OF ALL SRV CASES)

DAMPING VALUES = 0.010
0.020
0.030
0.040

VER DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

FIGURE 3.9A-25

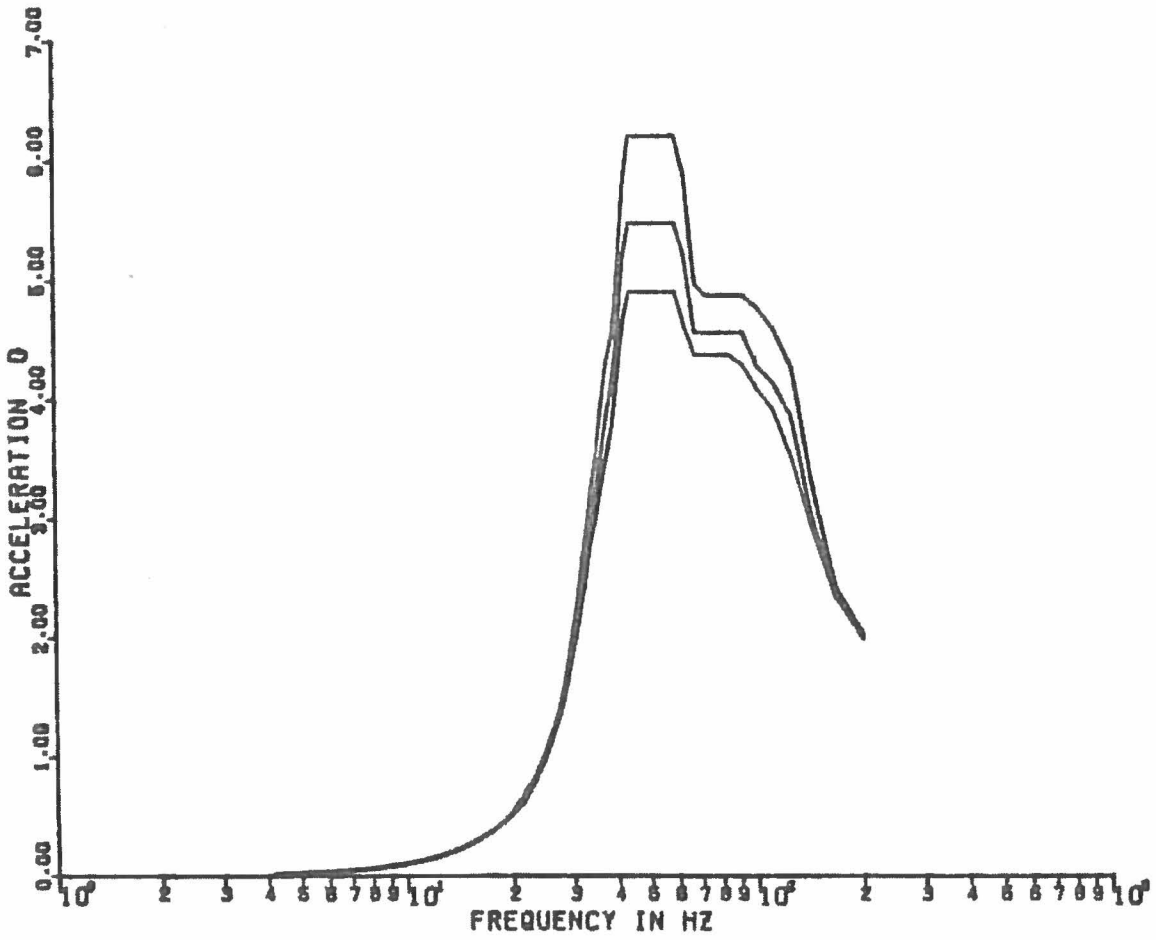
RRS OF ACC. SECONDARY CONT.
(ELEV 175) AT MAT

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

CHUGGING LOADING CASE

DAMPING VALUES = 0.020
0.030
0.040

HOR DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

FIGURE 3.9A-26

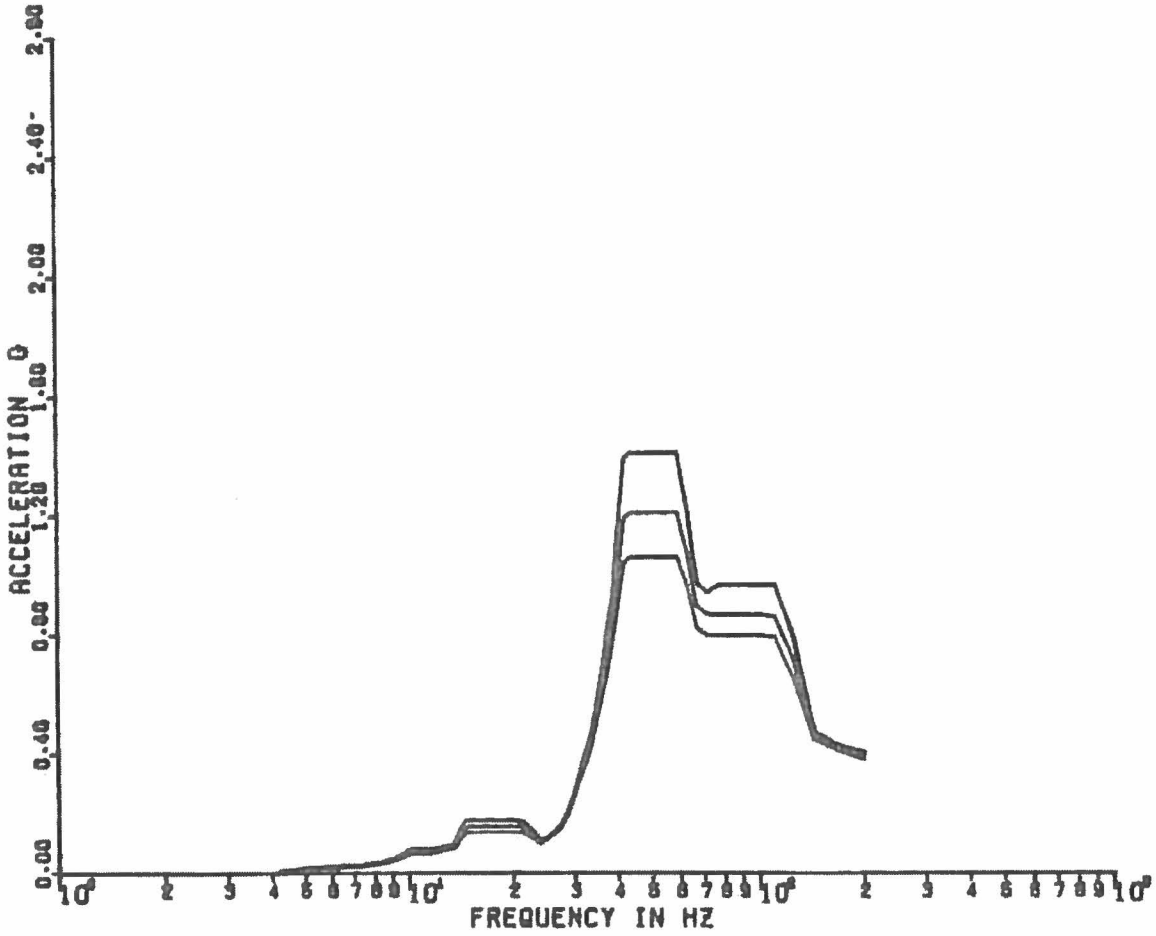
RRS OF ACC. PRIMARY CONT.
(ELEV 206.11 FT)

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

CHUGGING LOADING CASE

DAMPING VALUES = 0.020
0.030
0.040

VER DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

FIGURE 3.9A -27

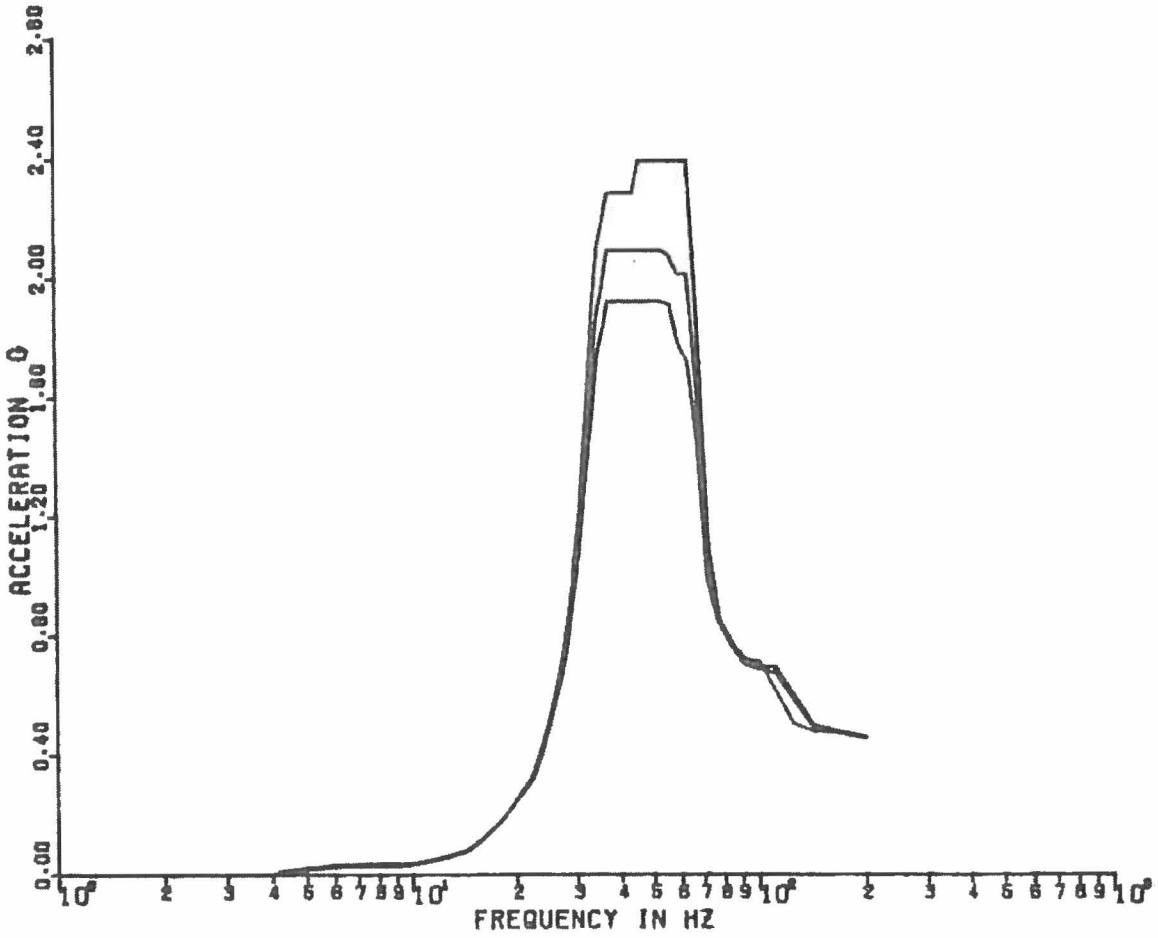
RRS OF ACC. PRIMARY CONT.
(ELEV 206.11 FT)

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

CHUGGING LOADING CASE

DAMPING VALUES = 0.020
0.030
0.040

HOR DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

FIGURE 3.9A-28

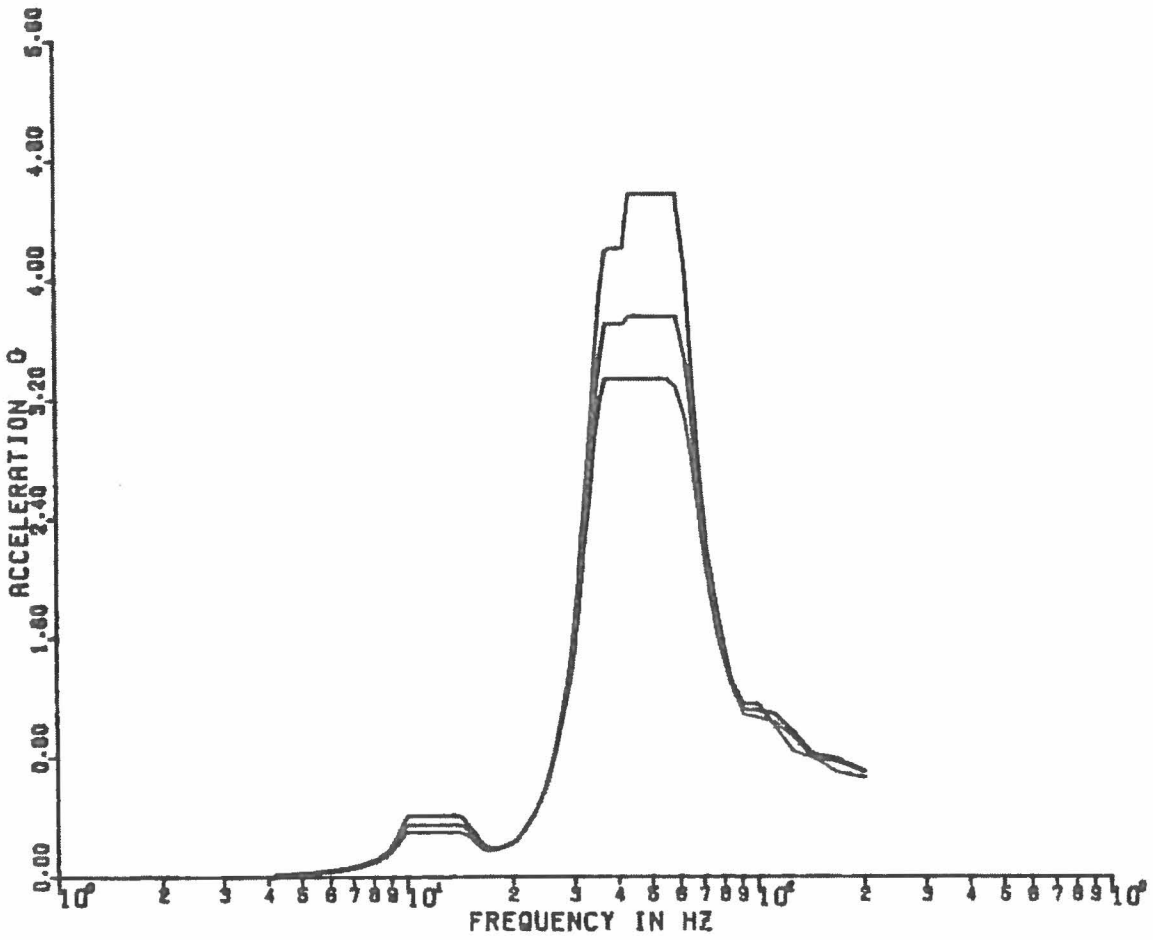
RRS OF ACC. SHIELD WALL OUT
(ELEV 315.23 FT)

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

CHUGGING LOADING CASE

DAMPING VALUES = 0.020
0.030
0.040

VER DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

FIGURE 3.9A – 29

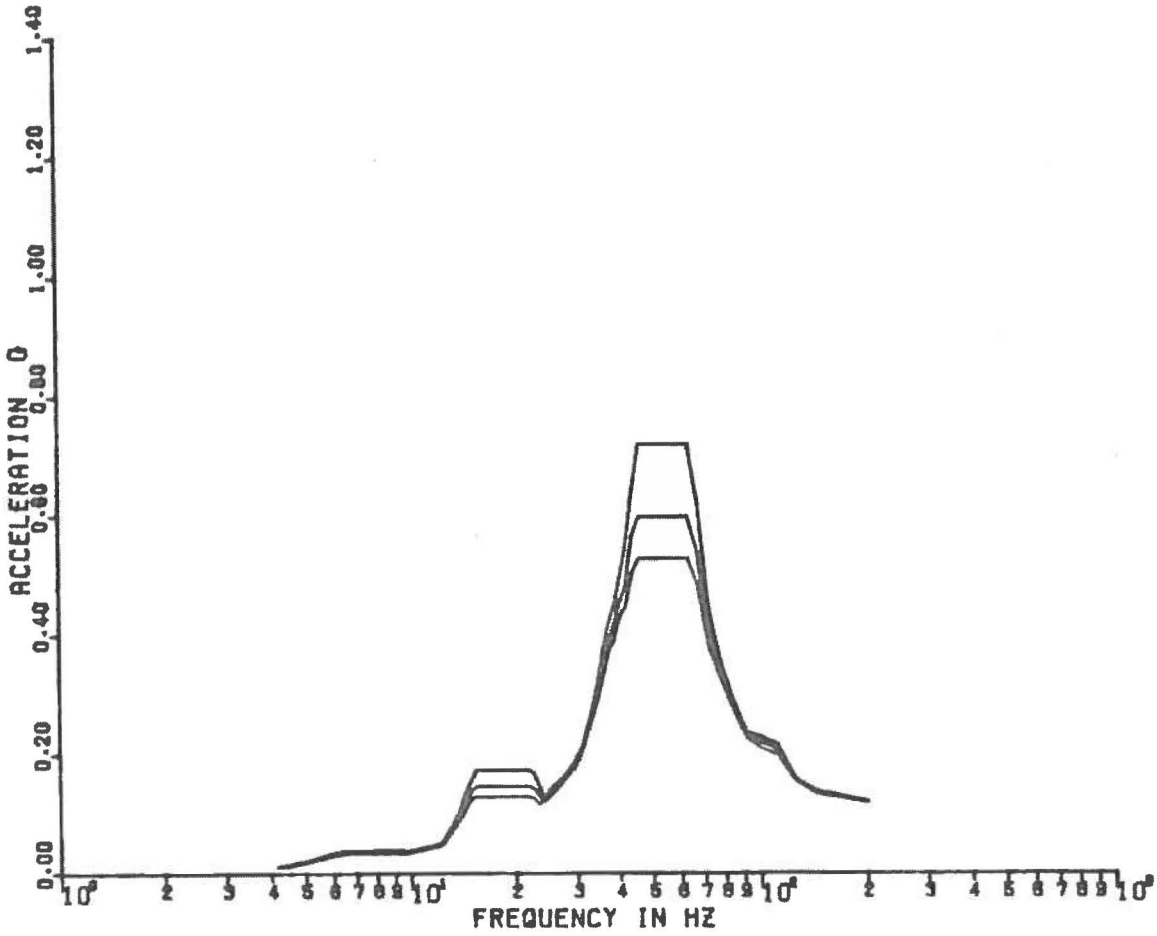
RRS OF ACC. SHIELD WALL OUT
(ELEV 315.23 FT)

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

CHUGGING LOADING CASE

DAMPING VALUES = 0.020
0.030
0.040

HOR DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

FIGURE 3.9A-30

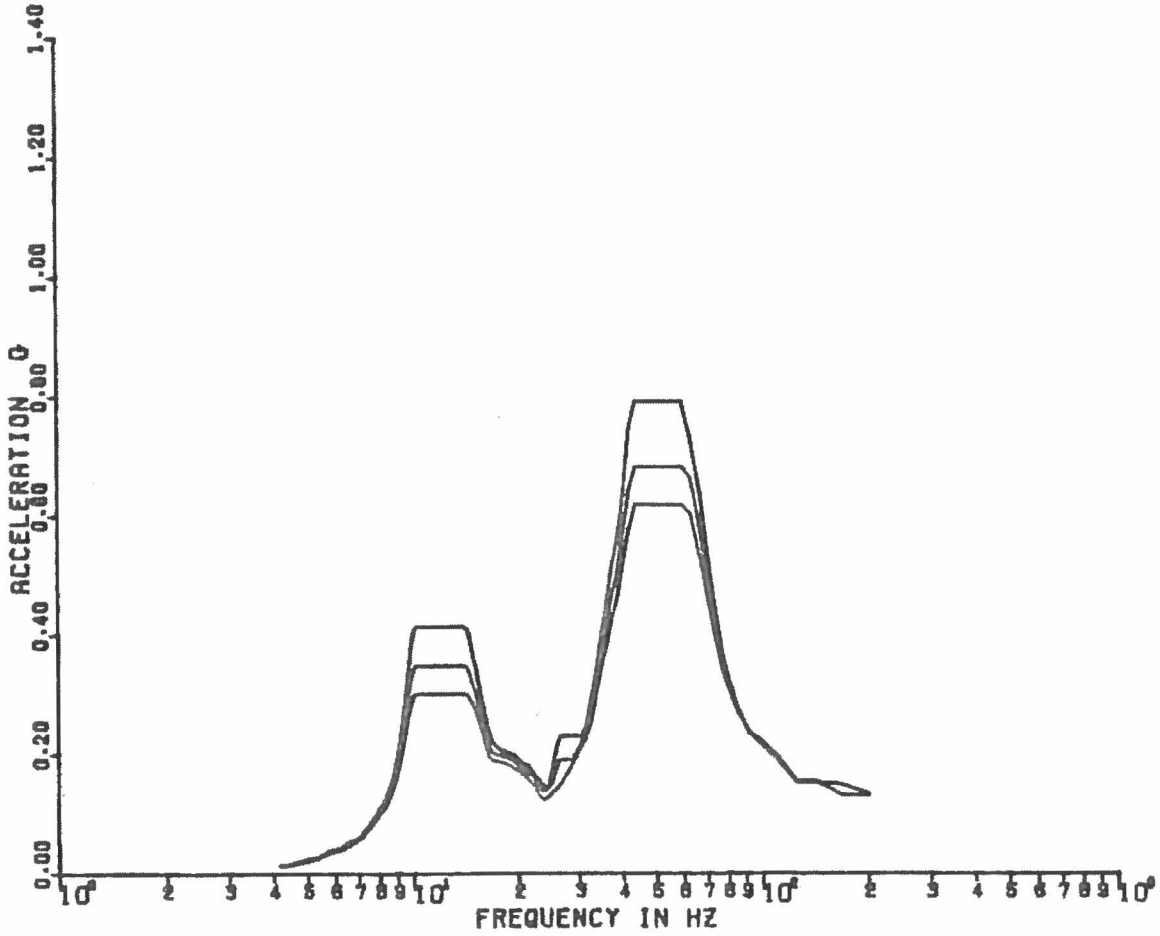
RRS OF ACC. RPV SHELL
(ELEV 315.08 FT)

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

CHUGGING LOADING CASE

DAMPING VALUES = 0.020
0.030
0.040

VER DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

FIGURE 3.9A-31

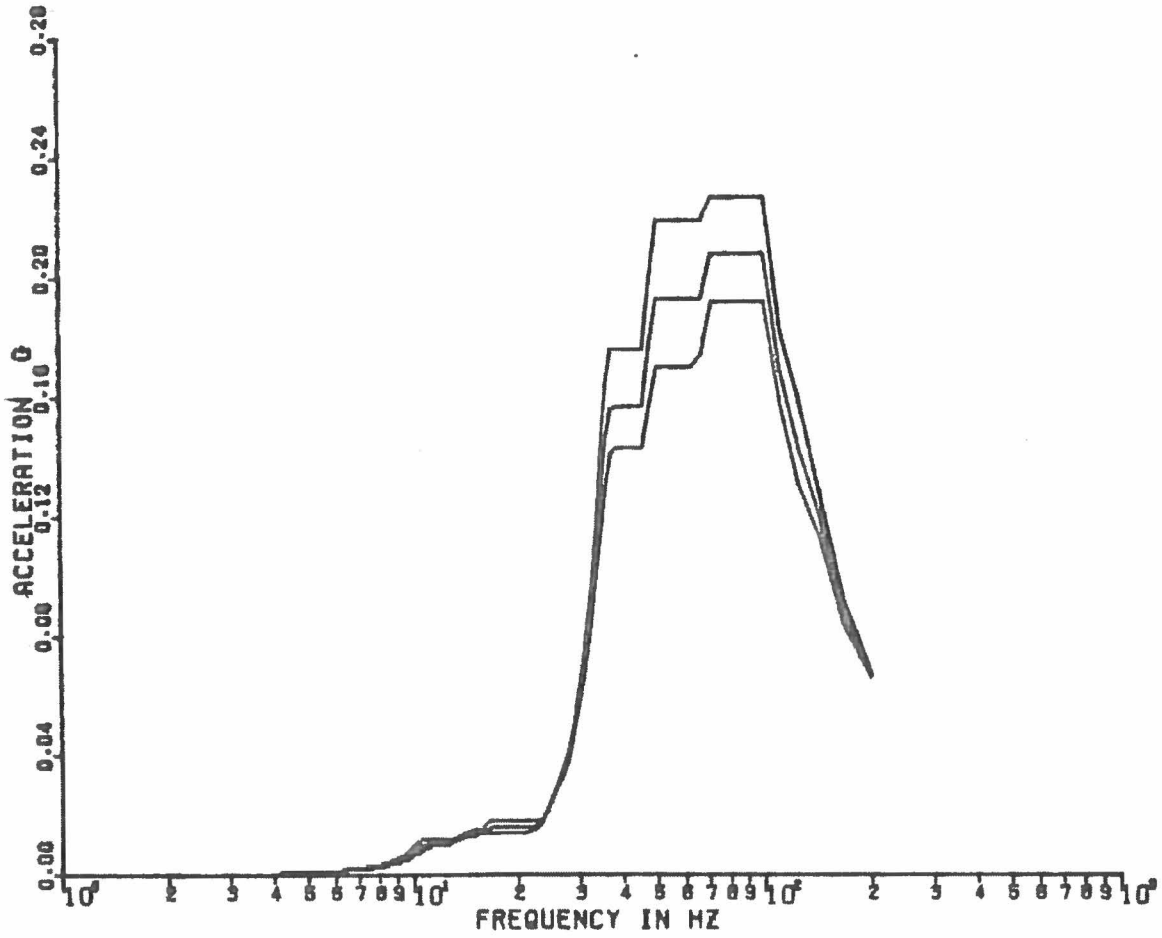
RRS OF ACC. RPV SHELL
(ELEV 315.08 FT)

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

CHUGGING LOADING CASE

DAMPING VALUES = 0.020
0.030
0.040

HOR DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

FIGURE 3.9A-32

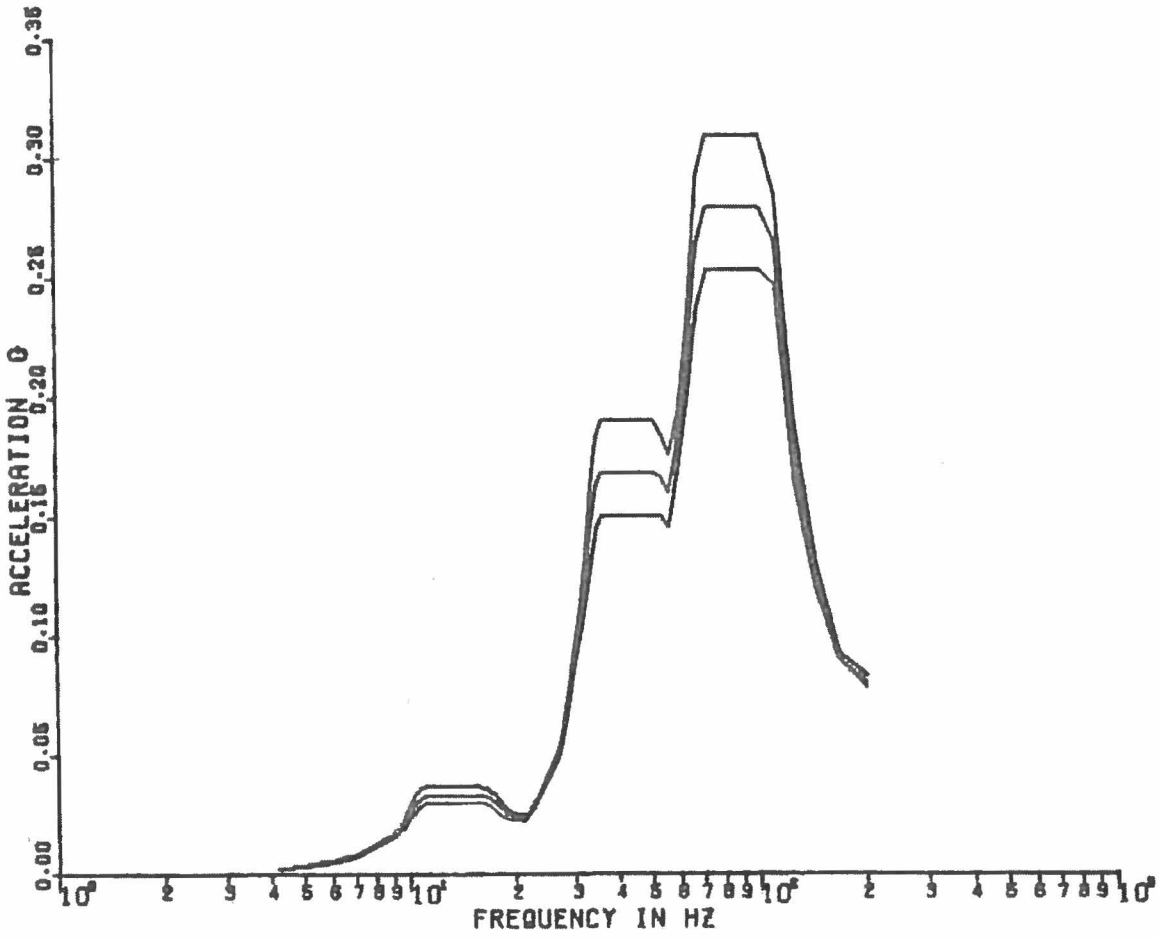
RRS OF ACC. SECONDARY CONT.
(ELEV 175) AT MAT

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

CHUGGING LOADING CASE

DAMPING VALUES = 0.020
0.030
0.040

VER DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

FIGURE 3.9A-33

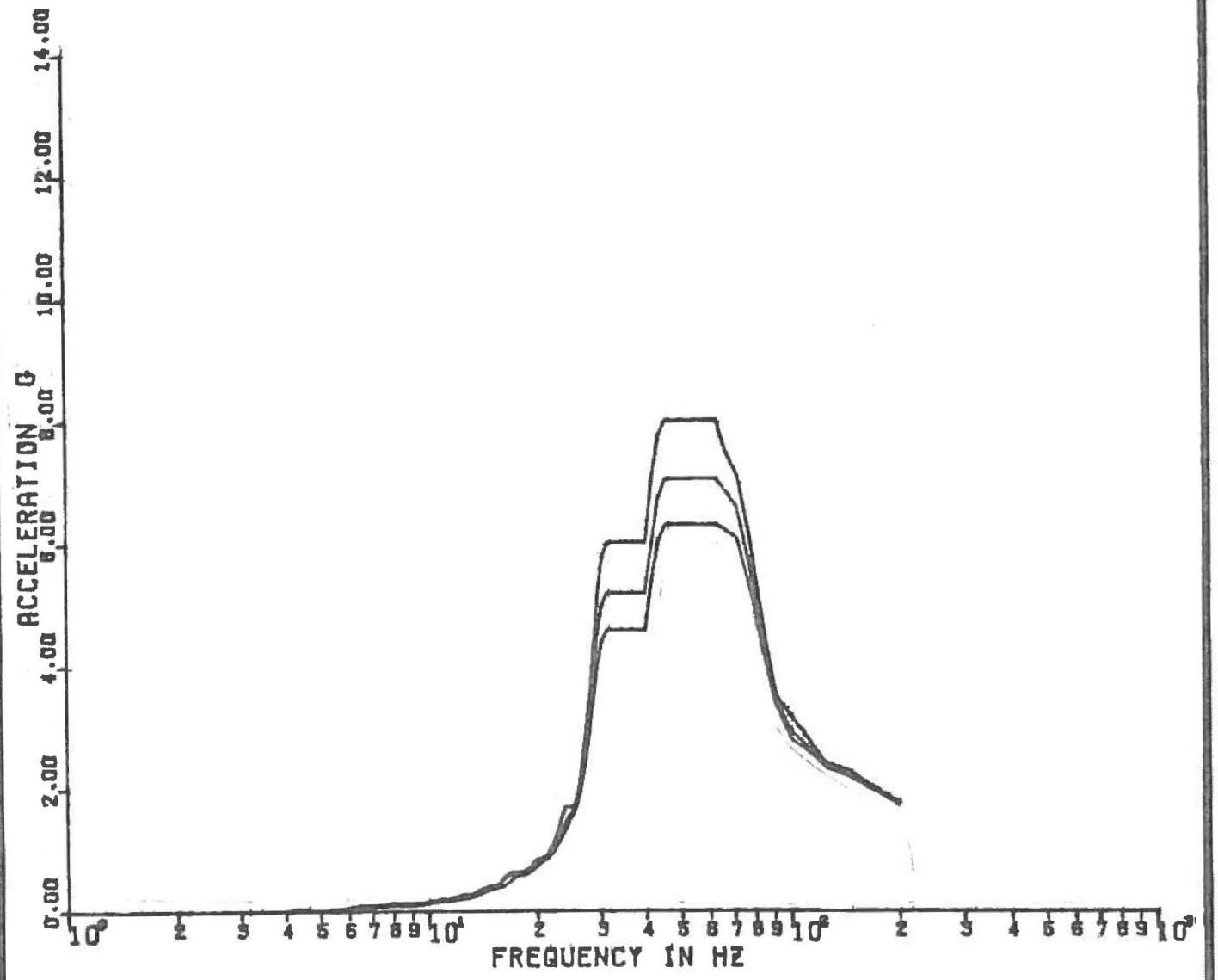
RRS OF ACC. SECONDARY CONT.
(ELEV 175) AT MAT

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

CONDENSATION OSCILLATION (CO1 OR BASIC)

DAMPING VALUES = 0.020
0.030
0.040

HOR DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

FIGURE 3.9A-34

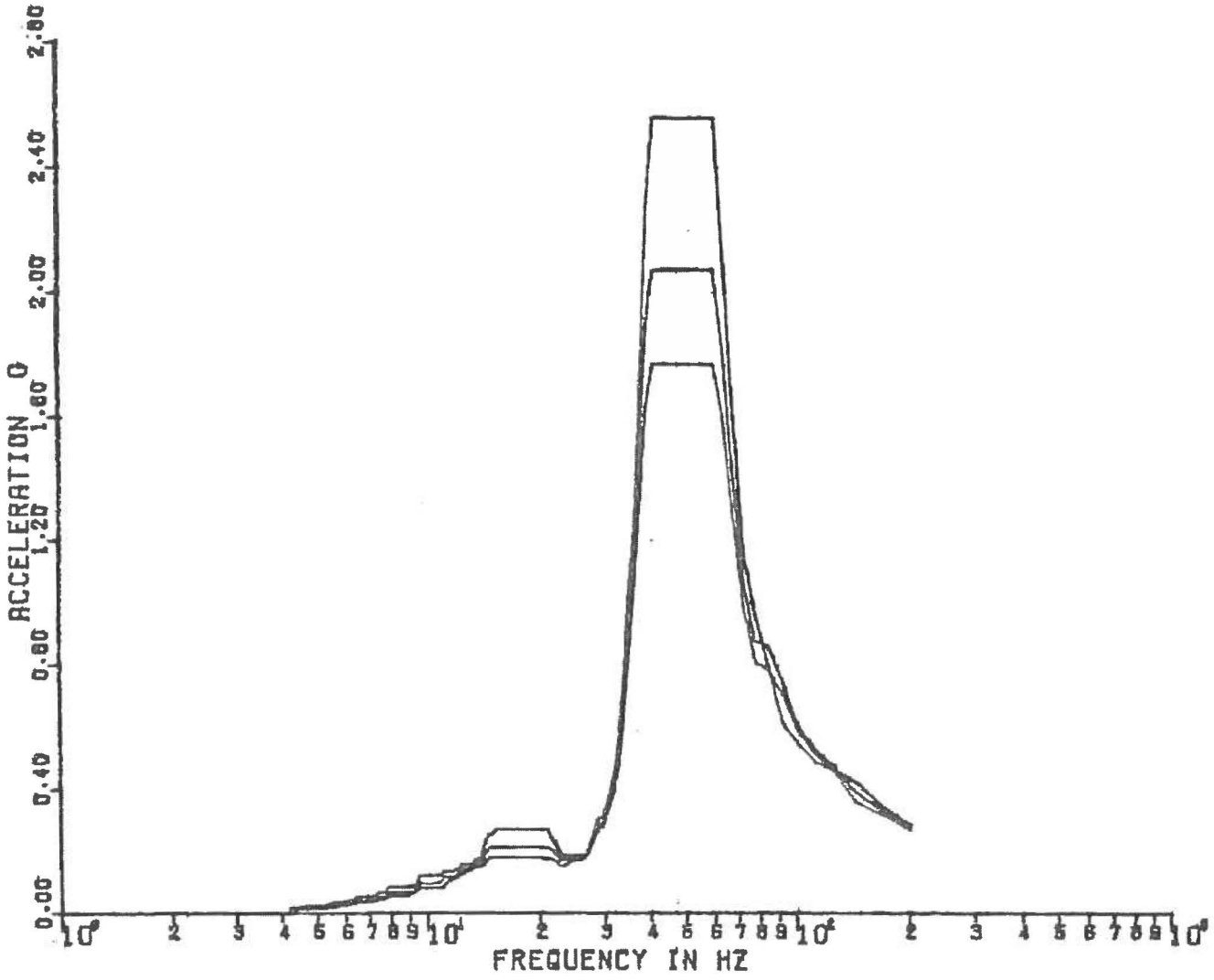
RRS OF ACC. PRIMARY CONT.
(ELEV 206.11 FT)

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

CONDENSATION OSCILLATION
(CO1 OR BASIC)

DAMPING VALUES = 0.020
0.030
0.040

VER DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

(SOURCE DOCUMENT: MS-1735 REV. 00)

FIGURE 3.9A-35

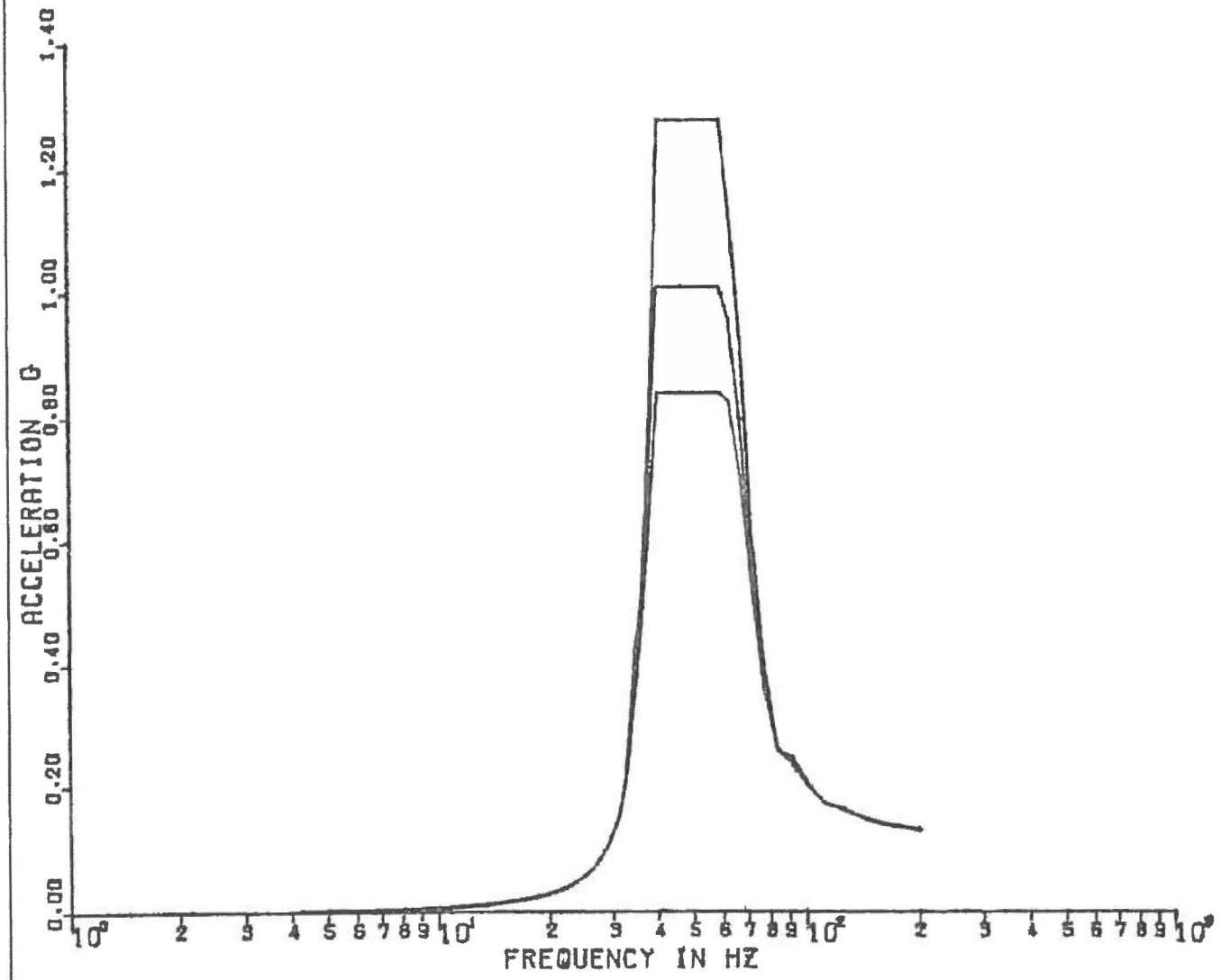
RRS OF ACC. PRIMARY CONT.
(ELEV 206.11 FT)

NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

CONDENSATION OSCILLATION
(CO1 OR BASIC)

DAMPING VALUES = 0.020
0.030
0.040

HOR DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

(SOURCE DOCUMENT: MS-1735 REV. 00)

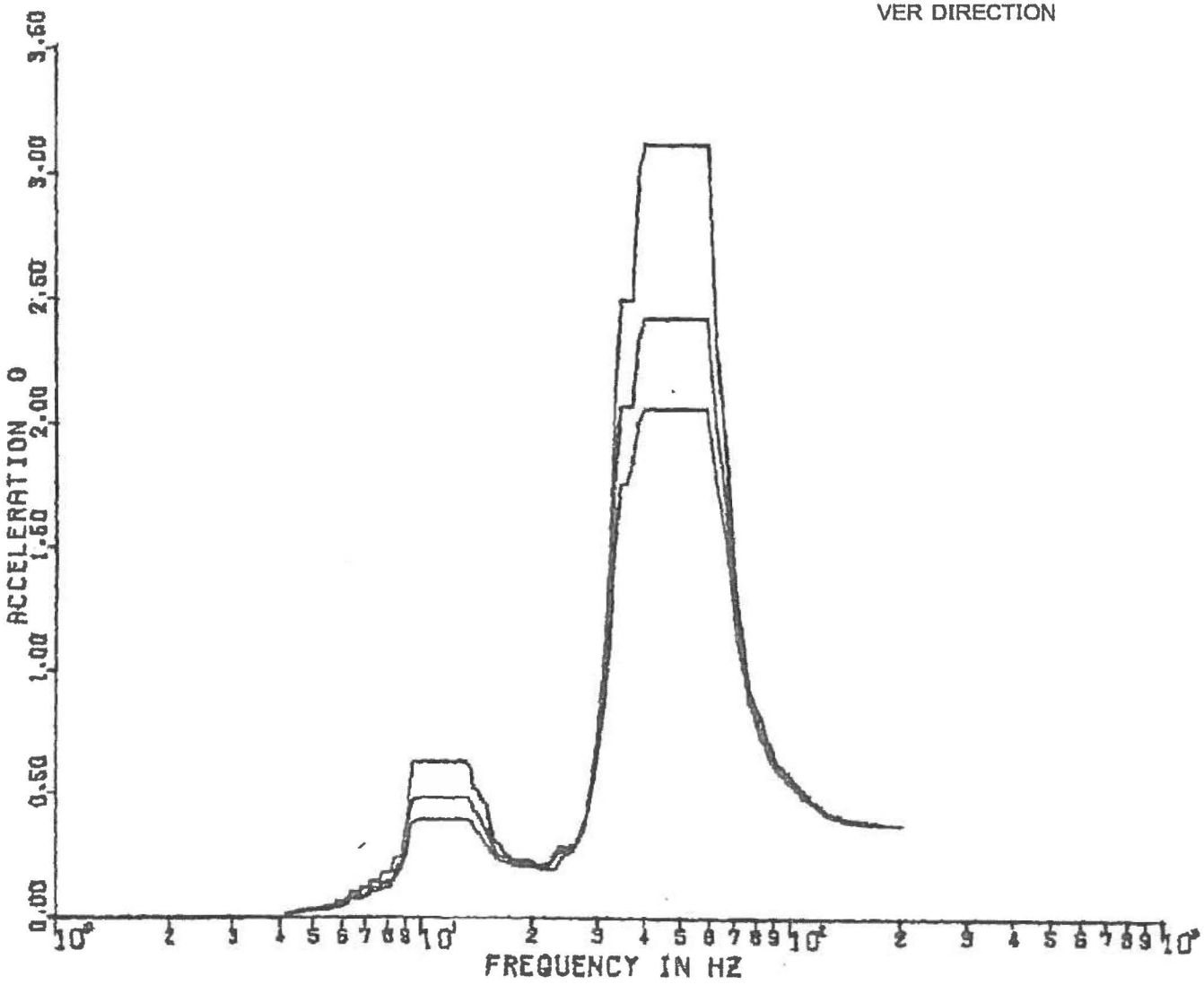
FIGURE 3.9A-36

RRS OF ACC. SHIELD WALL OUT
(ELEV 315.23 FT)

CONDENSATION OSCILLATION
(CO1 OR BASIC)

DAMPING VALUES = 0.020
0.030
0.040

VER DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

(SOURCE DOCUMENT: MS-1735 REV. 00)

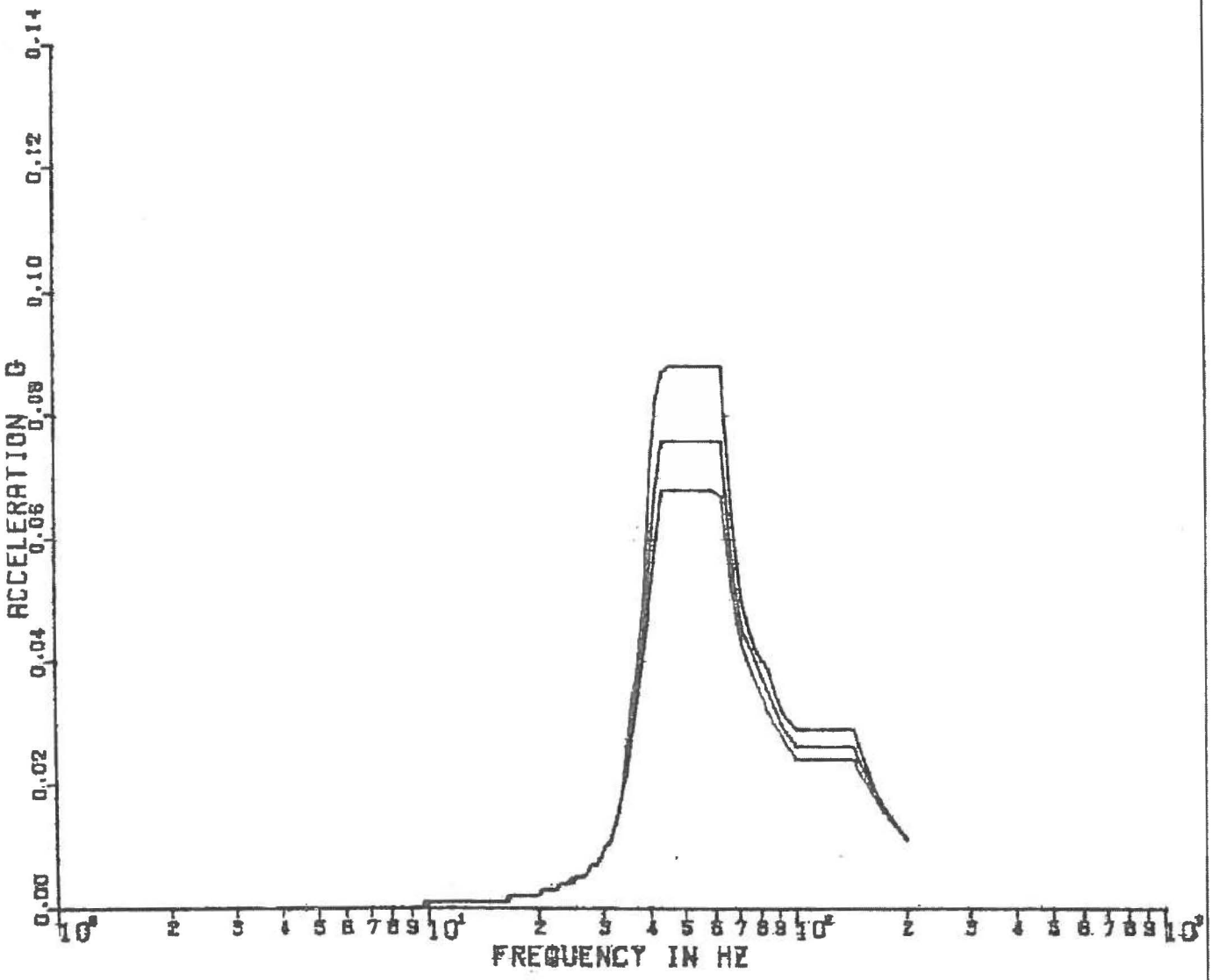
FIGURE 3.9A-37

RRS OF ACC. SHIELD WALL OUT
(ELEV 315.23 FT)

CONDENSATION OSCILLATION
(CO1 OR BASIC)

DAMPING VALUES = 0.020
0.030
0.040

HOR DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

(SOURCE DOCUMENT: MS-1735 REV. 00)

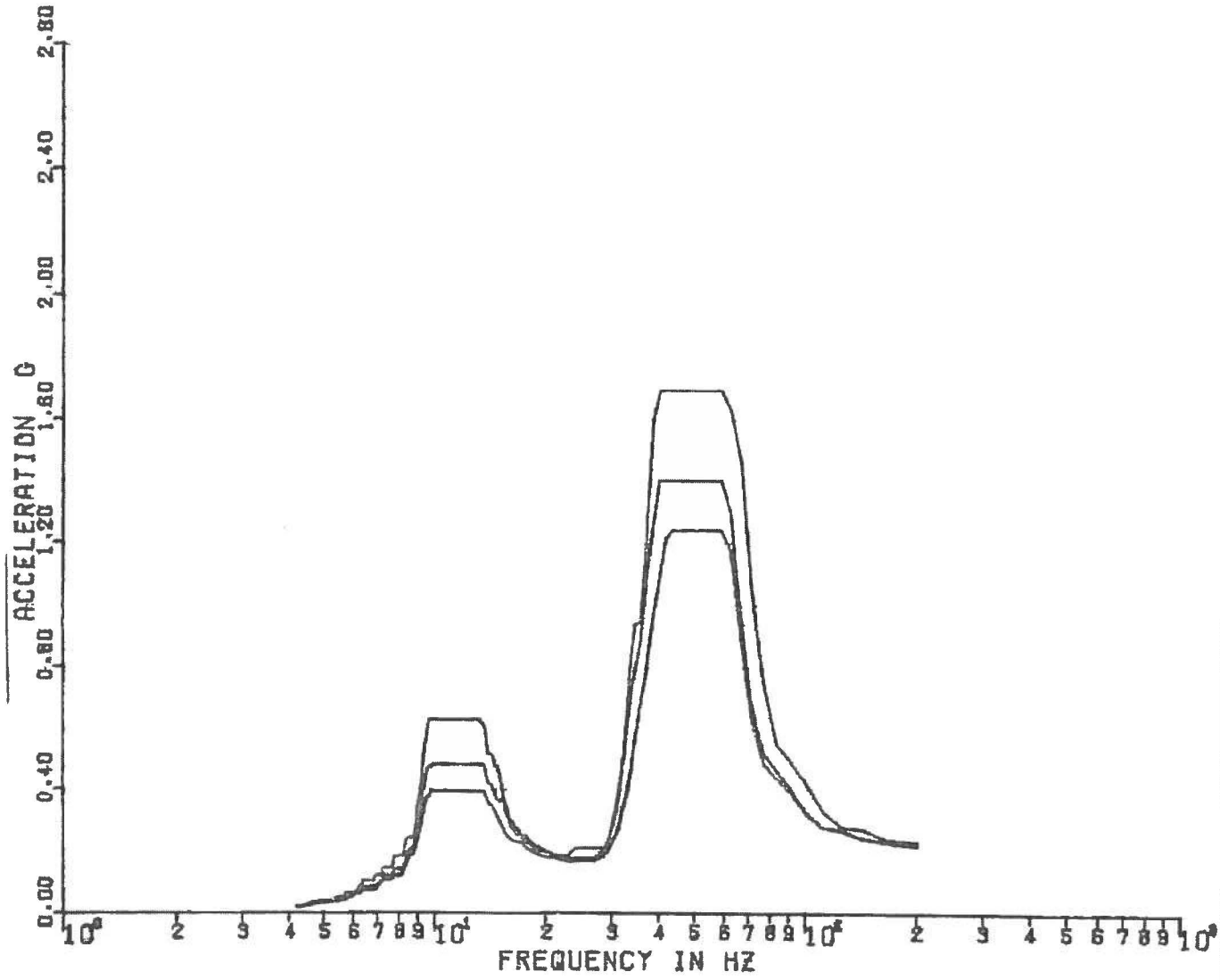
FIGURE 3.9A-38

RRS OF ACC. RPV SHELL
(ELEV 315.08 FT)

CONDENSATION OSCILLATION
(CO1 OR BASIC)

DAMPING VALUES = 0.020
0.030
0.040

VER DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

(SOURCE DOCUMENT: MS-1735 REV. 00)

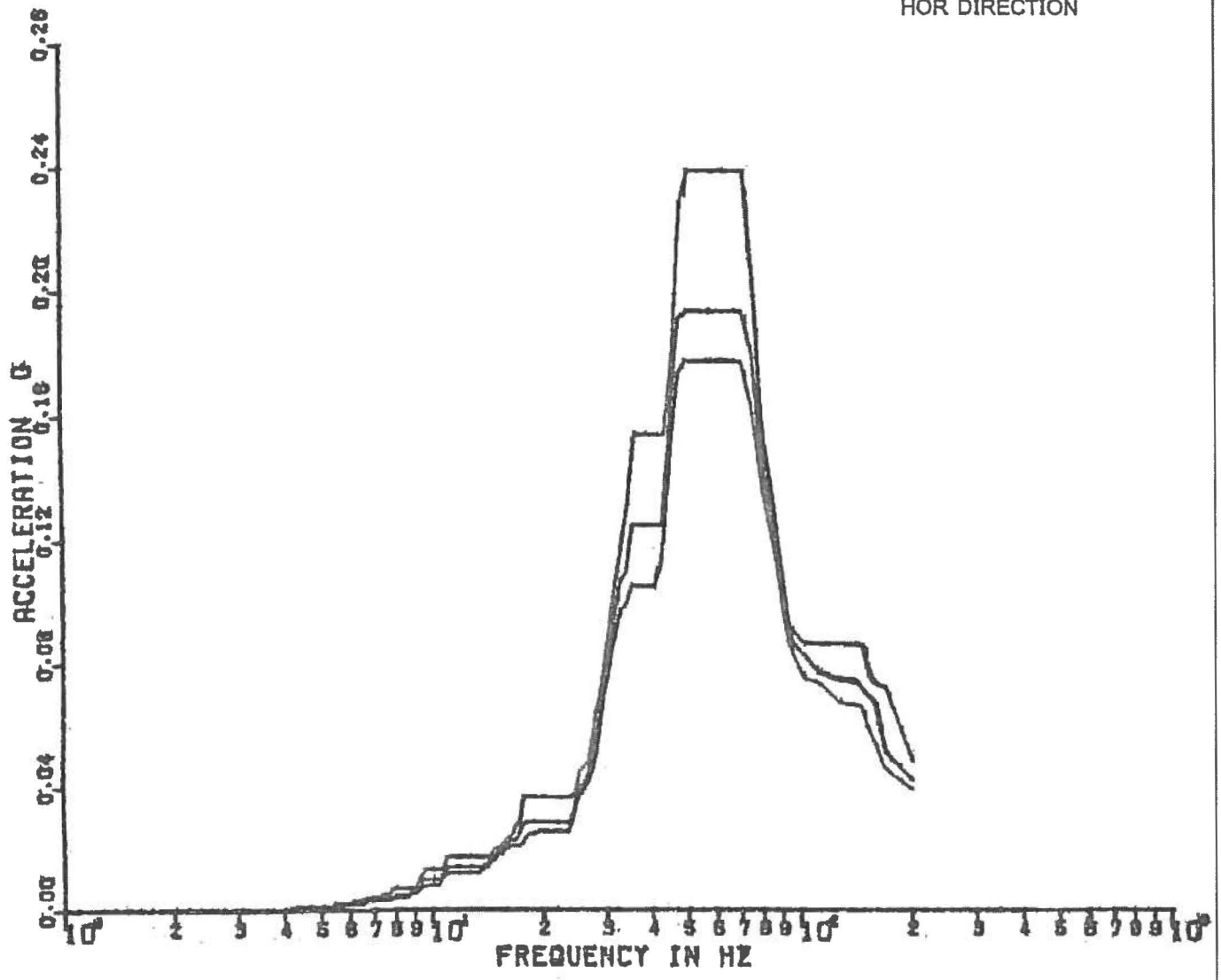
FIGURE 3.9A-39

RRS OF ACC. RPV SHELL
(ELEV 315.08 FT)

CONDENSATION OSCILLATION
(CO1 OR BASIC)

DAMPING VALUES = 0.020
0.030
0.040

HOR DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

(SOURCE DOCUMENT: MS-1735 REV. 00)

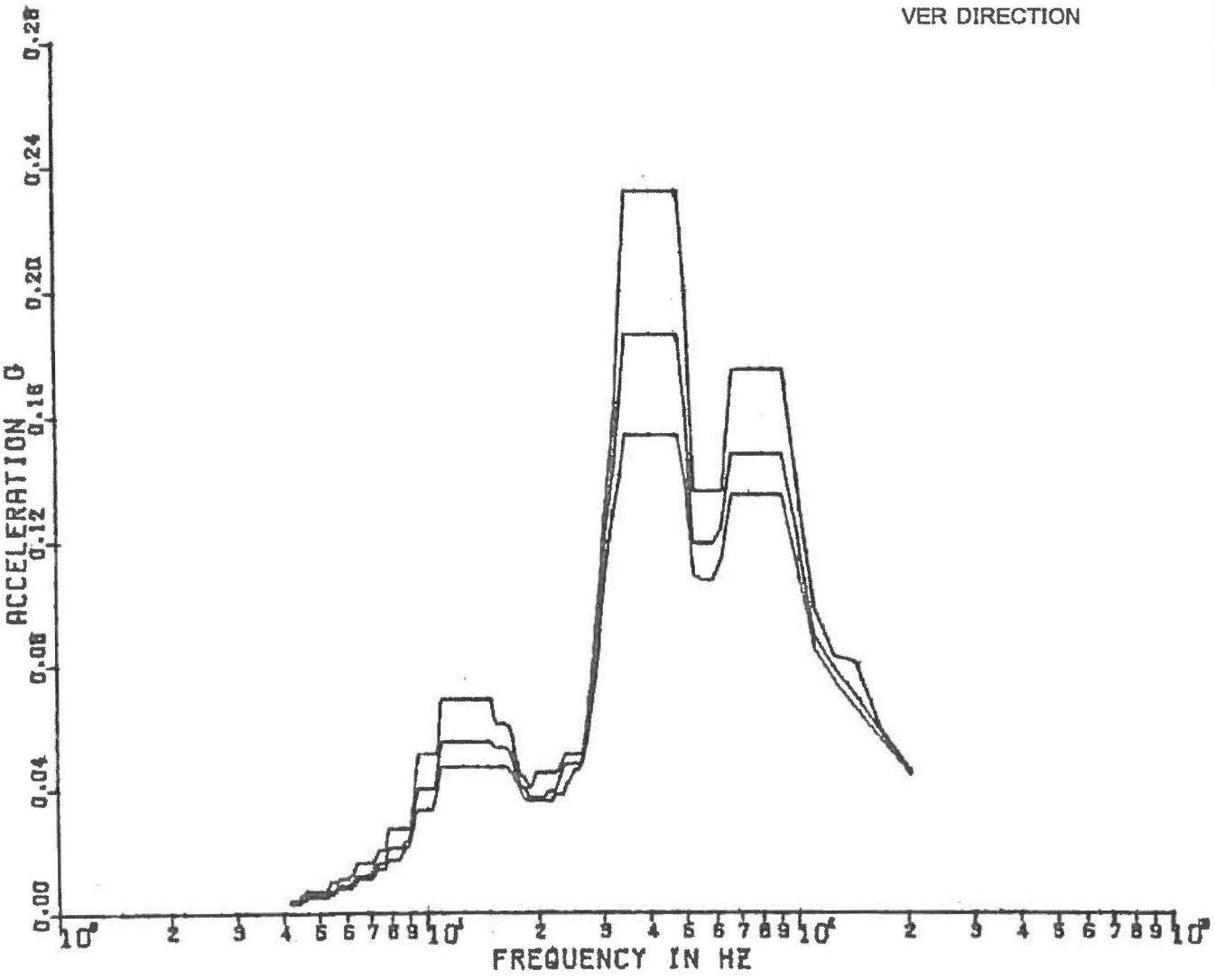
FIGURE 3.9A-40

RRS OF ACC. SECONDARY CONT. (ELEV 175) AT MAT

CONDENSATION OSCILLATION
(CO1 OR BASIC)

DAMPING VALUES = 0.020
0.030
0.040

VER DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

(SOURCE DOCUMENT: MS-1735 REV. 00)

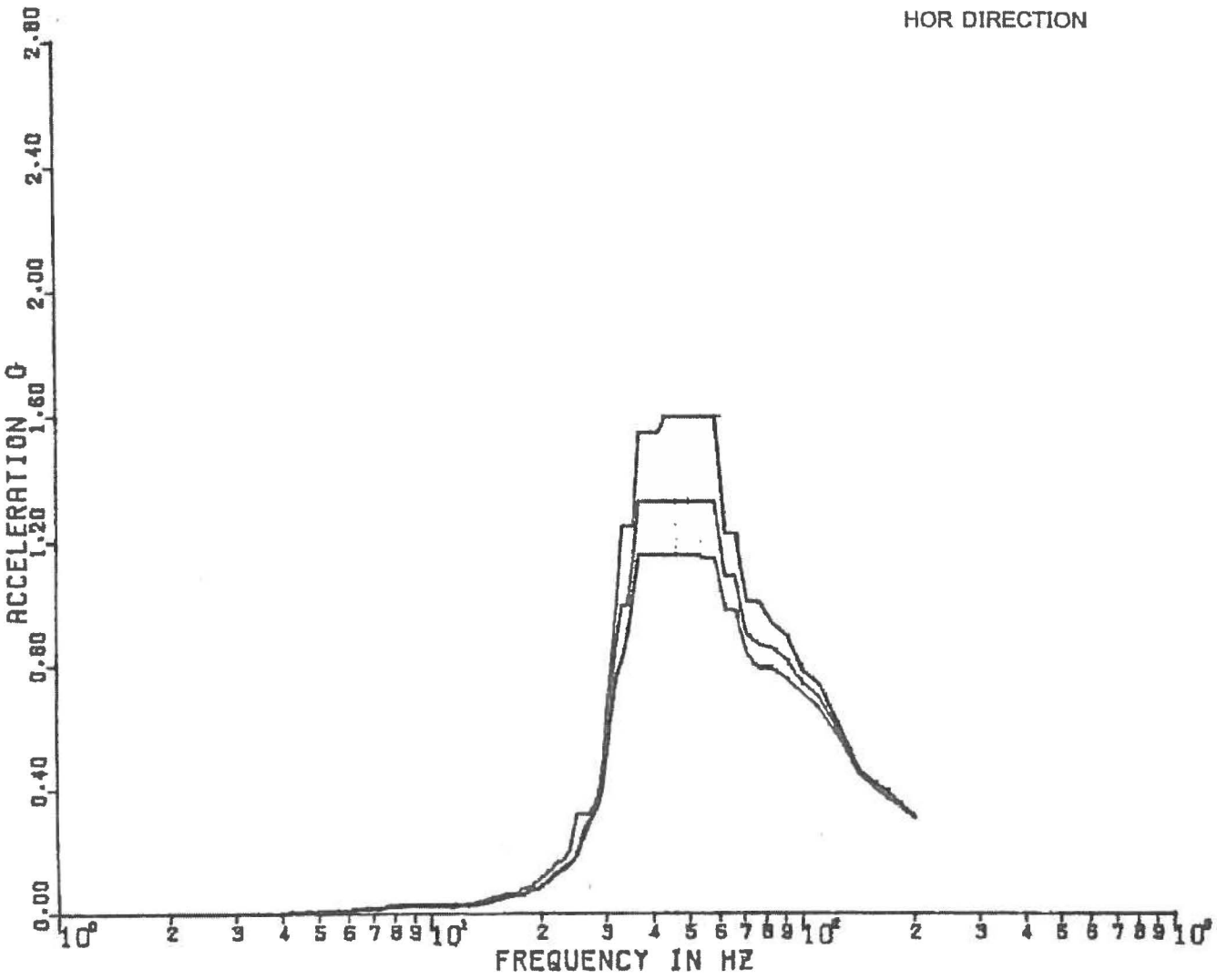
FIGURE 3.9A-41

RRS OF ACC. SECONDARY CONT.
(ELEV 175) AT MAT

CONDENSATION OSCILLATION
(CO2 OR ADS)

DAMPING VALUES = 0.020
0.030
0.040

HOR DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

(SOURCE DOCUMENT: MS-1736 REV. 00)

FIGURE 3.9A-42

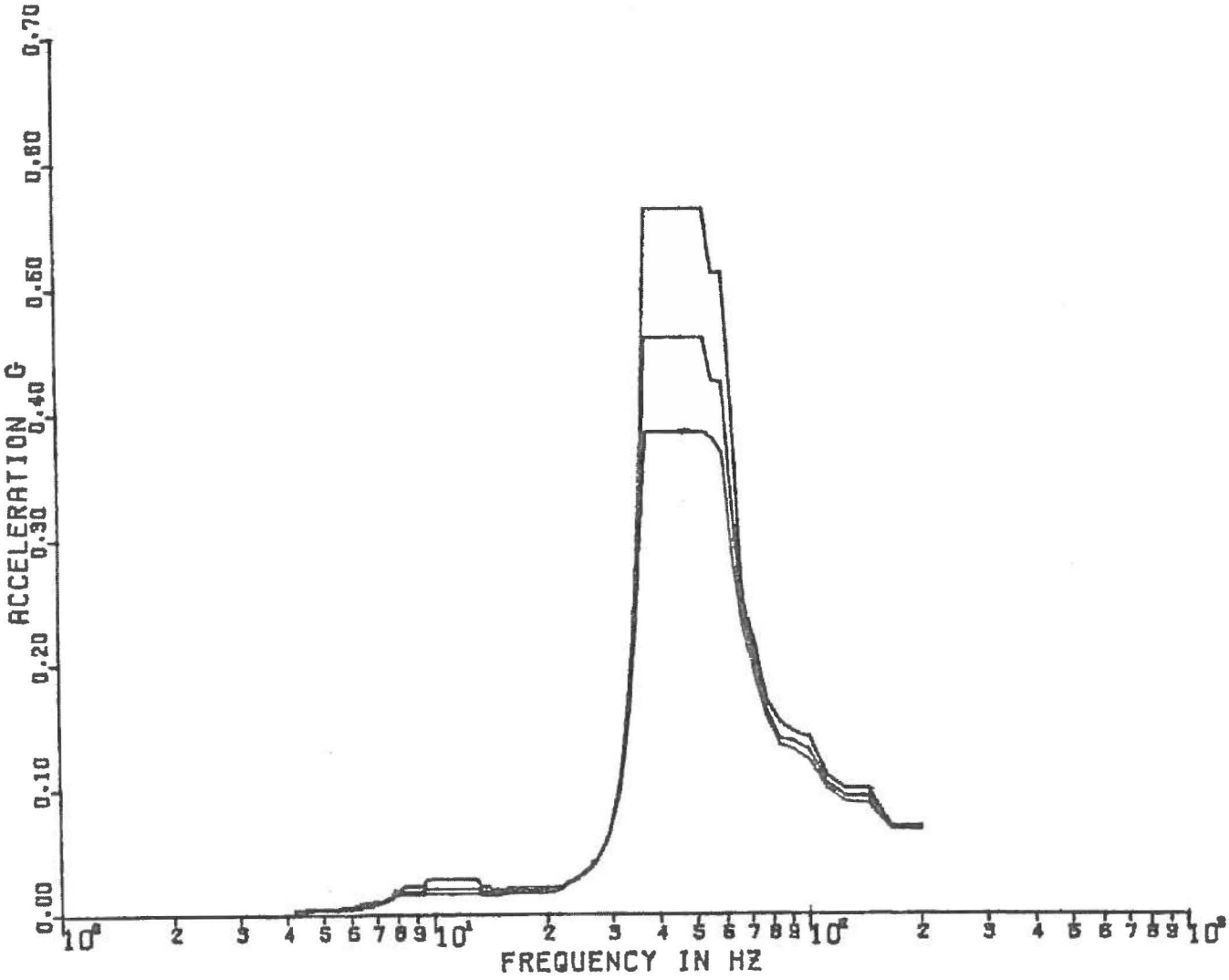
RRS OF ACC. PRIMARY CONT.
(ELEV 206.11 FT)

NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

CONDENSATION OSCILLATION
(CO2 OR ADS)

DAMPING VALUES = 0.020
0.030
0.040

VER DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

(SOURCE DOCUMENT: MS-1736 REV. 00)

FIGURE 3.9A-43

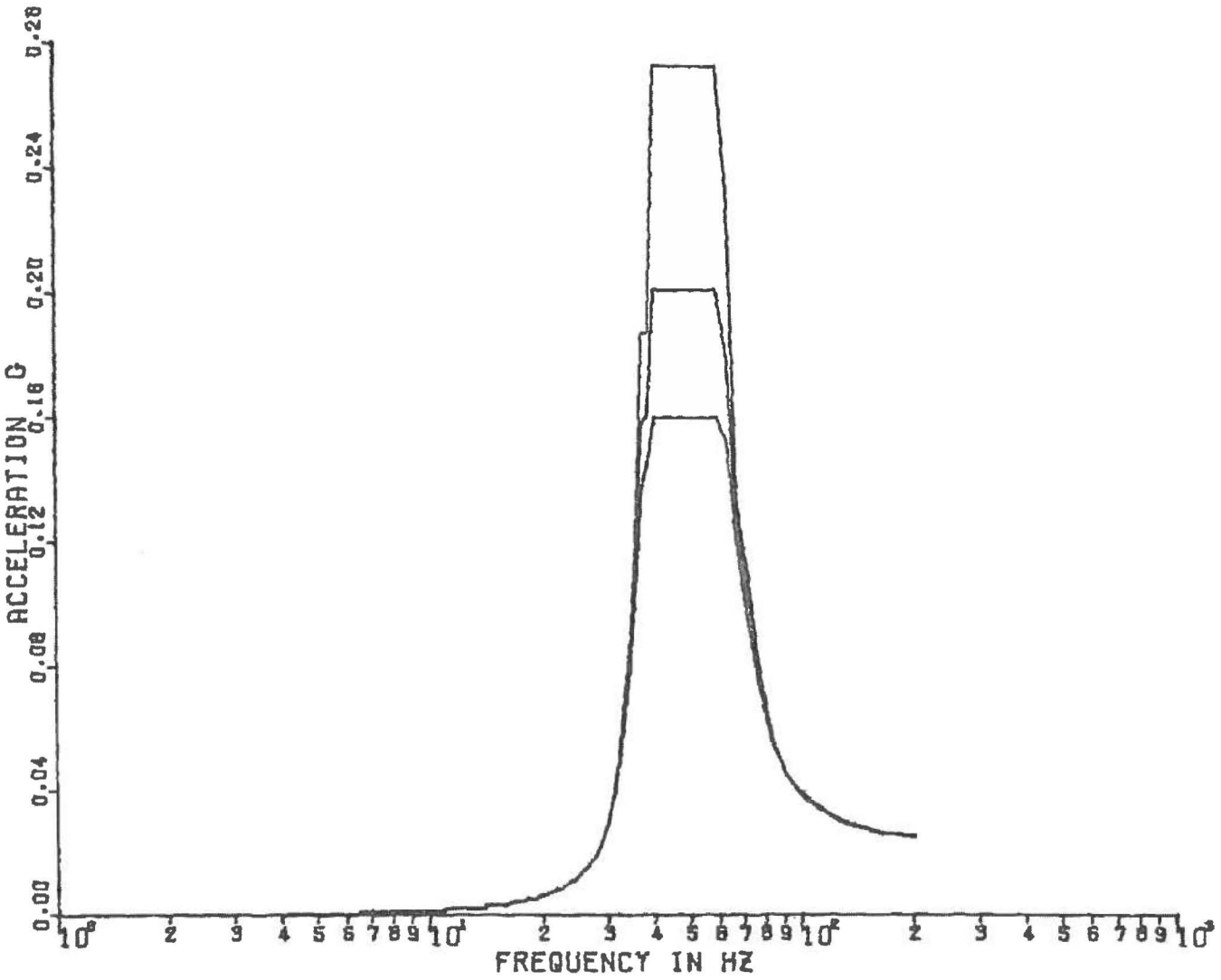
RRS OF ACC. PRIMARY CONT.
(ELEV 206.11 FT)

NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

CONDENSATION OSCILLATION
(CO2 OR ADS)

DAMPING VALUES = 0.020
0.030
0.040

HOR DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

(SOURCE DOCUMENT: MS-1736 REV. 00)

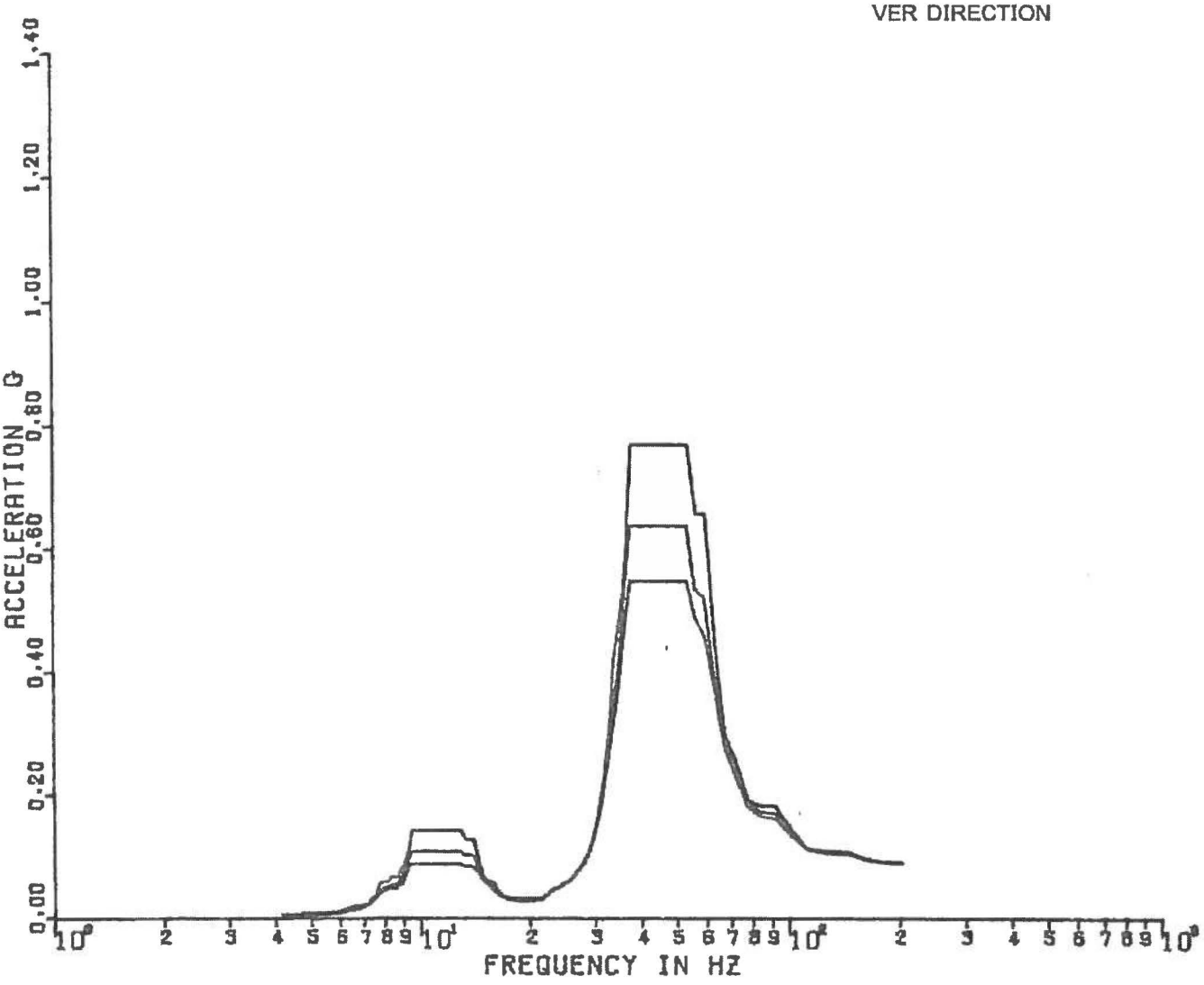
FIGURE 3.9A-44

RRS OF ACC. SHIELD WALL OUT
(ELEV 315.23 FT)

CONDENSATION OSCILLATION
(CO2 OR ADS)

DAMPING VALUES = 0.020
0.030
0.040

VER DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

(SOURCE DOCUMENT: MS-1736 REV. 00)

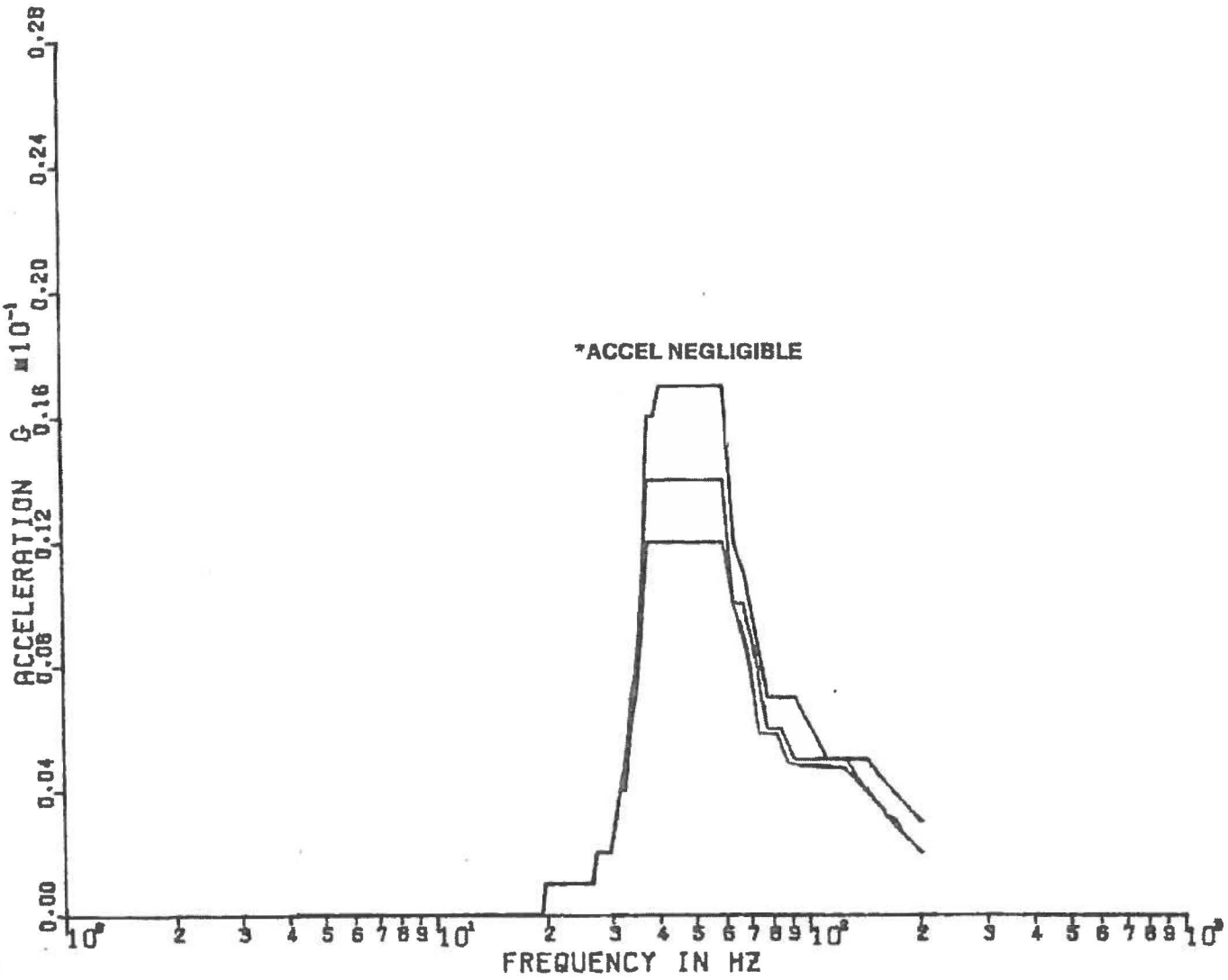
FIGURE 3.9A-45

RRS OF ACC. SHIELD WALL OUT
(ELEV 315.23 FT)

CONDENSATION OSCILLATION
(CO2 OR ADS)

DAMPING VALUES = 0.020
0.030
0.040

HOR DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

(SOURCE DOCUMENT: MS-1736 REV. 00)

FIGURE 3.9A-46

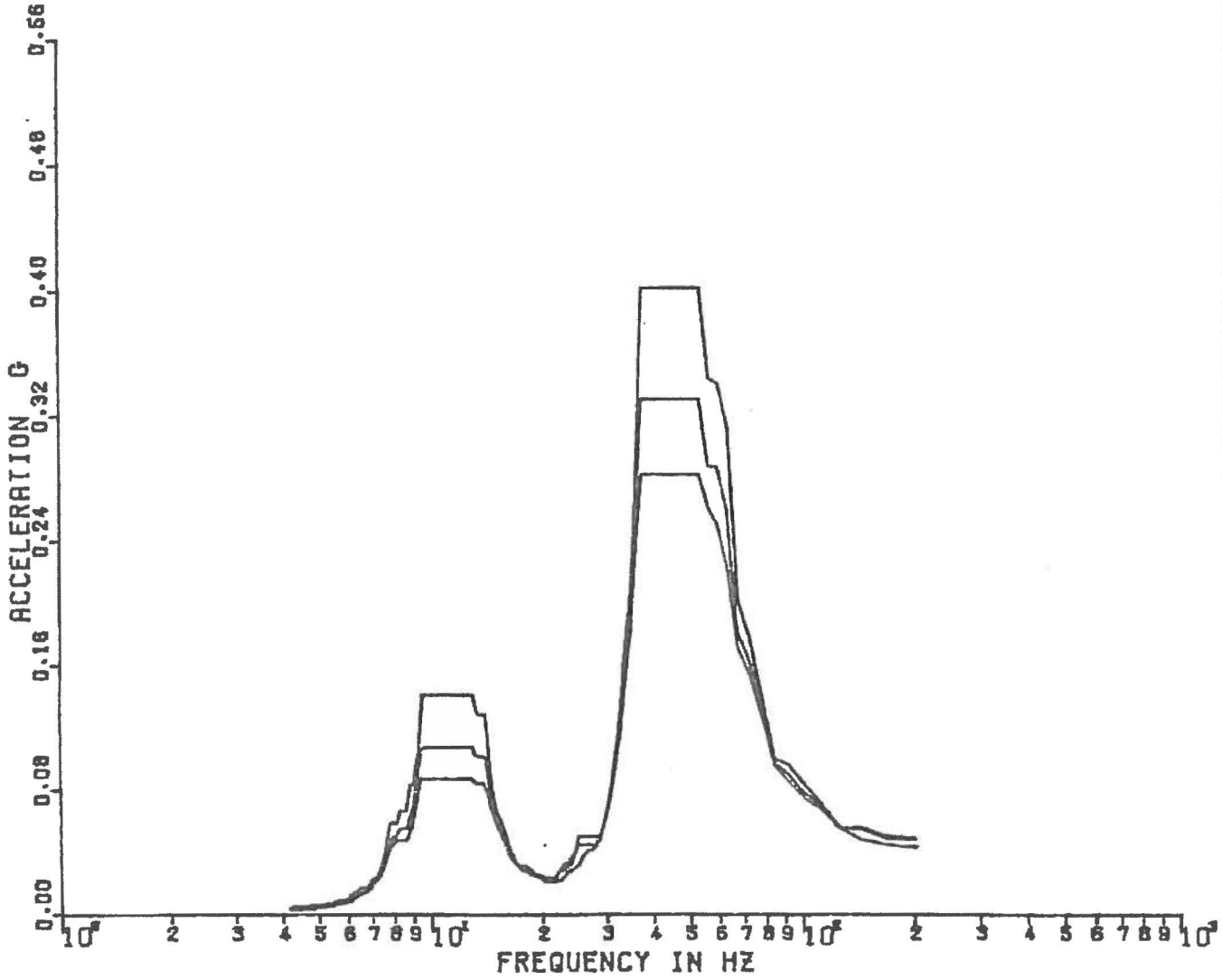
RRS OF ACC. RPV SHELL
(ELEV 315.08 FT)

NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

CONDENSATION OSCILLATION
(CO2 OR ADS)

DAMPING VALUES = 0.020
0.030
0.040

VER DIRECTION



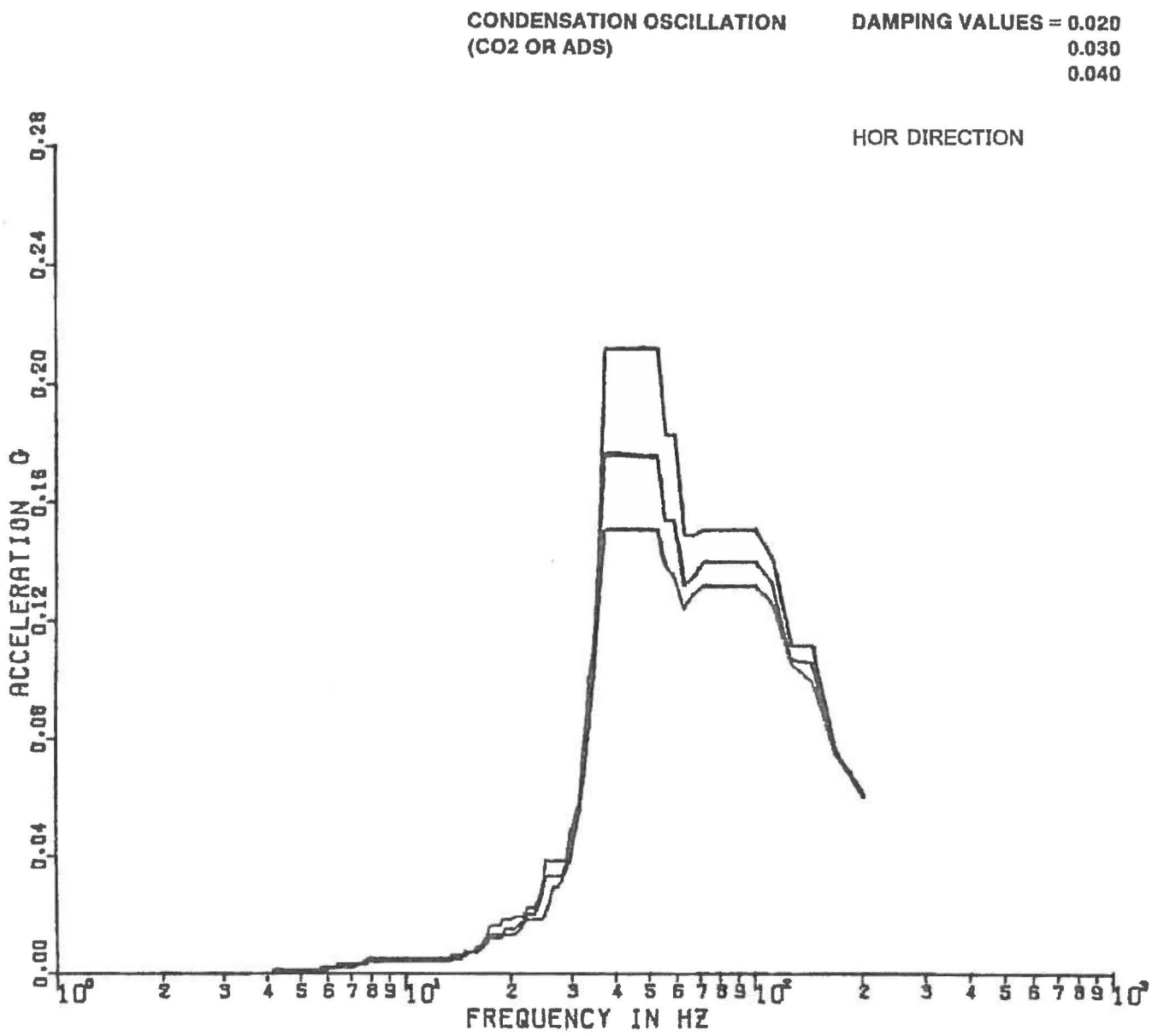
NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

(SOURCE DOCUMENT: MS-1736 REV. 00)

FIGURE 3.9A-47

RRS OF ACC. RPV SHELL
(ELEV 315.08 FT)

NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

(SOURCE DOCUMENT: MS-1736 REV. 00)

FIGURE 3.9A-48

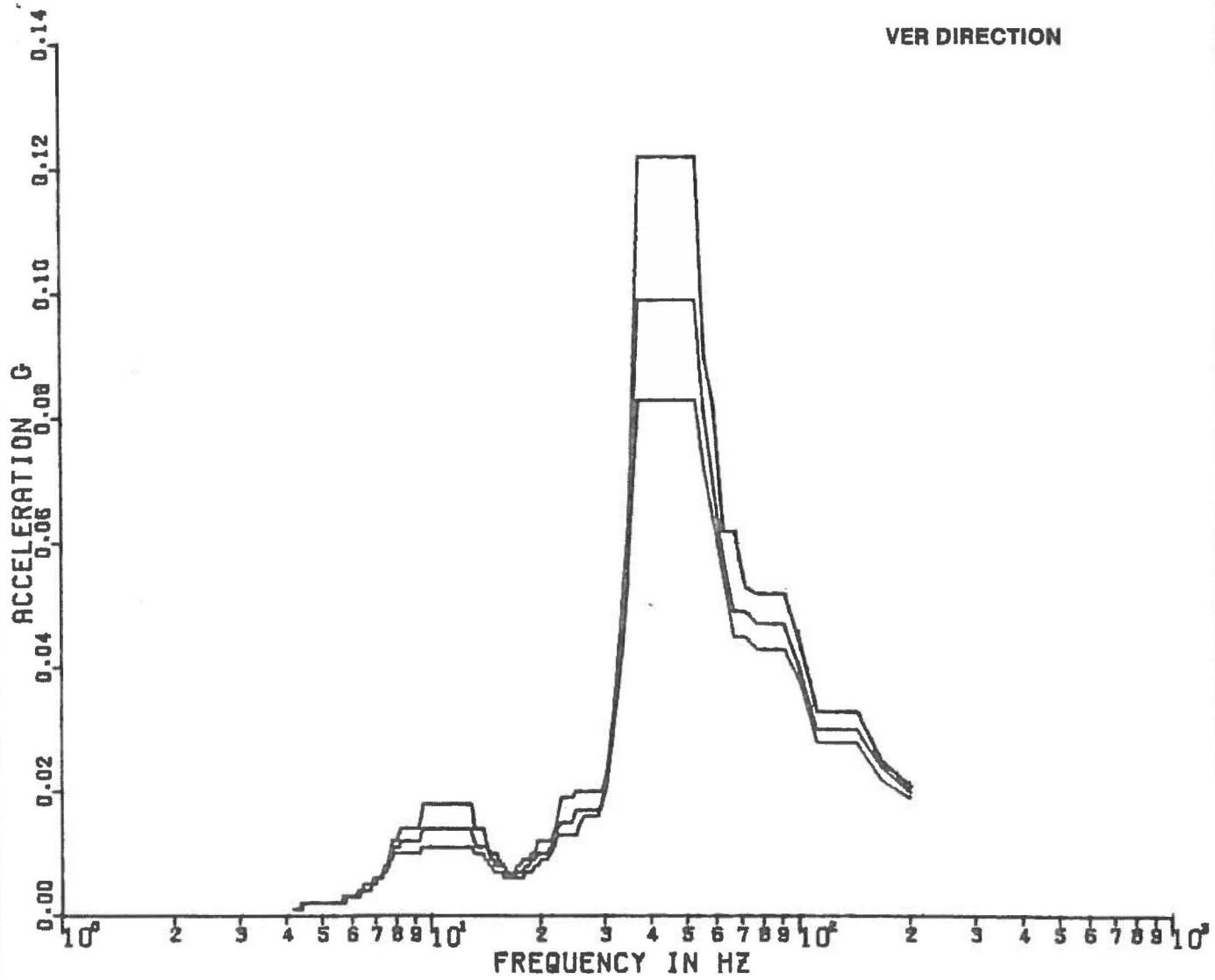
RRS OF ACC. PRIMARY CONT.
(ELEV 176.0 FT) AT MAT

NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

CONDENSATION OSCILLATION
(CO2 OR ADS)

DAMPING VALUES = 0.020
0.030
0.040

VER DIRECTION



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

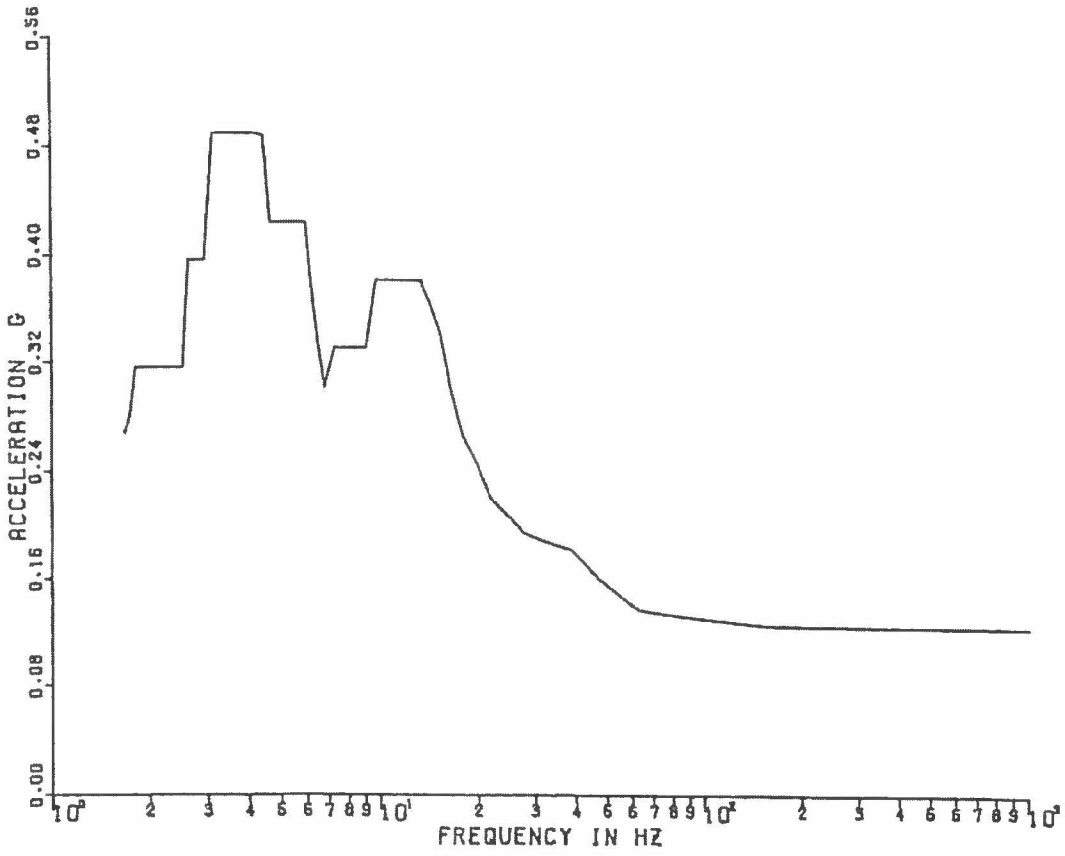
FIGURE 3.9A - 49

RRS OF ACC. PRIMARY CONT.
(ELEV 176.0 FT) AT MAT

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SEISMIC (OBE)

DAMPING VALUE 2-5%
E-W DIRECTION (X AXIS)



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

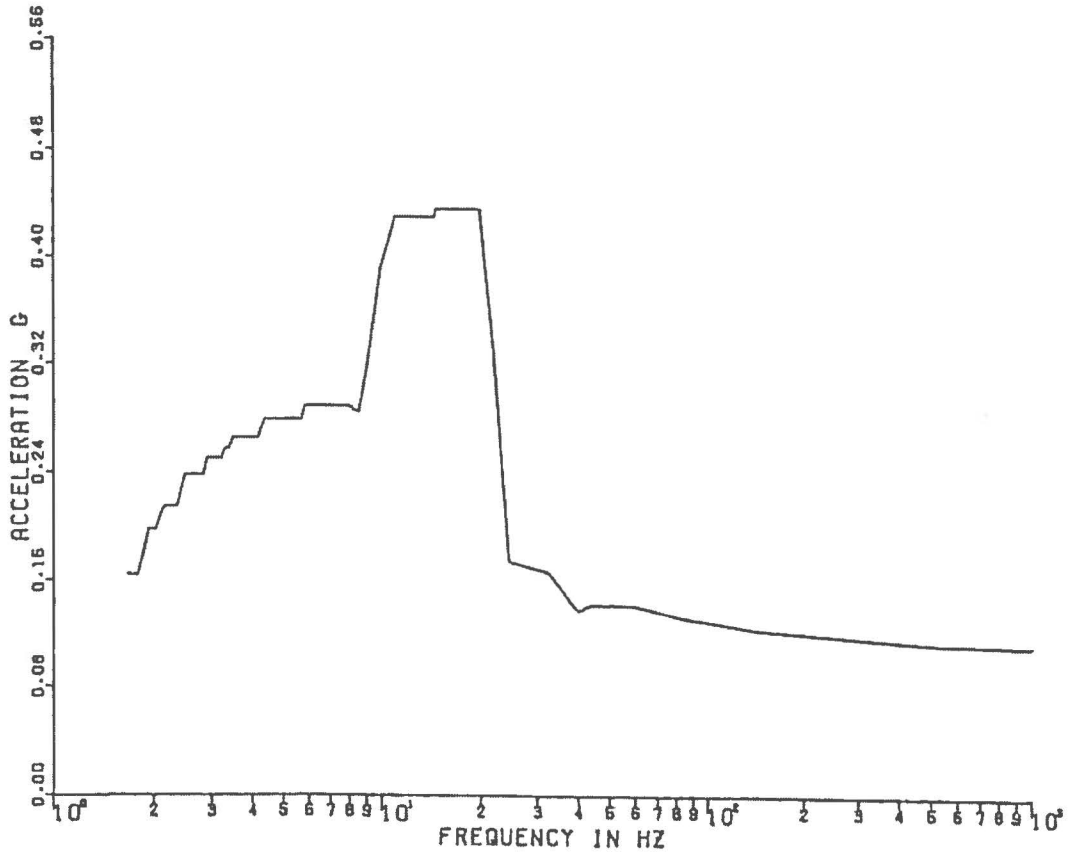
FIGURE 3.9A-50

ARS OF ACCELERATION
PRIMARY CONT. EL. 196.67 FT.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SEISMIC (OBE)

DAMPING VALUE 2-5%
VERT. DIRECTION (Y AXIS)



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

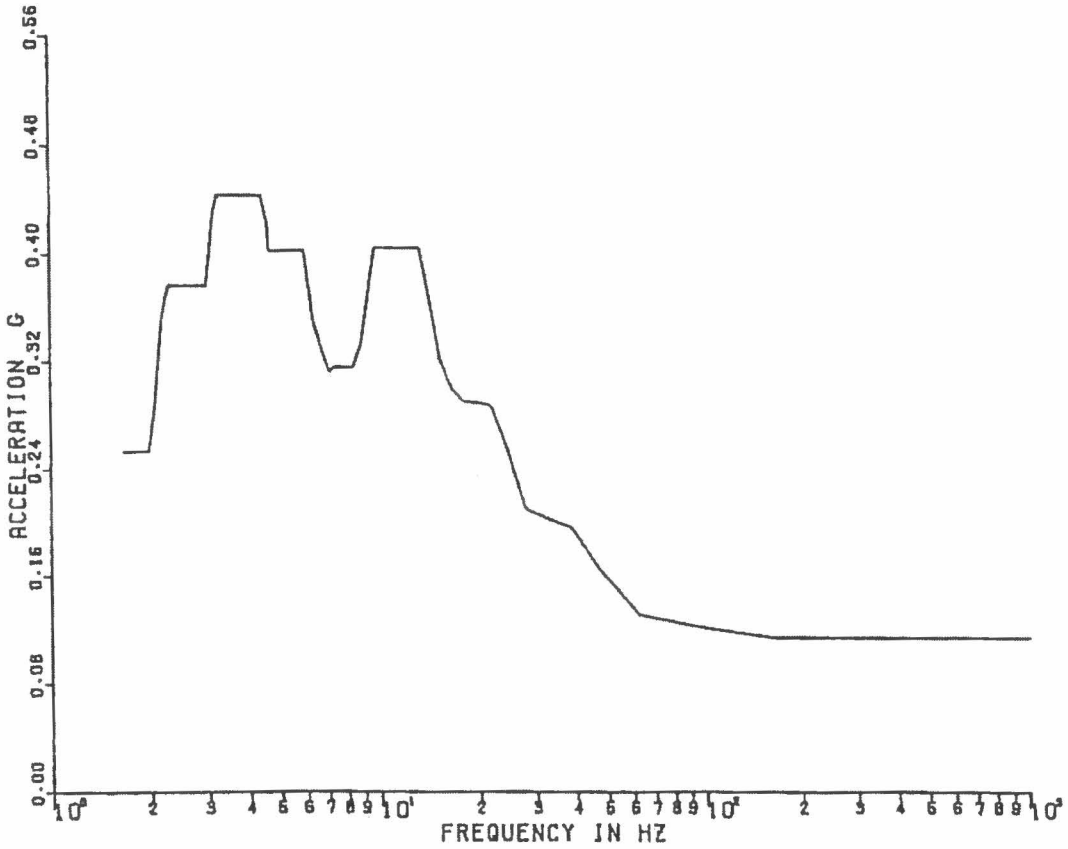
FIGURE 3.9A-51

ARS OF ACCELERATION
PRIMARY CONT. EL. 196.67 FT.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SEISMIC (OBE)

DAMPING VALUE 2-5%
N-S DIRECTION (Z AXIS)



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

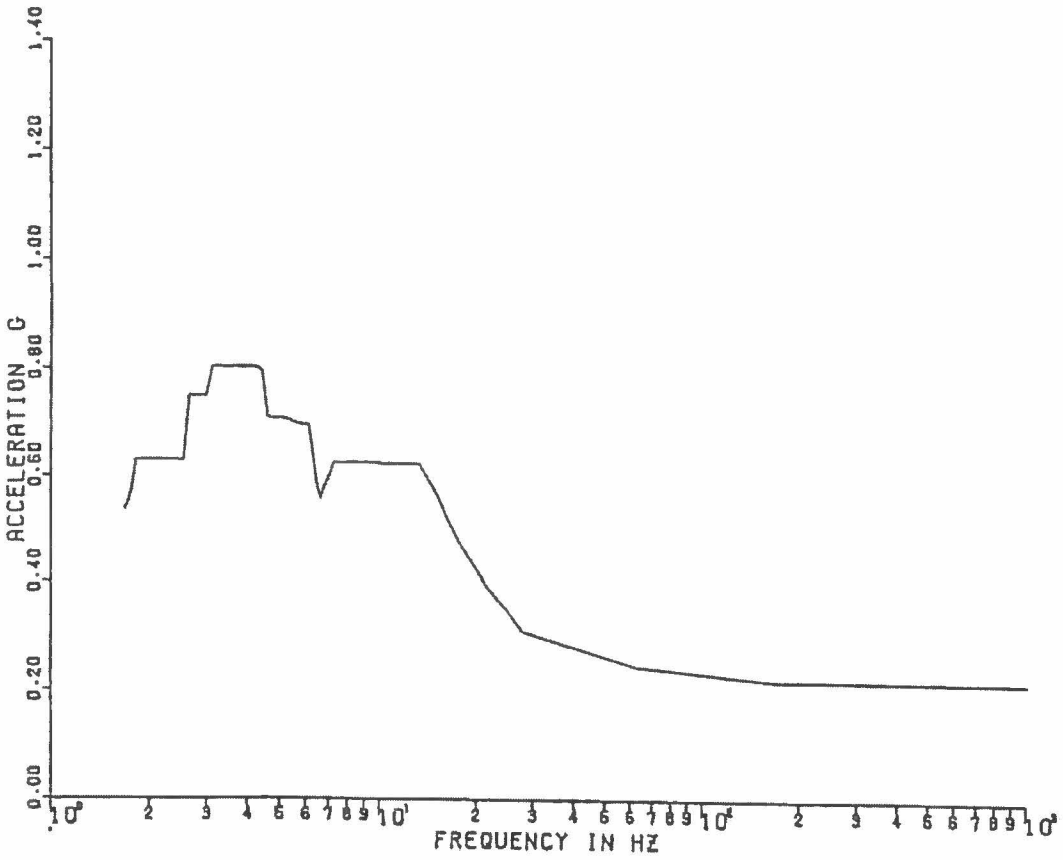
FIGURE 3.9A-52

ARS OF ACCELERATION
PRIMARY CONT. EL. 196.67 FT.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SEISMIC (SSE)

DAMPING VALUE 2-5%
E-W DIRECTION (X AXIS)



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

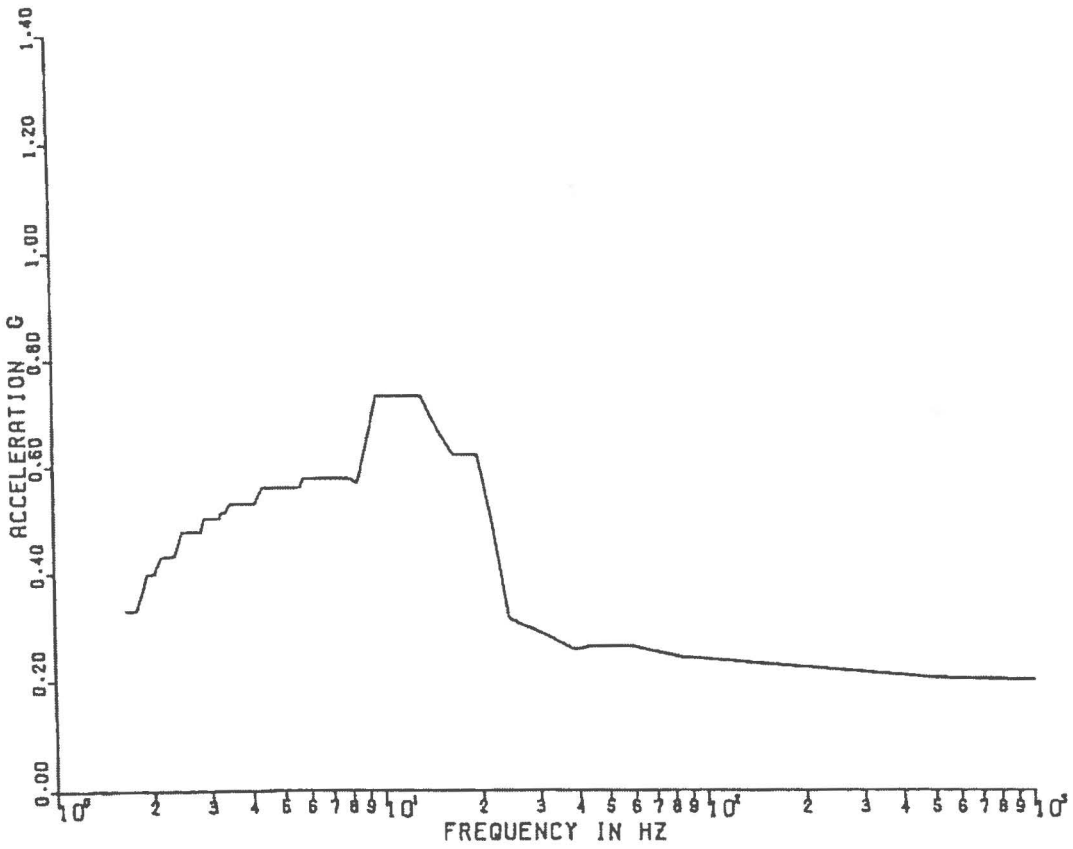
FIGURE 3.9A-53

ARS OF ACCELERATION
PRIMARY CONT. EL. 196.67 FT.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SEISMIC (SSE)

DAMPING VALUE 2-5%
VERT. DIRECTION (Y AXIS)



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

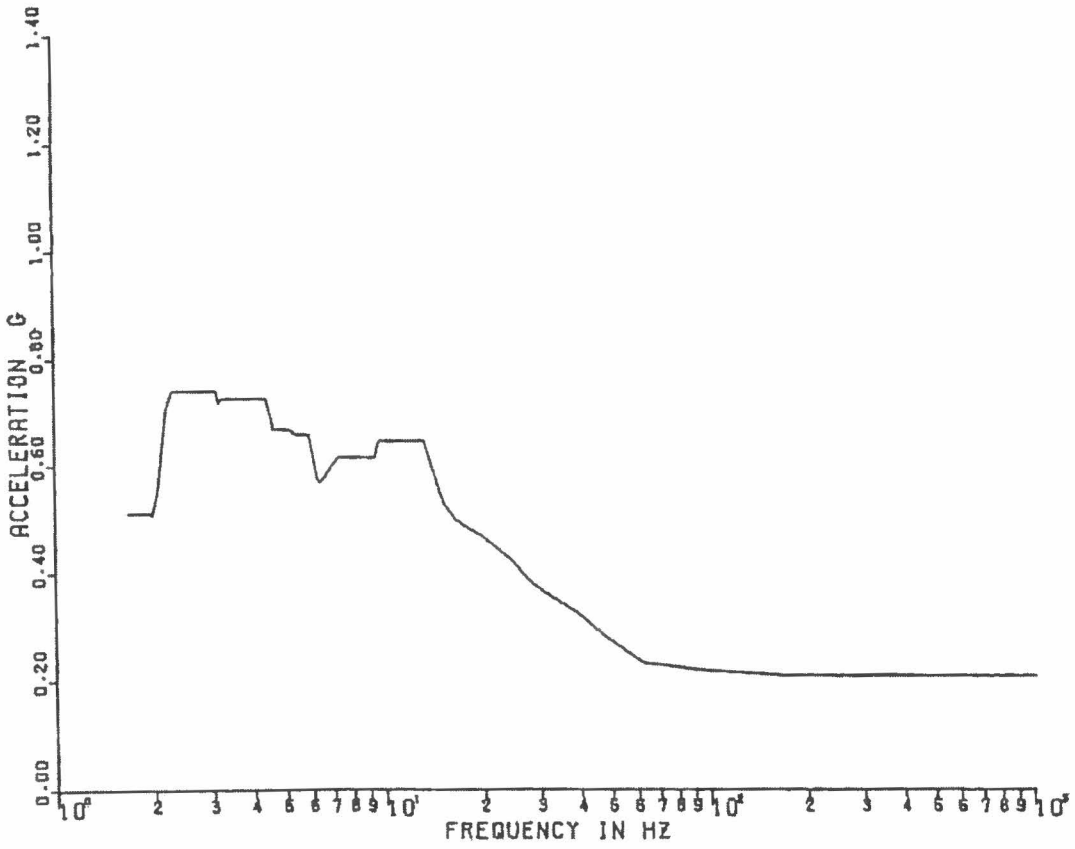
FIGURE 3.9A-54

ARS OF ACCELERATION
PRIMARY CONT. EL. 196.67 FT.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SEISMIC (SSE)

DAMPING VALUE 2-5%
N-S DIRECTION (Z AXIS)



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

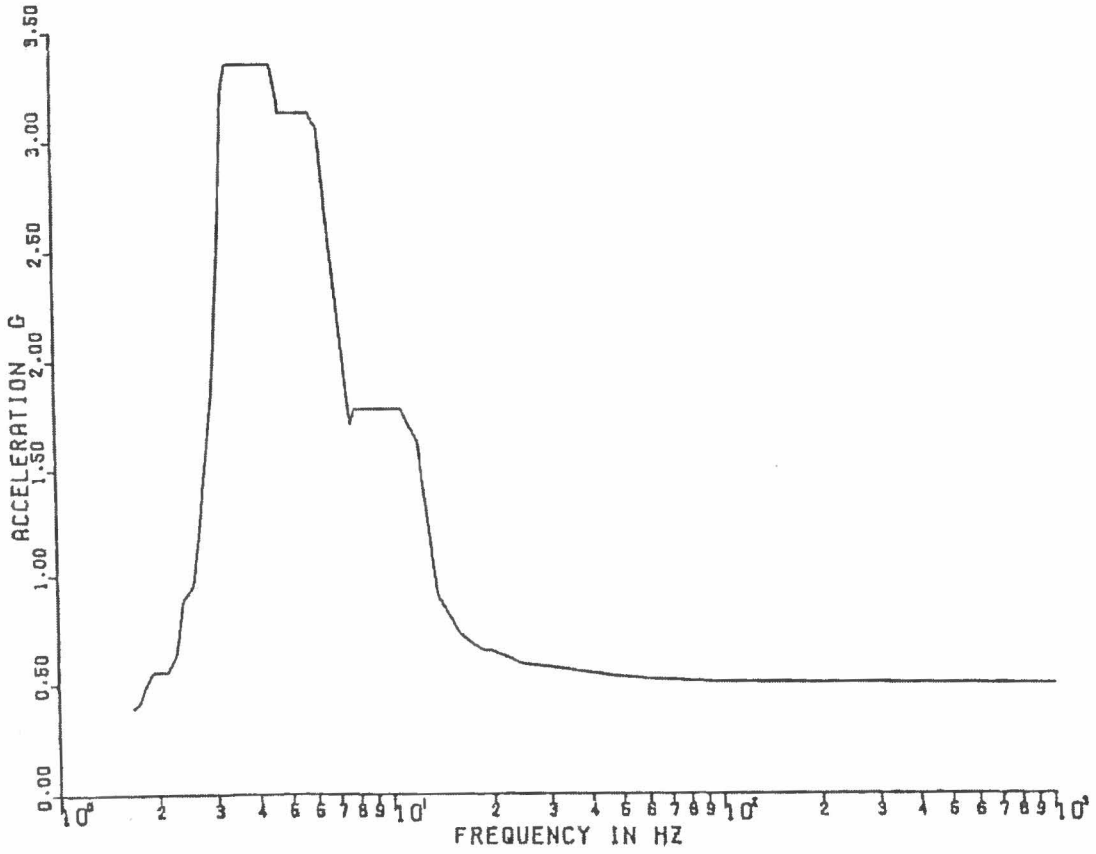
FIGURE 3.9A-55

ARS OF ACCELERATION
PRIMARY CONT. EL. 196.67 FT.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SEISMIC (OBE)

DAMPING VALUE 2-5%
E-W DIRECTION (X AXIS)



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

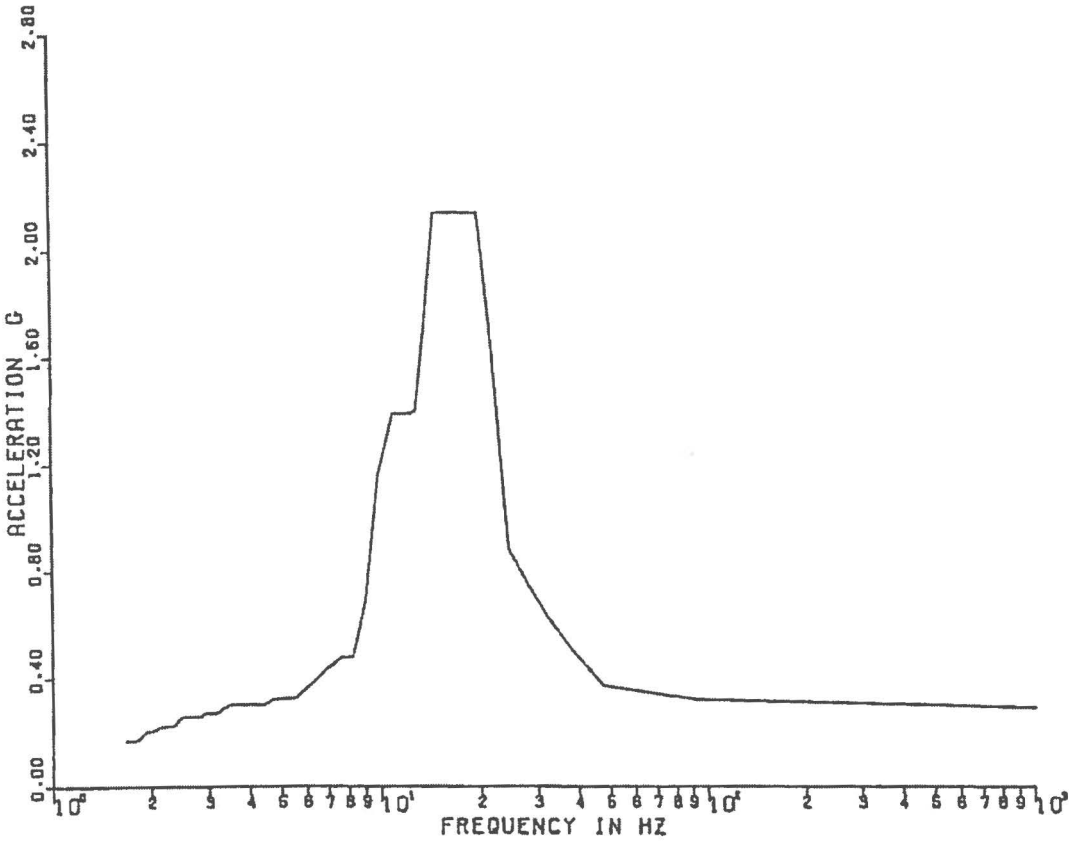
FIGURE 3.9A-56

ARS OF ACCELERATION
SHIELD WALL EL. 315.09 FT.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SEISMIC (OBE)

DAMPING VALUE 2-5%
VERT. DIRECTION (Y AXIS)



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

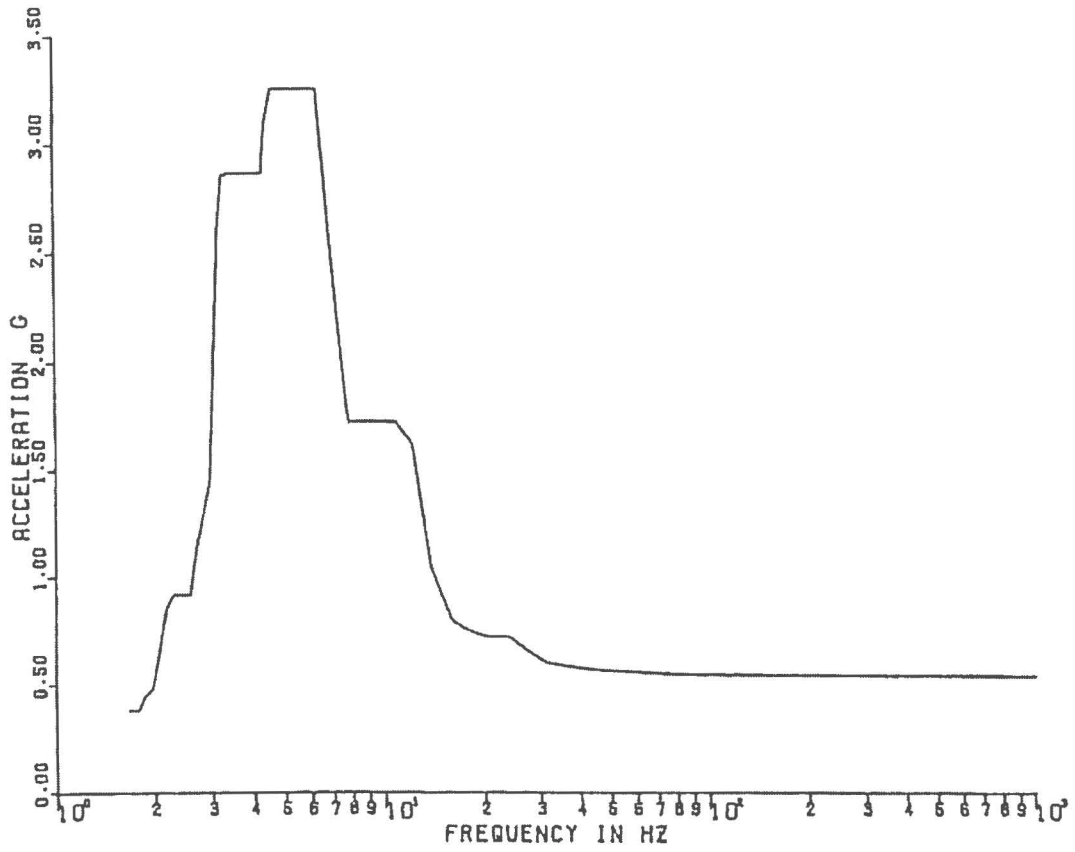
FIGURE 3.9A-57

ARS OF ACCELERATION
SHIELD WALL EL. 315.09 FT.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SEISMIC (OBE)

DAMPING VALUE 2-5%
N-S DIRECTION (Z AXIS)



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

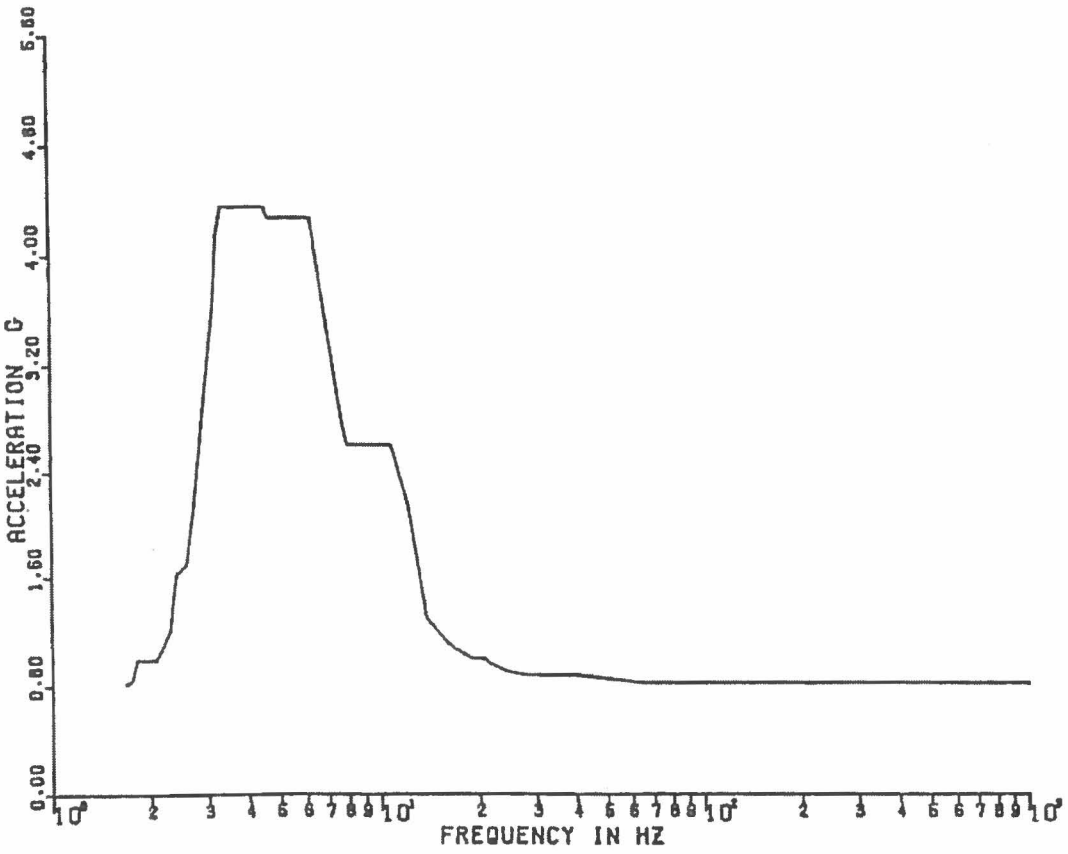
FIGURE 3.9A-58

ARS OF ACCELERATION
SHIELD WALL EL. 315.09 FT.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SEISMIC (SSE)

DAMPING VALUE 2-5%
E-W DIRECTION (X AXIS)



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

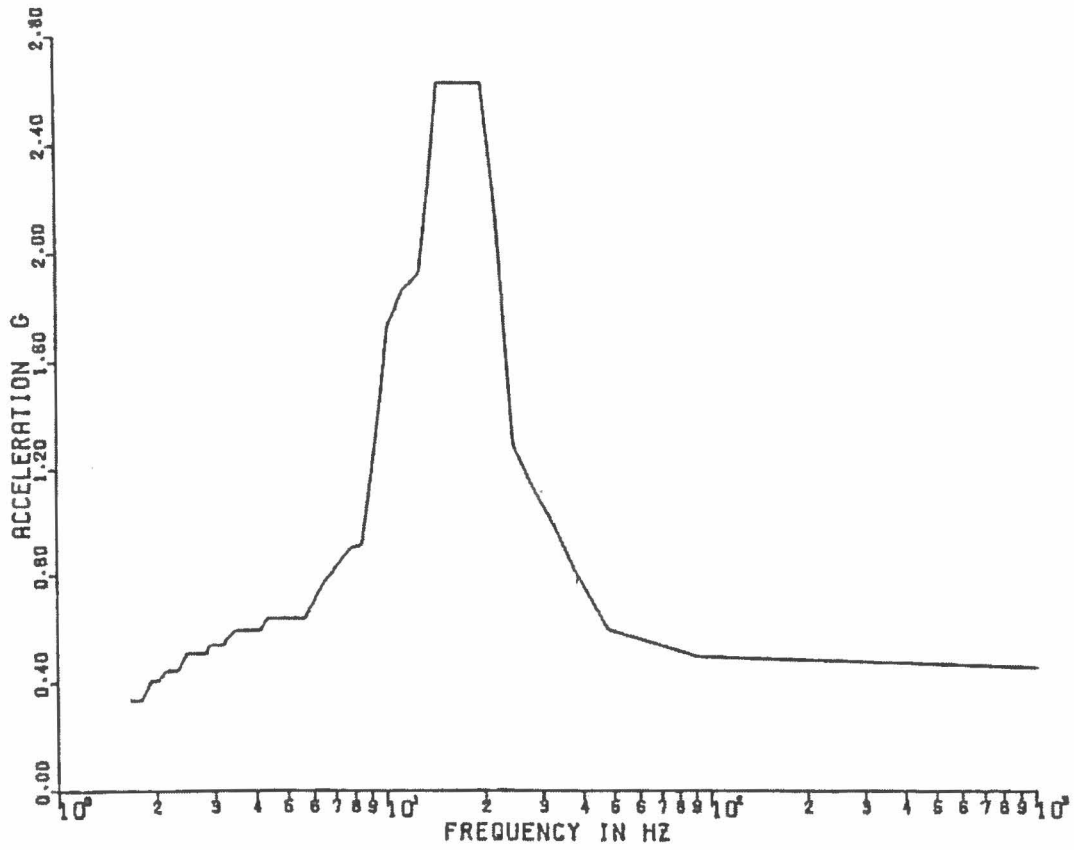
FIGURE 3.9A-59

ARS OF ACCELERATION
SHIELD WALL EL. 315.09 FT.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SEISMIC (SSE)

DAMPING VALUE 2-5%
VERT. DIRECTION (Y AXIS)



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

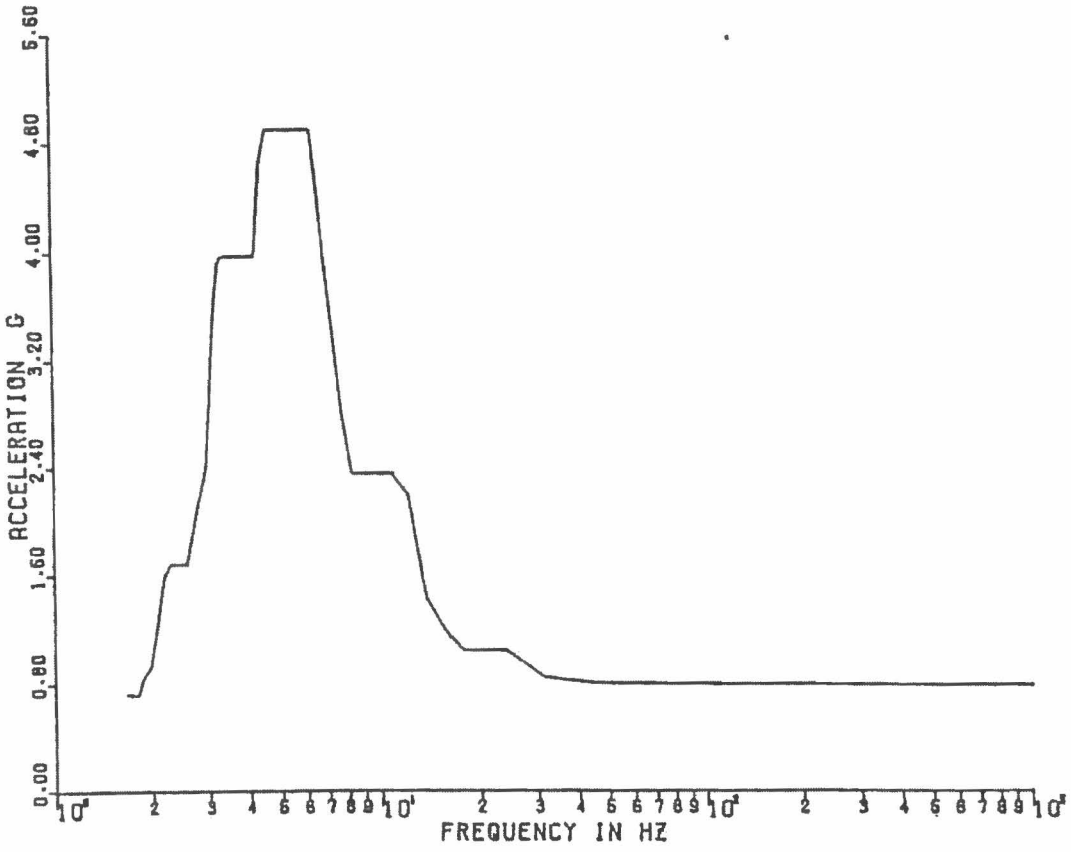
FIGURE 3.9A-60

ARS OF ACCELERATION
SHIELD WALL EL. 315.09 FT.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SEISMIC (SSE)

DAMPING VALUE 2-5%
N-S DIRECTION (Z AXIS)



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

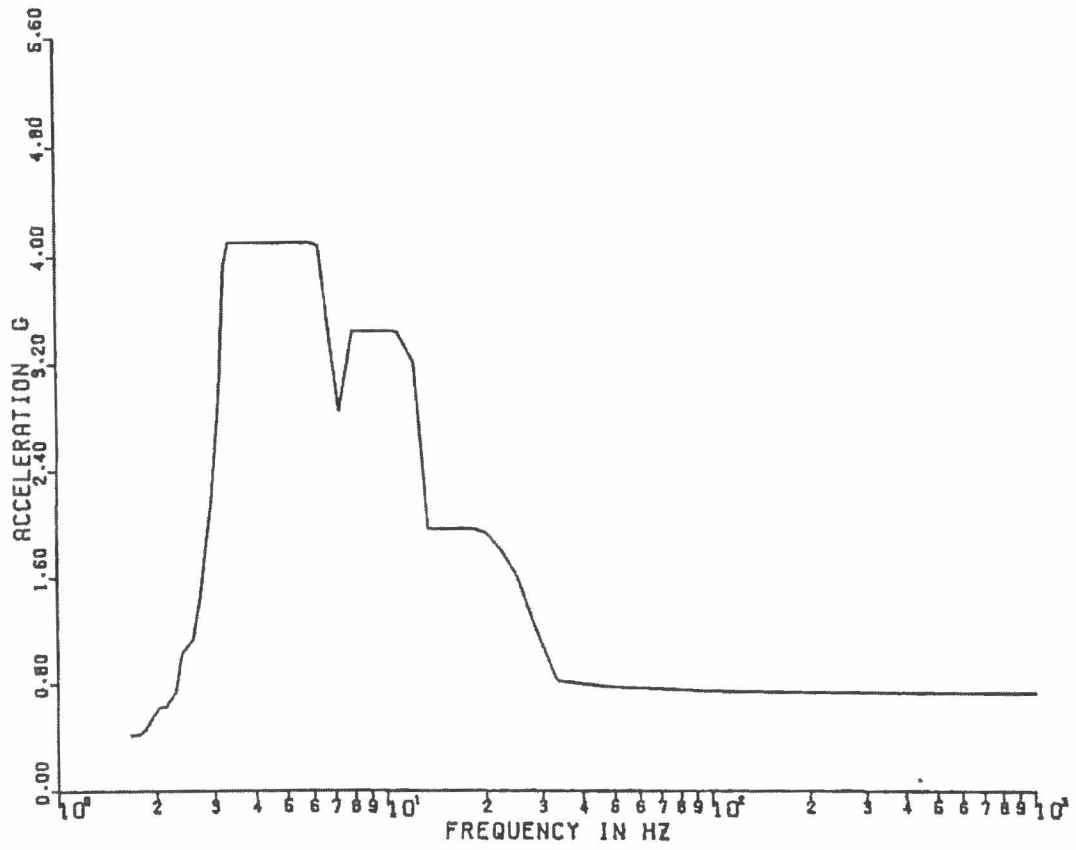
FIGURE 3.9A-61

ARS OF ACCELERATION
SHIELD WALL EL. 315.09 FT.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SEISMIC (OBE)

DAMPING VALUE 2-5%
E-W DIRECTION (X AXIS)



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

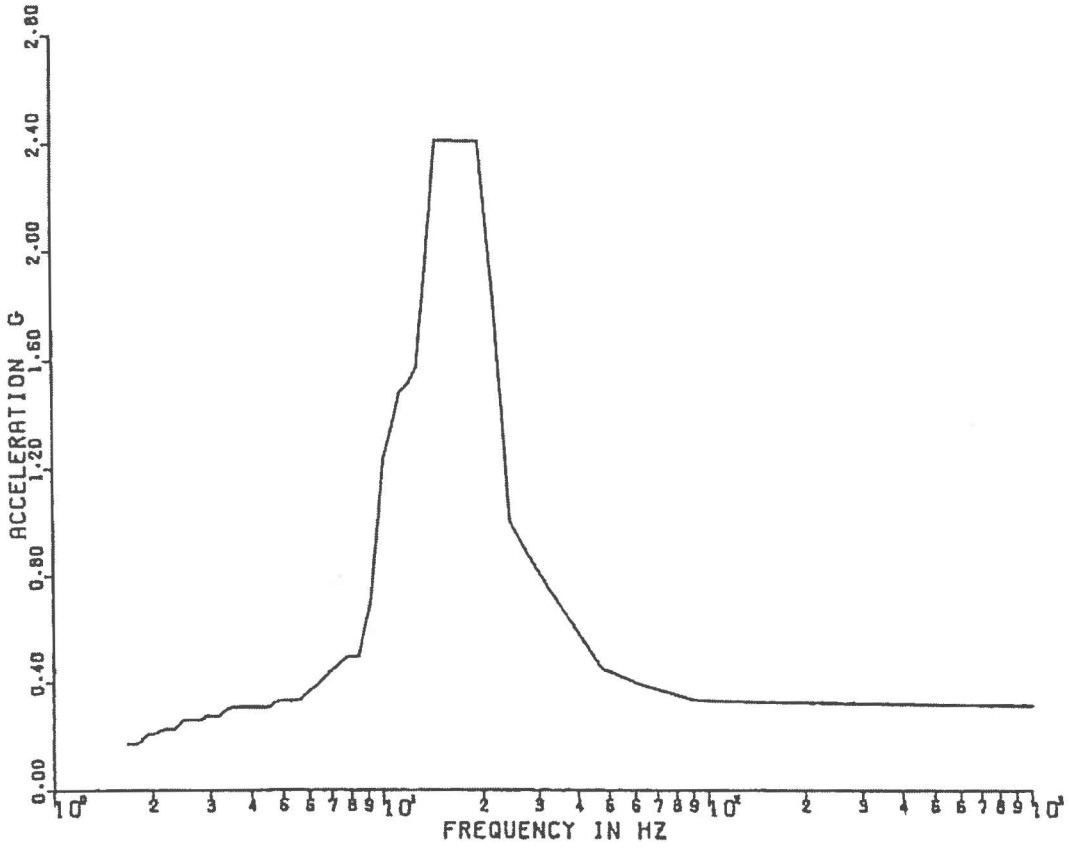
FIGURE 3.9A-62

ARS OF ACCELERATION
RPV SHELL EL. 332.70 FT.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SEISMIC (OBE)

DAMPING VALUE 2-5%
VERT. DIRECTION (Y AXIS)



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

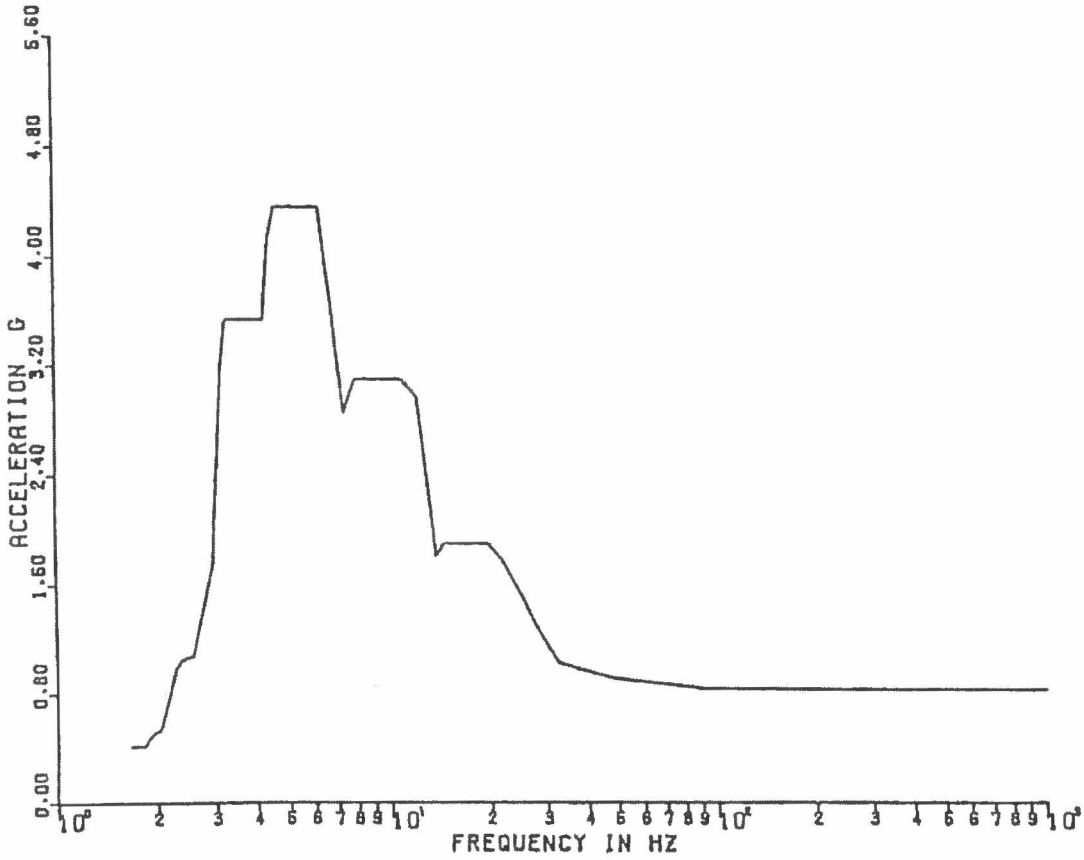
FIGURE 3.9A-63

ARS OF ACCELERATION
RPV SHELL EL. 332.70 FT.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SEISMIC (OBE)

DAMPING VALUE 2-5%
N-S DIRECTION (Z AXIS)



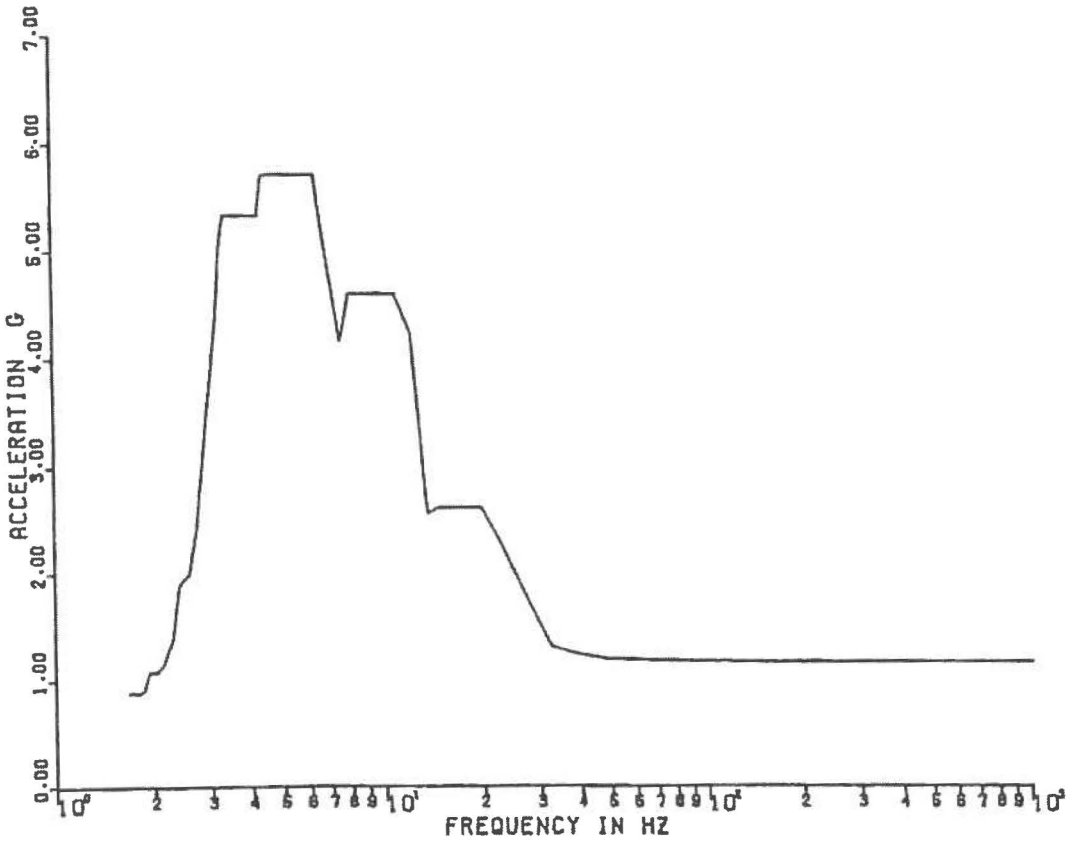
NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

FIGURE 3.9A-64

ARS OF ACCELERATION
RPV SHELL EL. 332.70 FT.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SEISMIC (SSE)
DAMPING VALUE 2-5%
E-W DIRECTION (X AXIS)



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

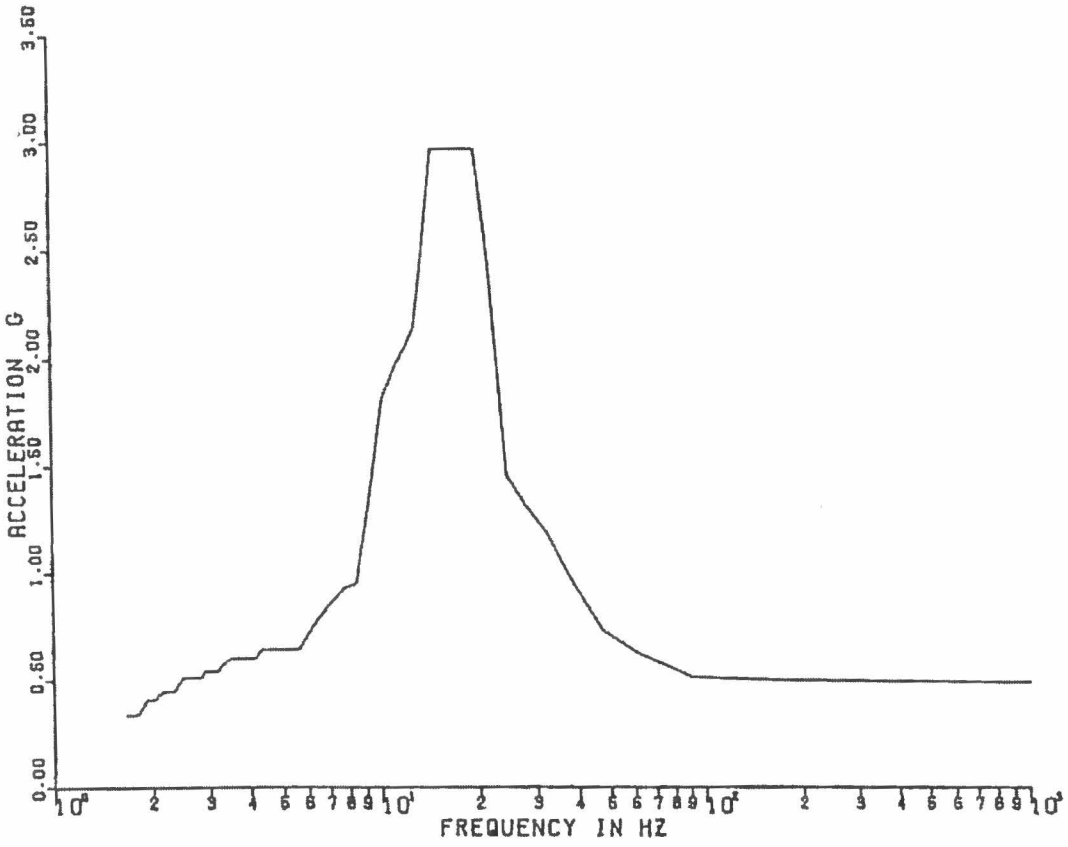
FIGURE 3.9A-65

ARS OF ACCELERATION
RPV SHELL EL. 332.70 FT.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SEISMIC (SSE)

DAMPING VALUE 2-5%
VERT. DIRECTION (Y AXIS)



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

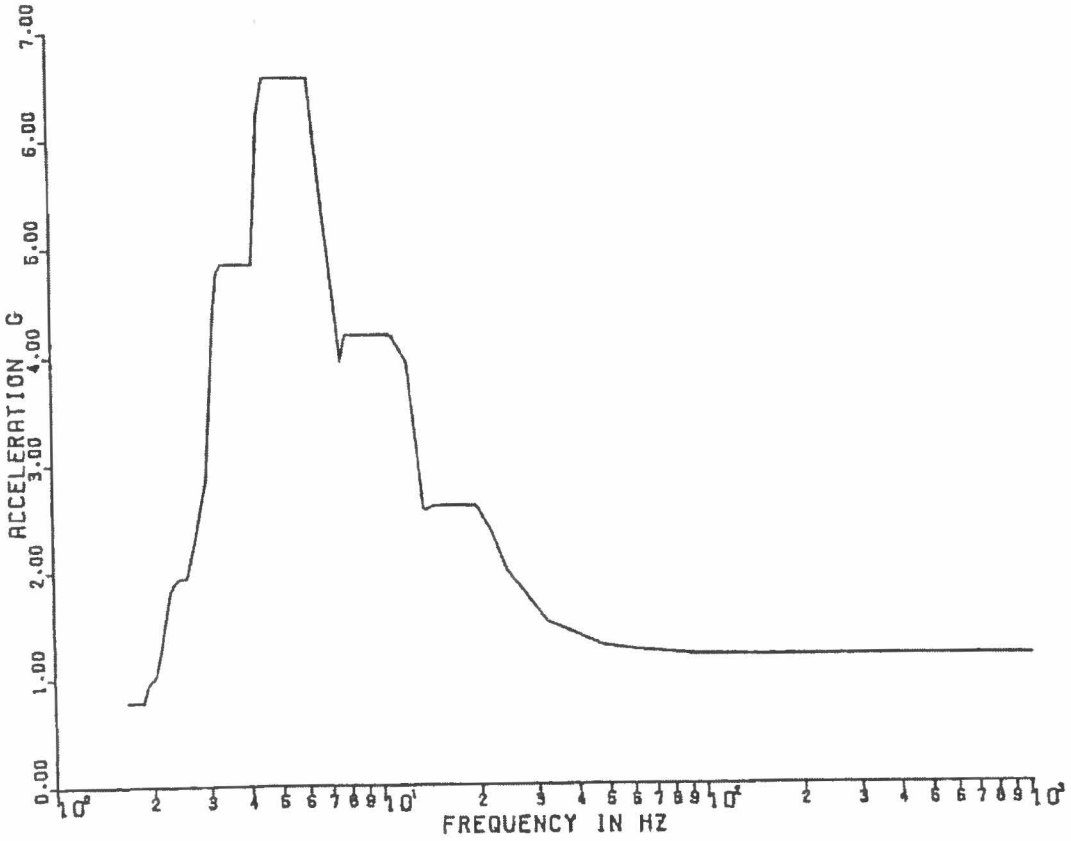
FIGURE 3.9A-66

ARS OF ACCELERATION
RPV SHELL EL. 332.70 FT.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

SEISMIC (SSE)

DAMPING VALUE 2-5%
N-S DIRECTION (Z AXIS)



NOTE: THESE CURVES REPRESENT A SPREAD OF + 15% AND -15%

FIGURE 3.9A-67

ARS OF ACCELERATION
RPV SHELL EL. 332.70 FT.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT

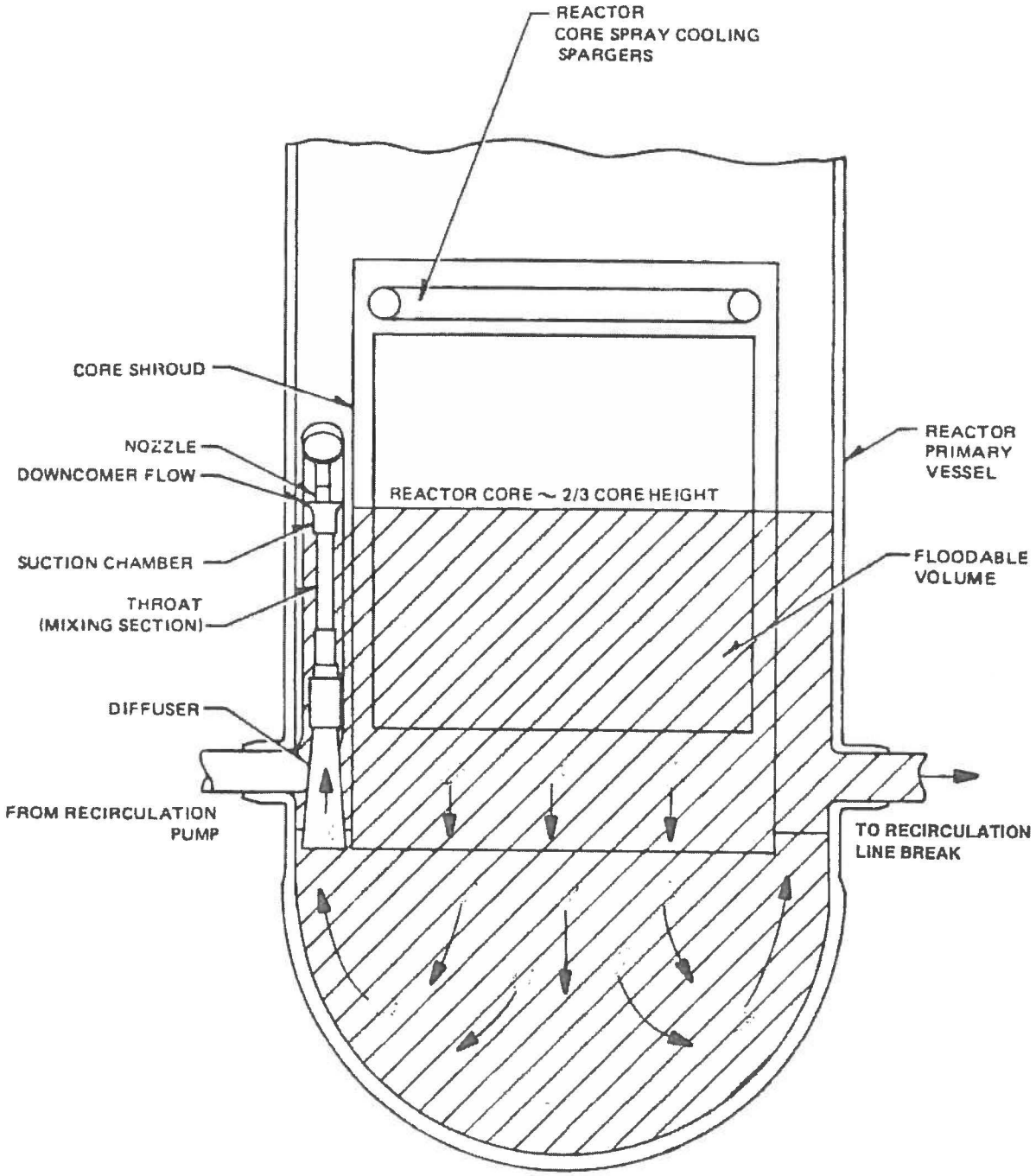


FIGURE 3.9B-2

REACTOR INTERNALS FLOW PATHS FOLLOWING A POSTULATED RECIRCULATION LINE BREAK

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

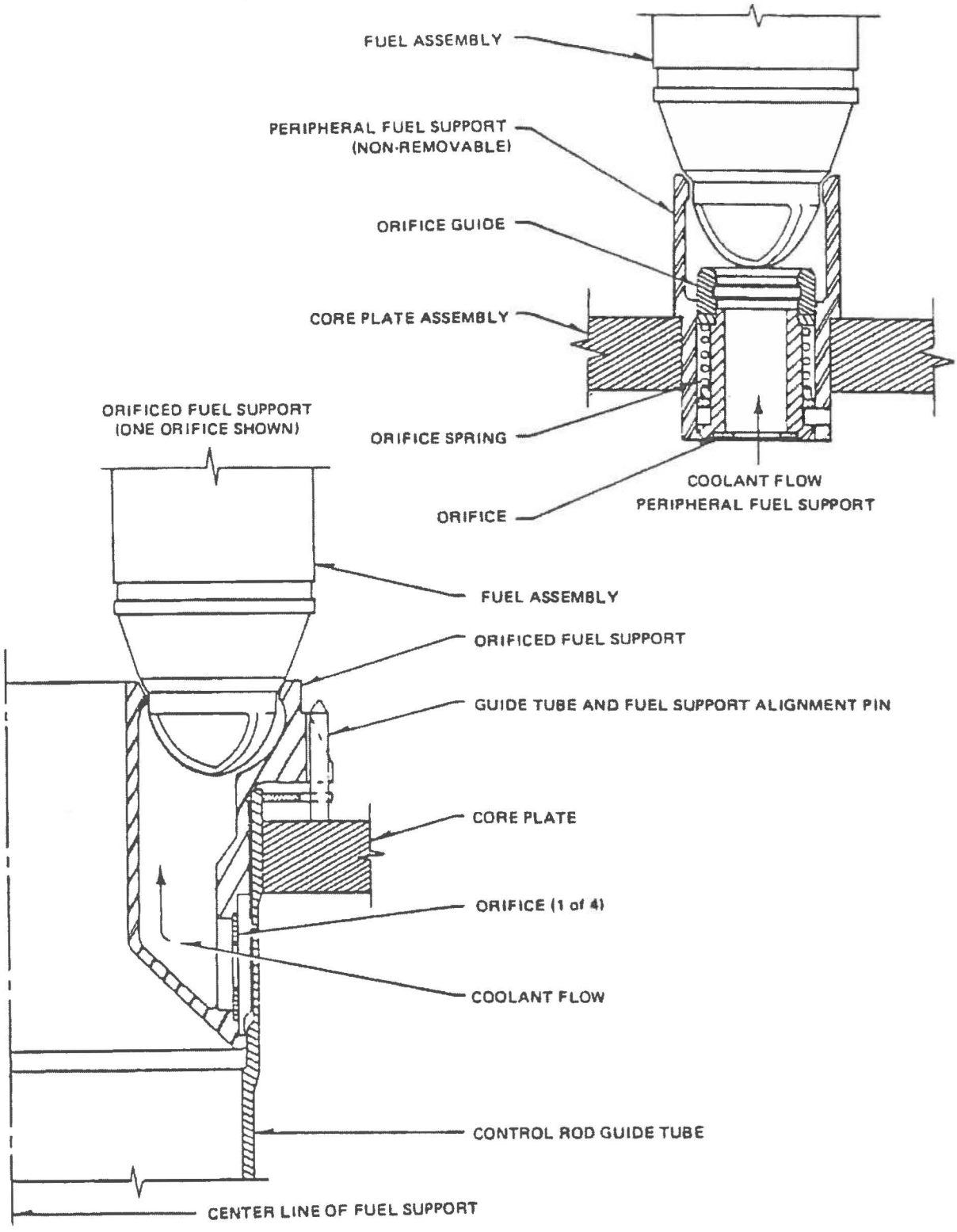


FIGURE 3.9B-3

FUEL SUPPORT PIECES

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

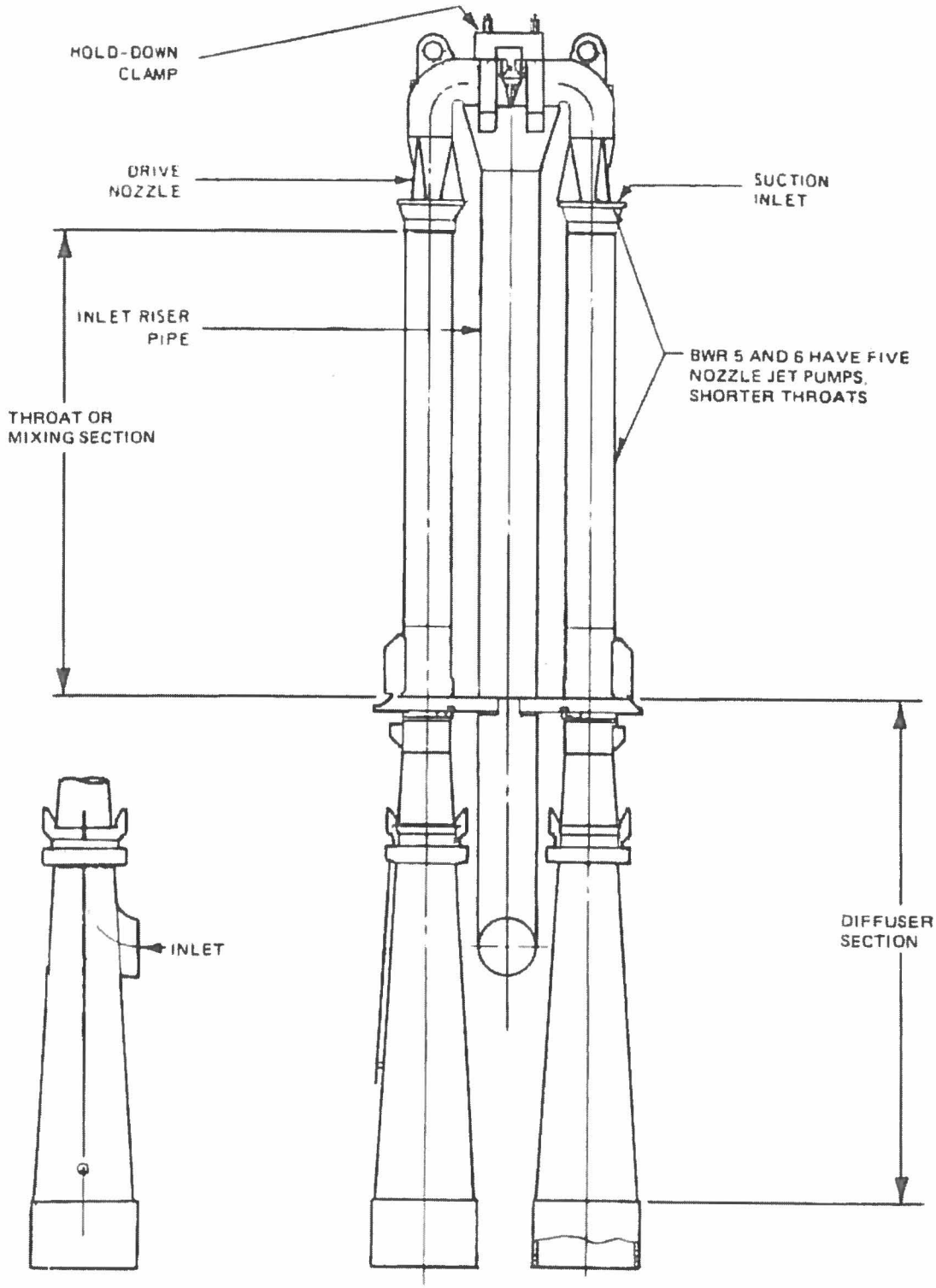


FIGURE 3.9B-4

JET PUMP

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

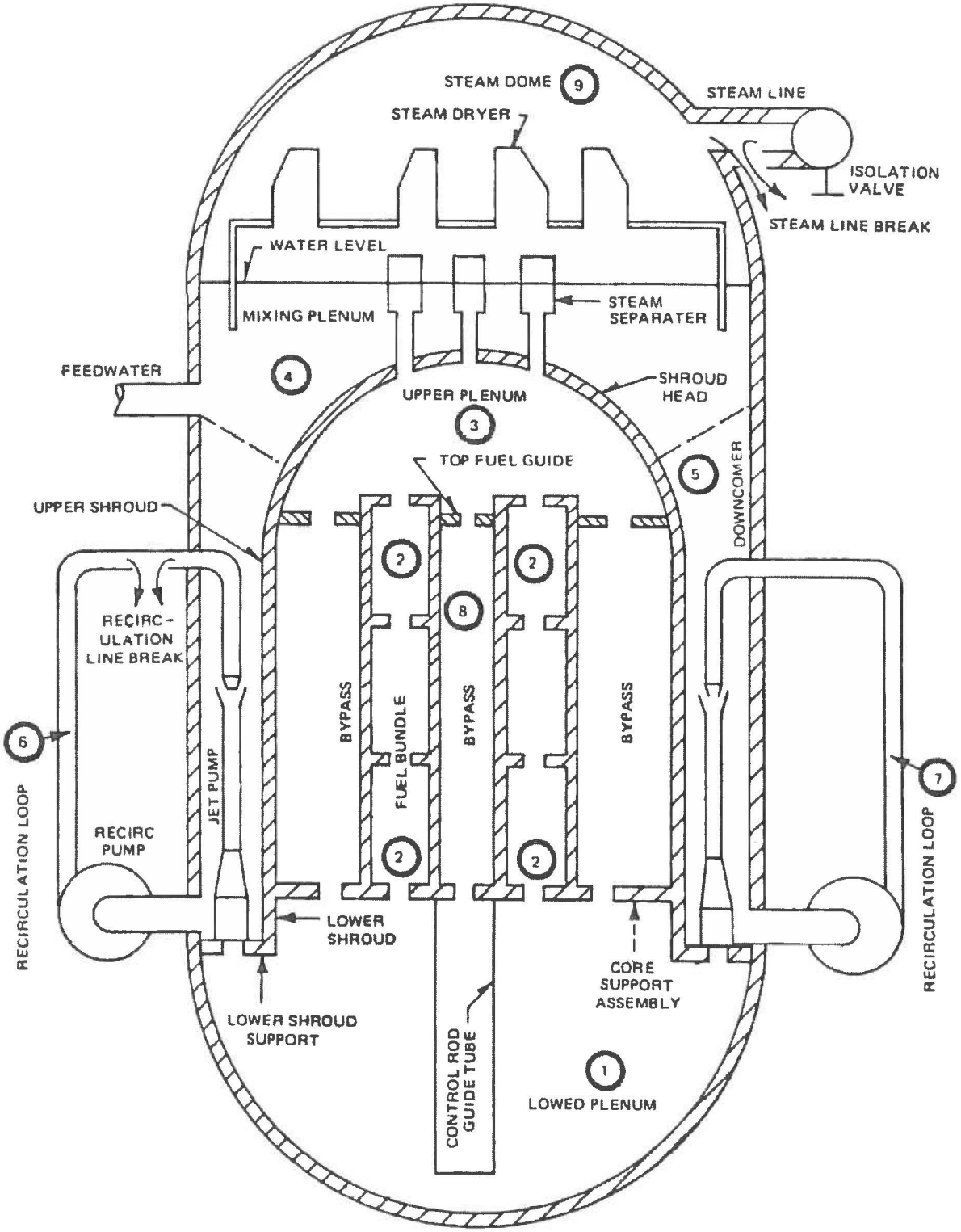


FIGURE 3.9B-5

PRESSURE NODES USED FOR DEPRESSURIZATION ANALYSIS

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

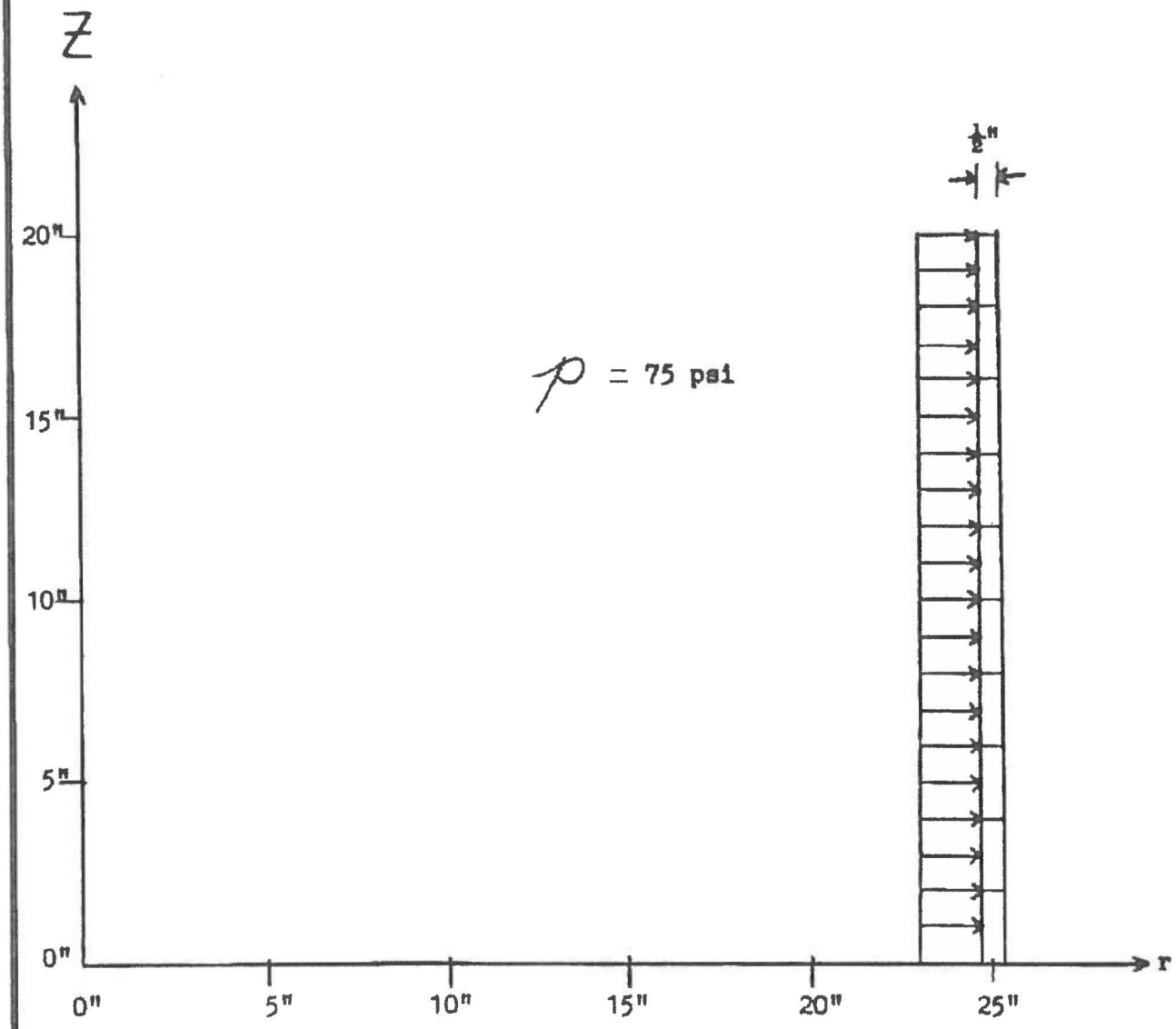


FIGURE 3A.1-1

TEN ELEMENT IDEALIZATION
OF THIN WALL CYLINDER

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

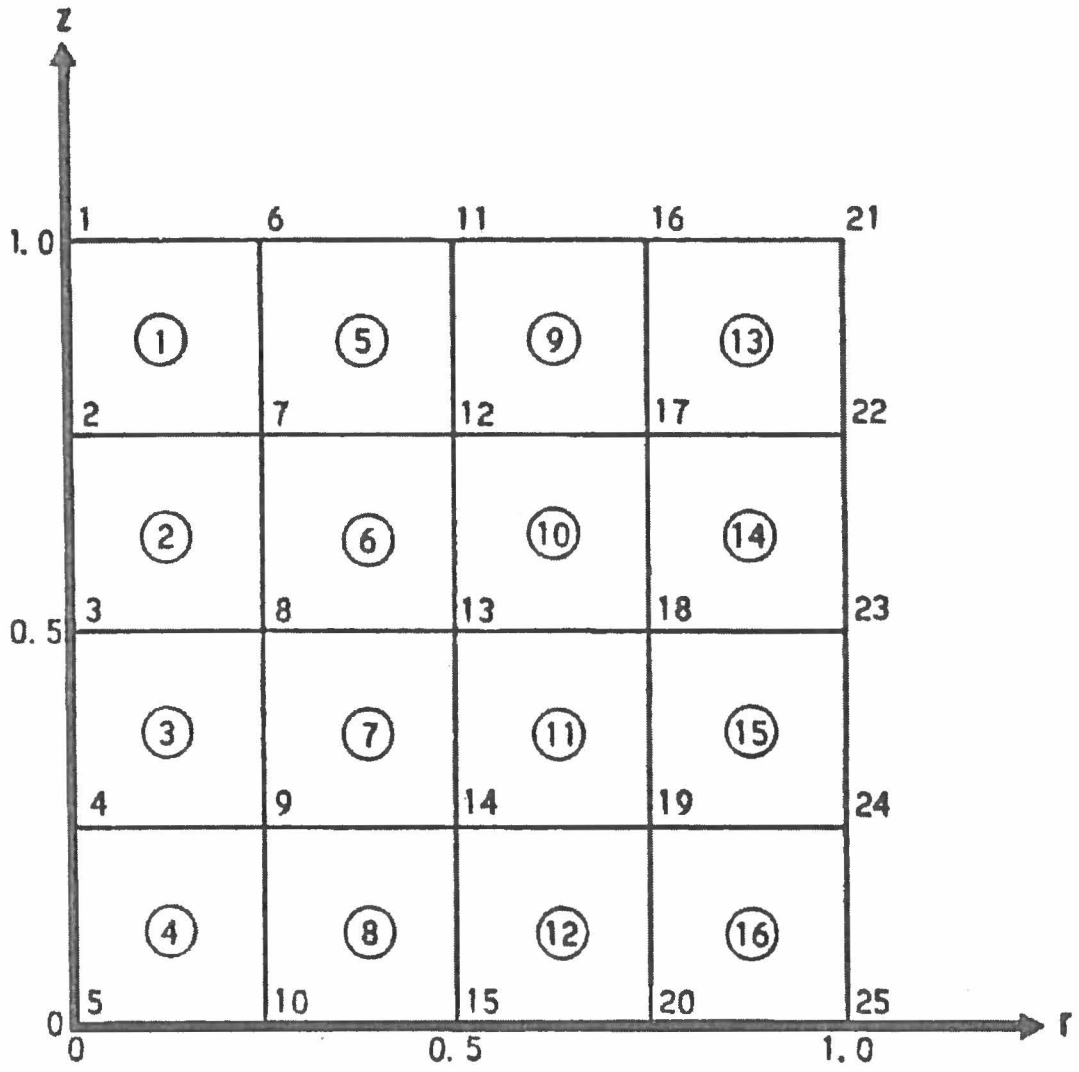


FIGURE 3A.2-1

ELEMENT PLOT

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

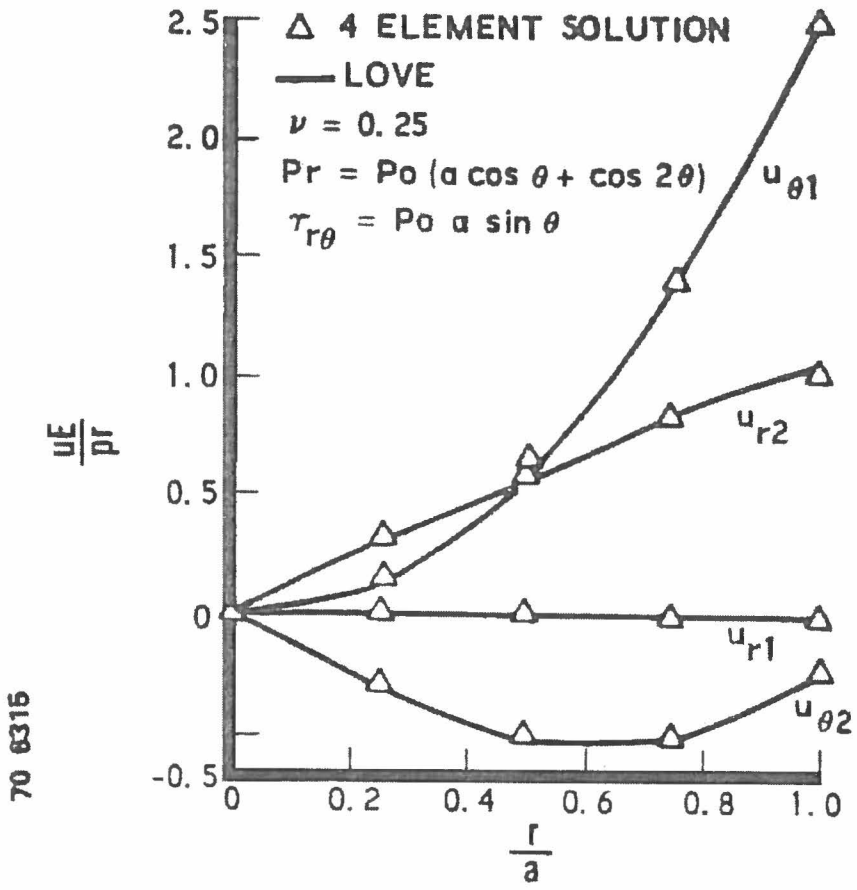


FIGURE 3A. 2-2

HARMONIC AXISYMMETRIC
PLANE STRAIN

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

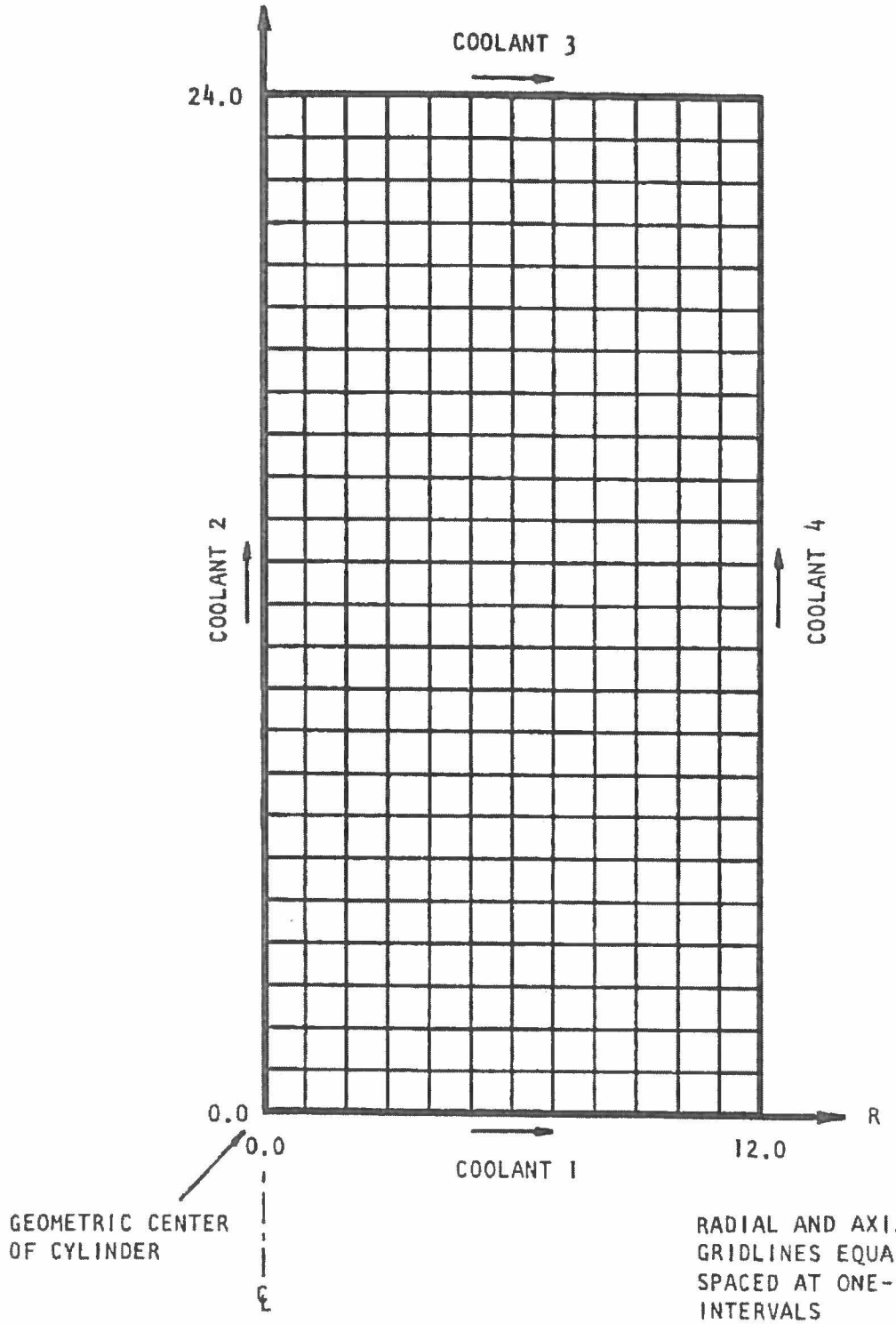


FIGURE 3A. 3-1

TAC2D SAMPLE PROBLEM,
THERMAL MODEL

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

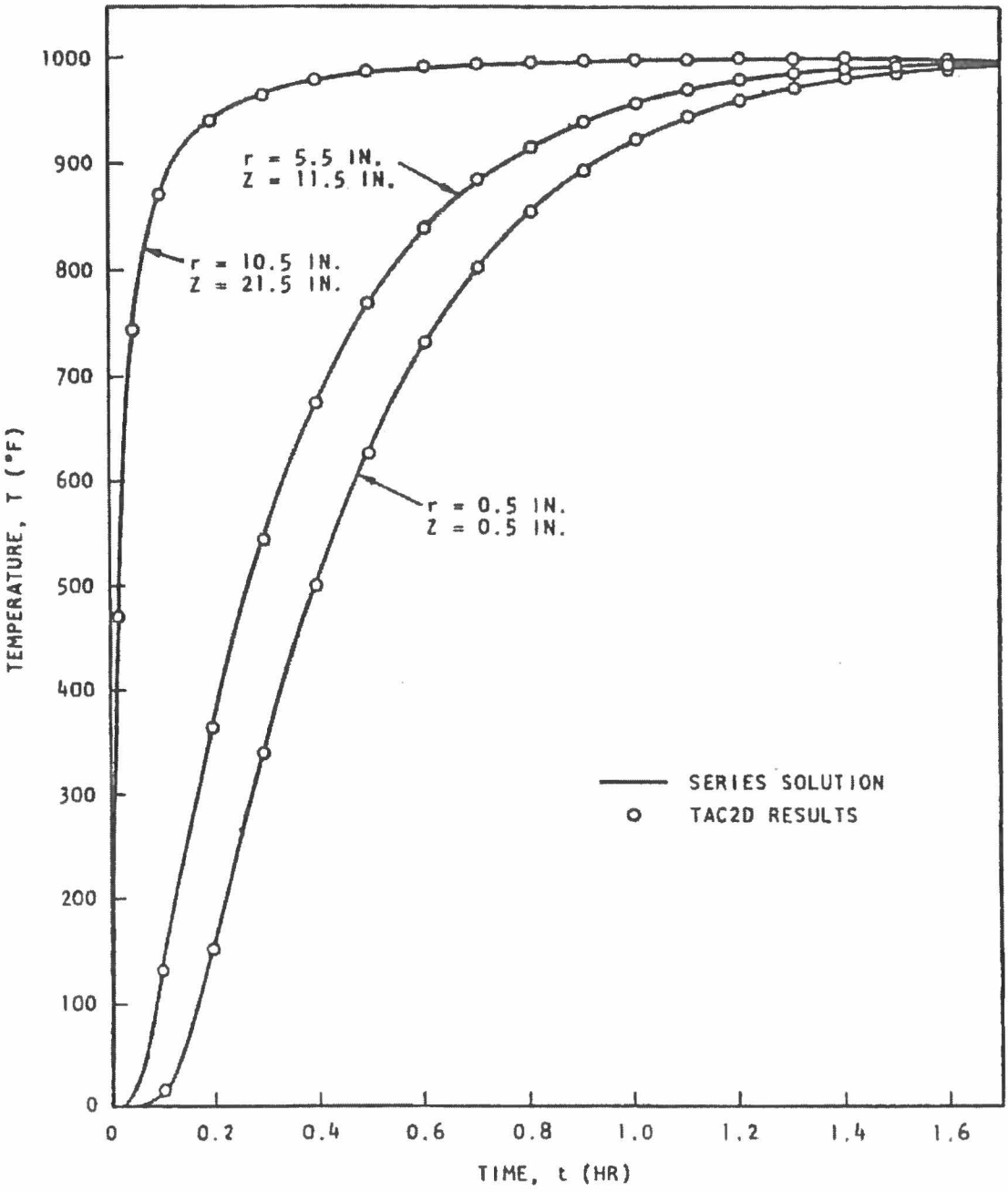
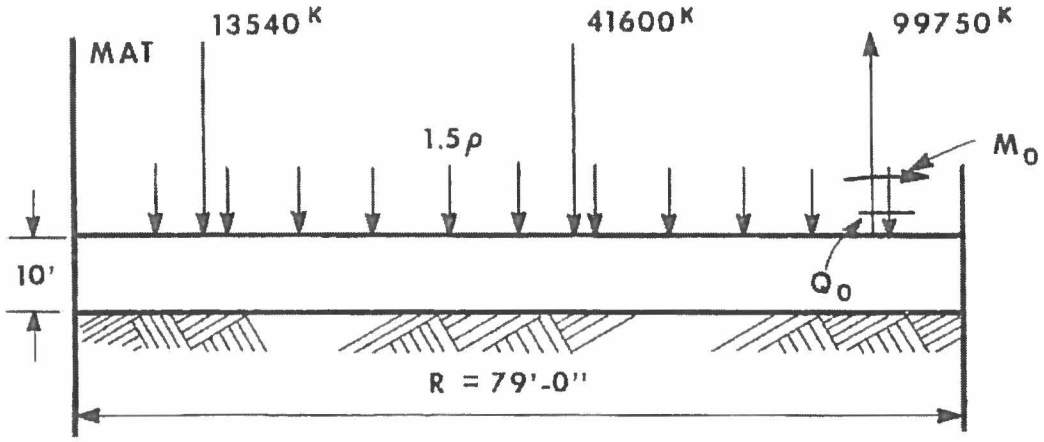


FIGURE 3A. 3-2

TRANSIENT TEMPERATURE IN A
RIGHT CIRCULAR CYLINDER
COMPARISON OF TAC2D RESULTS

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT



CIRCULAR MAT.

M_0 = 1283 MAT 6
1104 SHELL 1
Q_0 = 136 MAT 6
140 SHELL

FIGURE 3A. 4-1

STRUCTURE CONFIGURATION AND LOADING FOR MAT 6 VS SHELL 1

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

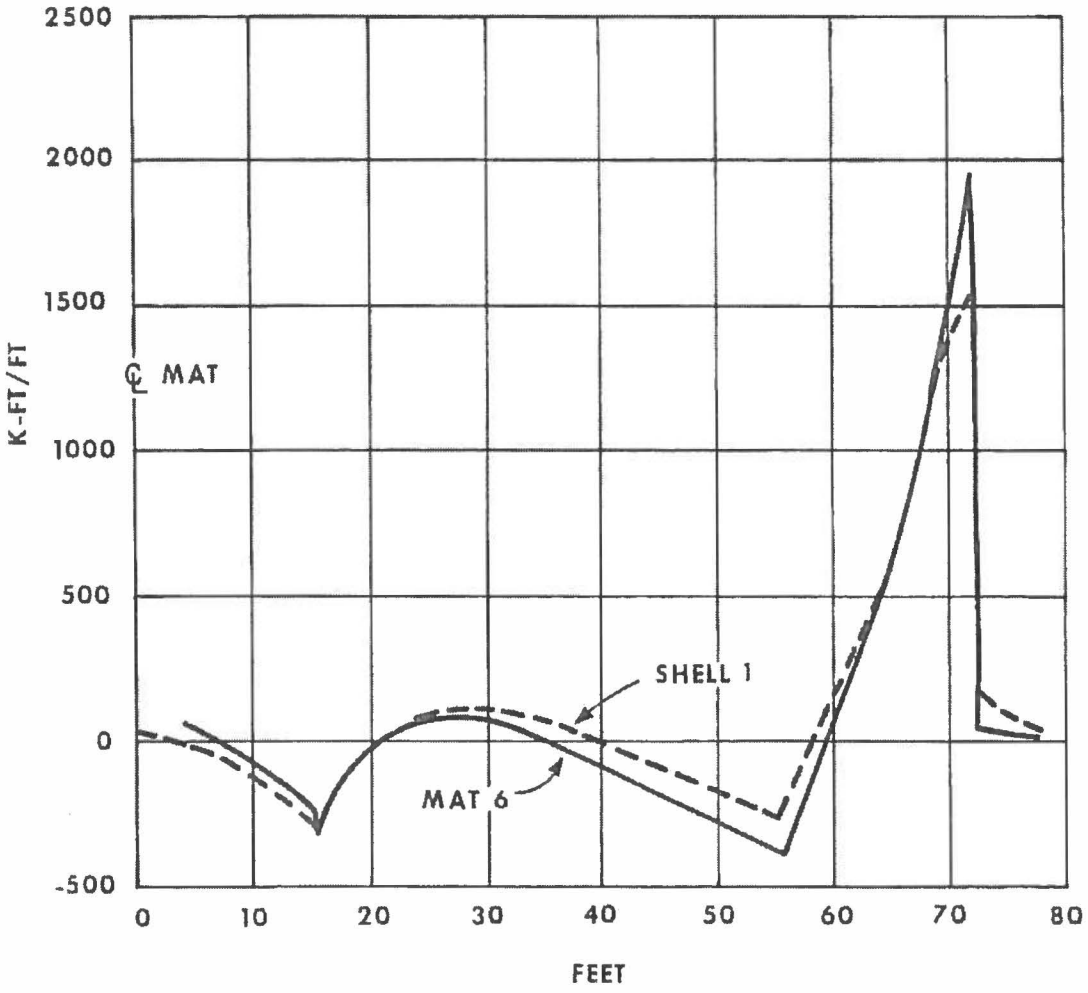


FIGURE 3A. 4-2

COMPARISON OF RESULTS OF MAT 6 VS SHELL 1-MAT RADIAL MOMENT

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

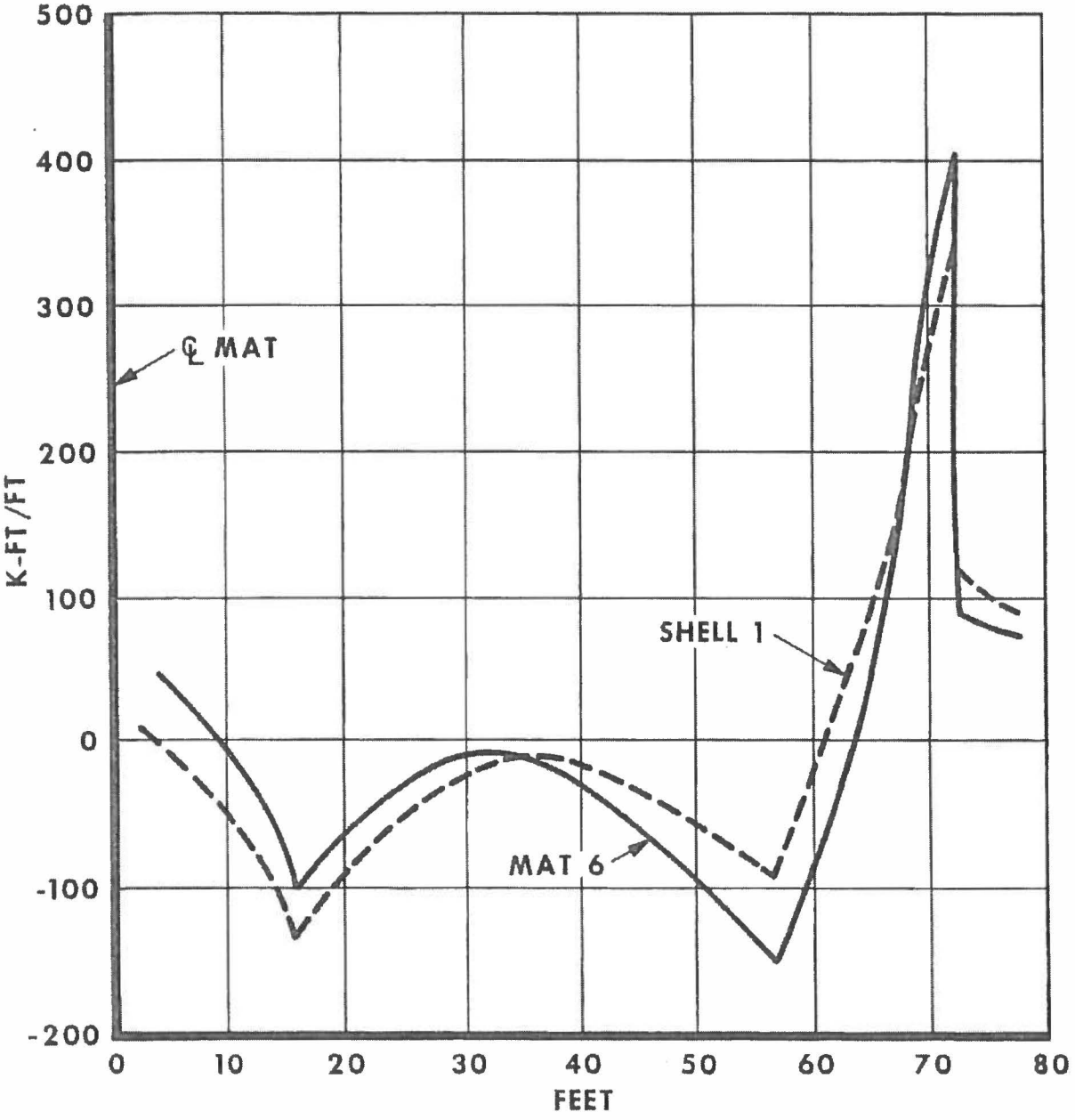


FIGURE 3A. 4-3

COMPARISON OF RESULTS OF MAT 6
VS SHELL 1-MAT TANGENTIAL MOMENT

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

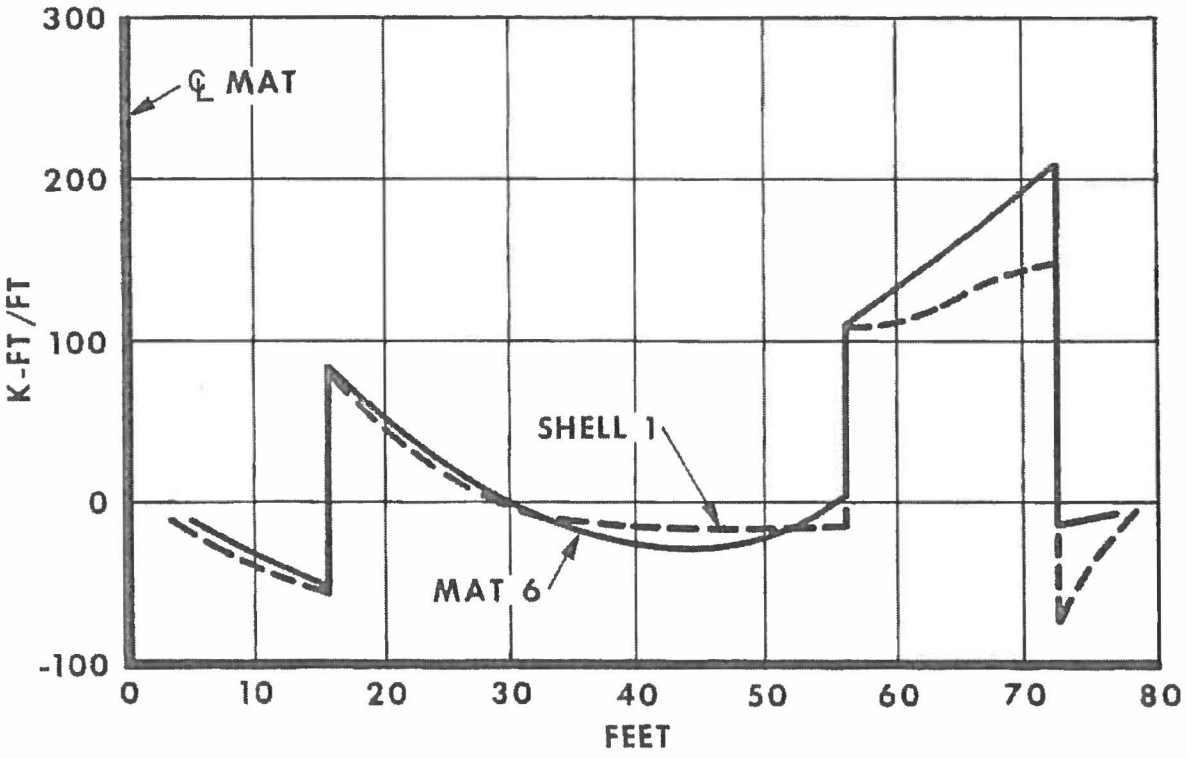
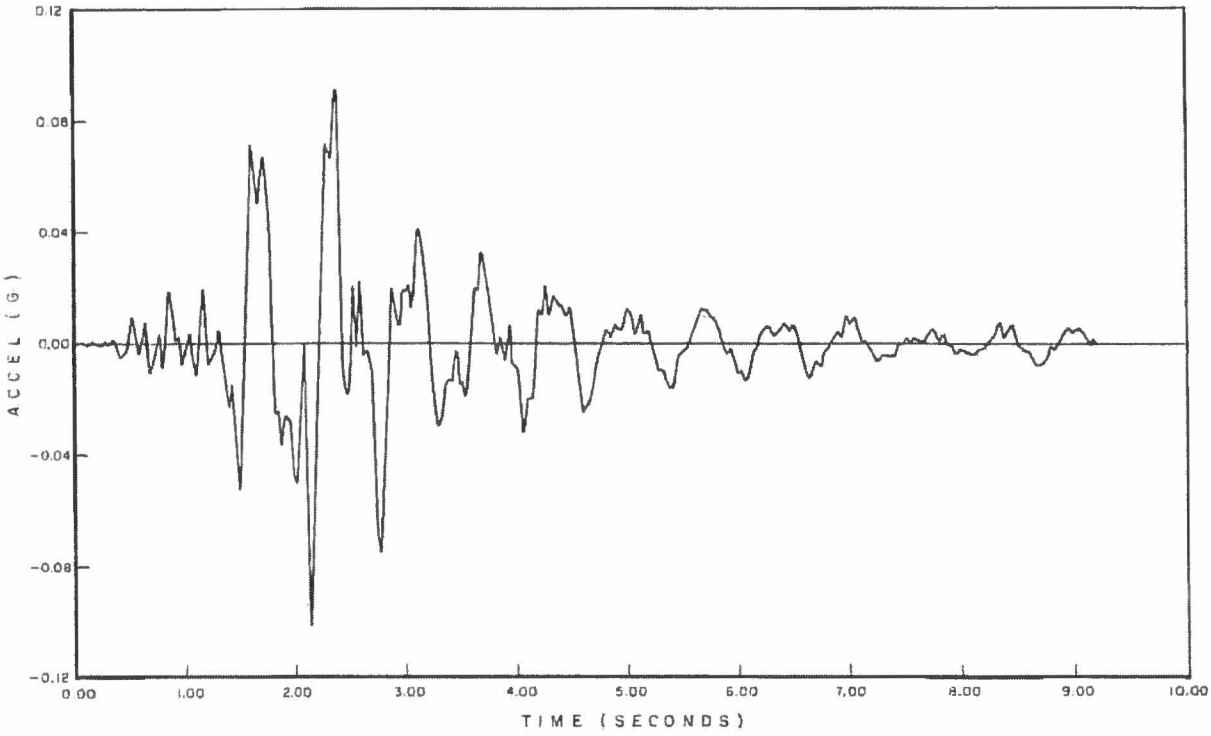


FIGURE 3A. 4-4

COMPARISON OF RESULTS OF MAT 6
VS SHELL 1-MAT RADIAL SHEAR

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

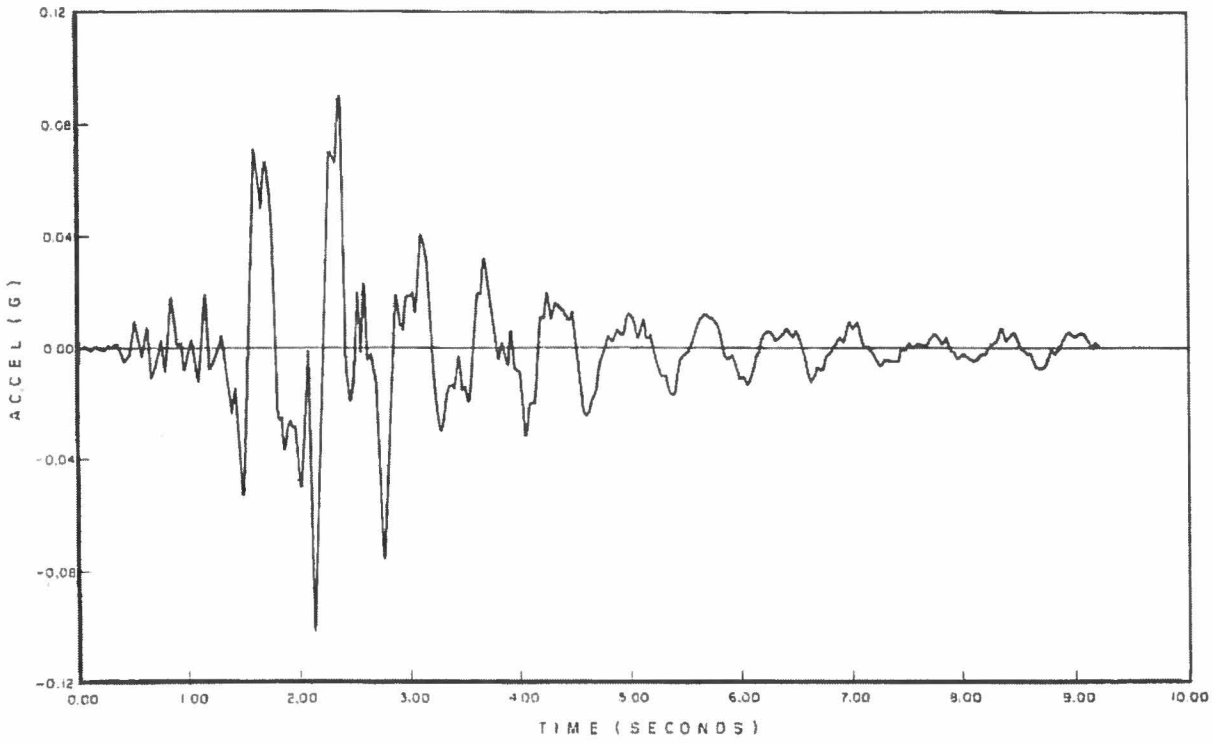


MAX. ACCEL. -0.1017
AT TIME 2.150

FIGURE 3A. 6-1

RESULTS OF TIME HISTORY PROGRAM
CONTAINMENT STRUCTURE-OPERATING
FLOOR LEVEL TIME HISTORY
OF STRUCTURAL RESPONSE

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

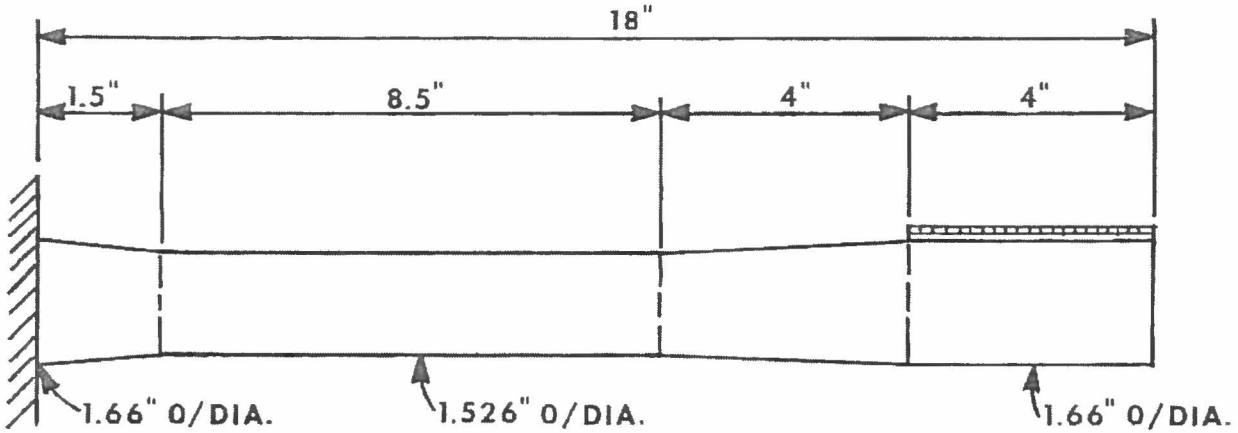


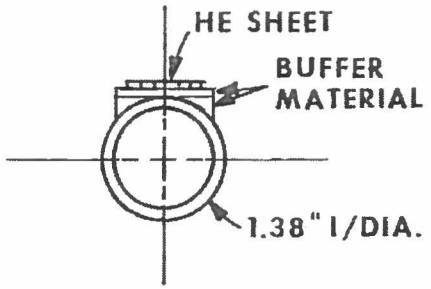
MAX. ACCEL = 0.1015
AT TIME 2.150

FIGURE 3A. 6-2

RESULTS OF STRUDL II ANALYSIS
CONTAINMENT STRUCTURE-
OPERATING FLOOR LEVEL TIME
HISTORY OF STRUCTURAL RESPONSE

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT





PIPE MATERIAL: A106 STEEL.

NOTE:
NOT DRAWN TO SCALE.

FIGURE 3A. 9-1

CANTILEVER PIPE
USED IN MIT EXPERIMENT

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

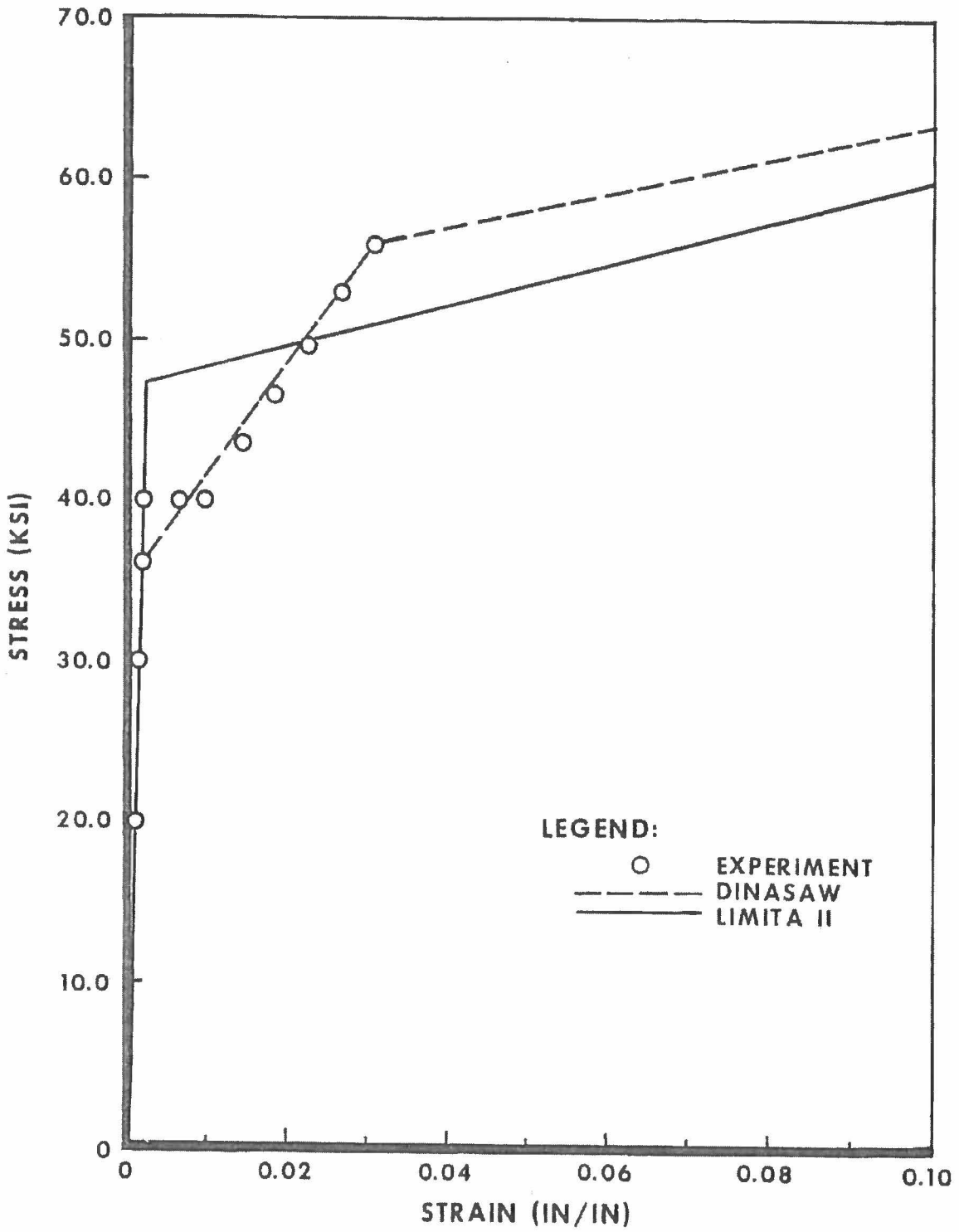
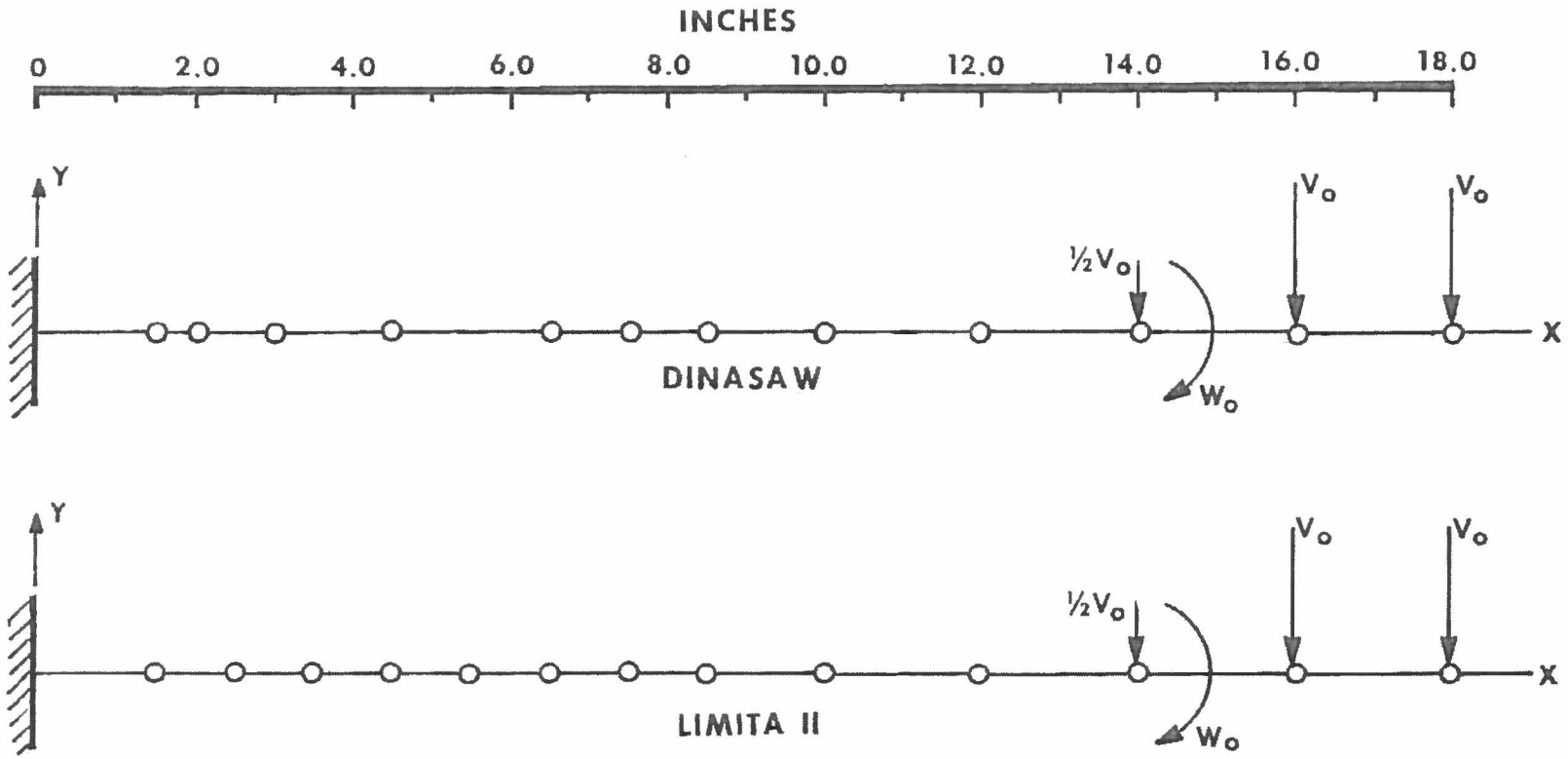


FIGURE 3A. 9-2

MIT EXPERIMENT
STRESS-STRAIN CURVES

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT



NOTES:

V_o =1,400 IN/SEC

W_o =600 RAD/SEC

FIGURE 3A. 9-3

DINASAW AND LIMITA II
LUMPED MASS MODELS

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

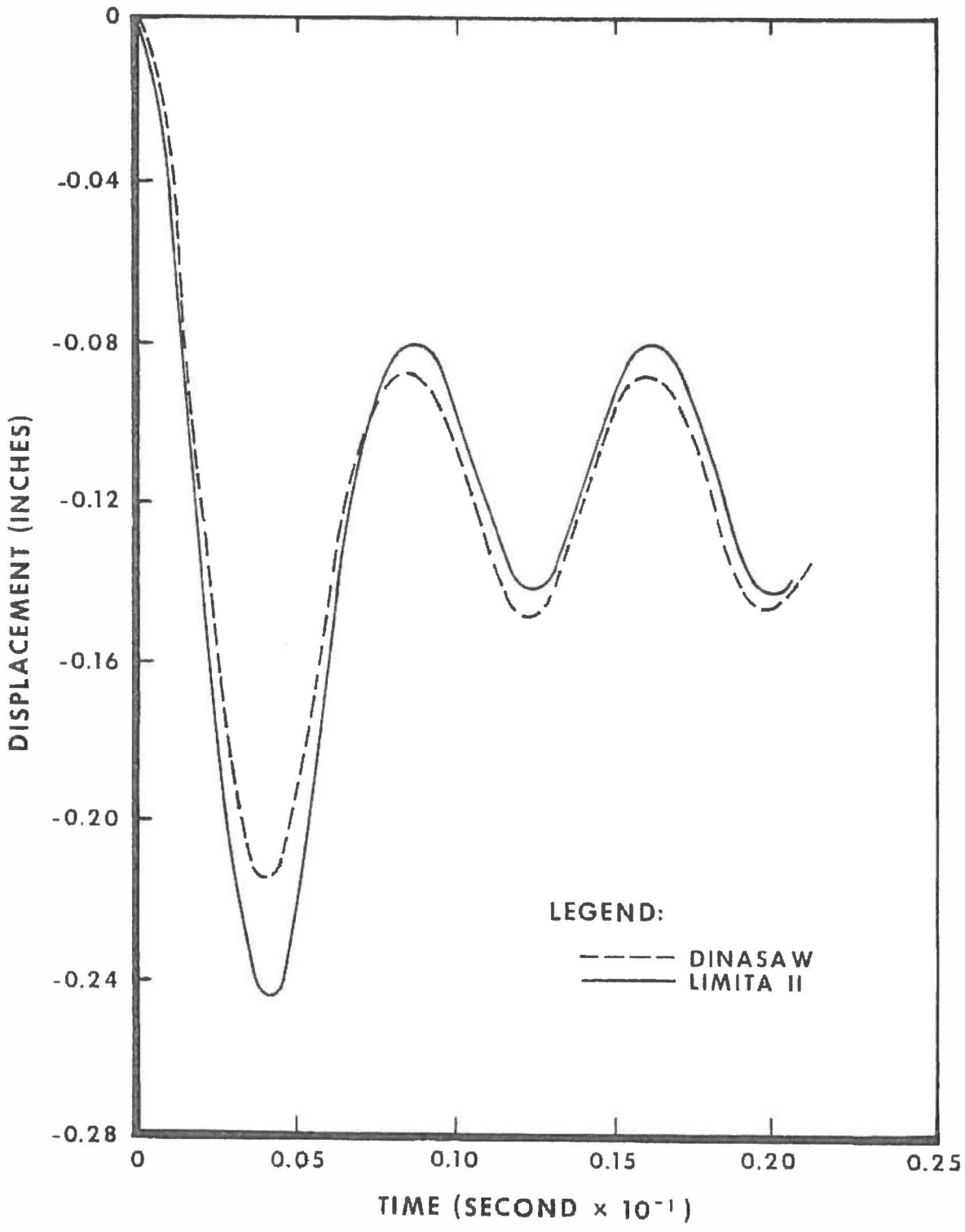


FIGURE 3A. 9-4

TIME HISTORY PLOTS OF THE
X-DISPLACEMENT AT THE FREE END

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

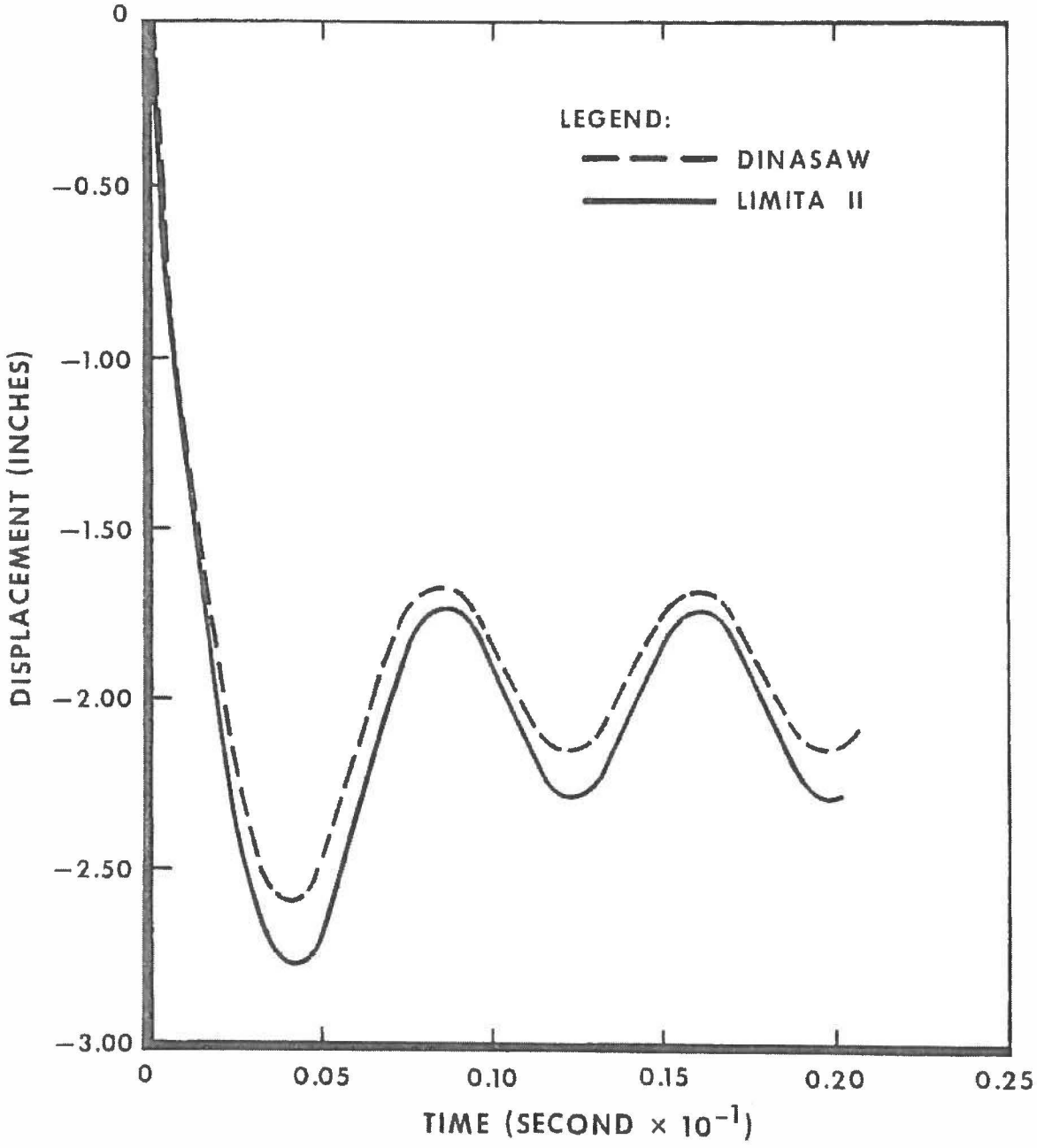


FIGURE 3A. 9-5

TIME HISTORY PLOTS OF THE
Y-DISPLACEMENT AT THE FREE END

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

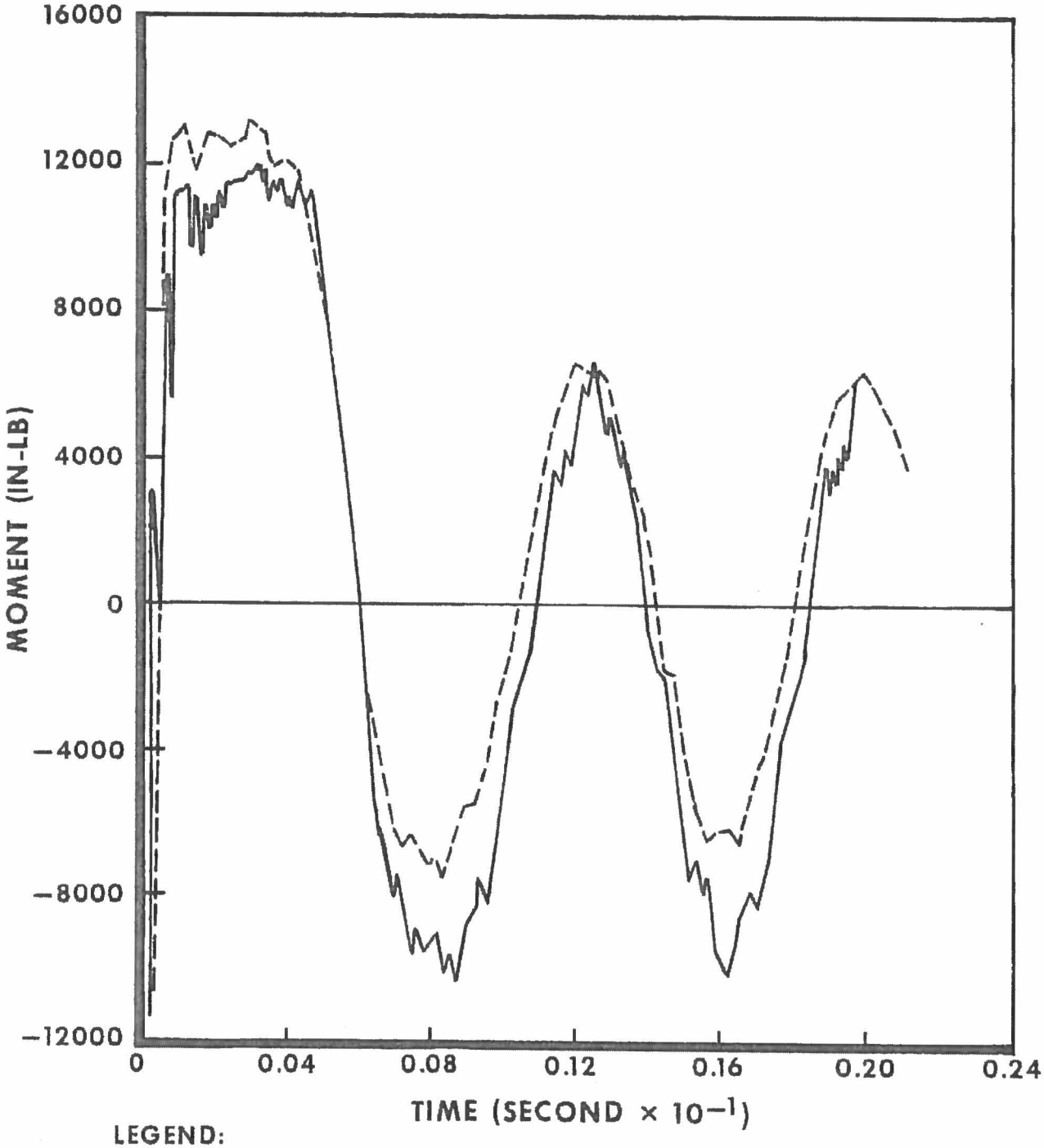
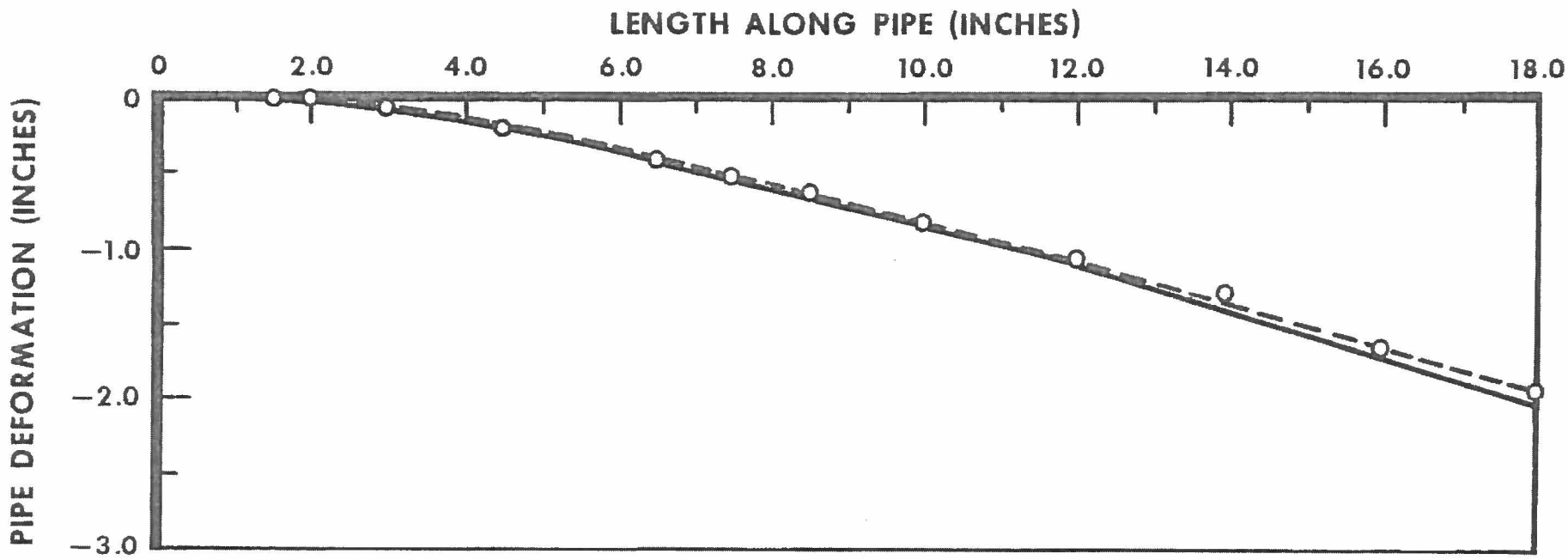


FIGURE 3A. 9-6

TIME HISTORY PLOTS OF THE MOMENT REACTION AT THE CLAMPED END

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT



LEGEND:

O EXPERIMENT

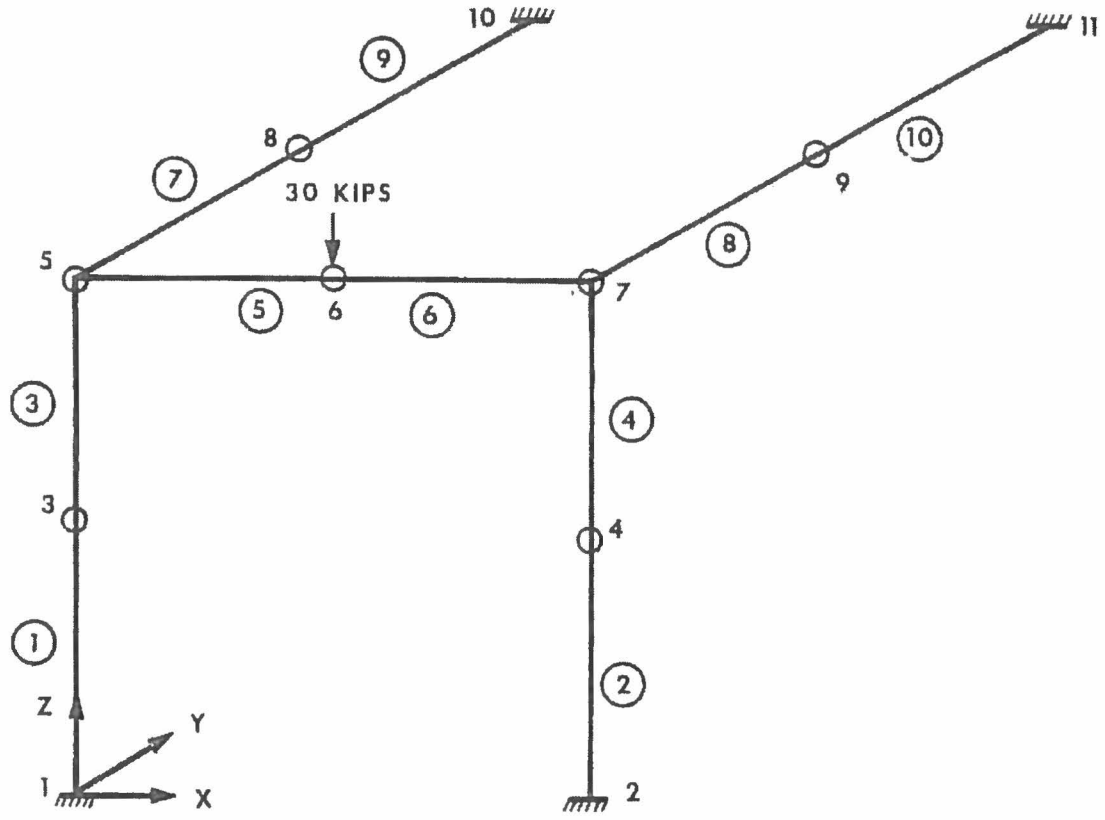
DINASAW

LIMITA II

FIGURE 3A. 9-7

PERMANENT PIPE DEFORMATION
FOR THE MIT EXPERIMENT

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT



NOTE:
ALL MEMBERS W14 × 500

FIGURE 3A. 10-1

LIMITA III ELASTIC SPACE FRAME

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

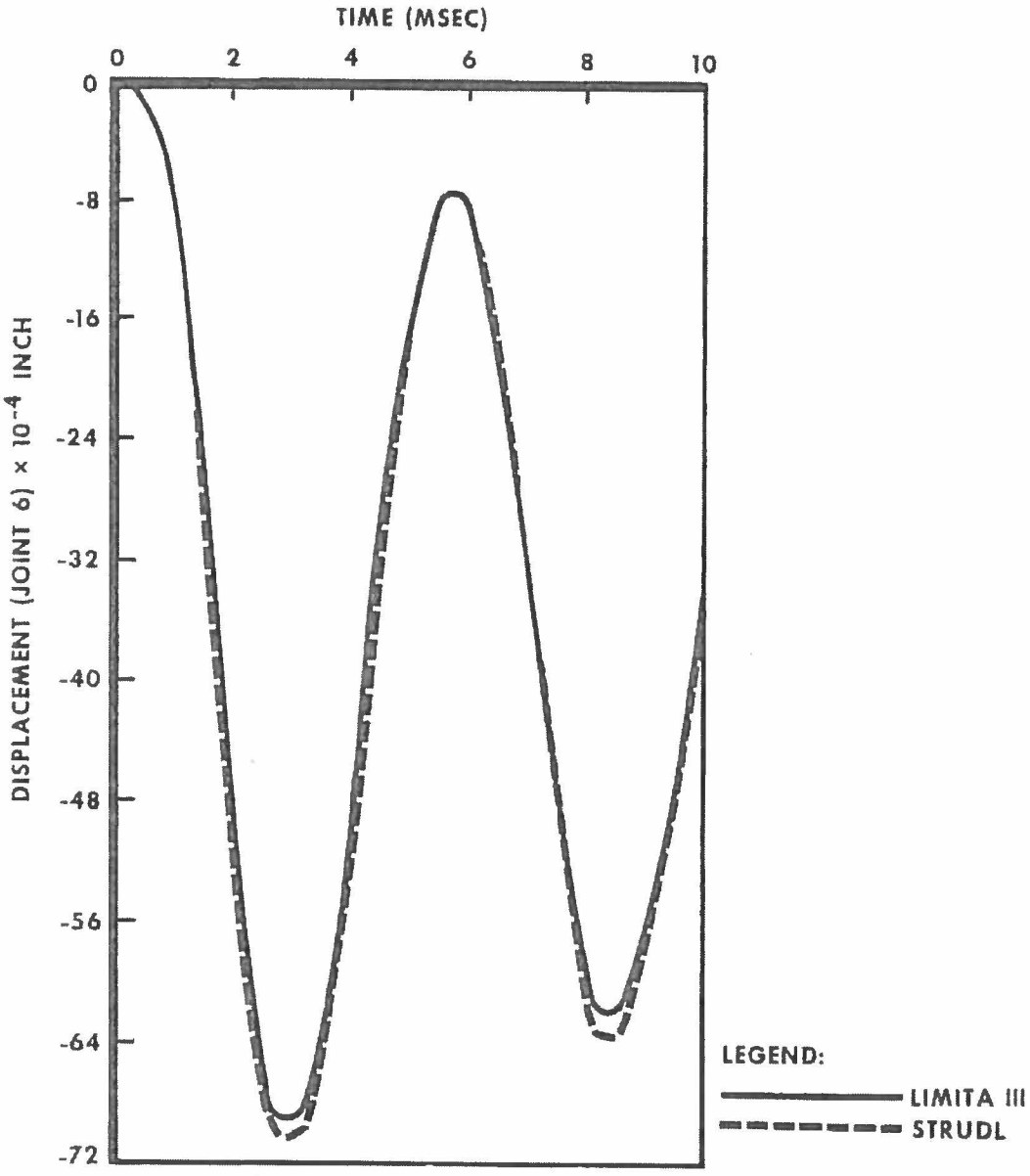


FIGURE 3A. 10-2

LIMITA III DISPLACEMENT
TIME HISTORY AT JOINT 6

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

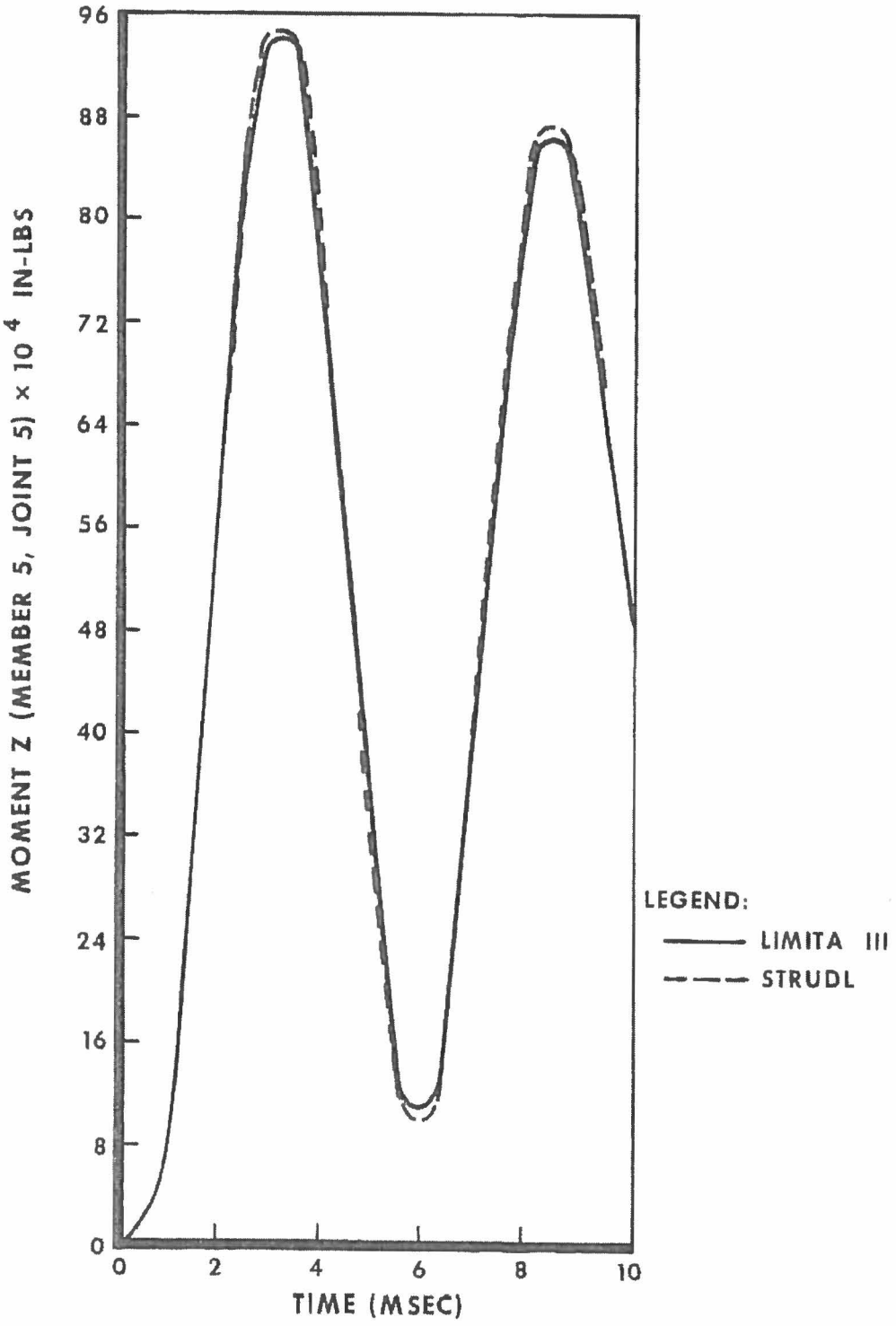
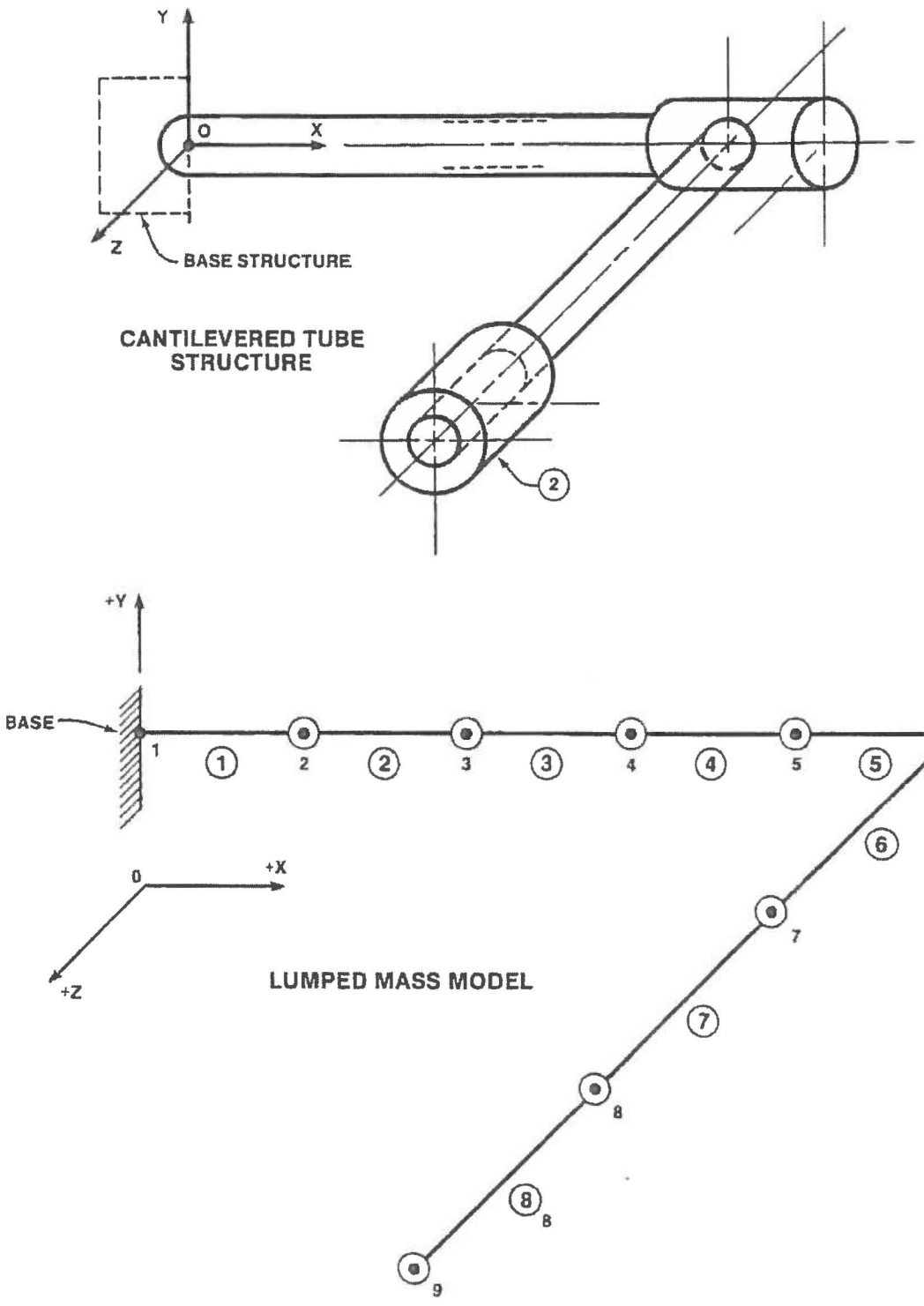


FIGURE 3A. 10-3

LIMITA III TIME HISTORY OF MOMENT Z
IN MEMBER 5, JOINT 6

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT



NOT TO SCALE

FIGURE 3A.10-4

STRUCTURE AND MODEL USED FOR LIMITA3 ANALYSES

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

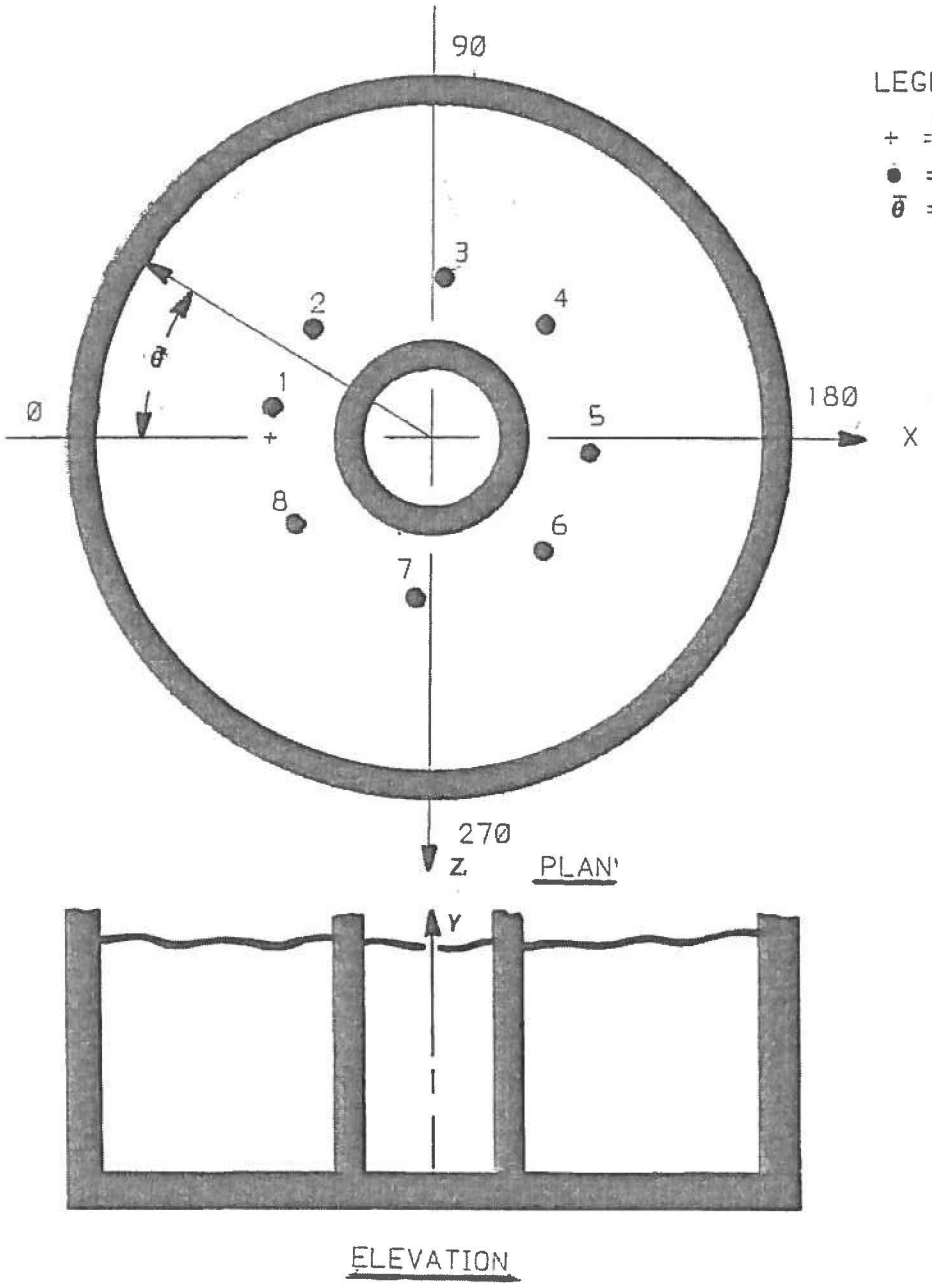
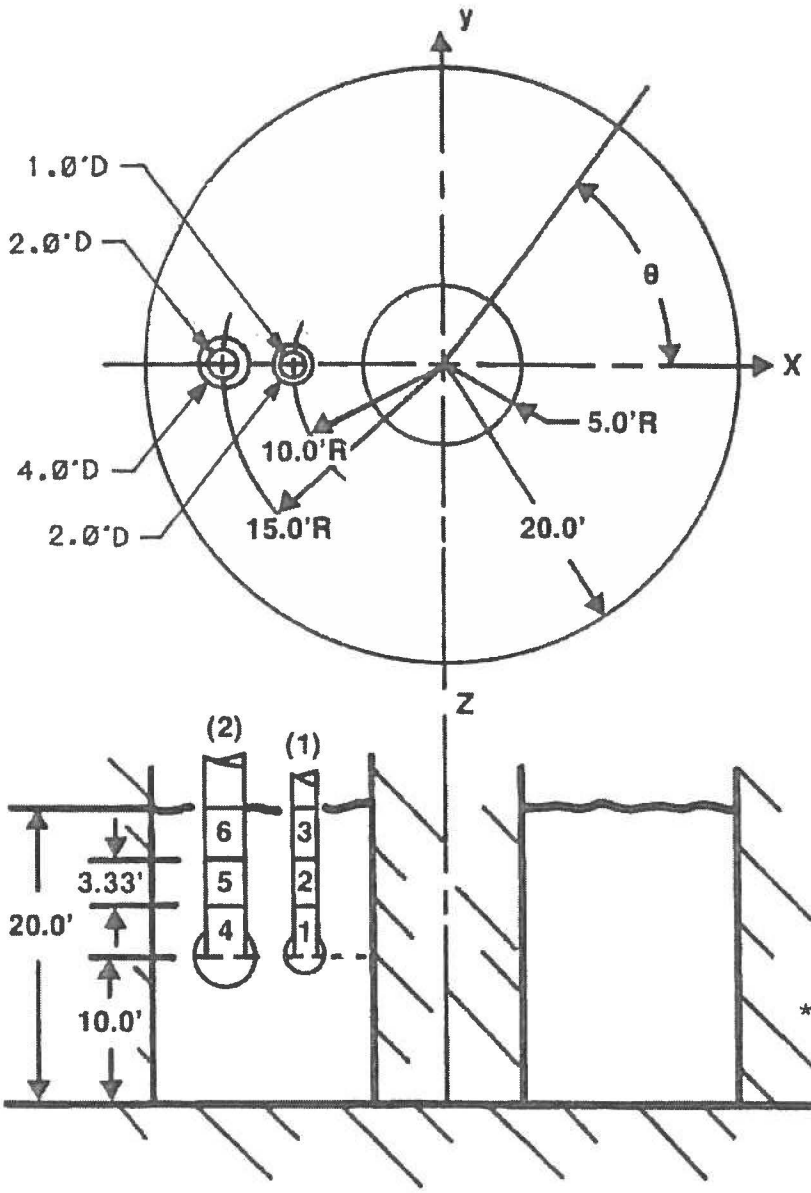


FIGURE 3A.12-1

SSLAM SAMPLE PROBLEM

(ANNULAR POOL)

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT



NOTES:

1. ACCELERATION (CM), LIFT (CL), AND STANDARD (CD) DRAG COEFFICIENTS- CM-2.0,CL-1.0,CD-2.0

2. CENTROIDS OF BUBBLES ARE LOCATED AT THE BASES OF THE SUBMERGED STRUCTURES

3. BUBBLES' SOURCE STRENGTHS ARE,

	SDOT * (FT^3/s)	SSDOT ** (FT^3/s^2)
BUBBLE 1	50	300
BUBBLE 2	50	300

4. **STRUCTURE (1) HAS SEGMENTS 1-3. STRUCTURE (2) HAS SEGMENTS 4-6 ALL SEGMENTS HAVE THE SAME LENGTH.**

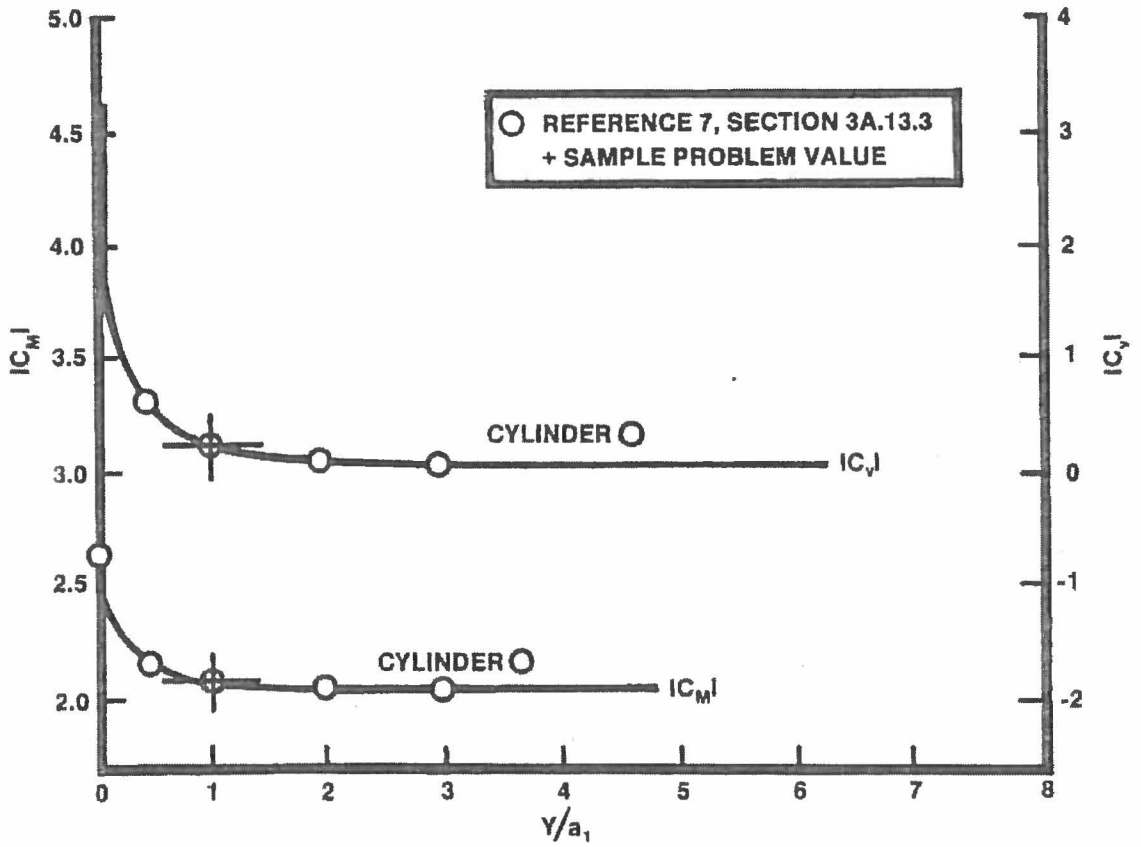
*** SDOT = VOLUMETRIC FLOW RATE OF SOURCE**

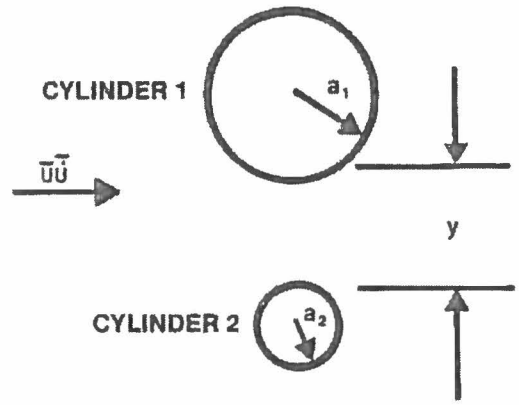
**** SSDOT =** TIME DERIVATIVE OF SDOT

FIGURE 3A.13-1

SSLOAD SAMPLE PROBLEM AND INPUT DATA

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
UPDATED SAFETY ANALYSIS REPORT





$a_1 = 2a_2$

FIGURE 3A.13-2

MODEL/DATA COMPARISON FOR C_M AND C_v

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

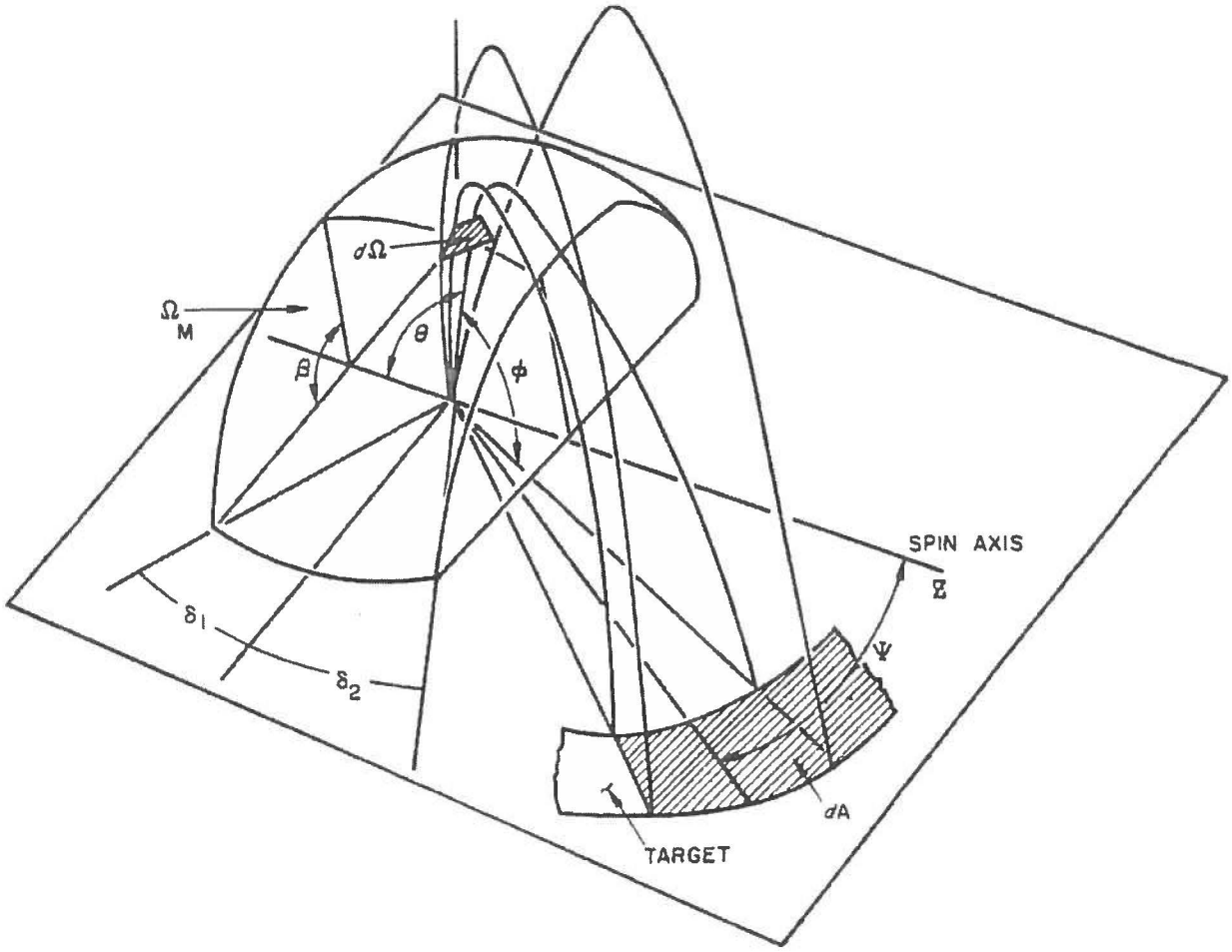
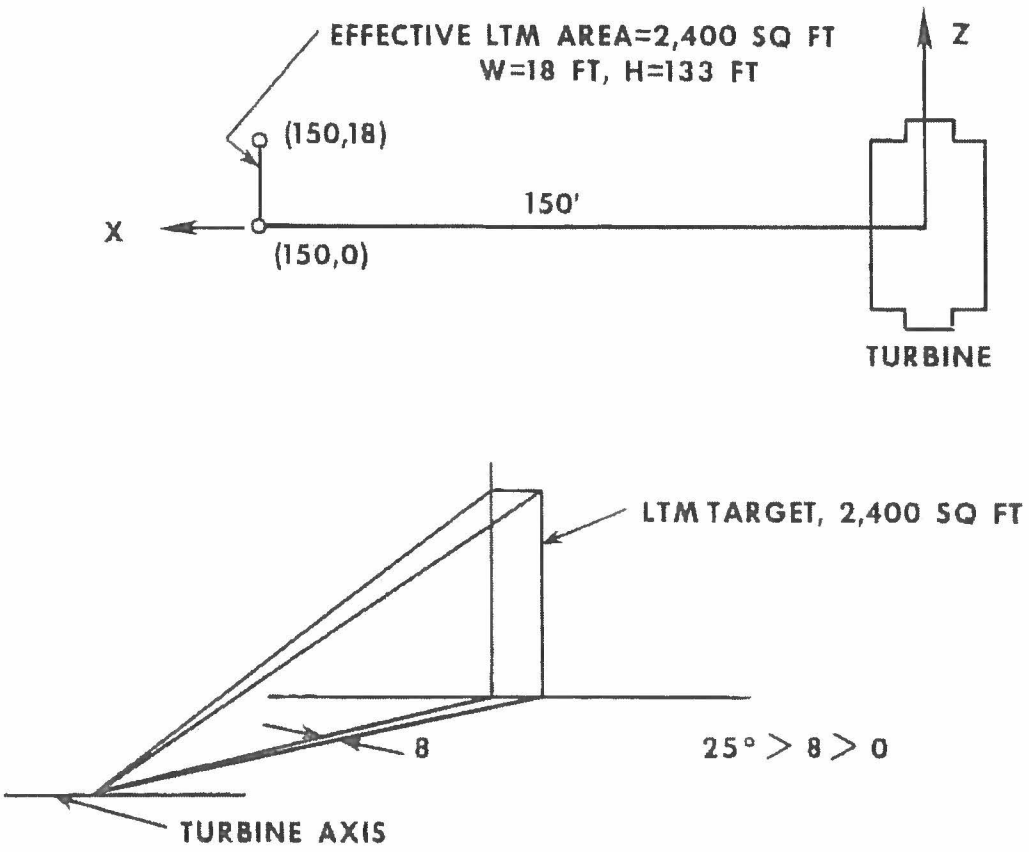


FIGURE 3A. 14-1

NOMENCLATURE FOR
MISSILE PROGRAM

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT



SOURCE:

BUSH S.H. PROBABILITY OF DAMAGE TO NUCLEAR COMPONENTS DUE TO TURBINE FAILURE.
NUCLEAR SAFETY, VOL 14, NO. 3
MAY-JUNE 1973.

FIGURE 3A. 14-2

TARGET FOR LOW TRAJECTORY MISSILE

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

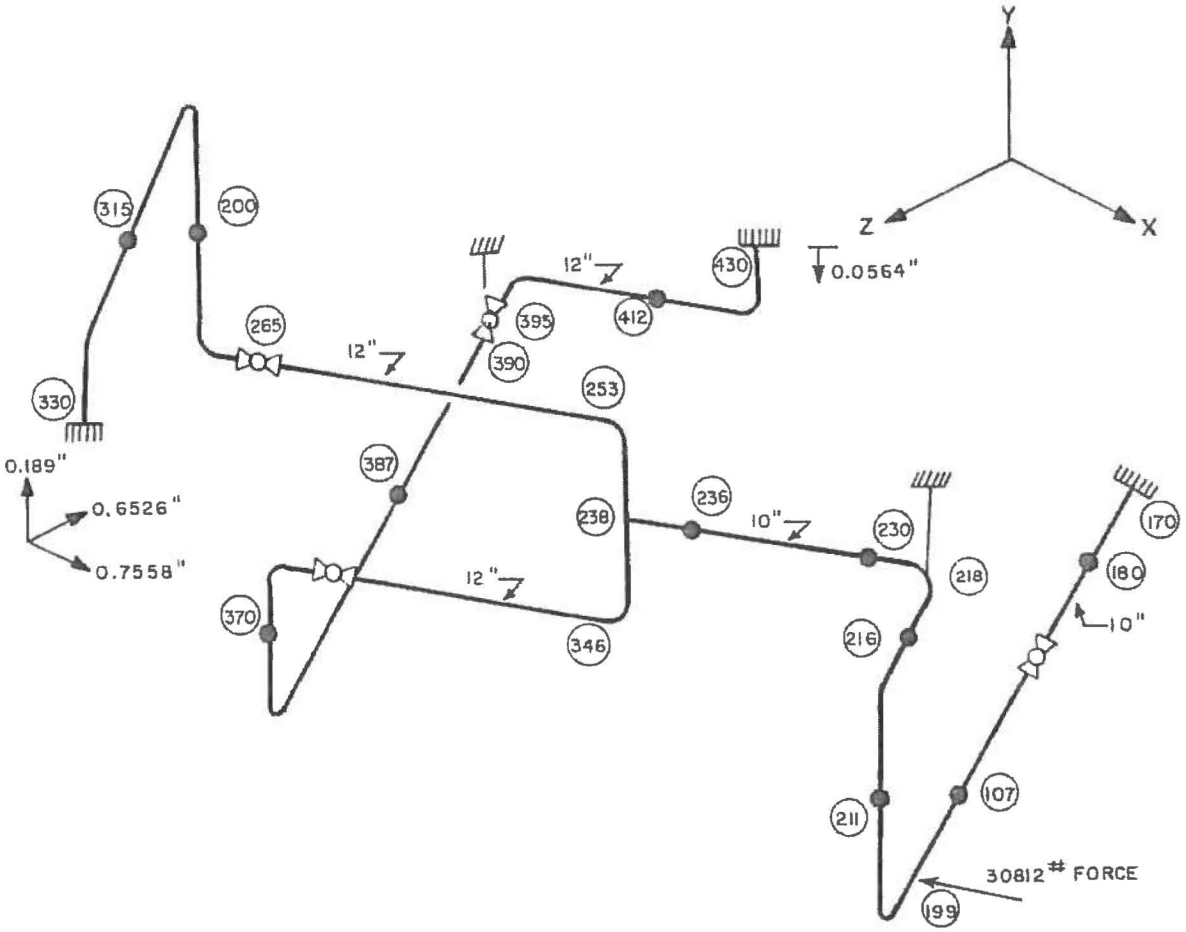
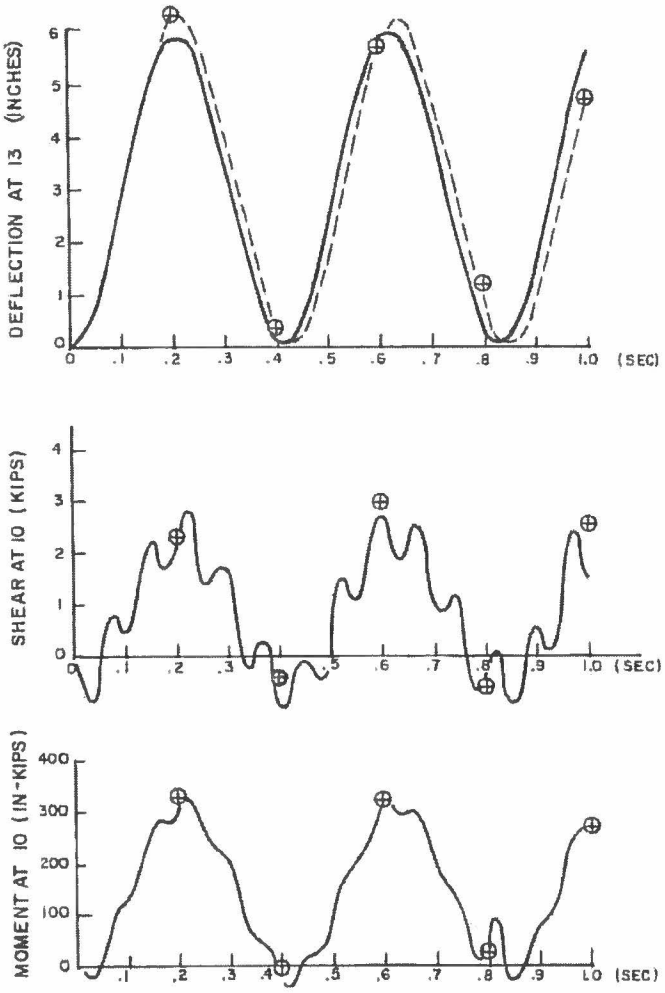
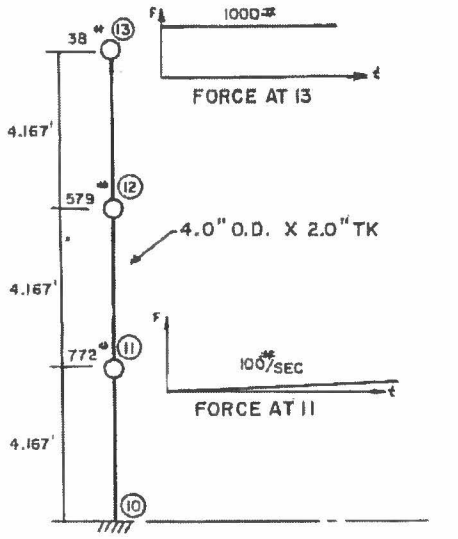


FIGURE 3A. 15-1

MATHEMATICAL MODEL FOR FLEXIBILITY ANALYSIS VERIFICATION

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT





ASME BENCHMARK PROBLEM 5 MODEL

——— K.M. VASHI'S RESULTS AS PRESENTED IN " PRESSURE VESSEL AND PIPING, 1972 COMPUTER PROGRAM VERIFICATION", ASME, 1972

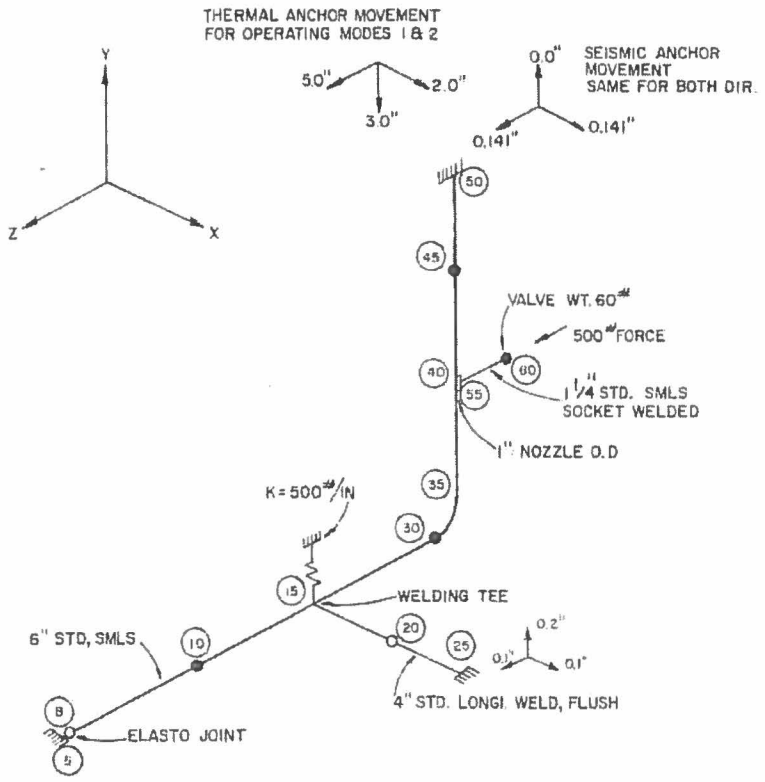
– – – NUPIPE RESULTS

⊕ NUPIPE RESULTS AT EQUIDISTANT INTERVAL

FIGURE 3A. 15-2

NUPIPE PROGRAM FORCE TIME HISTORY VERIFICATION

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

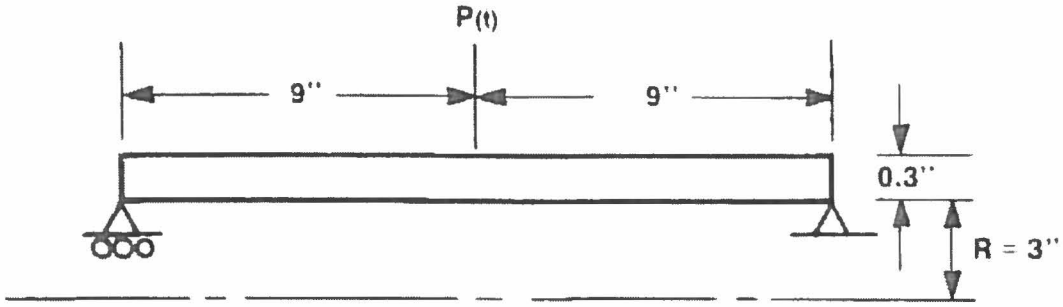


OPERATING CONDITIONS			
OPER MODE	PIPE	PRESS (PSI)	TEMP (°F)
1	6"	200	400
	4"	200	400
	1¼"	200	400
$E/\sigma_1 T_1 - \alpha_0 T_0$ AT 15 = 440 PSI			
2	6"	200	700
	4"	0	70
	1¼"	200	700
$\alpha(\Delta T_1 = 0.0002, \alpha(\Delta T_2 = 0.0004$ IN/FT			
3	6"	700	70
	4"	700	70
	1¼"	700	70

FIGURE 3A. 15-3

MATHEMATICAL MODEL FOR
SAFETY CLASS 1 STRESS VERIFICATION

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT



E = 30 x 10^6 psi

ν = 0.3

P = 0.000732

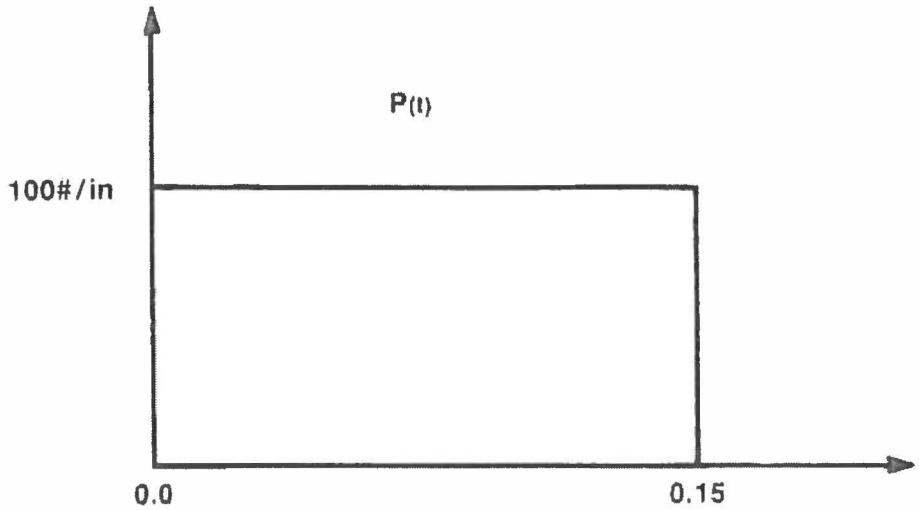


FIGURE 3A.18-1

SAMPLE PROBLEM NO. 2
FOR GHOSH-WILSON

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

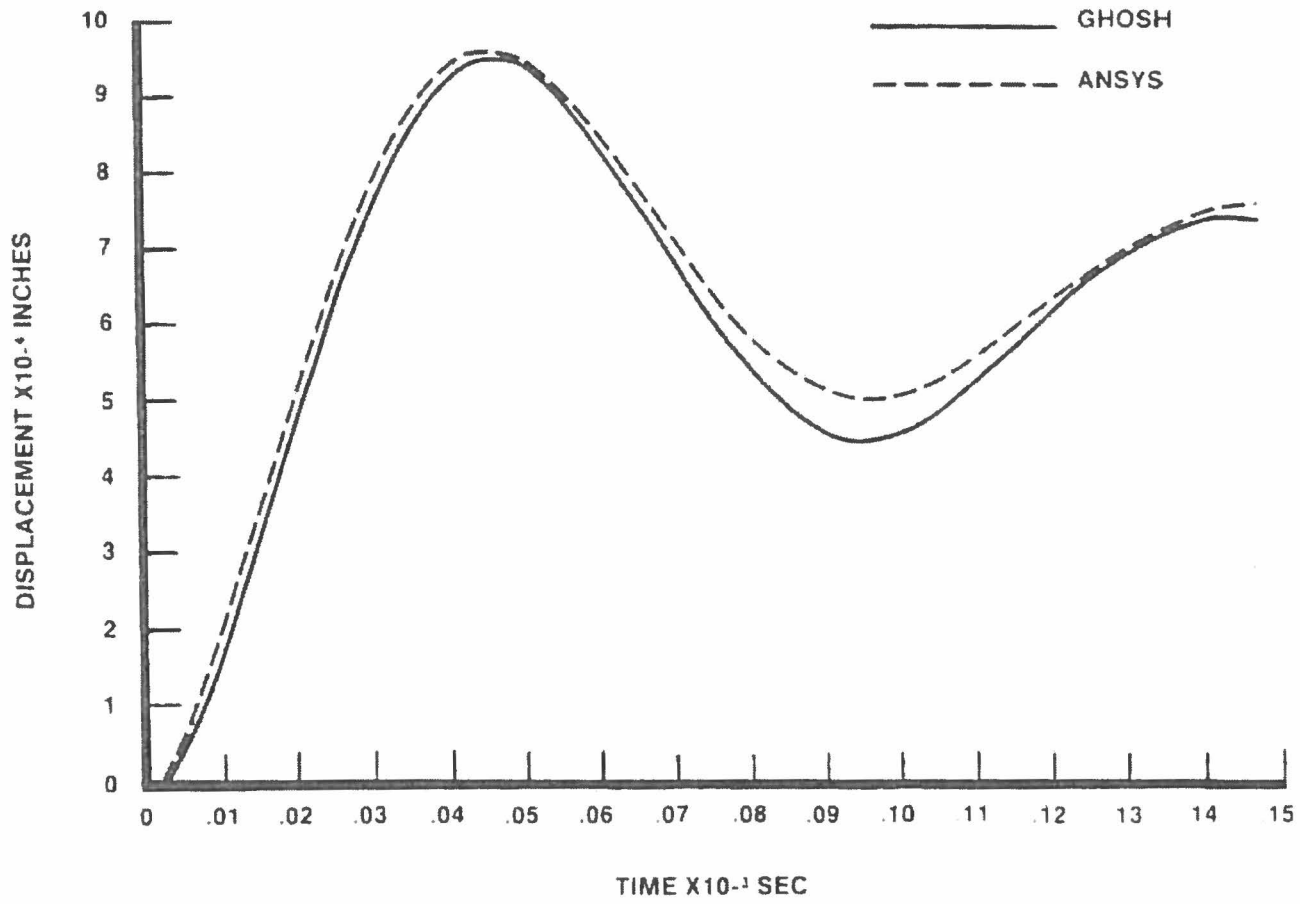
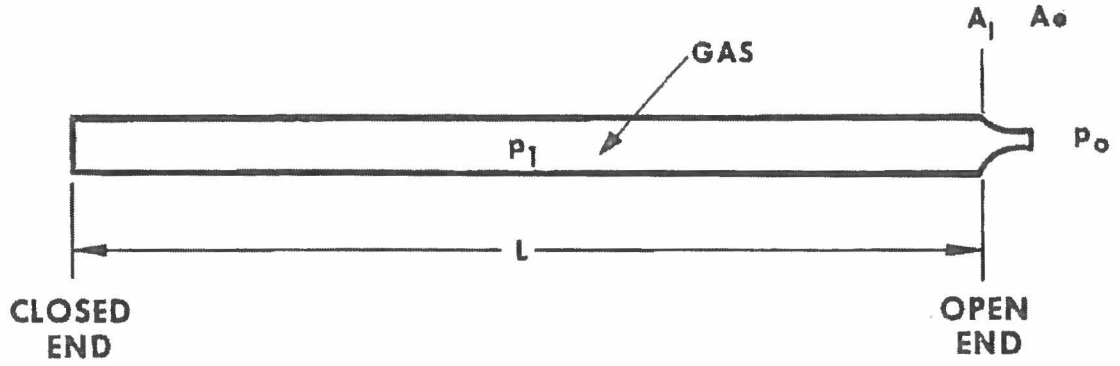


FIGURE 3A.18-2

COMPARISON OF RESULTS FROM GHOSH AND ANSYS FOR A CYLINDER SUBJECTED TO A SUDDENLY APPLIED LOAD

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT



CASE (A) FOR COMPARISON WITH ANALYTICAL RESULTS

INITIAL CONDITIONS =

$p_1/p_o = 4.72$, $a_o/a_1 = 0.80$

DIMENSIONS =

$A_e/A_1 = 0.6$, L = PIPE LENGTH

SPECIFIC HEAT RATIO =

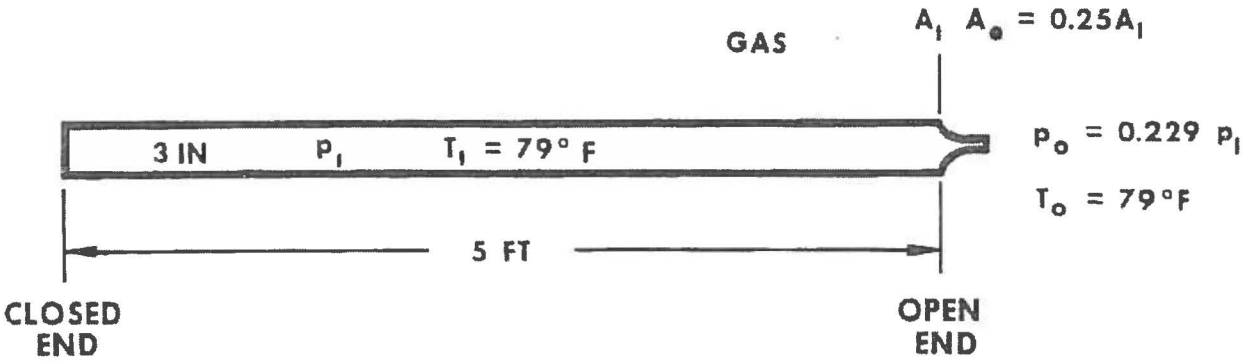
$\gamma = C_p/C_v = 1.4$

p = PRESSURE, a = SOUND VELOCITY, A = FLOW AREA

FIGURE 3A. 20-1

SUDDEN DISCHARGE OF GAS FROM A PIPELINE THROUGH A NOZZLE (CASE A)

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT



CASE (B) FOR COMPARISON WITH EXPERIMENTAL DATA AND HAND CALCULATION

PRESSURE = $p_o = 14.7$ psia, $p_1 = 14.7/0.229 = 64.2$ psia

AREA = $A_1 = \frac{\pi}{4}(0.25)^2 = 0.0491\ ft^2$, $A_e = 0.25A_1 = 0.0123\ ft^2$

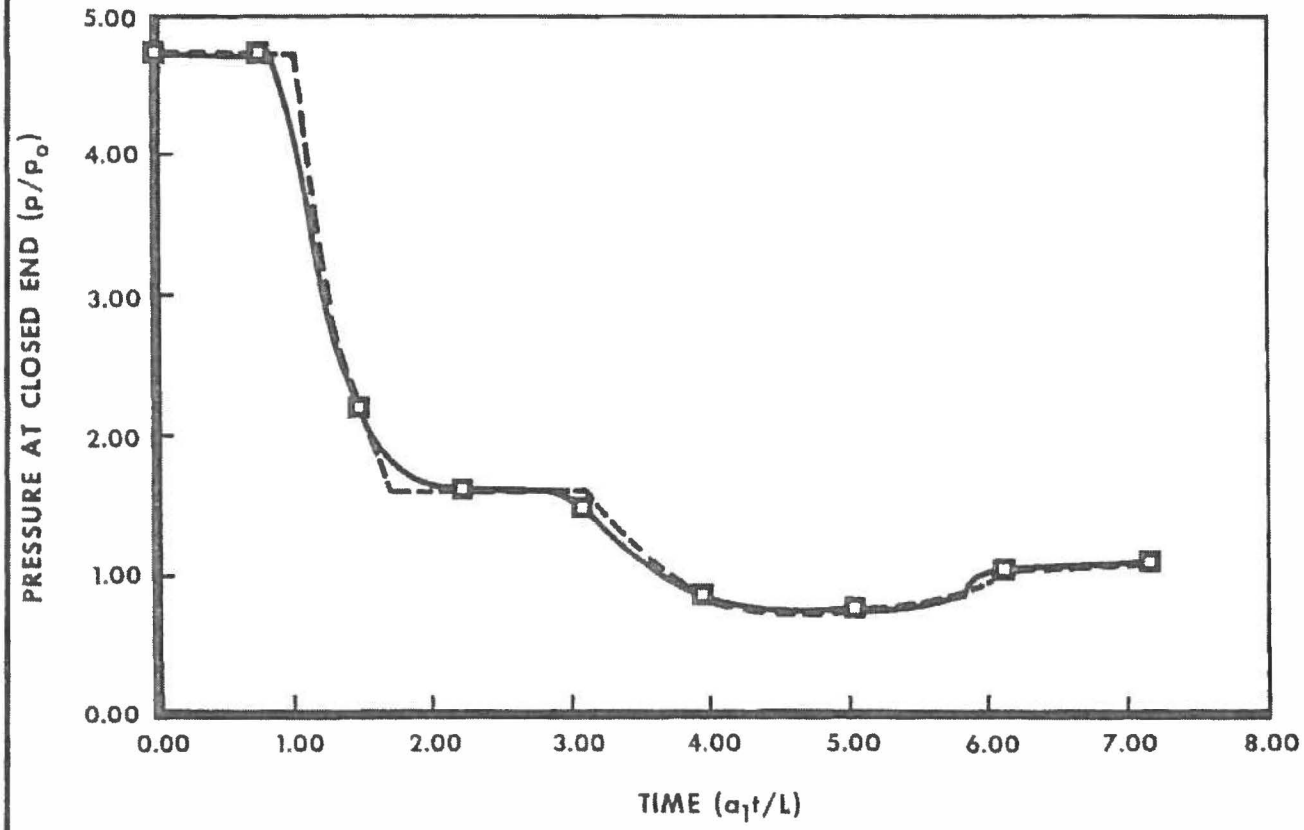
GAS CONSTANT = $R = 53.35$ ft - $lb_f/lb°R$

TEMPERATURE = $T_o = 79°F = 539°R$, $T_1 = T_o$

DENSITY = $\rho_o = \frac{P_o}{RT_o} = 0.0736\ lb/ft^3$, $\rho_1 = \frac{P_1}{RT_1} = 0.3215\ lb/ft^3$

FIGURE 3A. 20-2

SUDDEN DISCHARGE OF GAS FROM A PIPELINE THROUGH A NOZZLE (CASE B)



LEGEND

(CASE A)

——— STEHAM

– – – – ANALYTICAL SOLUTION (REF 4&5)

FIGURE 3A. 20-3

COMPARISON OF PRESSURE RESPONSE AT THE CLOSED END

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

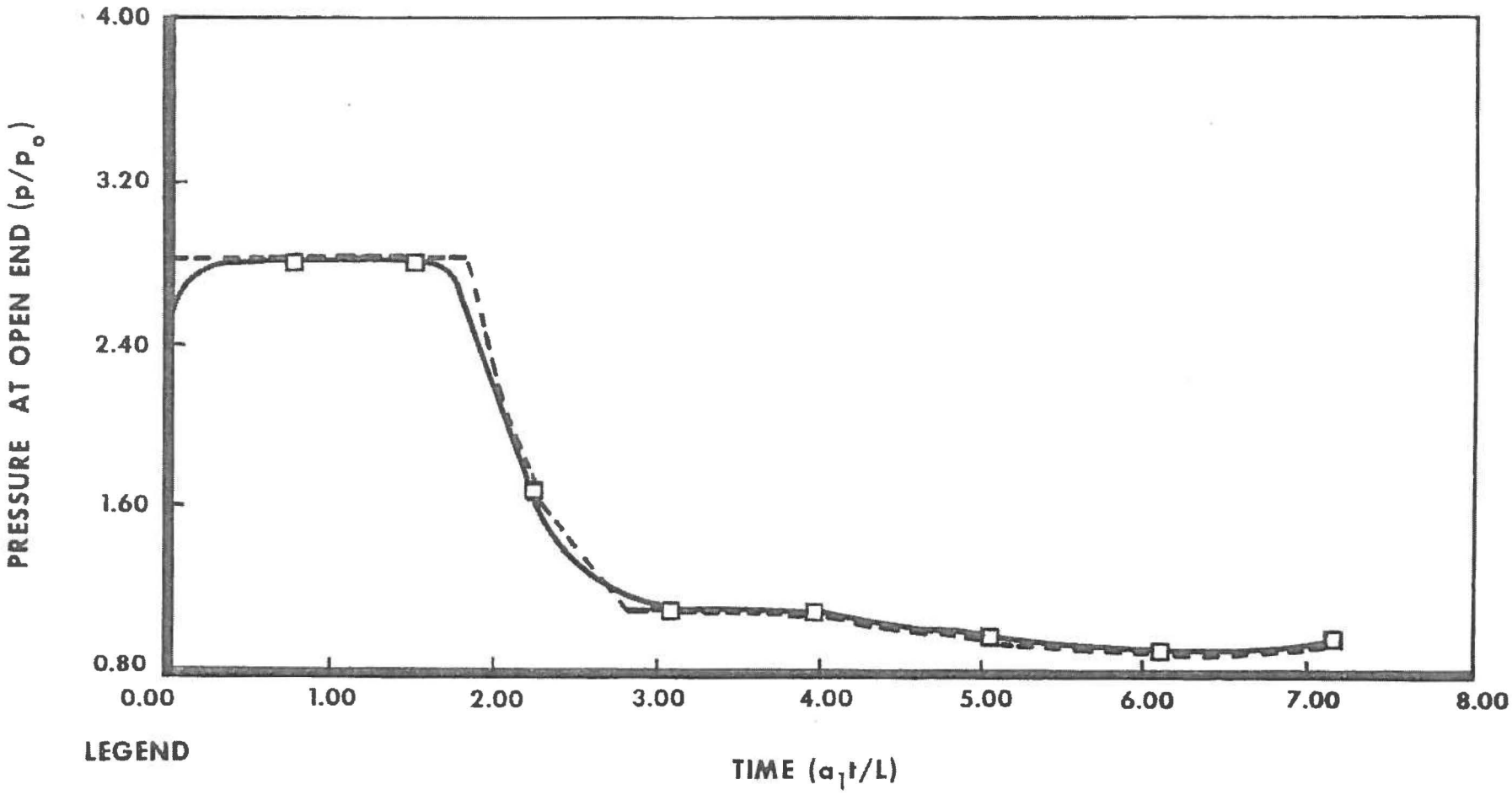


FIGURE 3A. 20-4

COMPARISON OF PRESSURE RESPONSE AT THE OPEN END

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

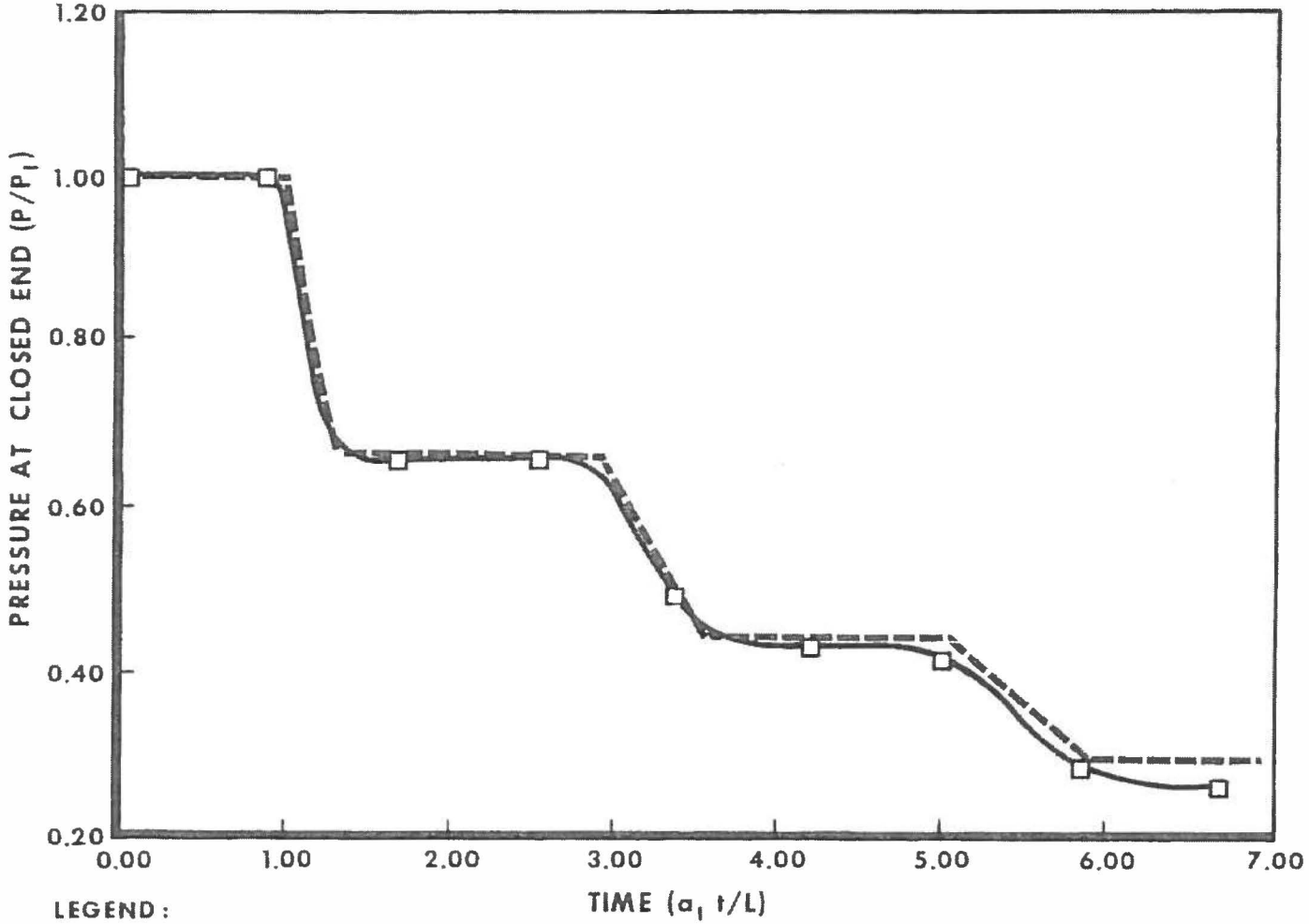


FIGURE 3A. 20-5

COMPARISON OF PRESSURE RESPONSES BY STEHAM AND EXPERIMENT

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

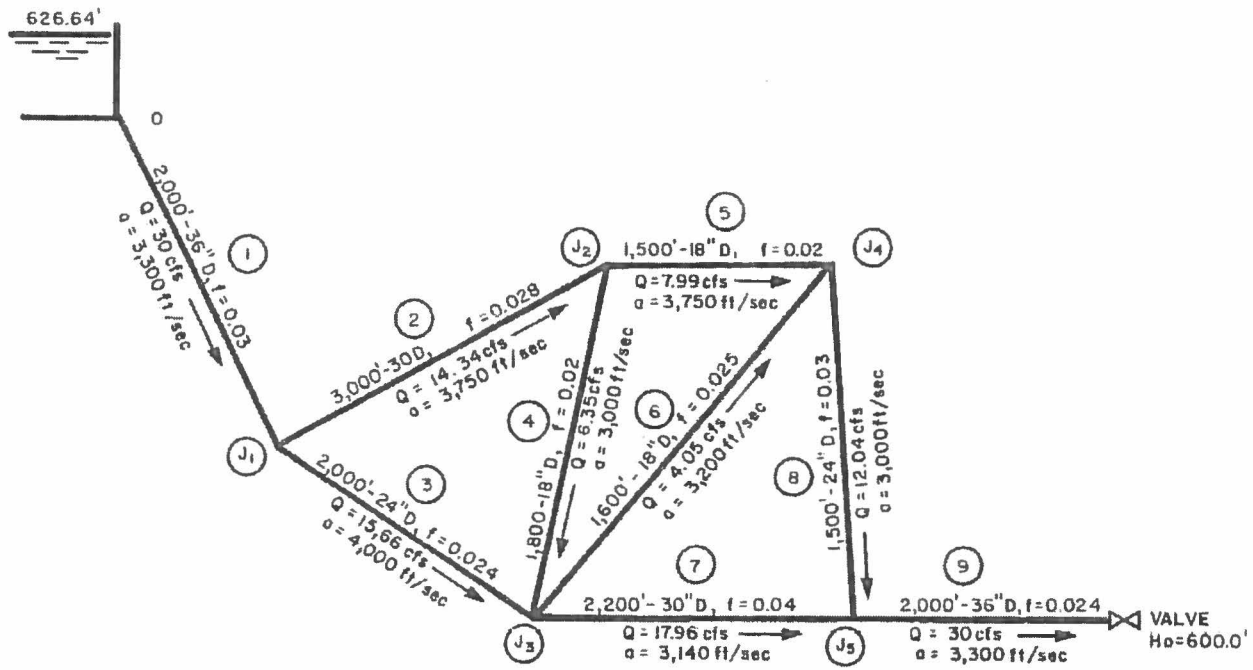
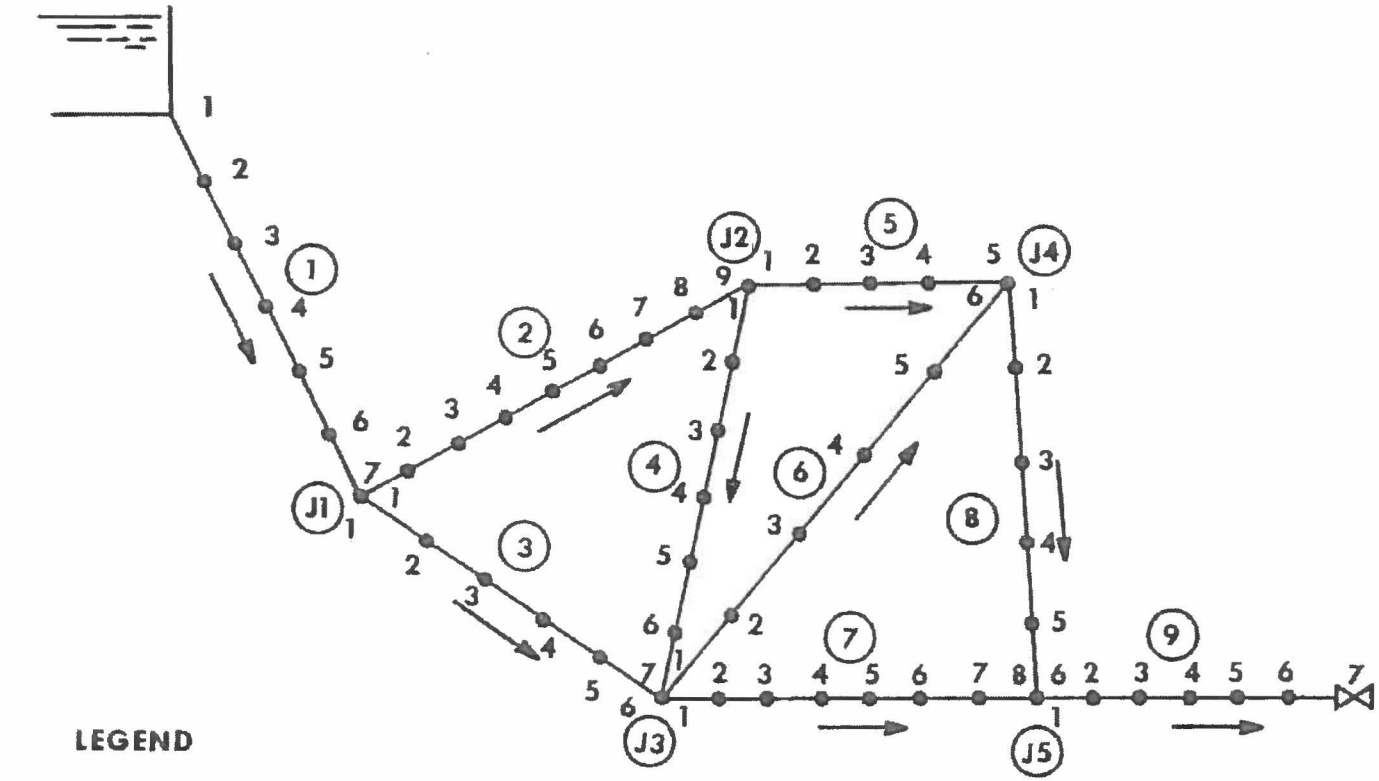


FIGURE 3A. 21-1

HYDRAULIC NETWORK FOR VERIFICATION PROBLEM

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT



LEGEND

(5) PIPE NUMBER

(J1) PIPE JUNCTION

5 NODE NUMBER

VALVE

FIGURE 3A. 21-2

HYDRAULIC NETWORK FOR
WATHAM VERIFICATION

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

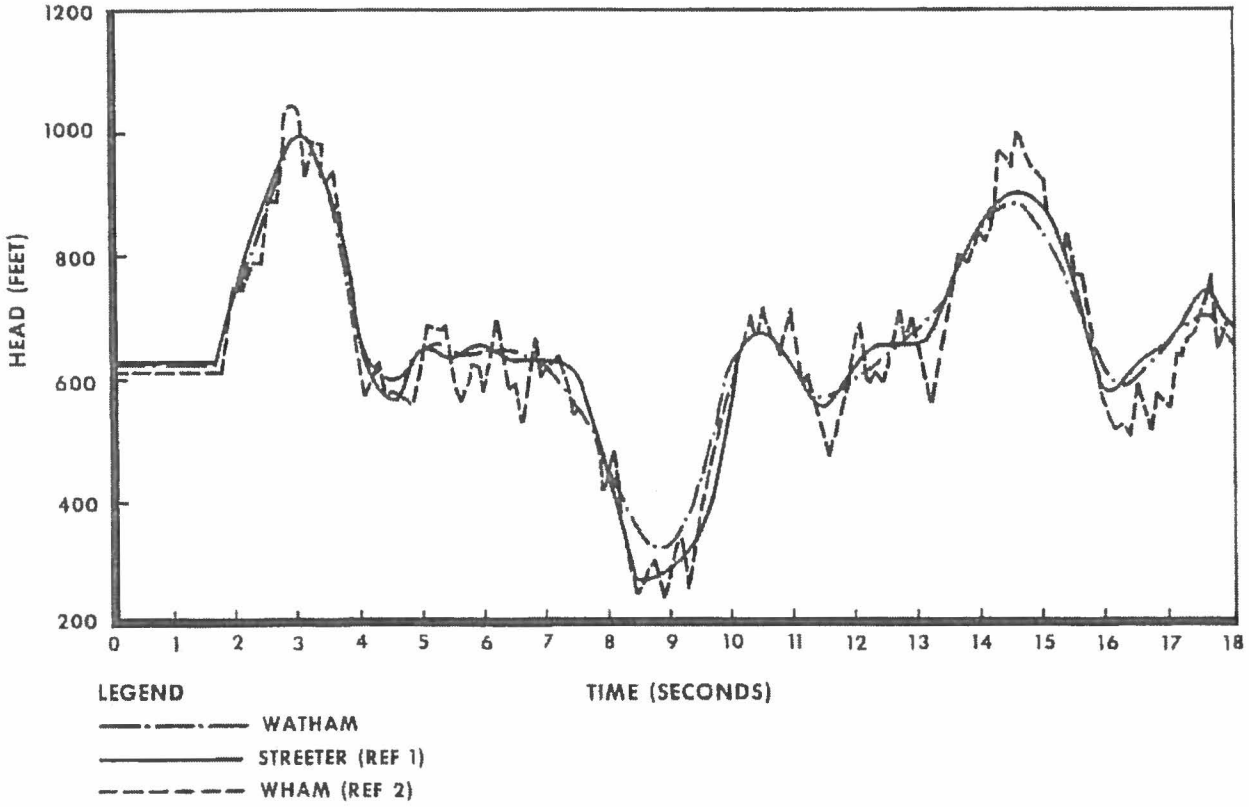


FIGURE 3A. 21-3

HEAD-VERSUS-TIME PLOT
FOR JUNCTION J

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

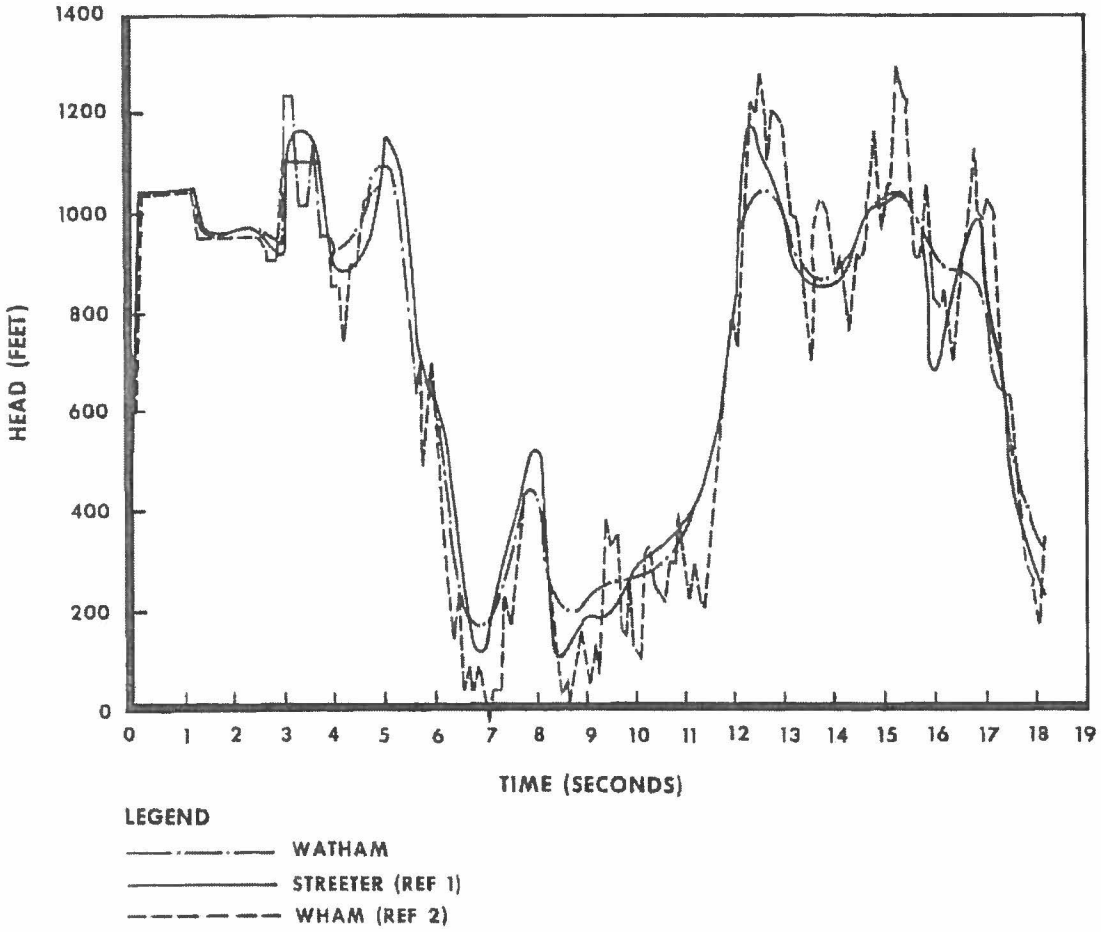


FIGURE 3A. 21-4

HEAD-VERSUS-TIME PLOT AT VALVE

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

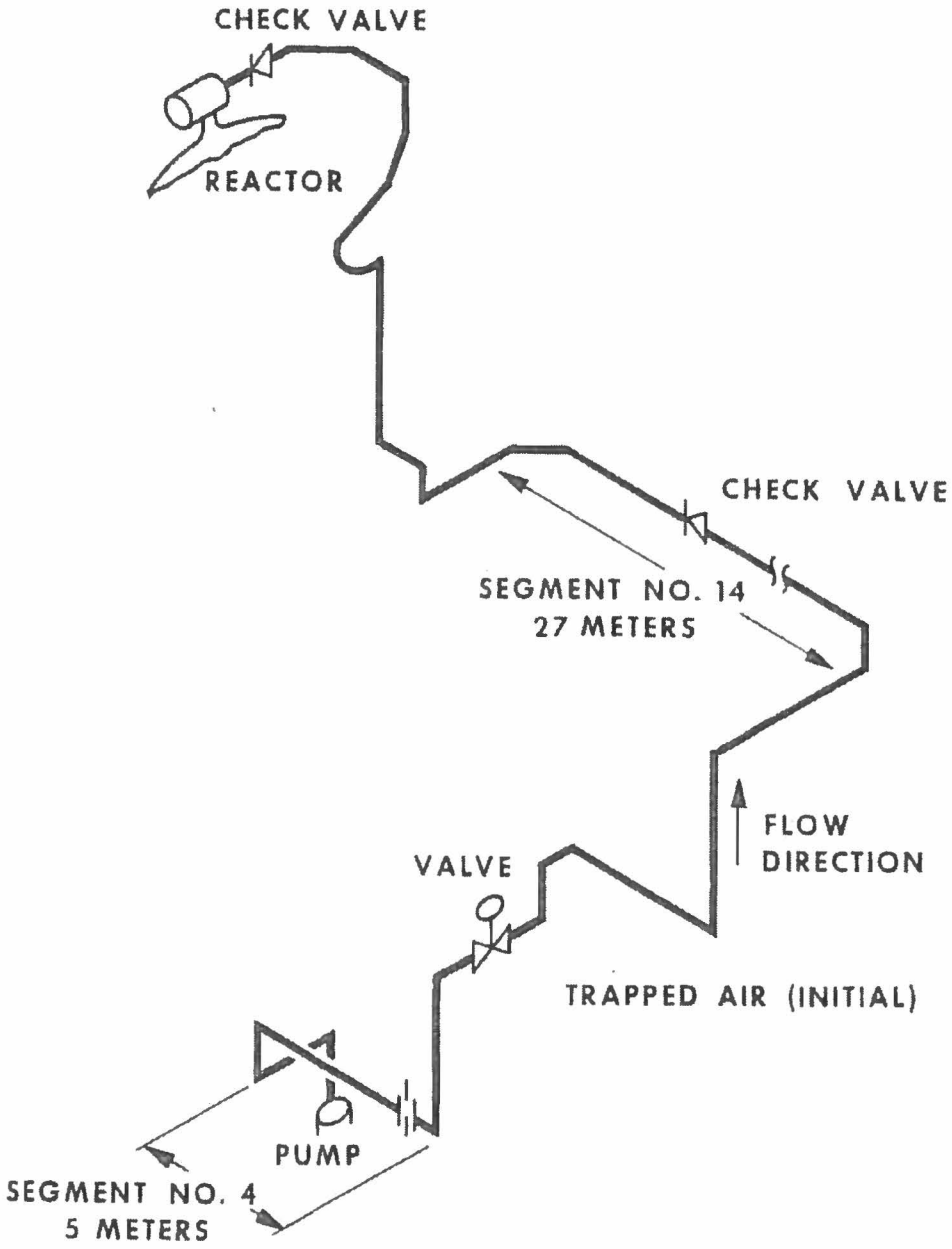


FIGURE 3A. 24-1

RCIC PIPING SYSTEM USED IN THE ANALYSIS OF WATER HAMMER LOADS

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

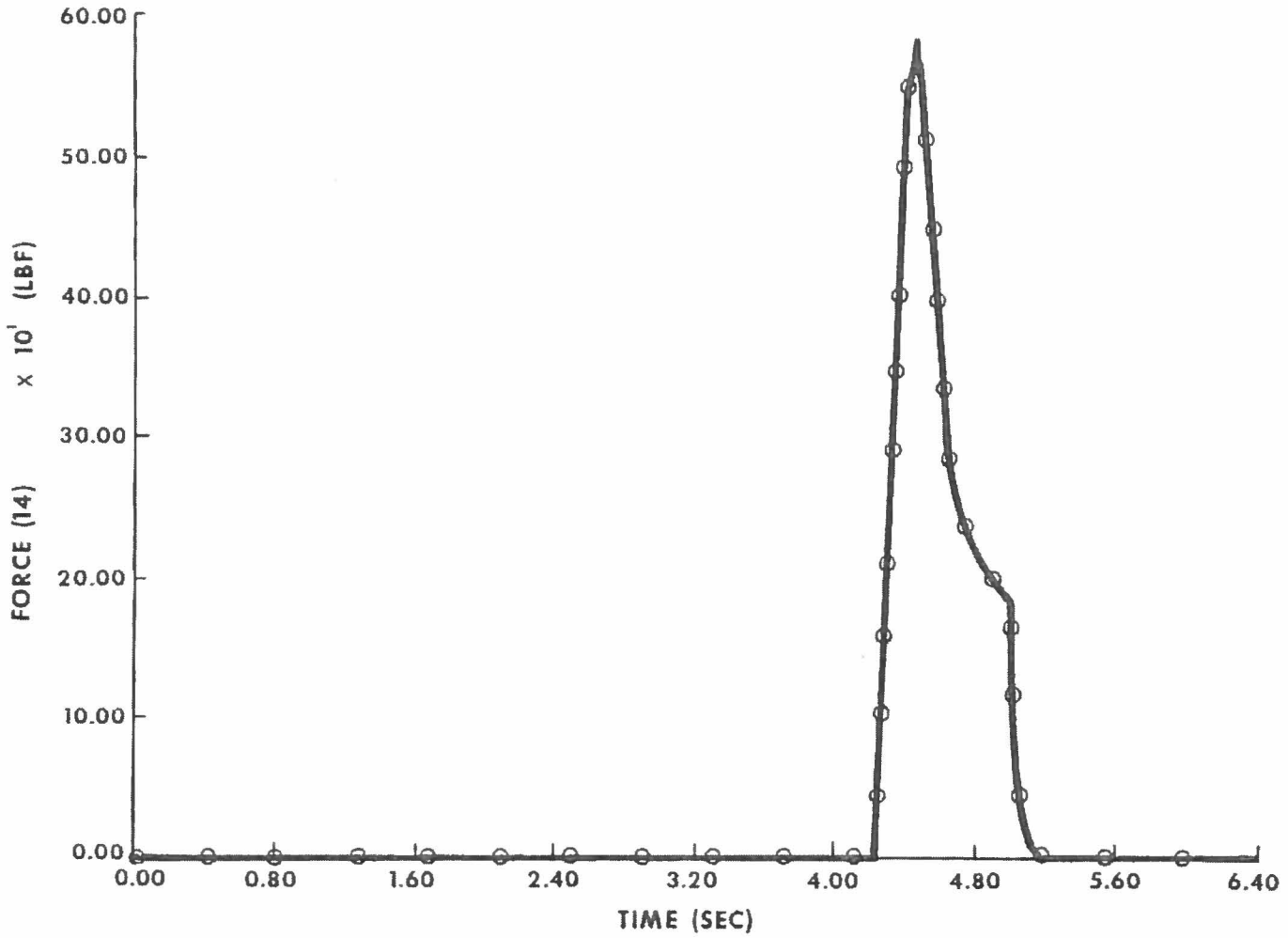


FIGURE 3A. 24-2

TRANSIENT FORCE BY WATAIR
IN PIPE SEGMENT 14

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

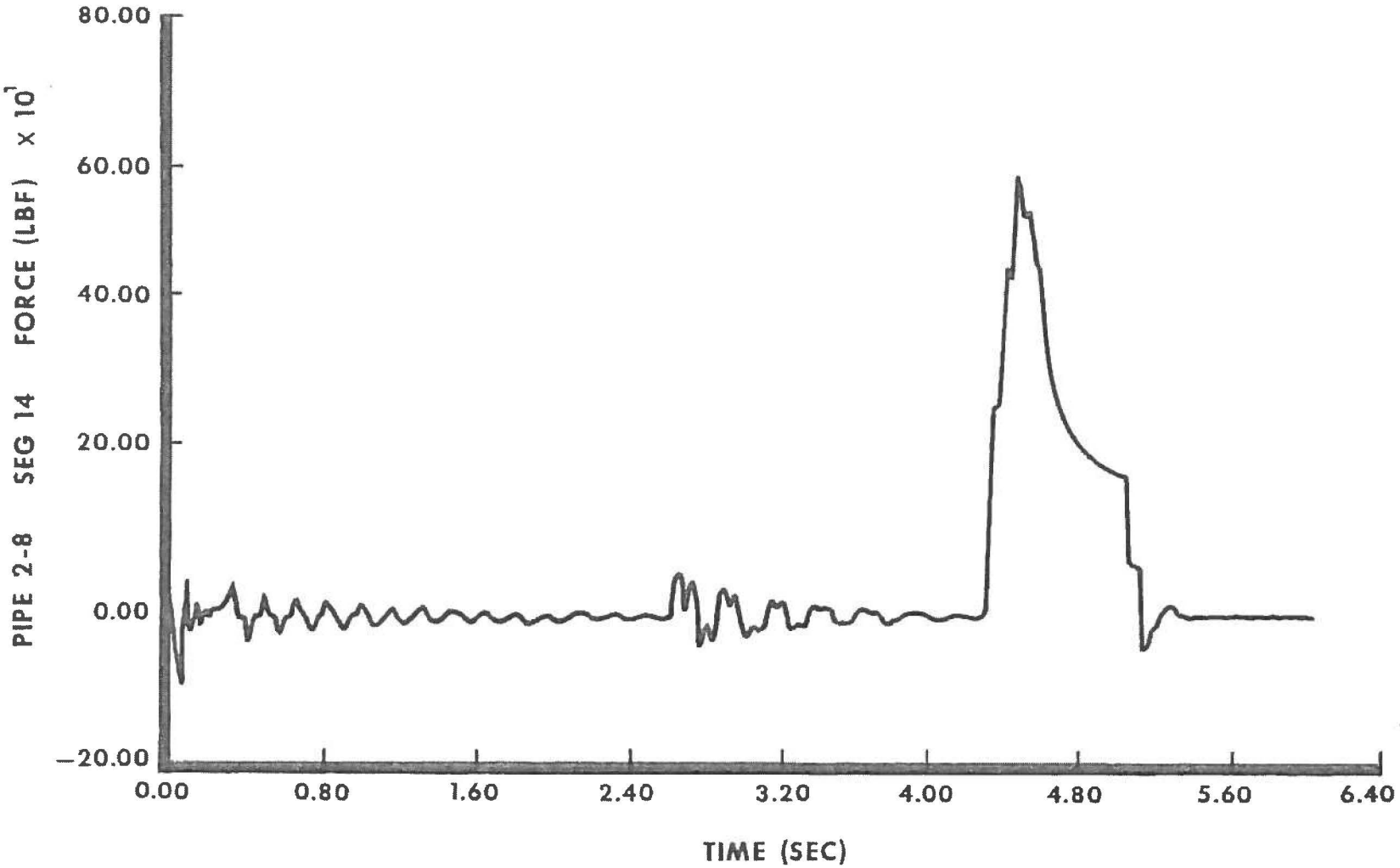
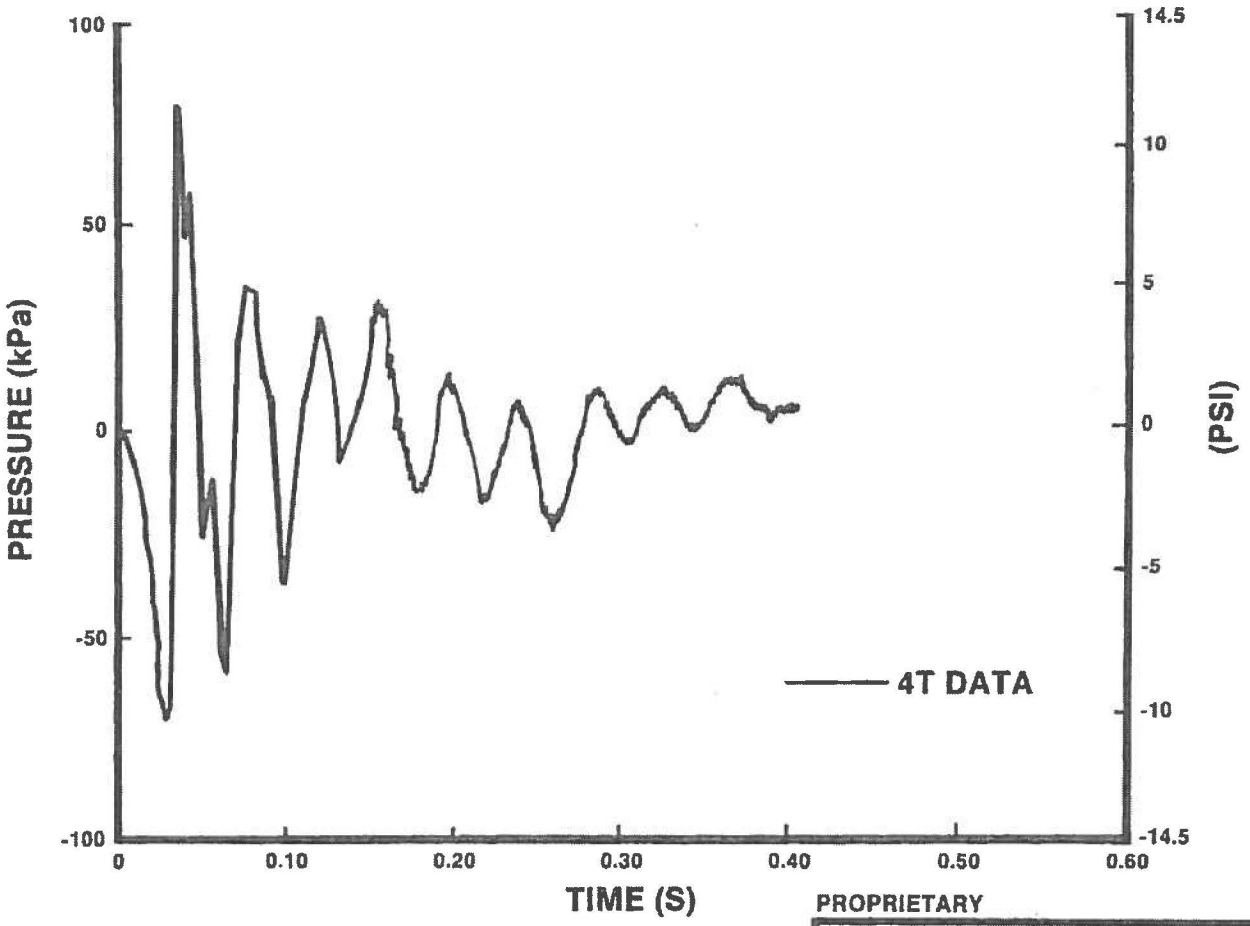


FIGURE 3A. 24-3

TRANSIENT FORCE BY WATHAM
IN PIPE SEGMENT 14

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT



PROPRIETARY

FIGURE 3A.26-1

4TCO TEST DATA FOR CHUG 30

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

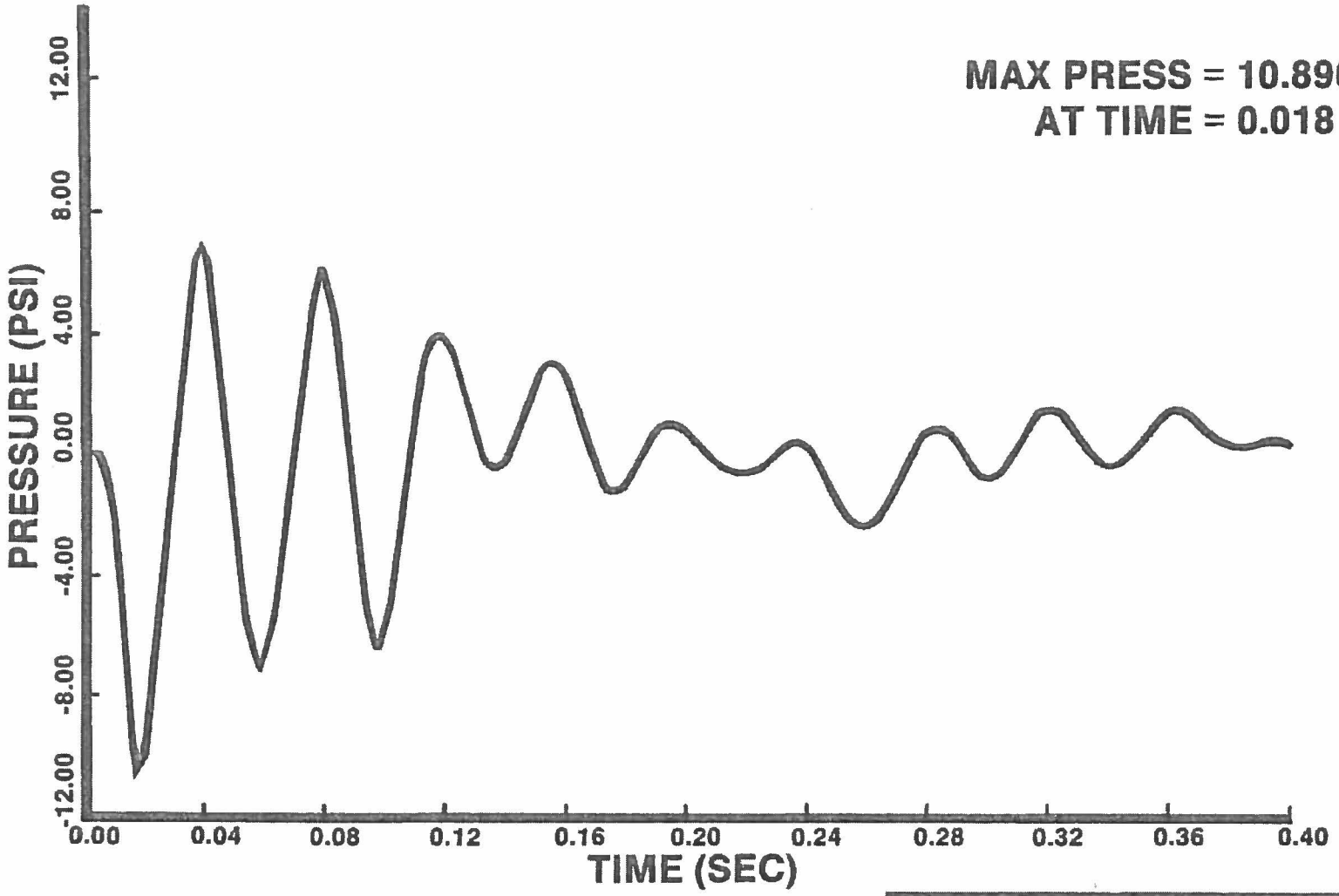
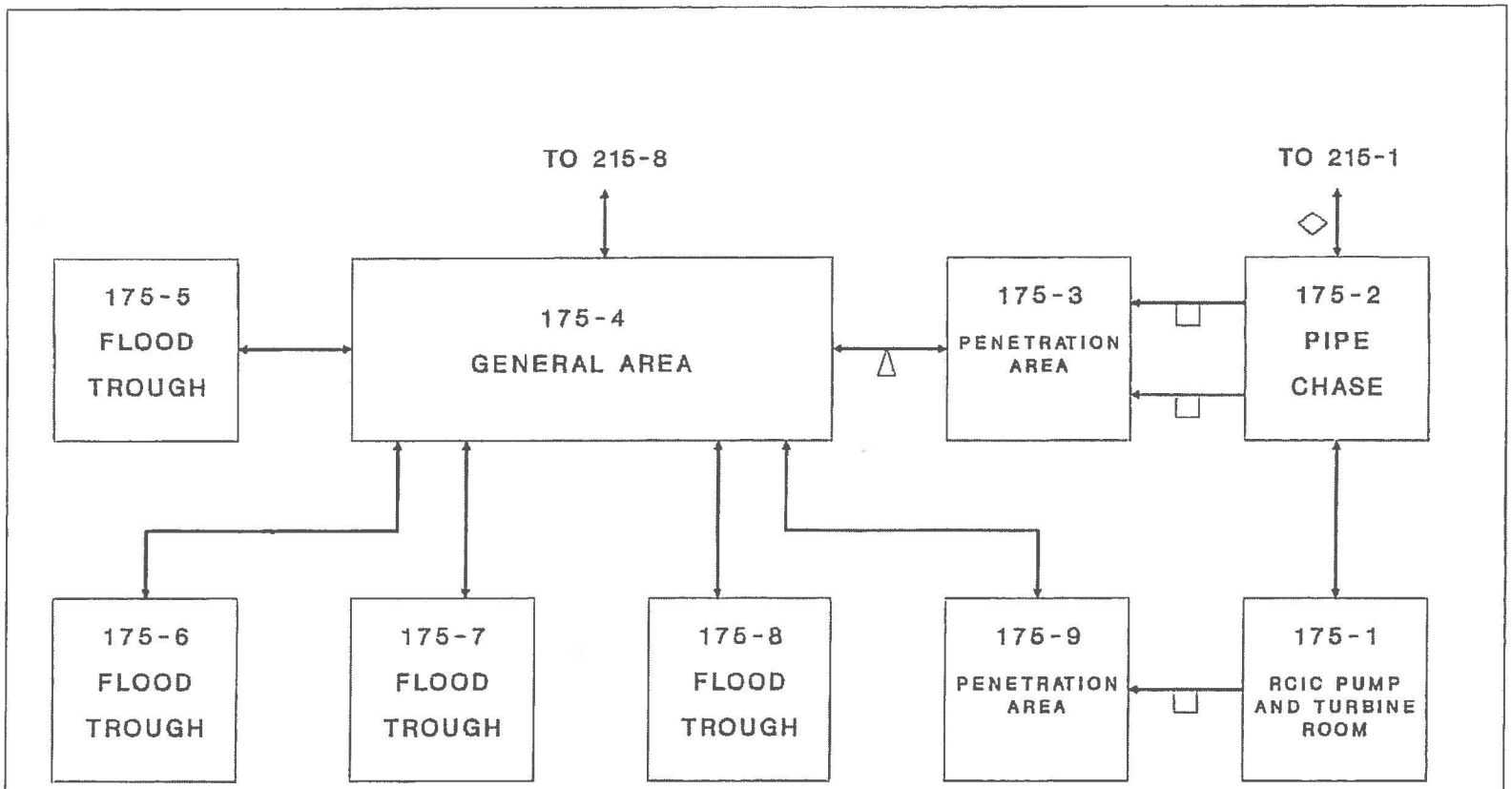


FIGURE 3A.26-2

CALCULATED PRESSURE TIME HISTORY
OF CHUG 30 USING CWL

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT



NOTES:

□ : BLOWOUT PANEL JUNCTION (OPENS IN DIRECTION SHOWN). FLOW IS IN BOTH DIRECTIONS ONCE FULLY OPEN. ONE BLOWOUT PANEL JUNCTION IS ASSUMED NOT TO OPEN.

◇ : FIRE DAMPER JUNCTION (USED ONLY IN BREAK NUMBERS 6 AND 9)

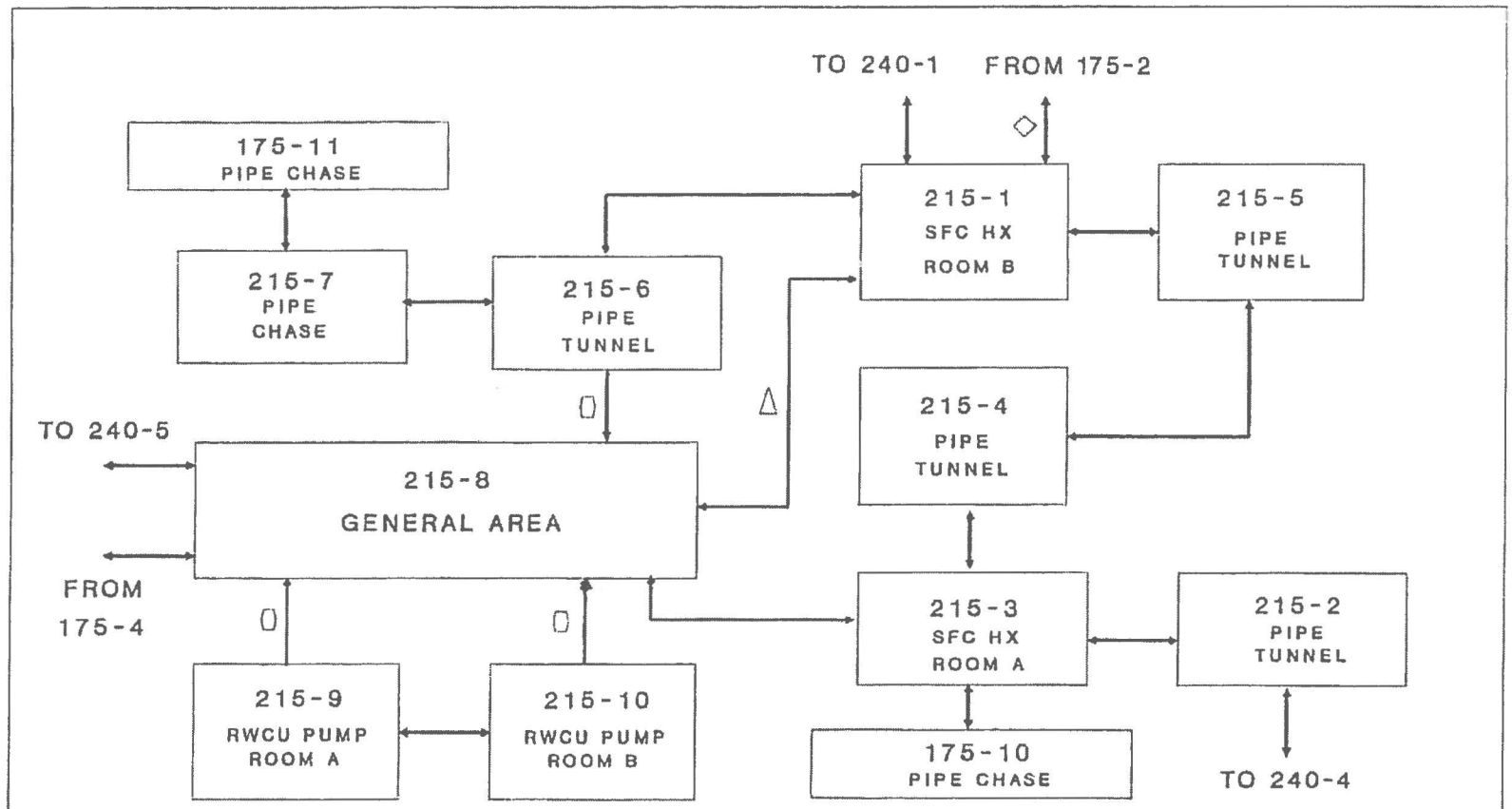
△ : WIRE-MESH DOOR JUNCTION

⟶ : DIRECTION OF VENT FLOW

FIGURE 3B-1

NODALIZATION DIAGRAM - REACTOR BUILDING HIGH-ENERGY LINE BREAK ANALYSIS (45 NODE MODEL)
SHEET 1 OF 5

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



NOTES:

△ : WIRE-MESH DOOR JUNCTION

() : VENT CURTAIN JUNCTION

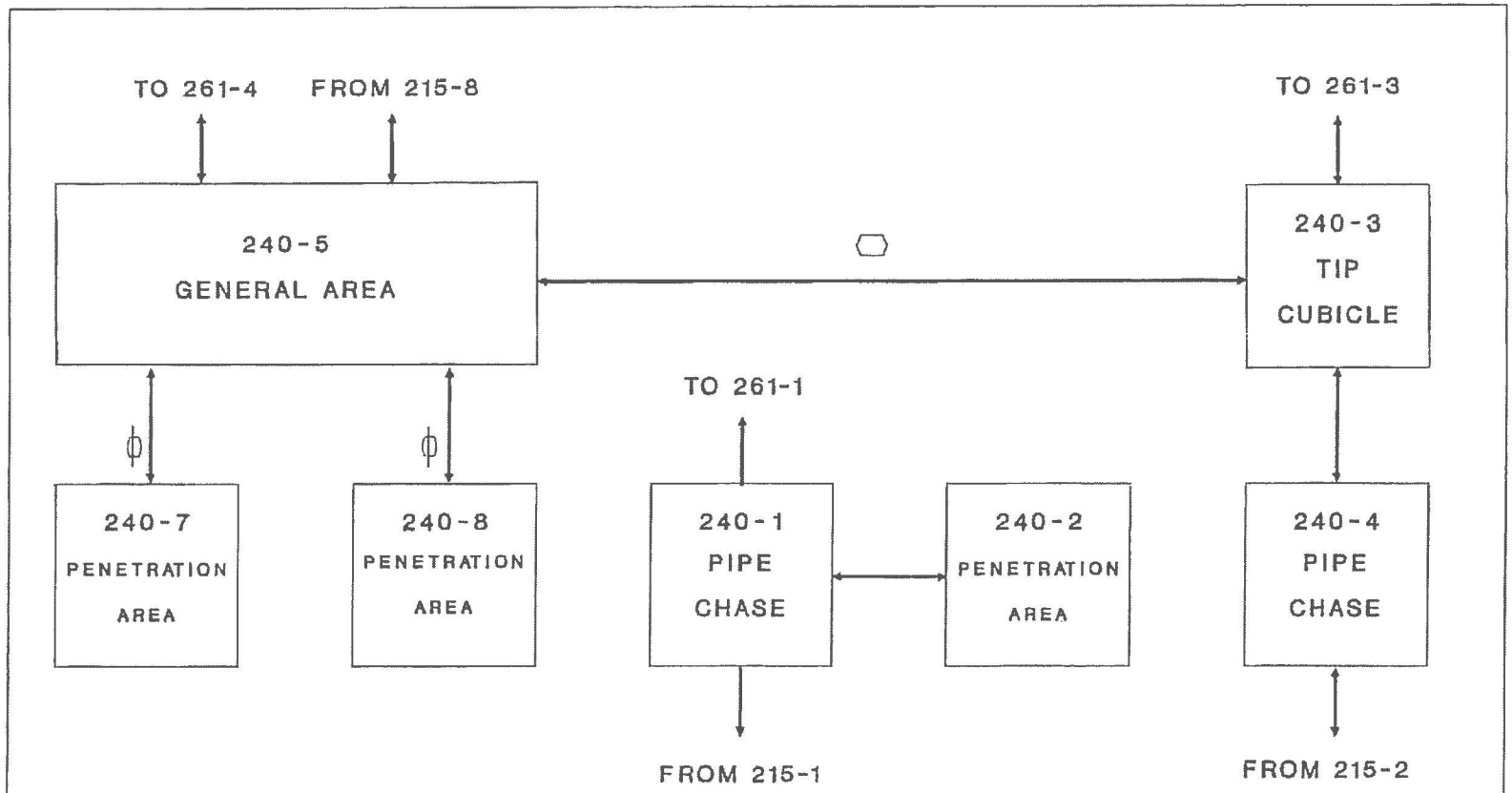
◇ : FIRE DAMPER JUNCTION (USED ONLY IN BREAK NUMBERS 8 AND 9)

⟶ : DIRECTION OF VENT FLOW

FIGURE 3B-1

NODALIZATION DIAGRAM - REACTOR BUILDING HIGH-ENERGY LINE BREAK ANALYSIS (45 NODE MODEL)
SHEET 2 OF 5

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



NOTES:

: VENT CURTAIN JUNCTION

: DOOR WITH LOUVER

: DIRECTION OF VENT FLOW

VOLUME 240-6 IS SHOWN ON SHEET 6 OF FIGURE 3B-1

FIGURE 3B-1

NODALIZATION DIAGRAM - REACTOR BUILDING HIGH-ENERGY LINE BREAK ANALYSIS (45 NODE MODEL)
SHEET 3 OF 5

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT

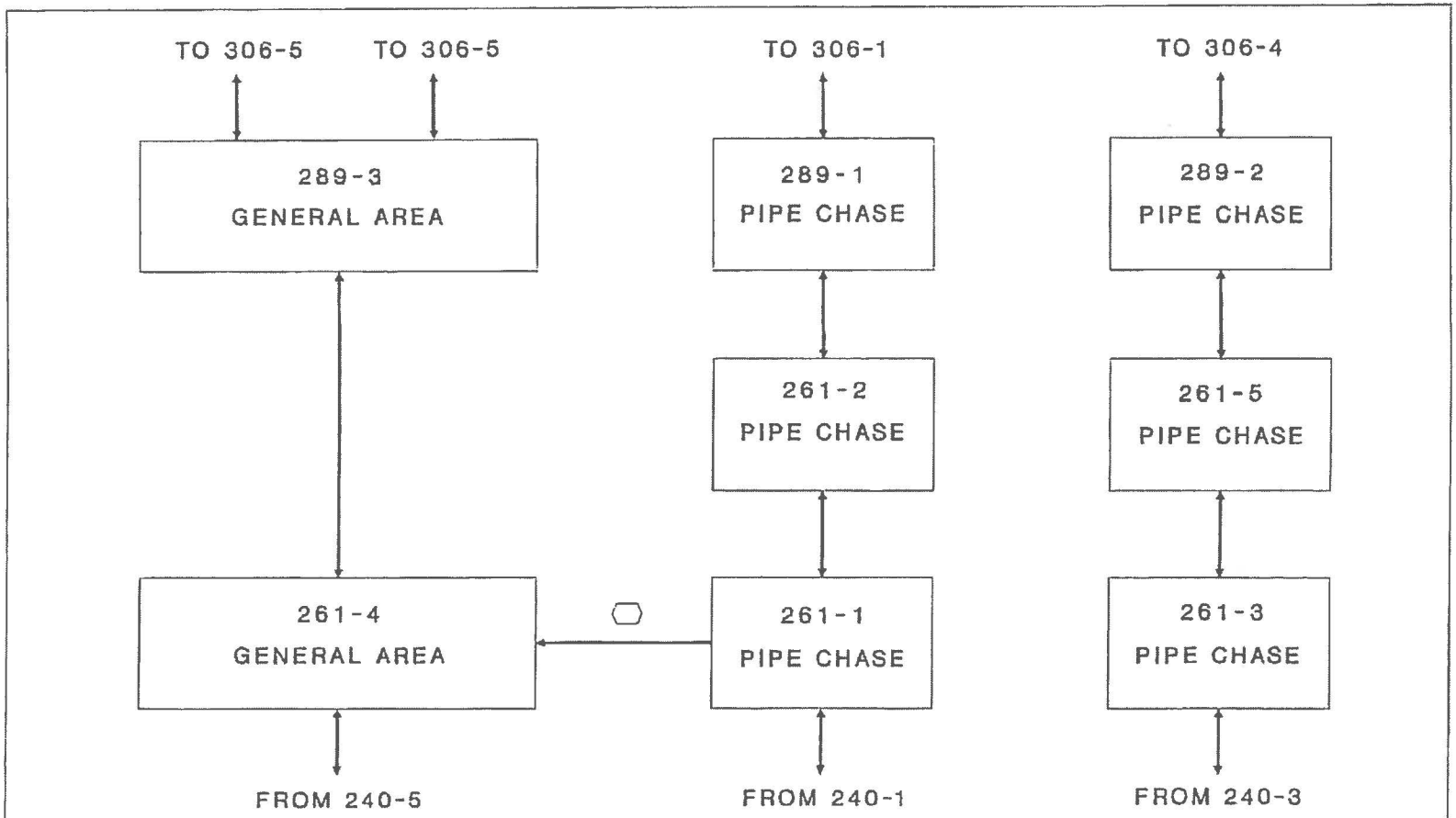


FIGURE 3B-1

NODALIZATION DIAGRAM - REACTOR BUILDING HIGH-ENERGY LINE BREAK ANALYSIS (45 NODE MODEL)
SHEET 4 OF 5

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT

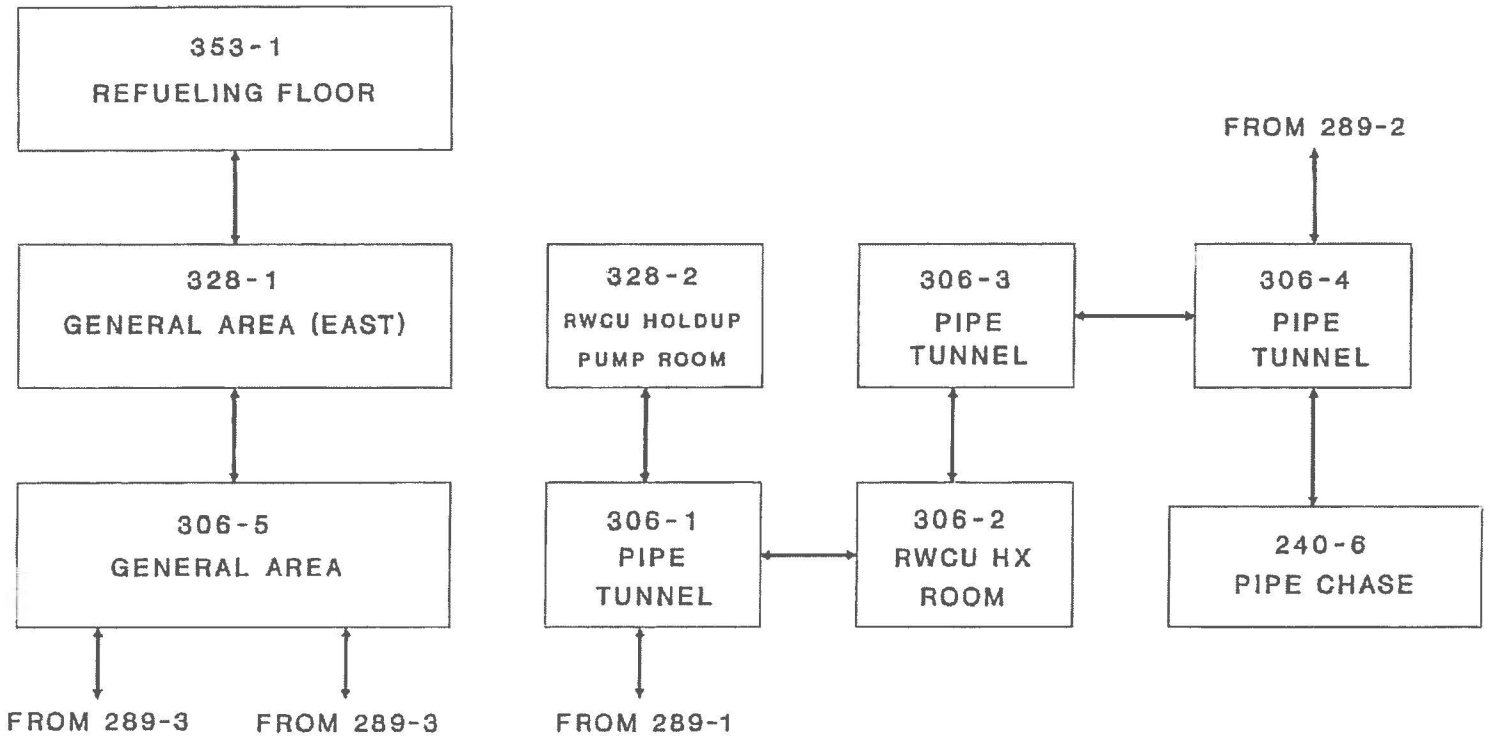
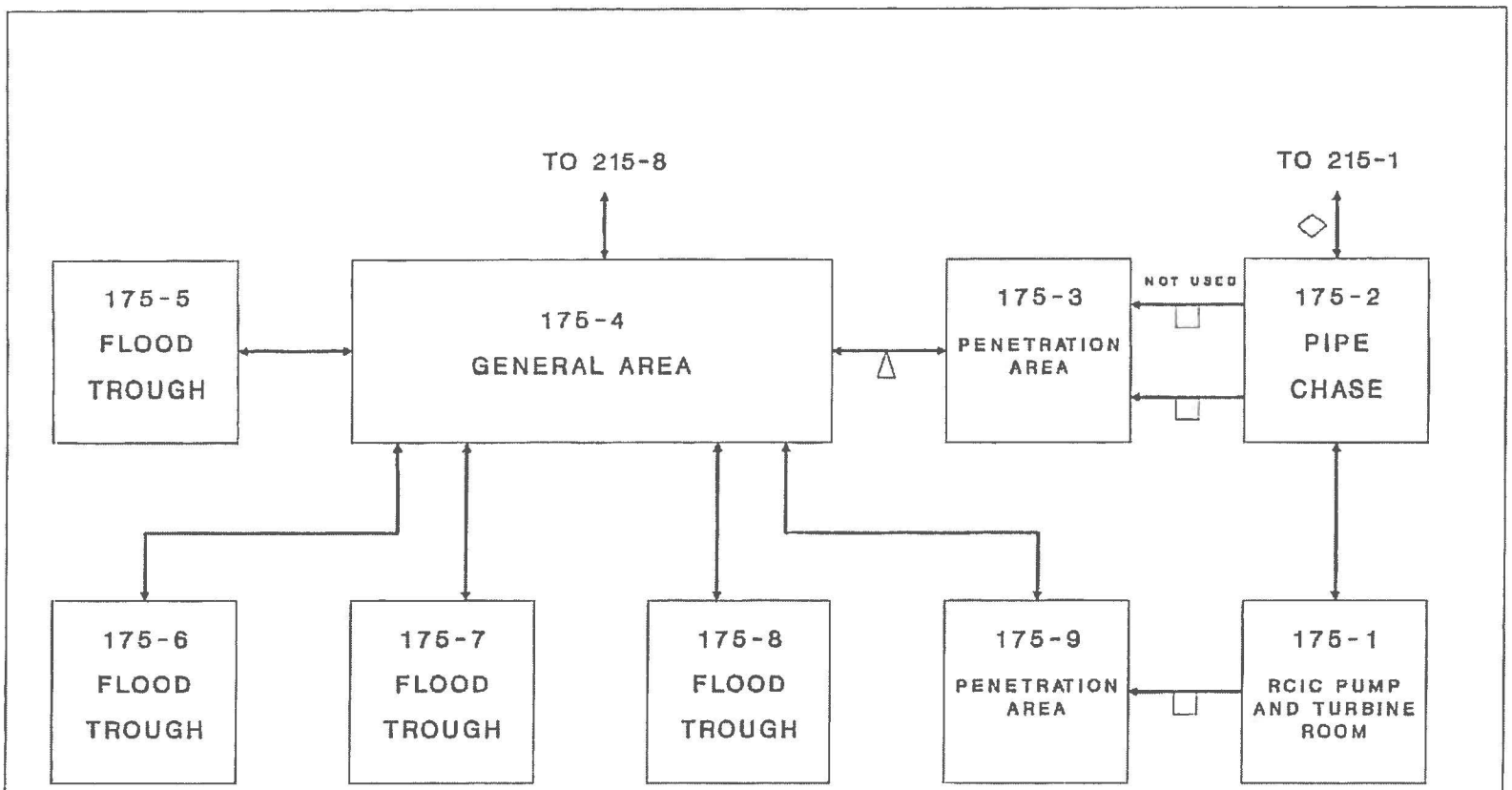


FIGURE 3B-1

NODALIZATION DIAGRAM - REACTOR BUILDING HIGH-ENERGY LINE BREAK ANALYSIS (45 NODE MODEL)
SHEET 5 OF 5

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



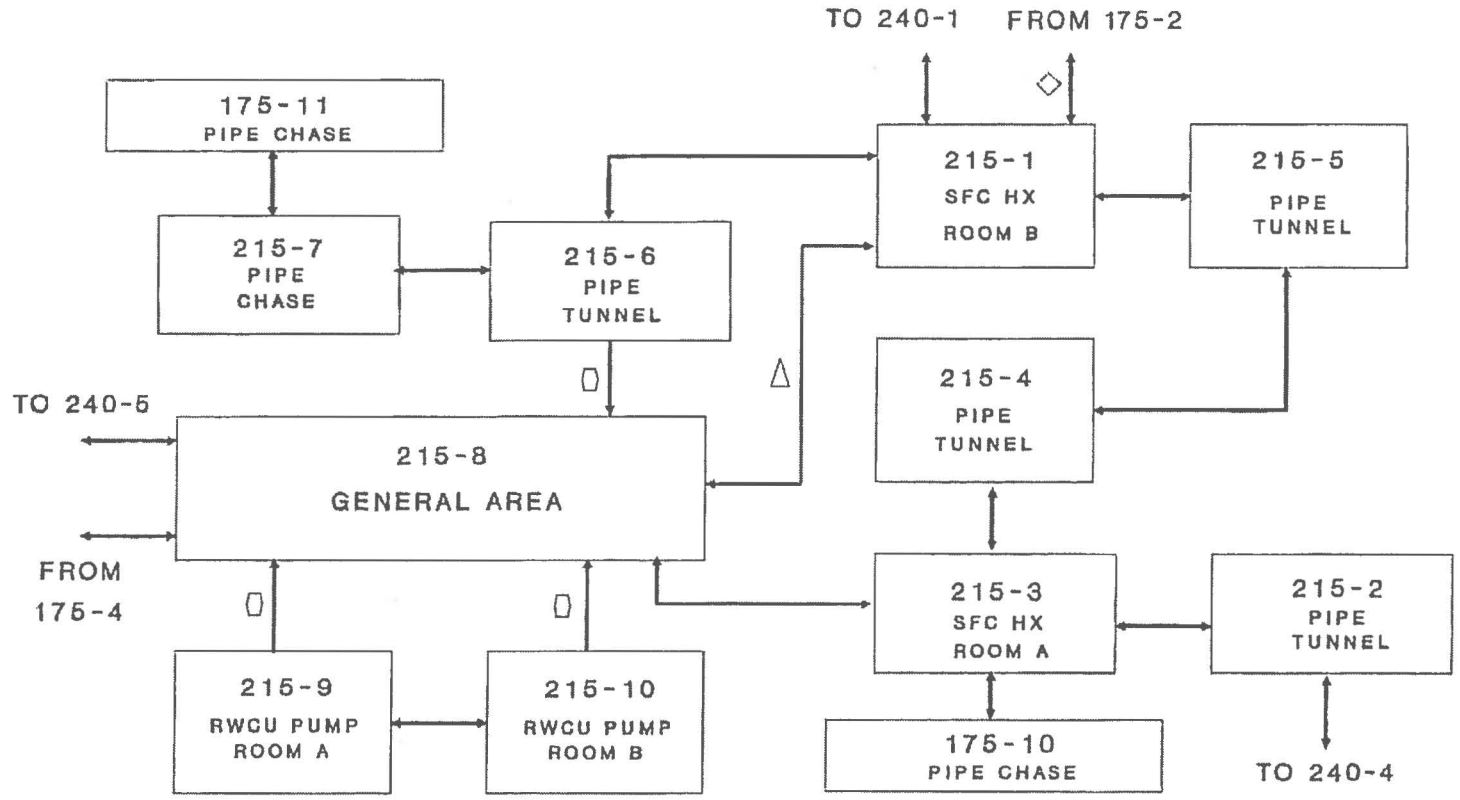
NOTES:

- □ : BLOWOUT PANEL JUNCTION (OPENS IN DIRECTION SHOWN). FLOW IS IN BOTH DIRECTIONS ONCE FULLY OPEN. A BLOWOUT PANEL JUNCTION BETWEEN VOLUME 175-2 AND 175-3 IS ASSUMED NOT TO OPEN.
- ◇ : FIRE DAMPER JUNCTION
- △ : WIRE-MESH DOOR JUNCTION
- ⟶ : DIRECTION OF VENT FLOW

FIGURE 3B-2

NODALIZATION DIAGRAM - REACTOR BUILDING HIGH-ENERGY LINE BREAK ANALYSIS (46 NODE MODEL)
SHEET 1 OF 5

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



NOTES:

△ : WIRE-MESH DOOR JUNCTION

⬯ : VENT CURTAIN JUNCTION

◇ : FIRE DAMPER JUNCTION

⟶ : DIRECTION OF VENT FLOW

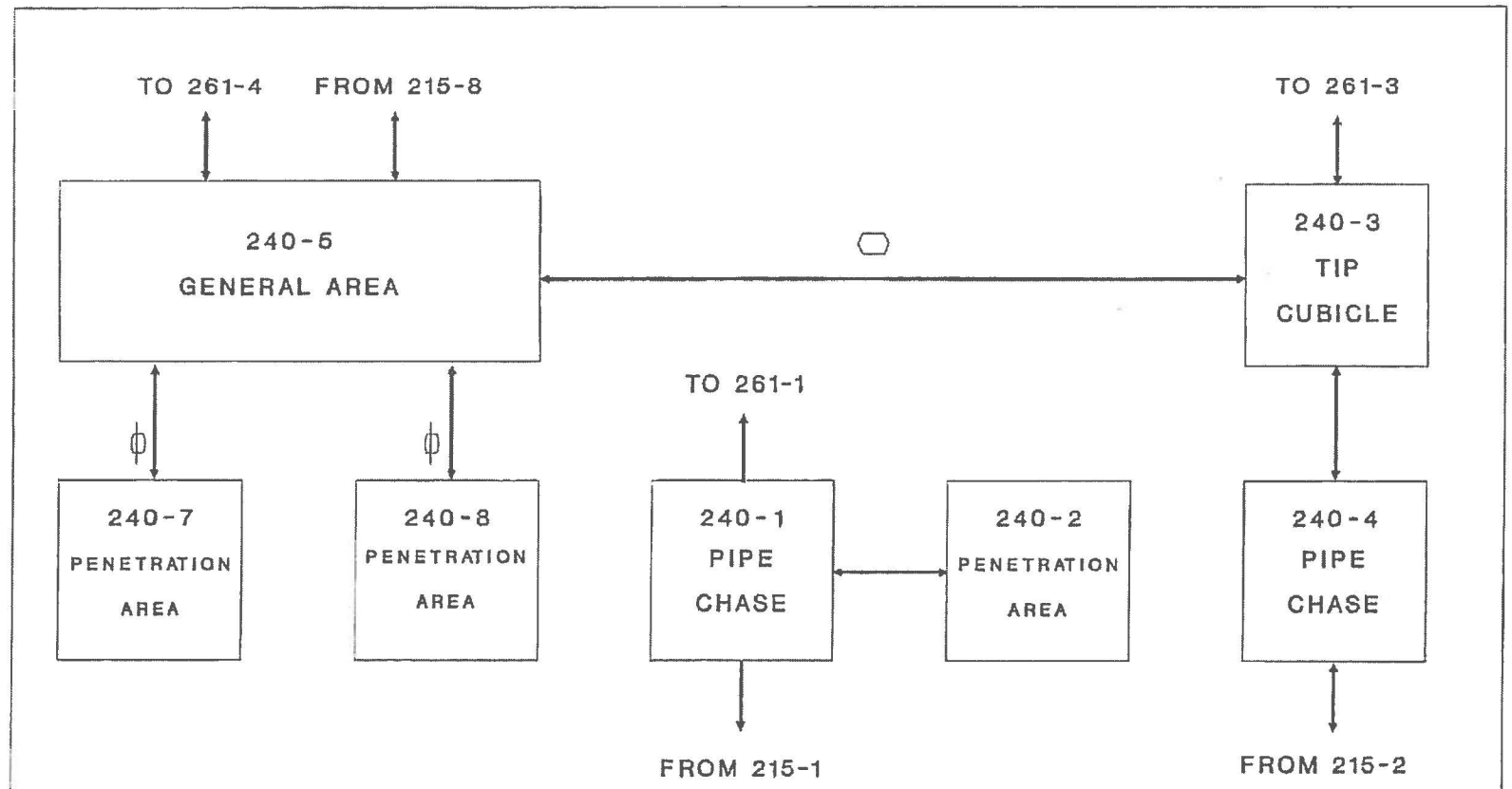
FIGURE 3B-2

NODALIZATION DIAGRAM - REACTOR BUILDING HIGH-ENERGY LINE BREAK ANALYSIS (46 NODE MODEL)
SHEET 2 OF 5

NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT - UNIT 2

UPDATED SAFETY ANALYSIS REPORT



NOTES:

: VENT CURTAIN JUNCTION

: DOOR WITH LOUVER

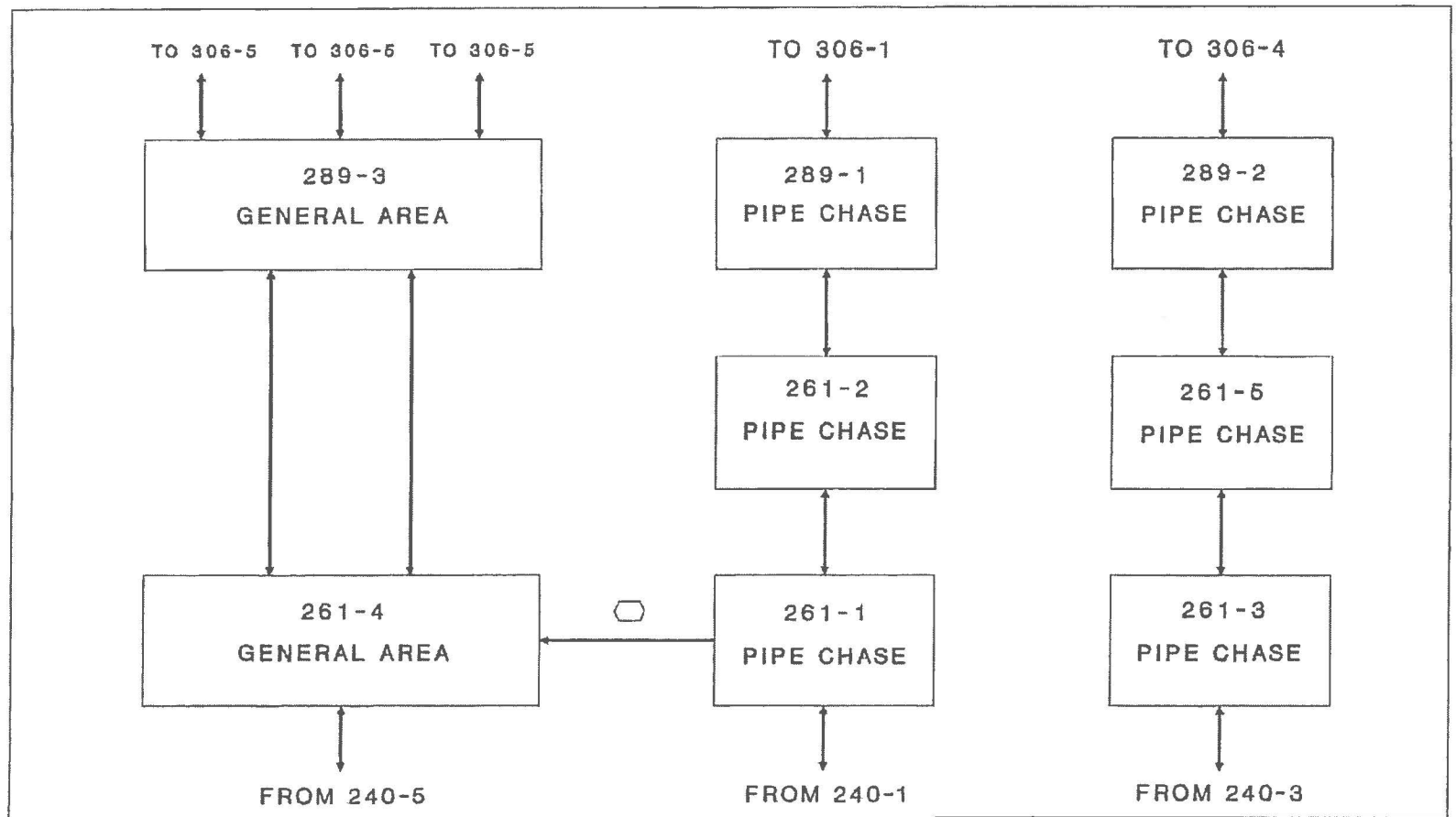
: DIRECTION OF VENT FLOW

VOLUME 240-6 IS SHOWN ON SHEET 5 OF FIGURE 3B-2

FIGURE 3B-2

NODALIZATION DIAGRAM - REACTOR BUILDING HIGH-ENERGY LINE BREAK ANALYSIS (46 NODE MODEL)
SHEET 3 OF 5

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



NOTES:

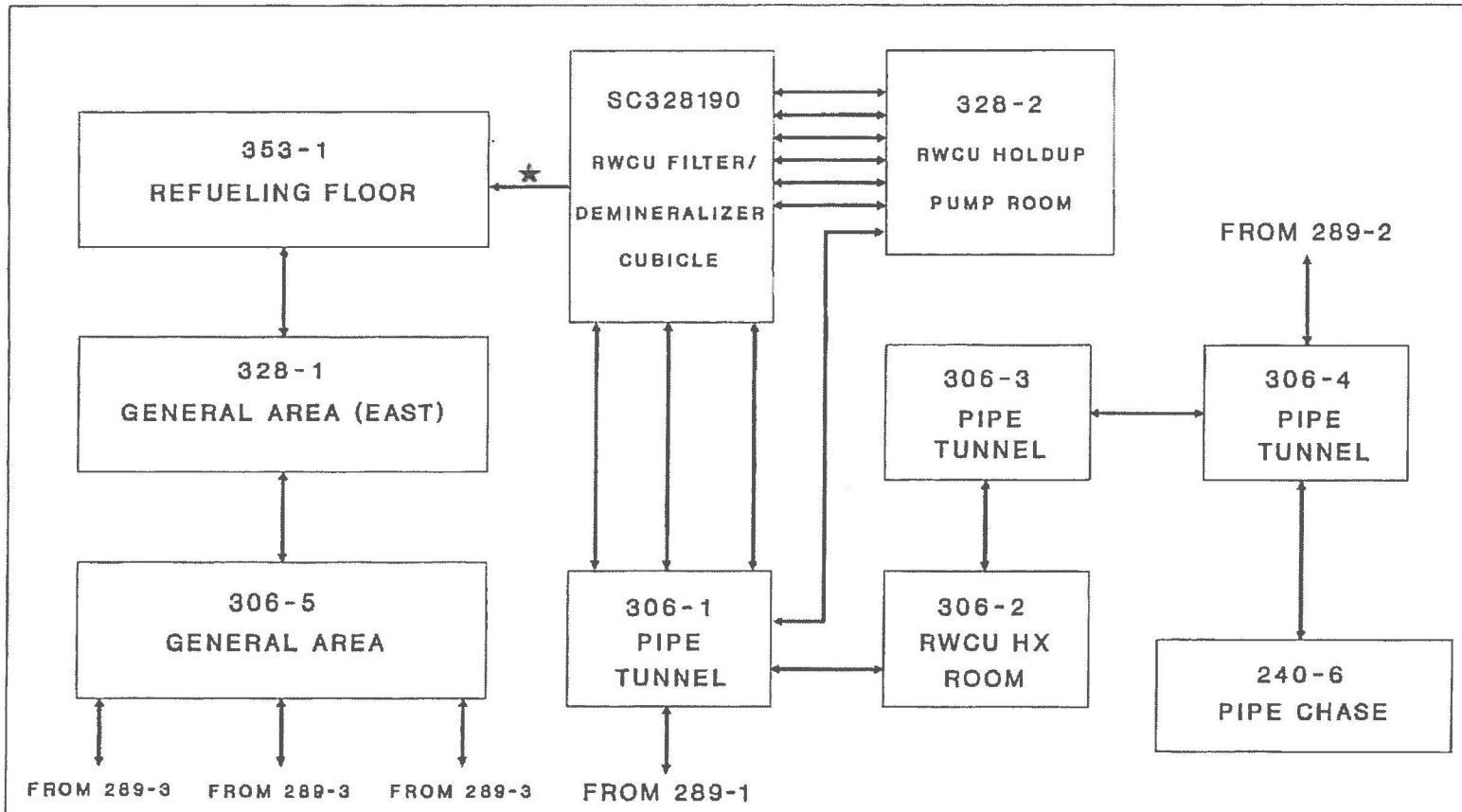
⬡ : VENT CURTAIN JUNCTION

⟶ : DIRECTION OF VENT FLOW

FIGURE 3B-2

NODALIZATION DIAGRAM - REACTOR BUILDING HIGH-ENERGY LINE BREAK ANALYSIS (46 NODE MODEL)
SHEET 4 OF 5

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



NOTES:

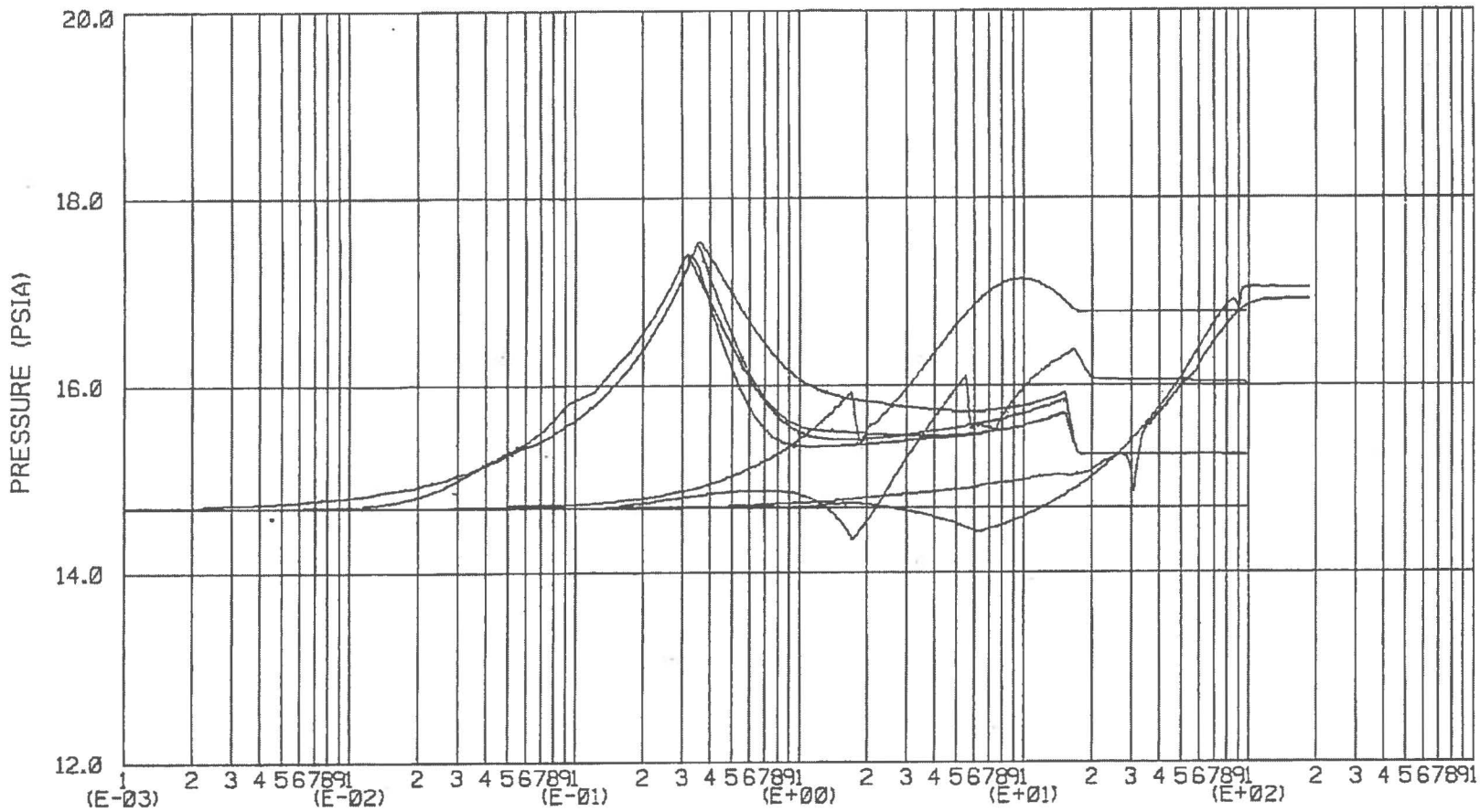
→ : DIRECTION OF VENT FLOW

★ : CONCRETE PLUG JUNCTION (USED ONLY IN BREAK NUMBER 56)
THE JUNCTION OPENS IN THE SHOWN DIRECTION.
FLOW IS IN BOTH DIRECTIONS ONCE FULLY OPEN.

FIGURE 3B-2

NODALIZATION DIAGRAM - REACTOR BUILDING HIGH-ENERGY LINE BREAK ANALYSIS (46 NODE MODEL)
SHEET 5 OF 5

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

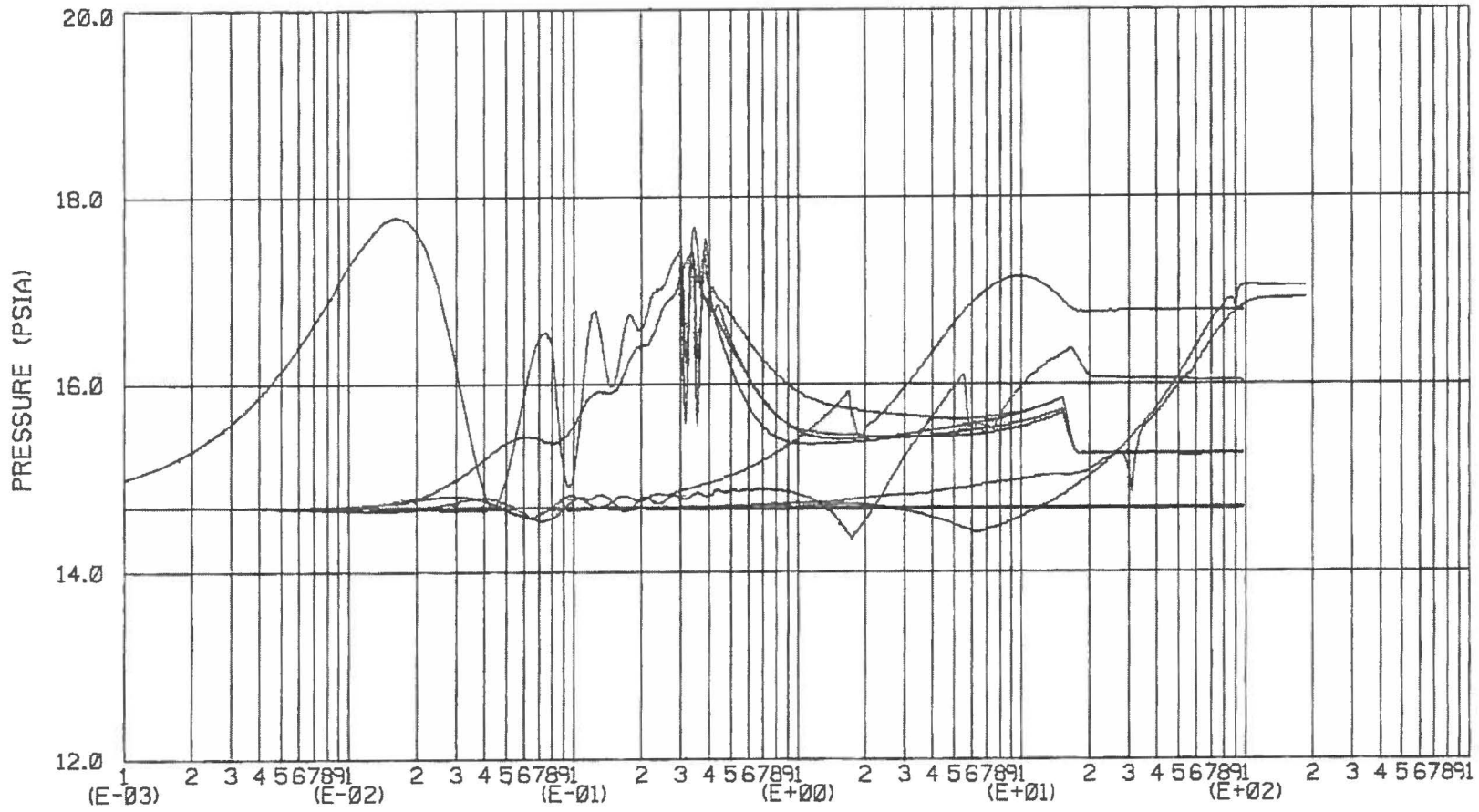
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-3

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 175-1. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



TIME AFTER ACCIDENT (SECONDS)

Note: All breaks are shown on this figure.

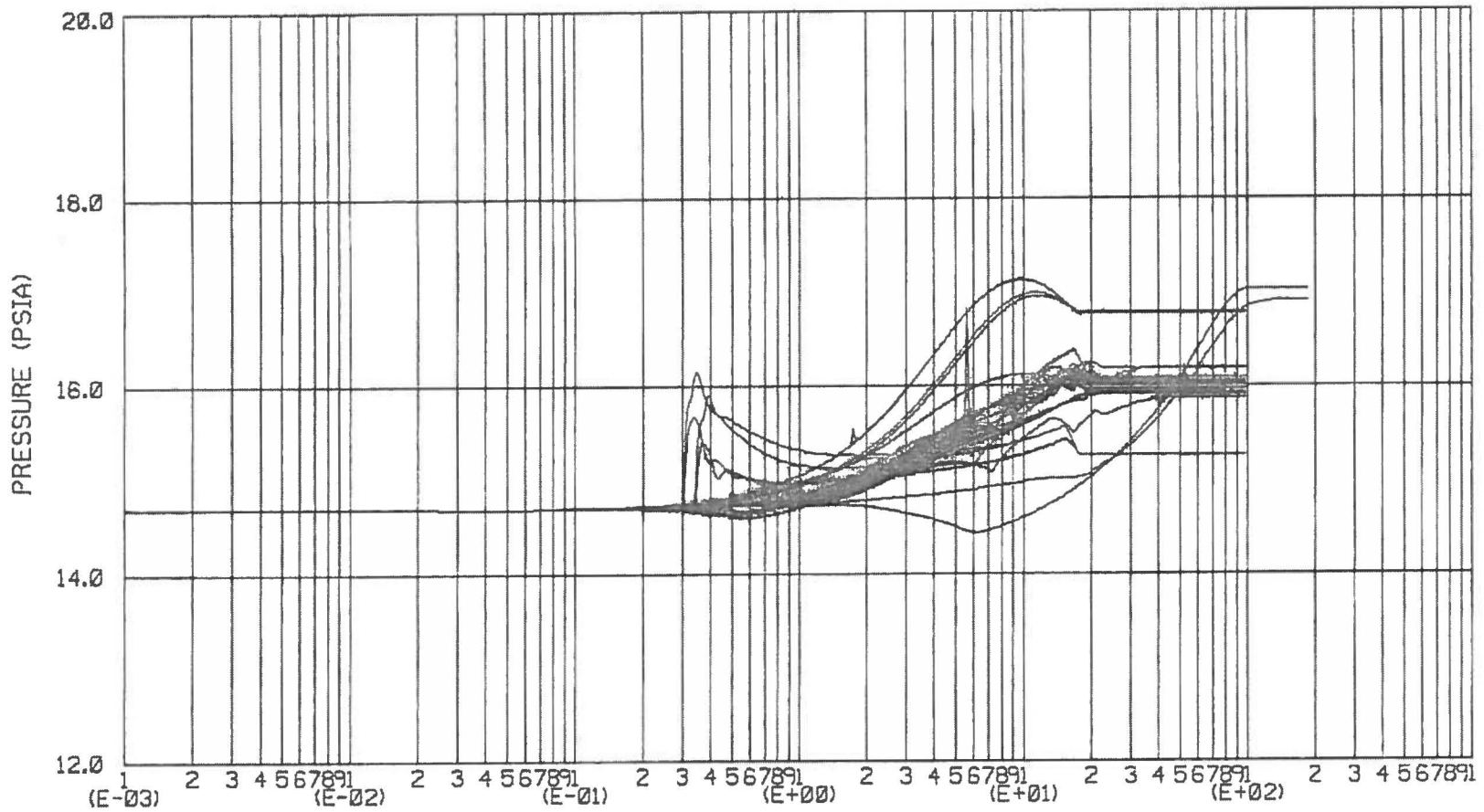
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-4

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 175-2. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

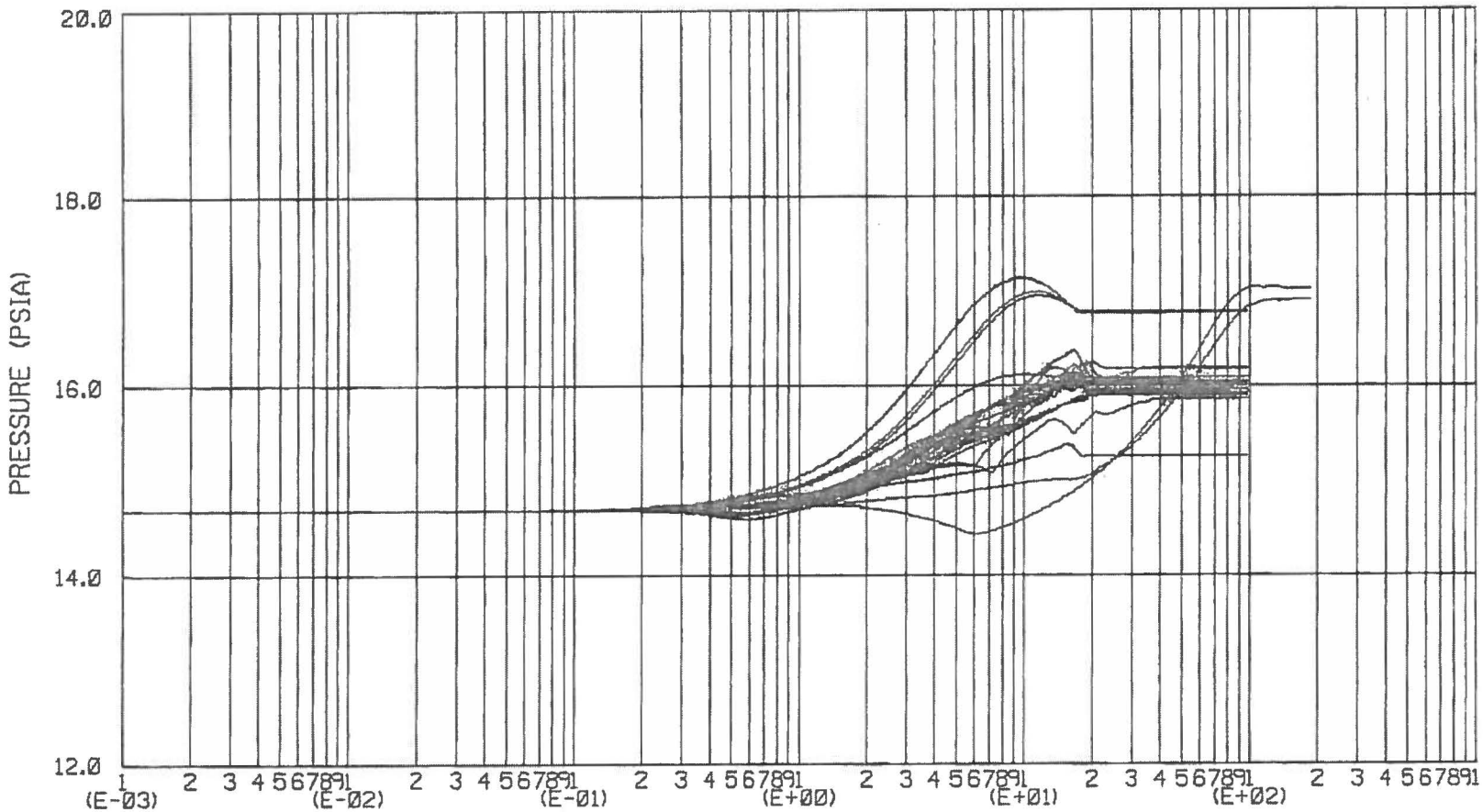
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-5

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 175-3. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

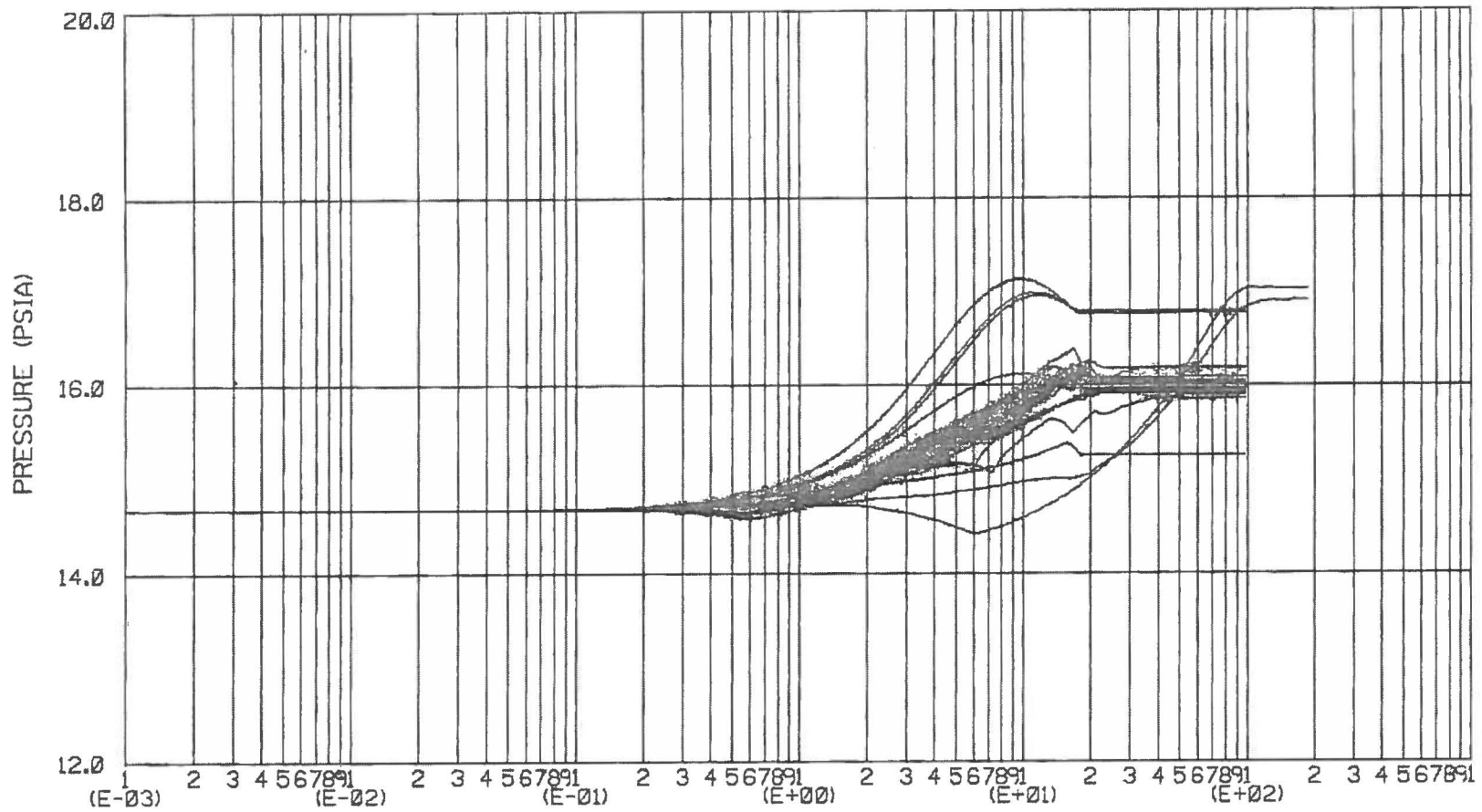
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-6

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 175-4. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

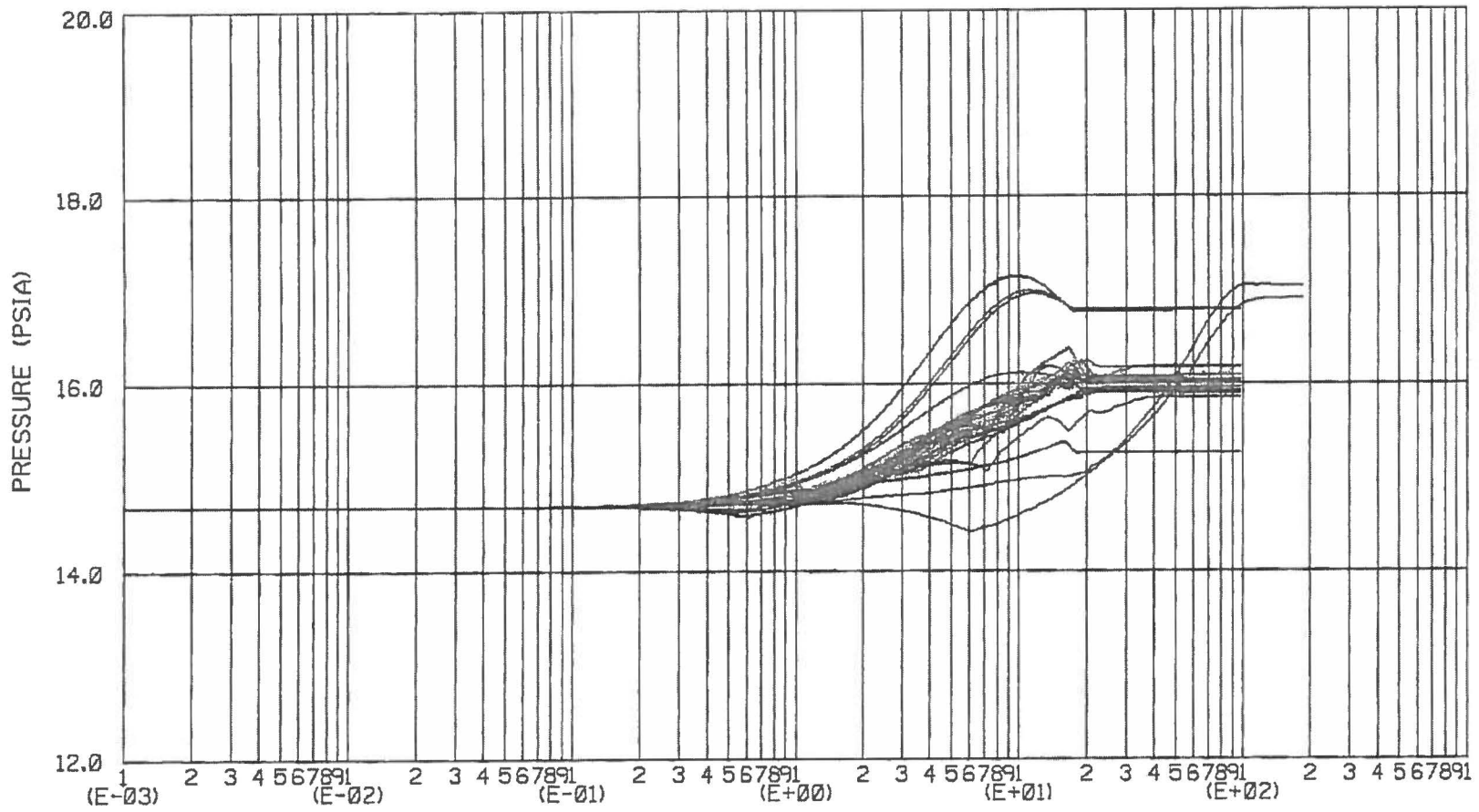
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-7

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 175-5. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

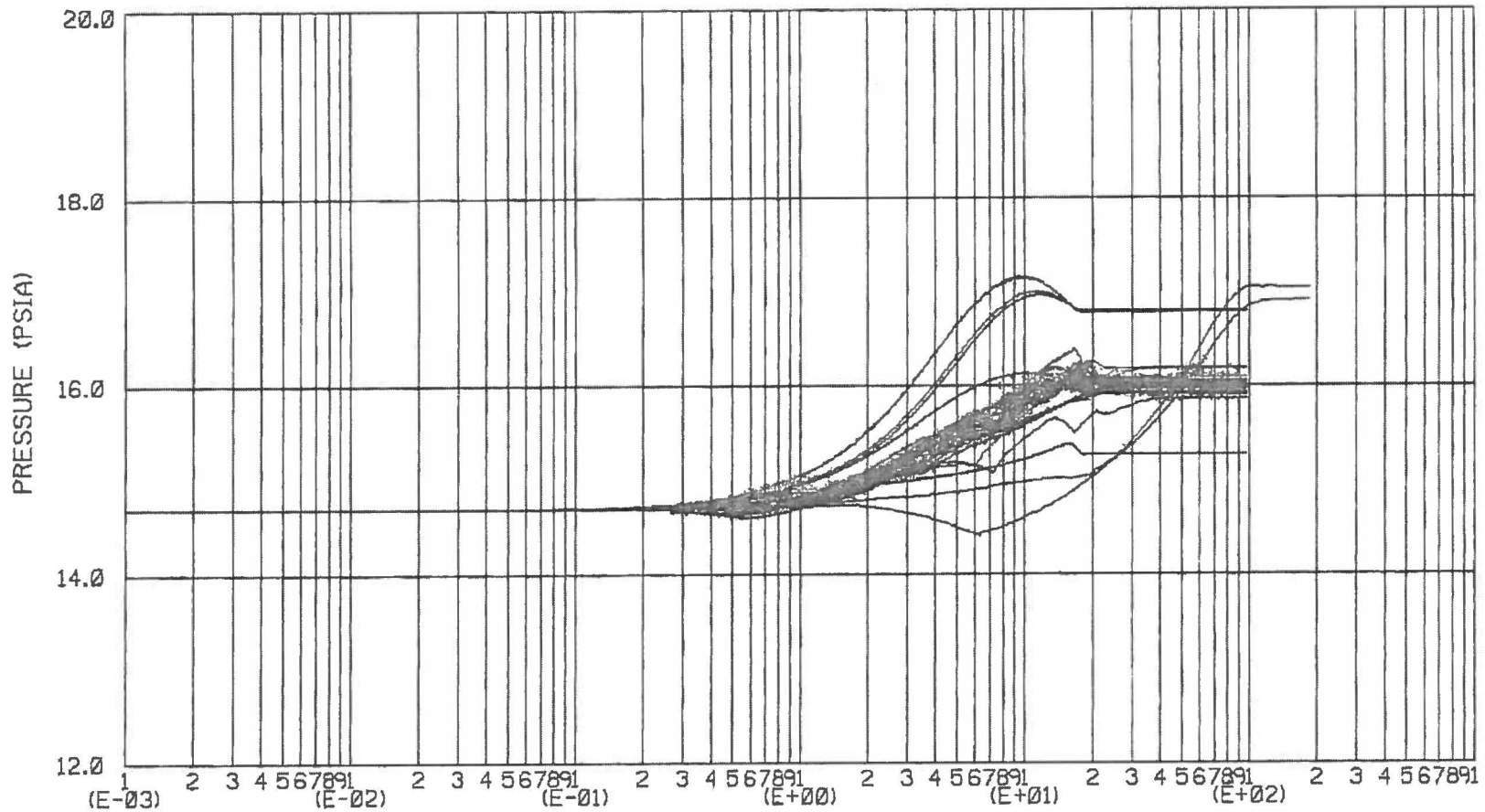
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-8

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 175-6. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



TIME AFTER ACCIDENT (SECONDS)

Note: All breaks are shown on this figure.

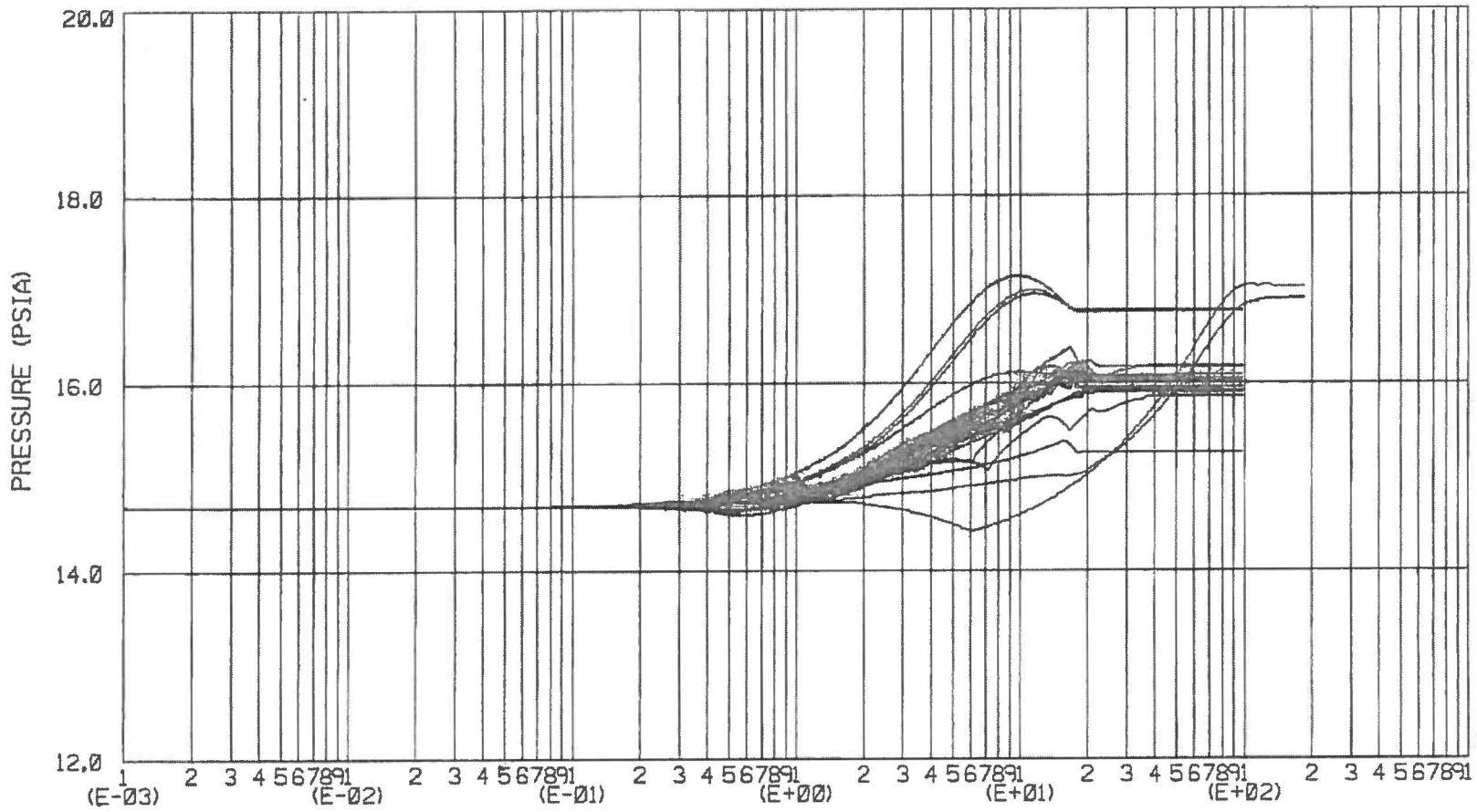
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-9

ABSOLUTE PRESSURE TRANSIENTS:
VOLUME 175-7. SECONDARY
CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



TIME AFTER ACCIDENT (SECONDS)

Note: All breaks are shown on this figure.

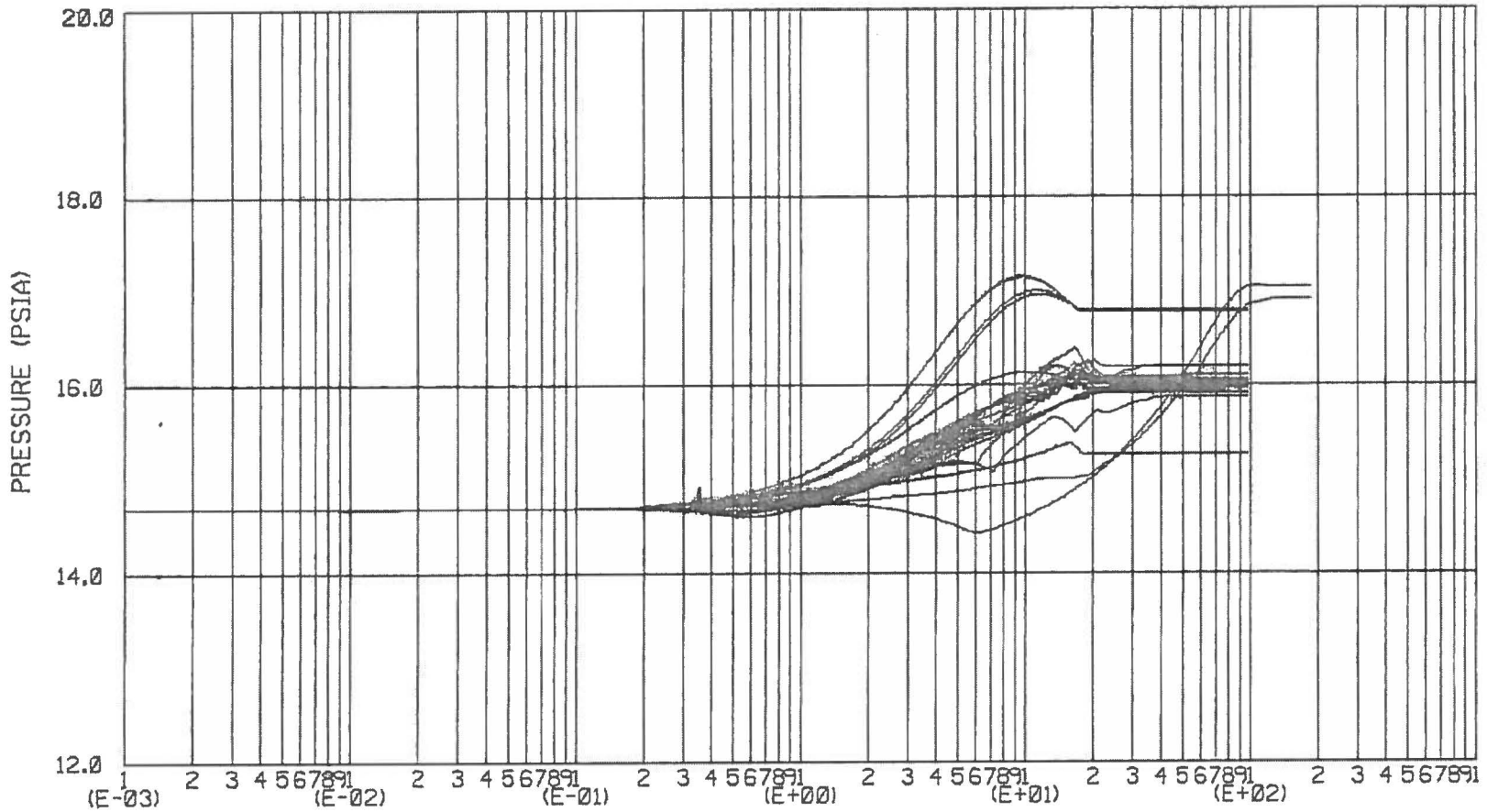
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 38.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-10

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 175-8. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

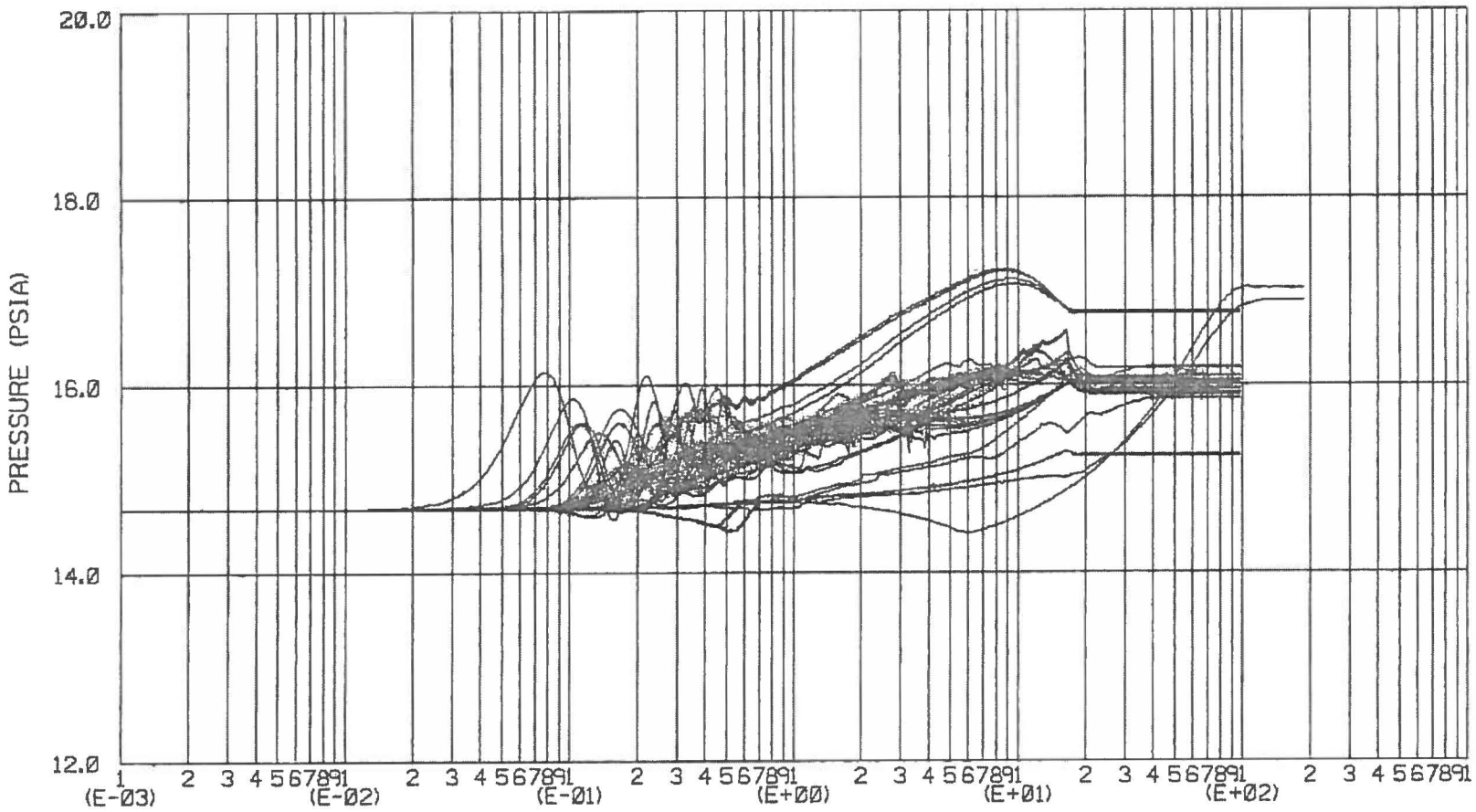
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial 'cold' water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-11

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 175-9. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

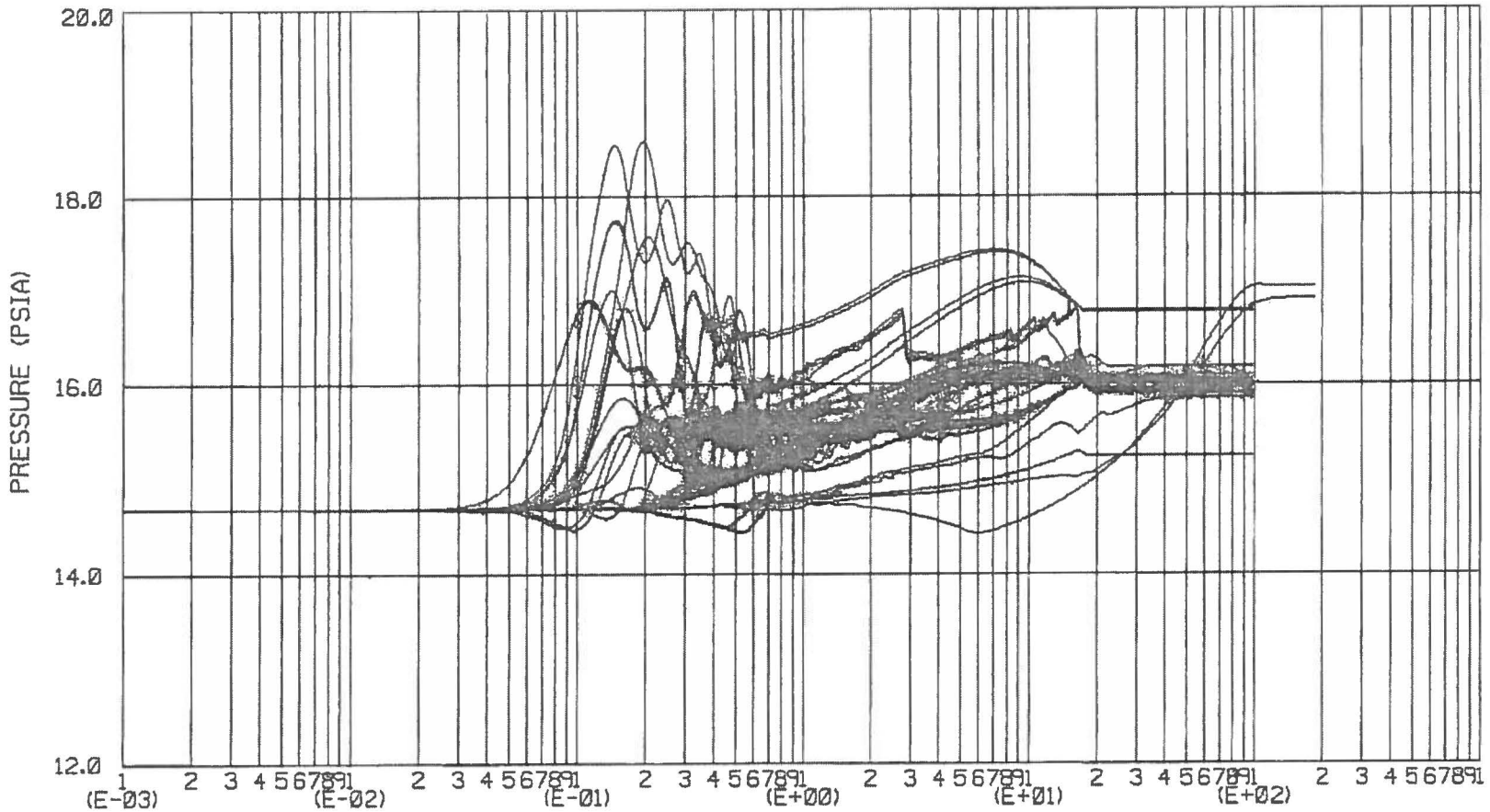
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-12

ABSOLUTE PRESSURE TRANSIENTS:
VOLUME 175-10. SECONDARY
CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



TIME AFTER ACCIDENT (SECONDS)

Note: All breaks are shown on this figure.

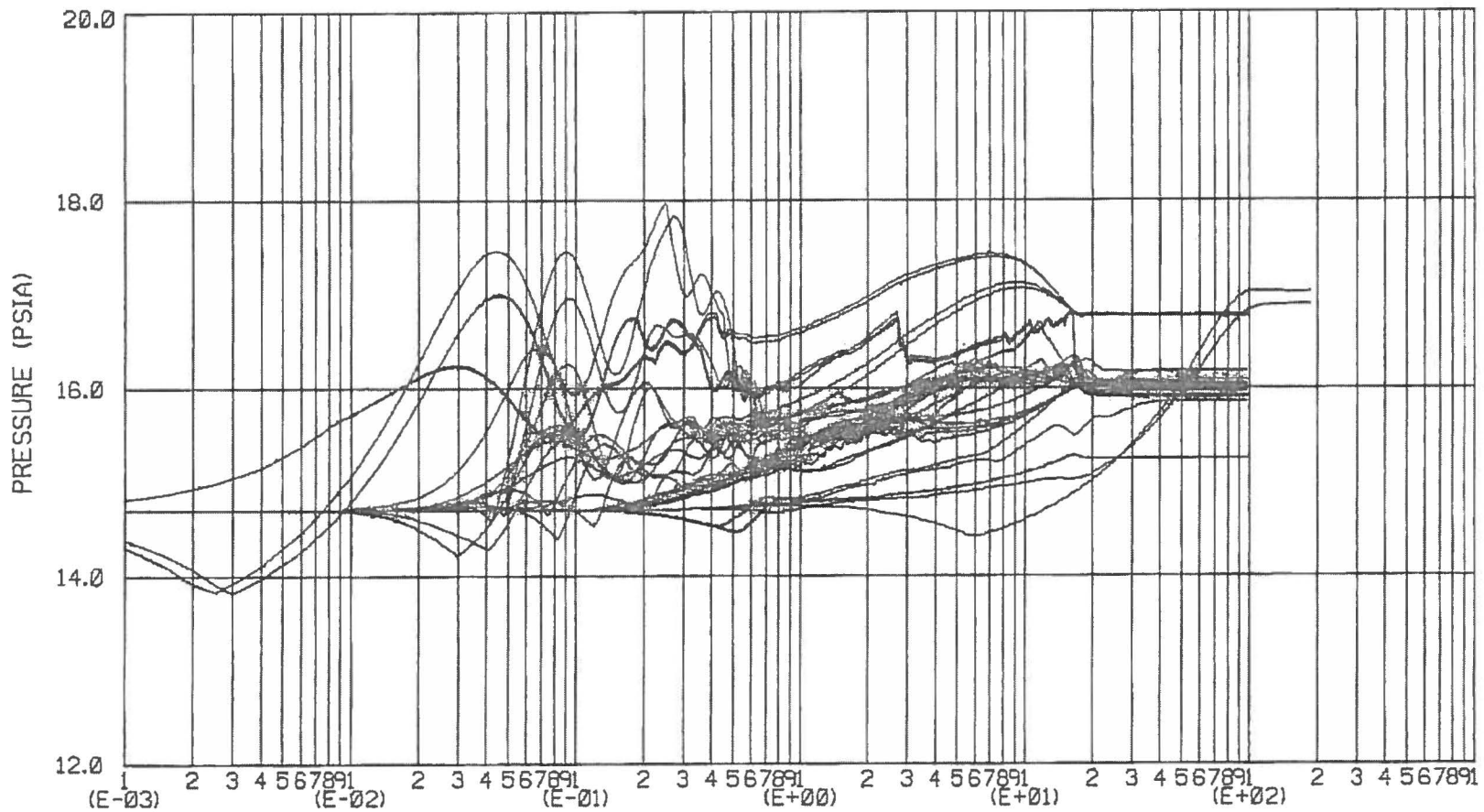
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-13

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 175-11. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

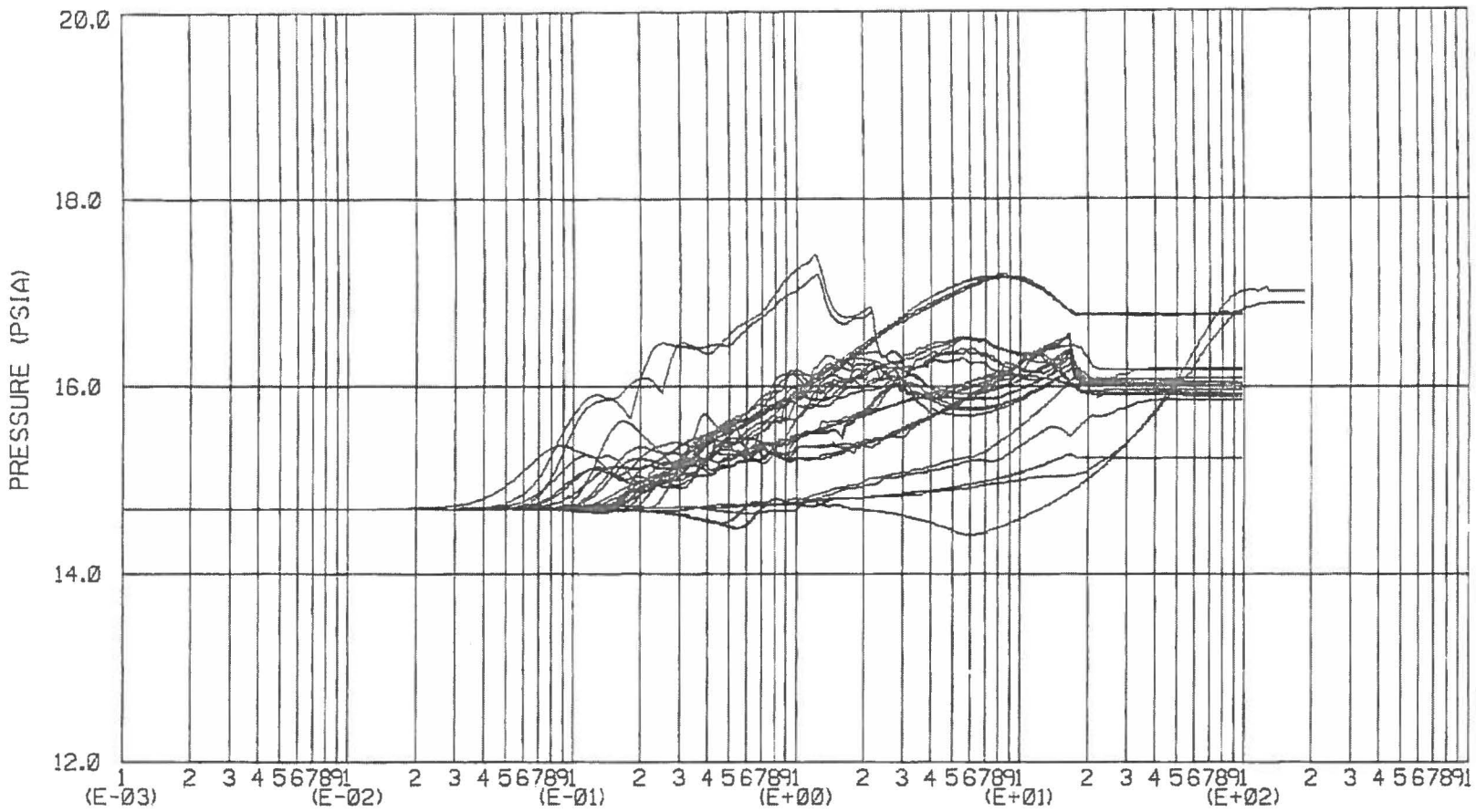
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial 'cold' water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-14

ABSOLUTE PRESSURE TRANSIENTS:
VOLUME 215-1. SECONDARY
CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

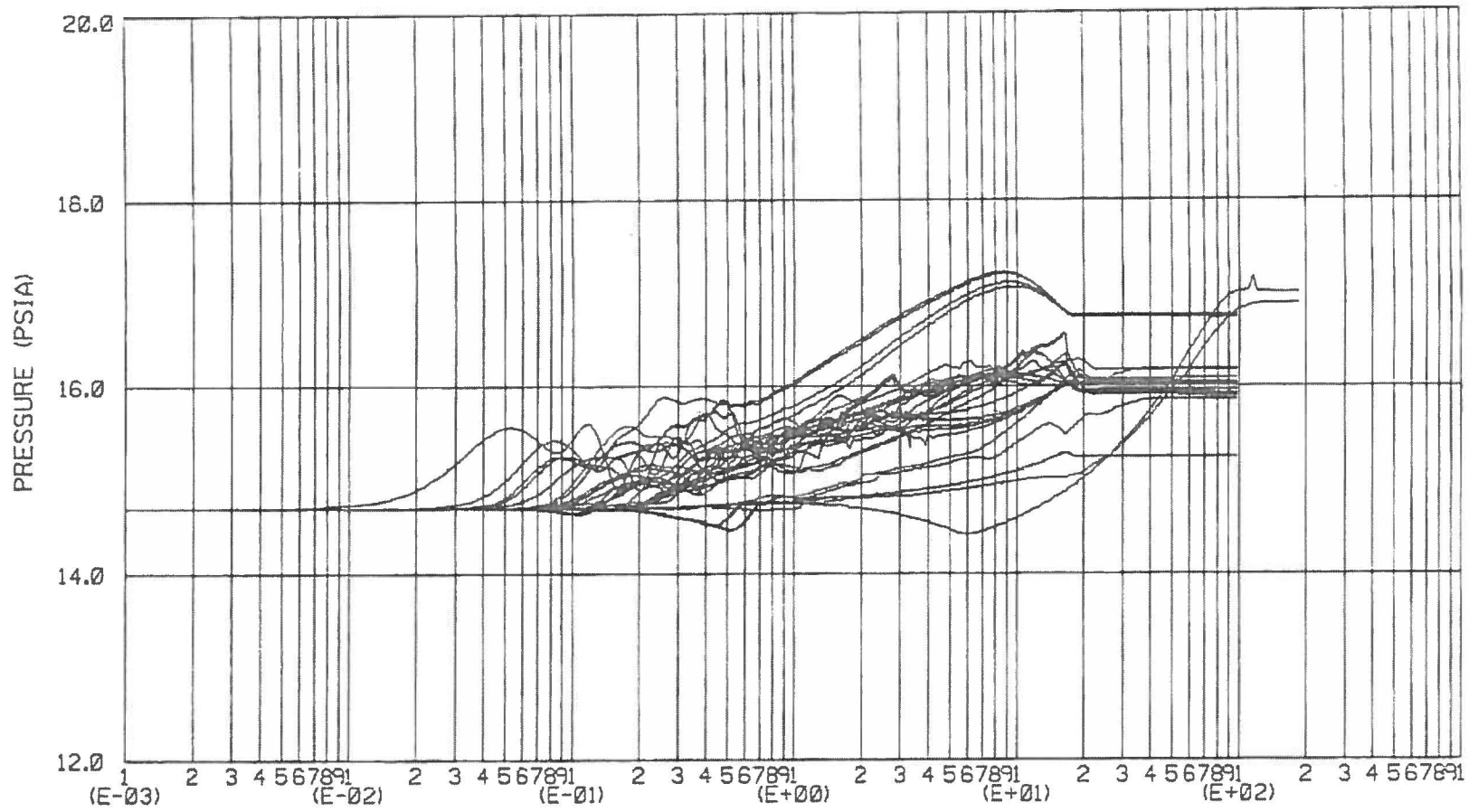
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-15

ABSOLUTE PRESSURE TRANSIENTS:
VOLUME 215-2. SECONDARY
CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

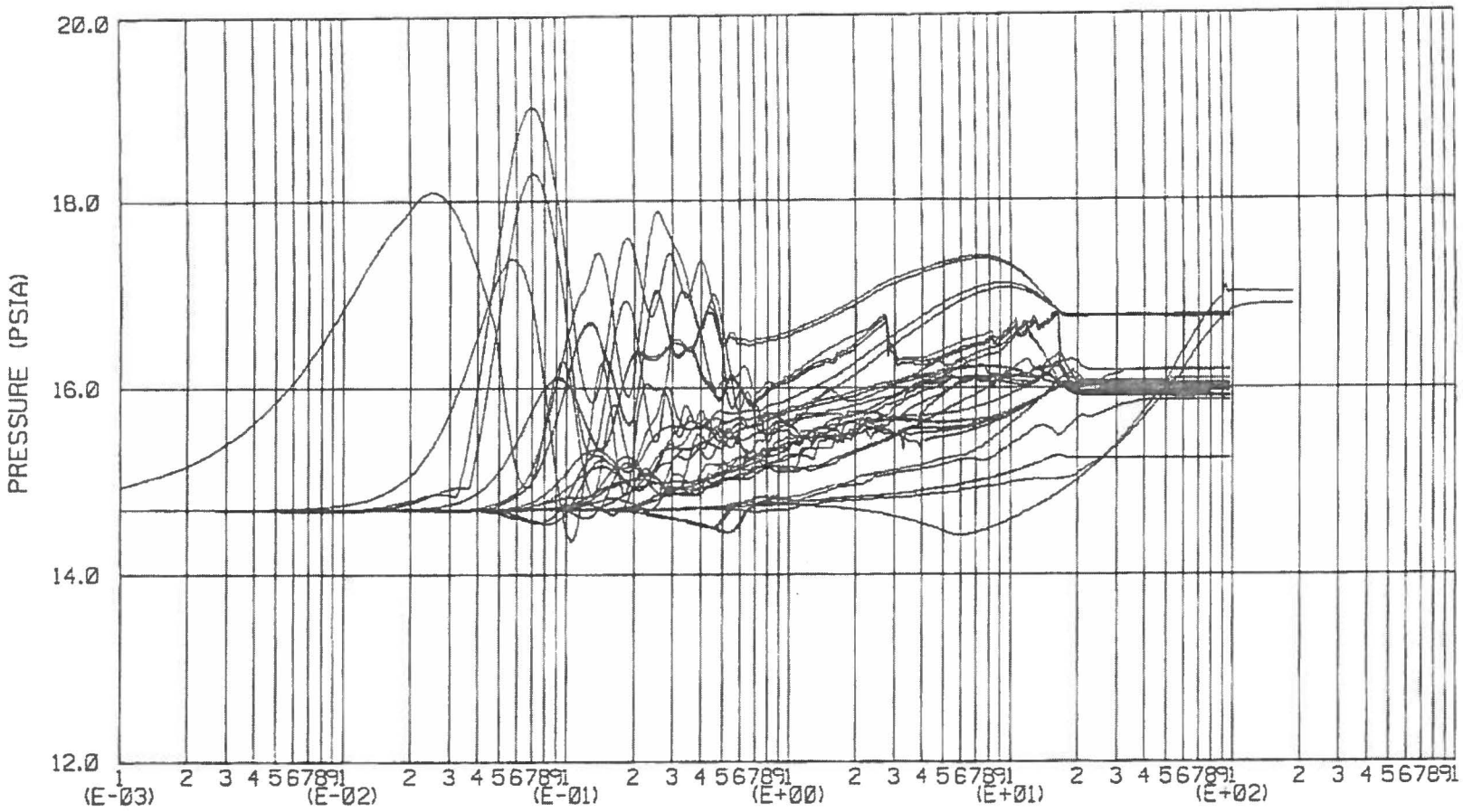
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial 'cold' water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-16

ABSOLUTE PRESSURE TRANSIENTS:
VOLUME 215-3. SECONDARY
CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

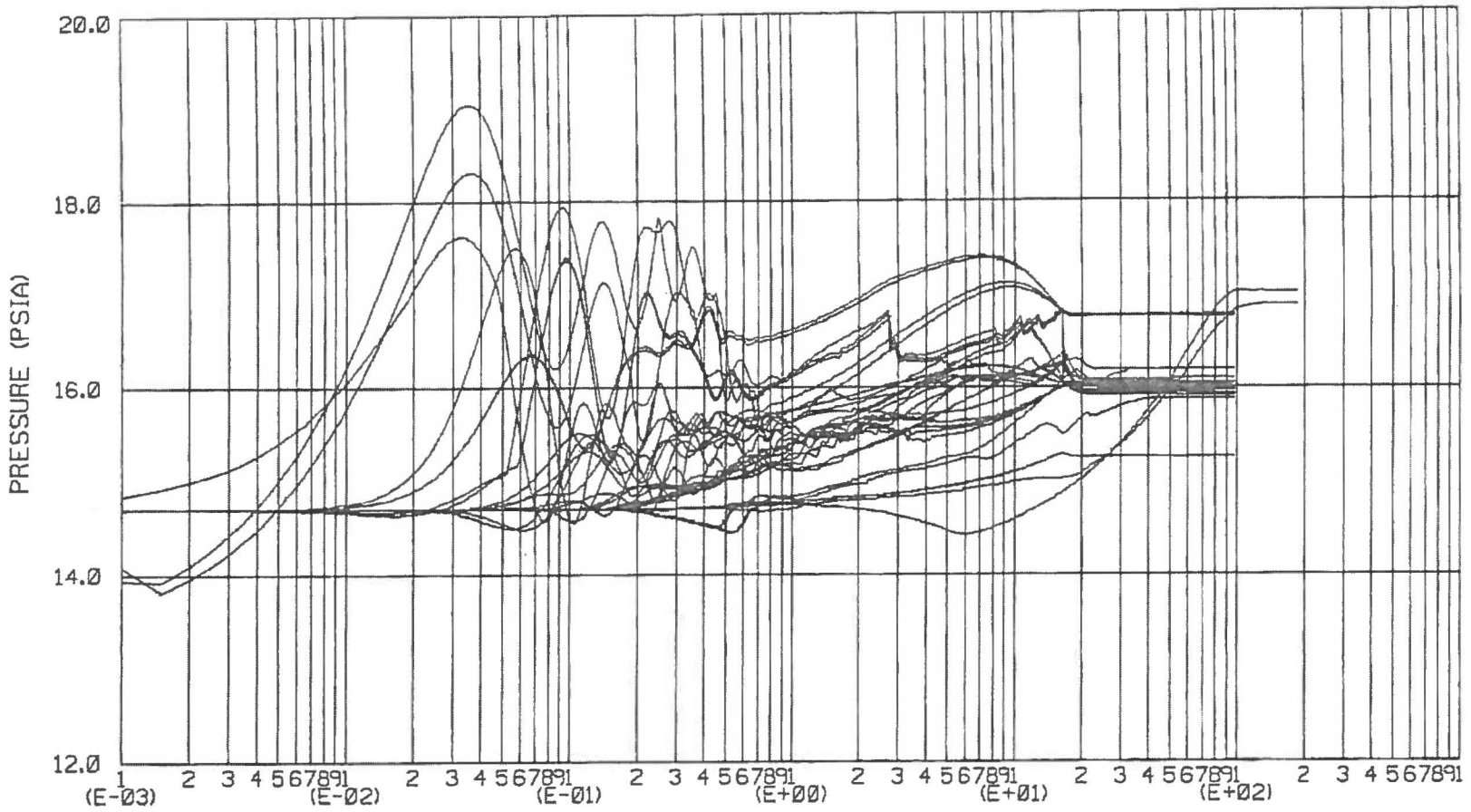
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-17

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 215-4. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

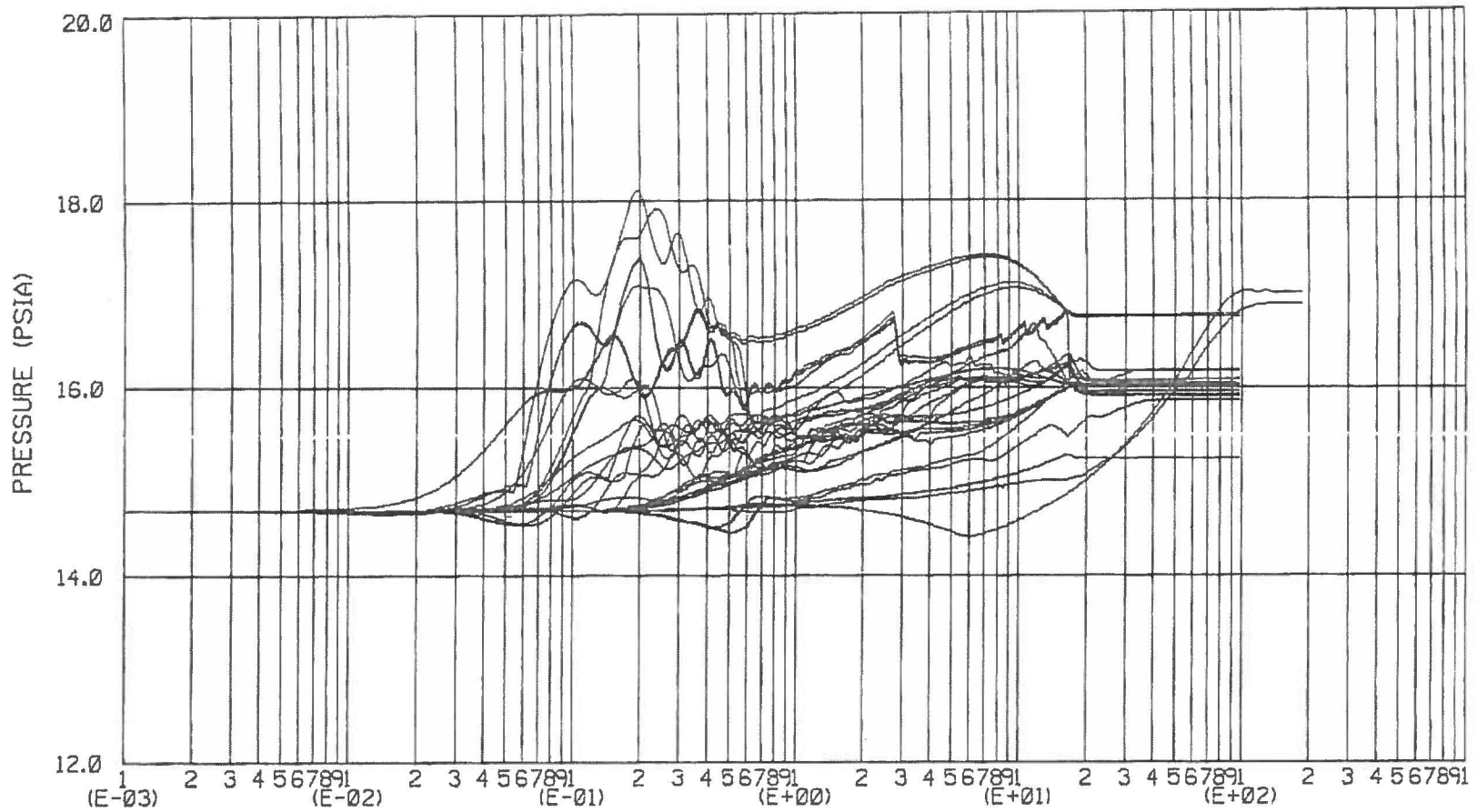
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-18

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 215-5. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



TIME AFTER ACCIDENT (SECONDS)

Note: All breaks are shown on this figure.

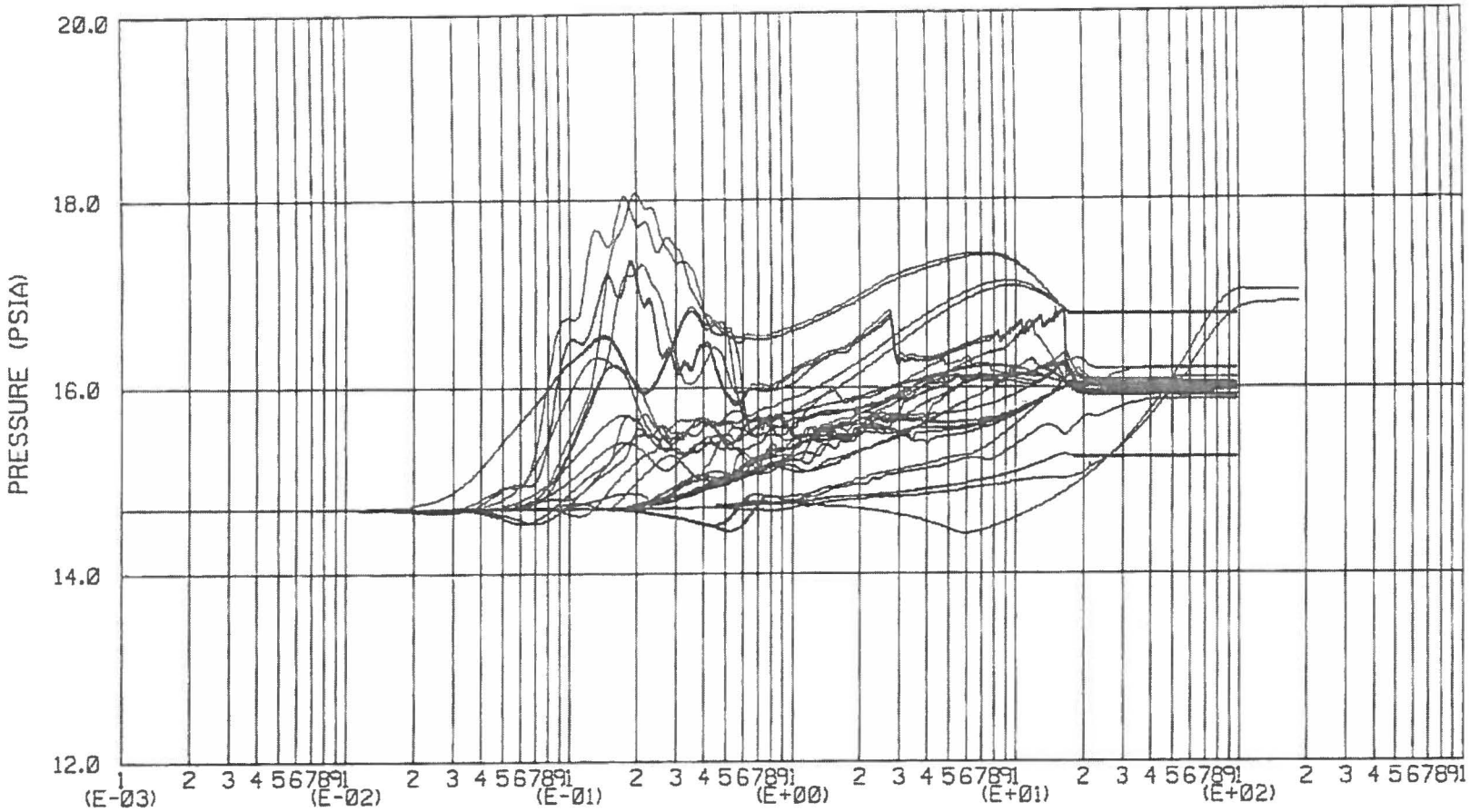
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-19

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 215-6. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

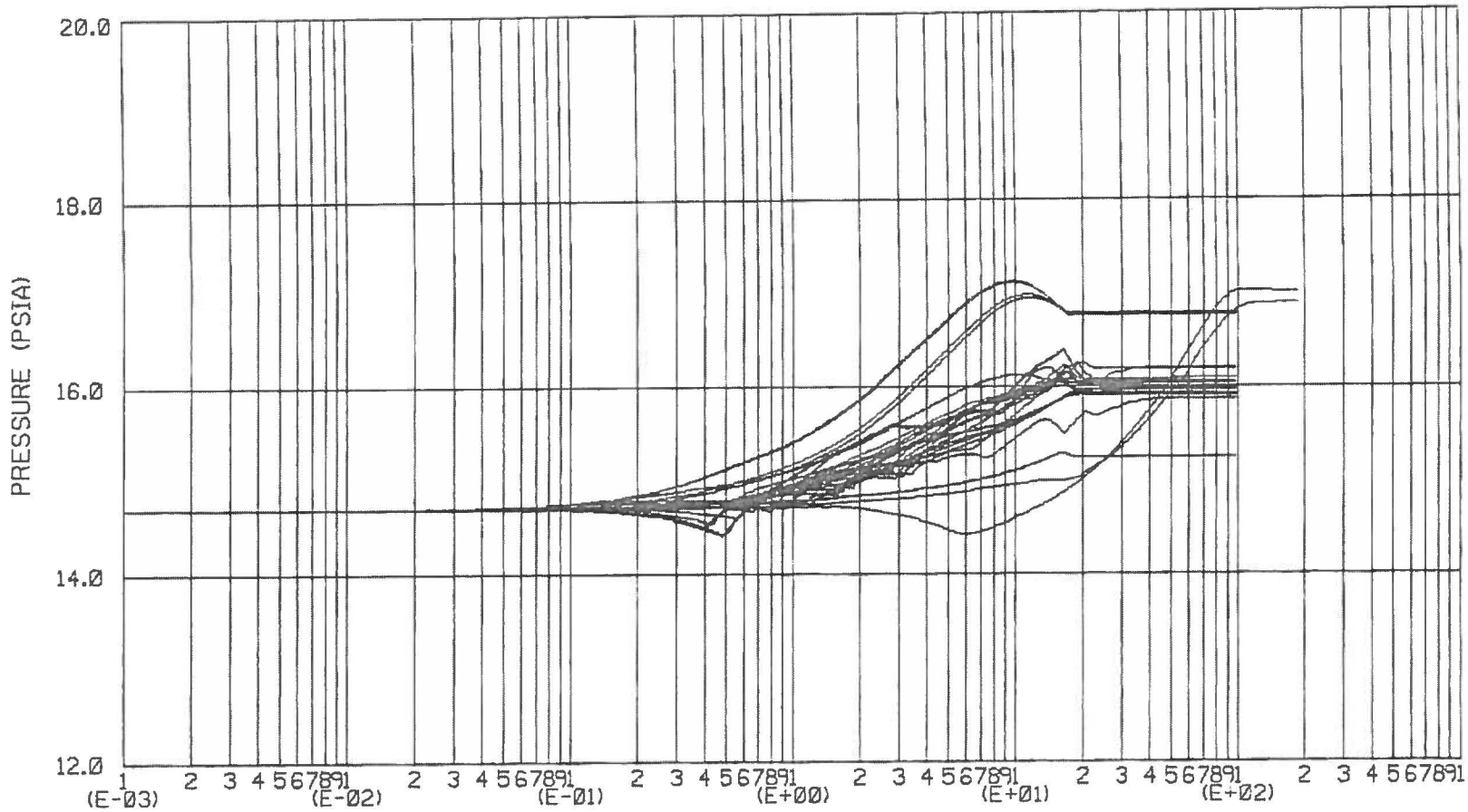
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-20

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 215-7. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

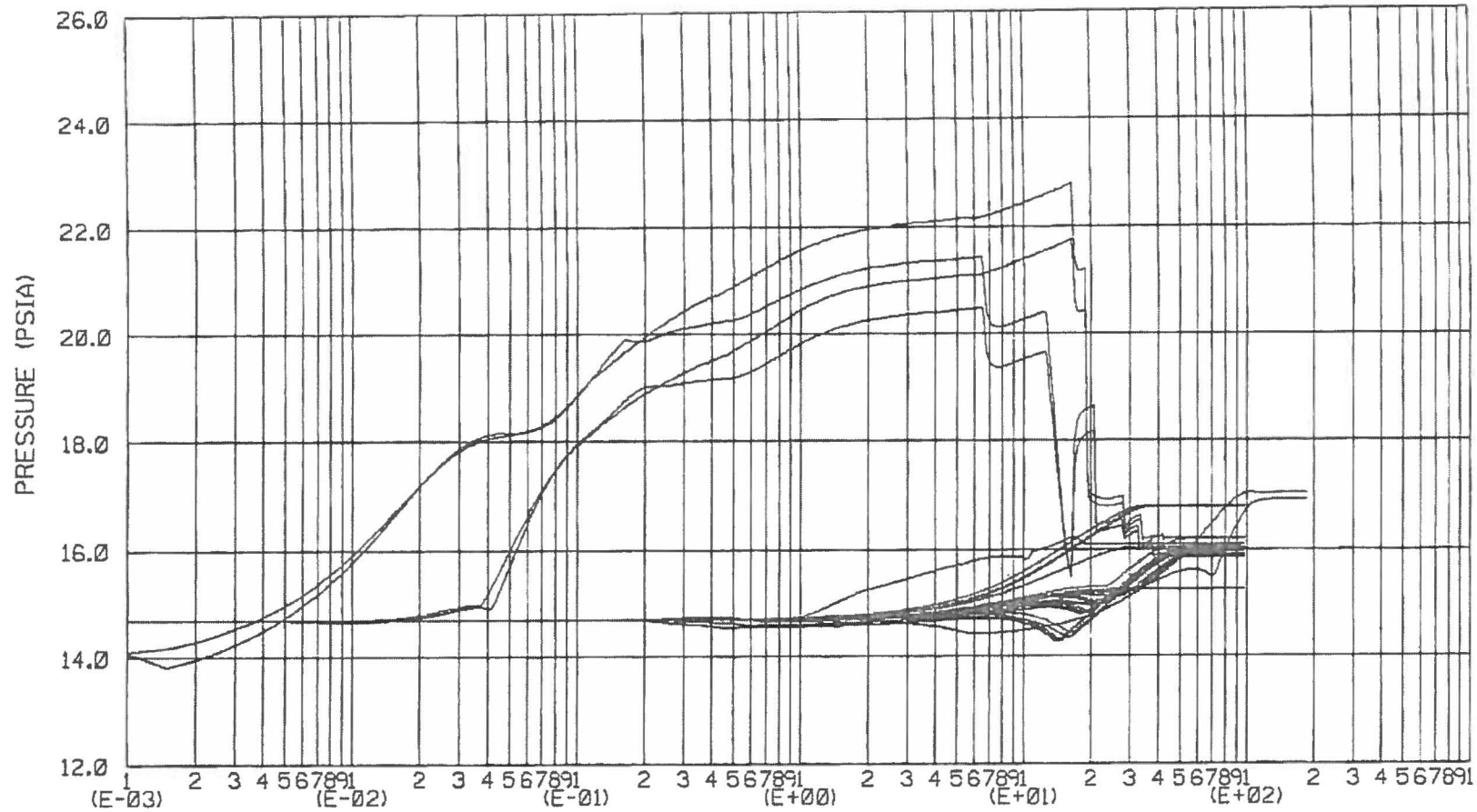
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-21

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 215-8. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

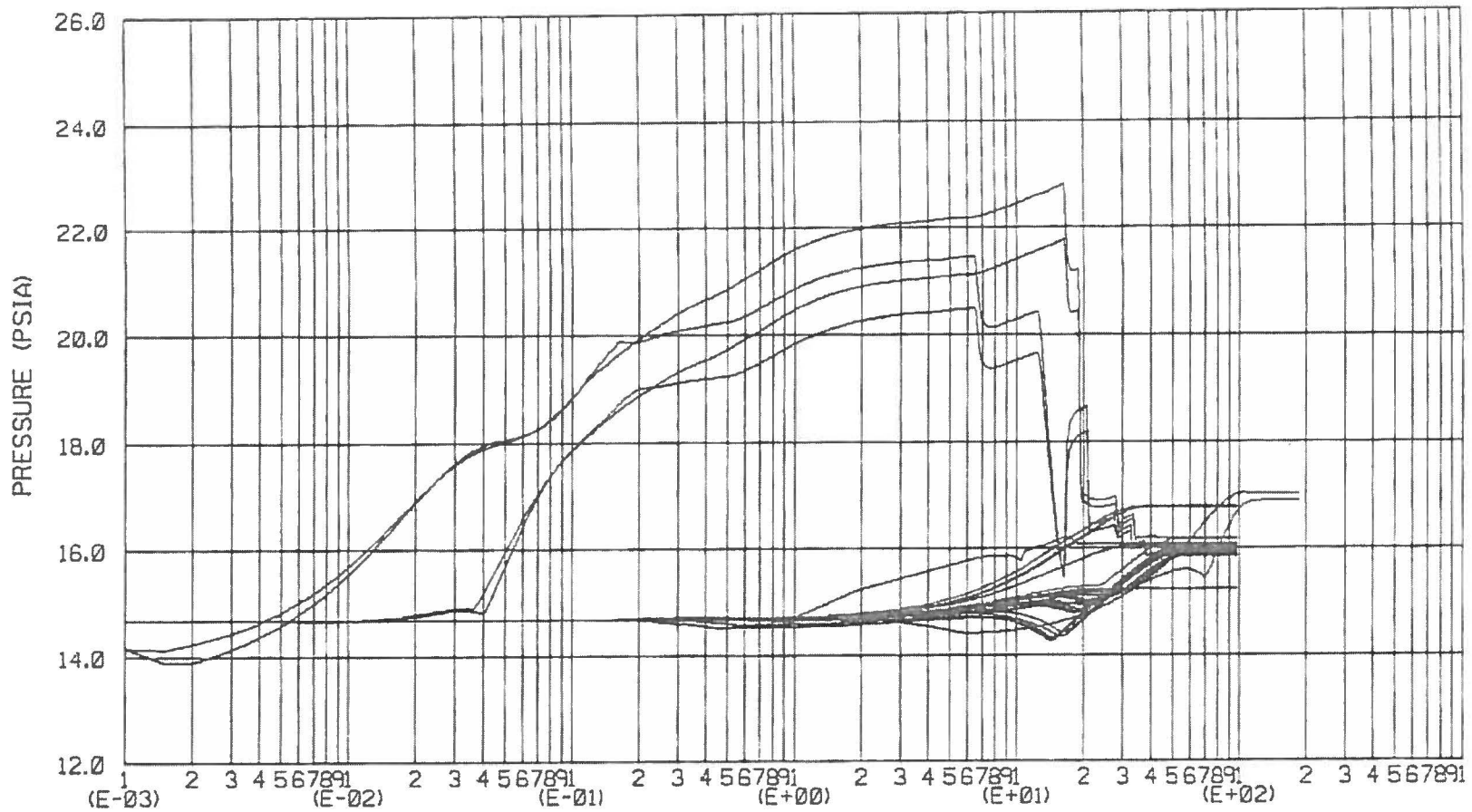
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-22

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 215-9. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

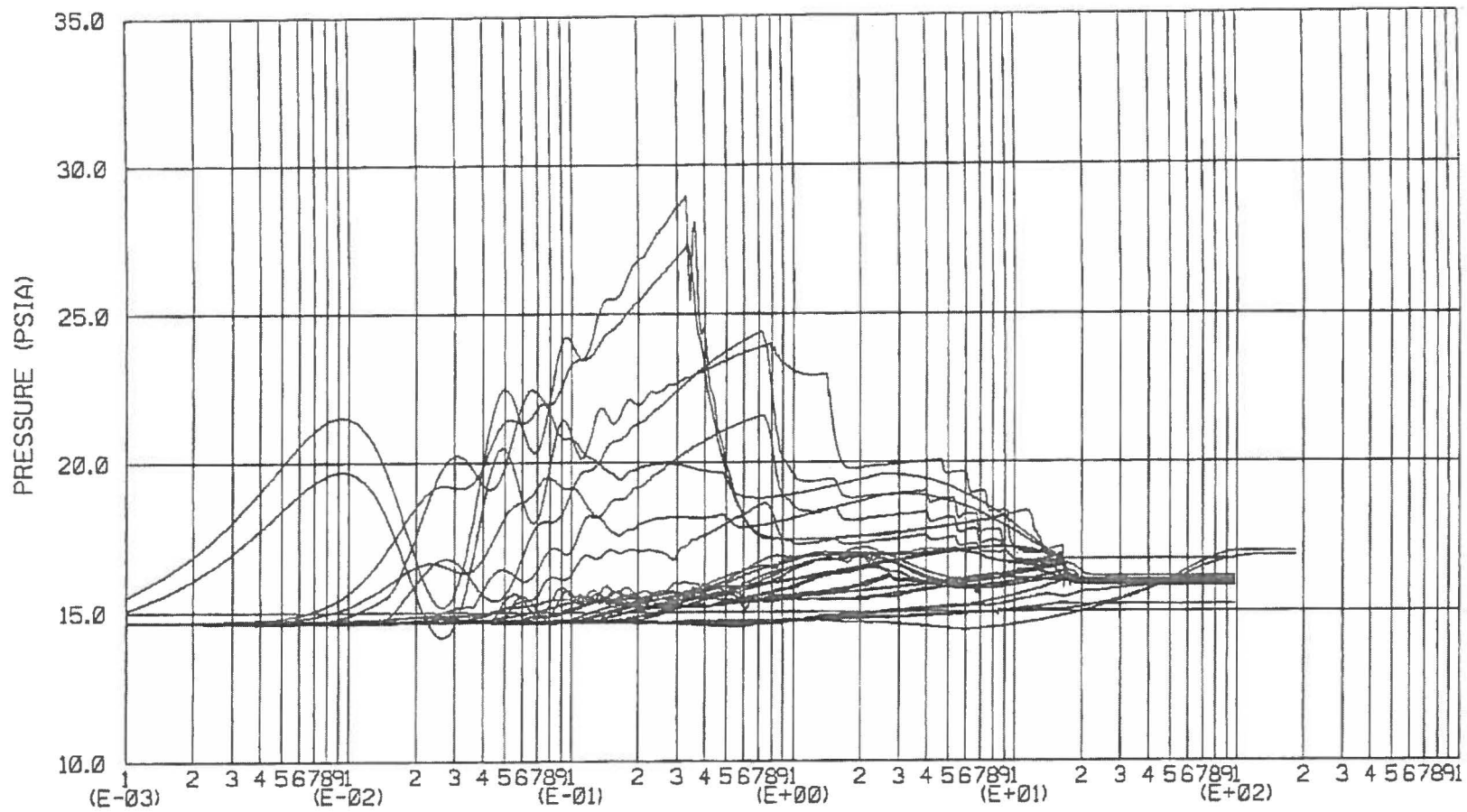
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-23

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 215-10. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



TIME AFTER ACCIDENT (SECONDS)

Note: All breaks are shown on this figure.

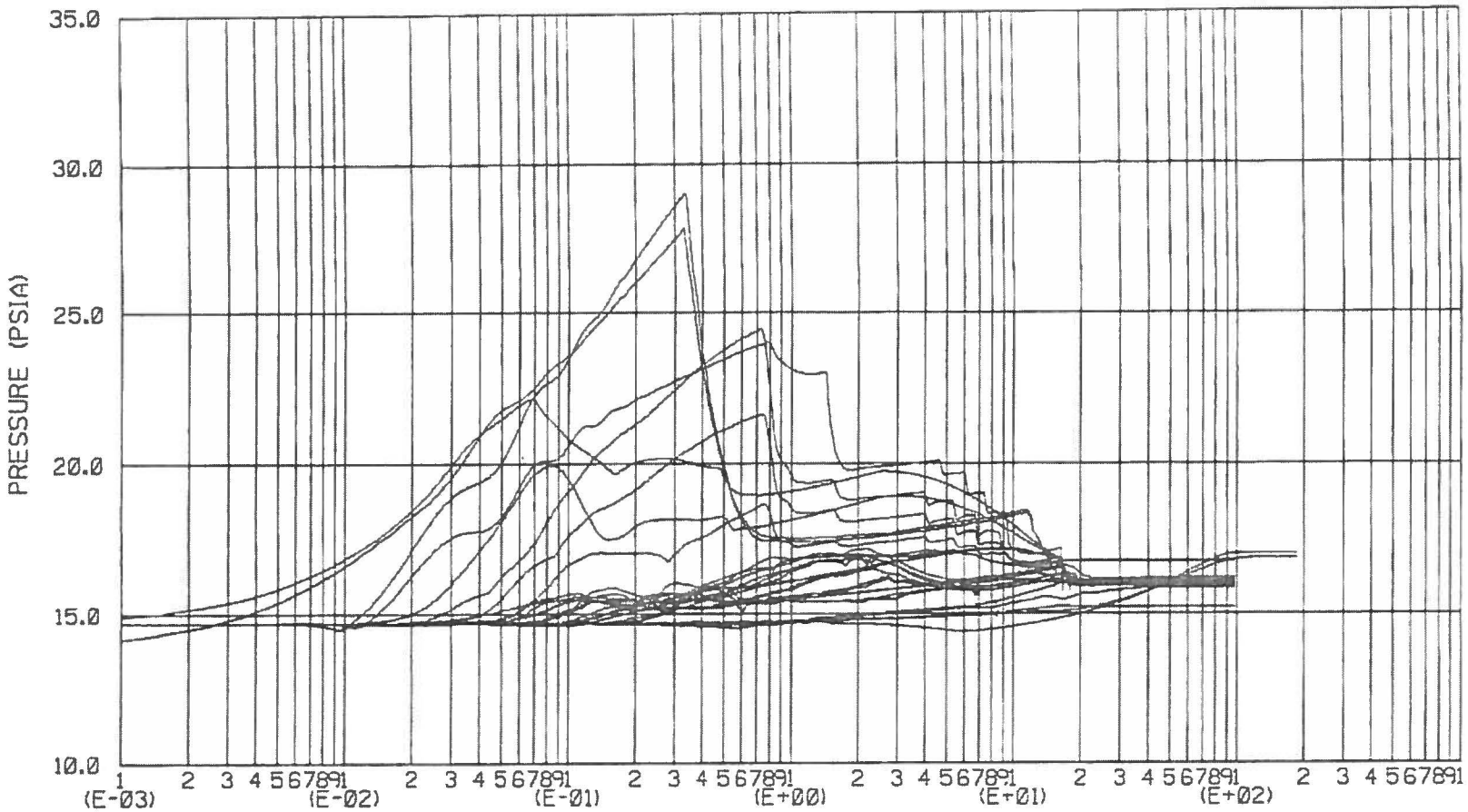
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-24

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 240-1. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

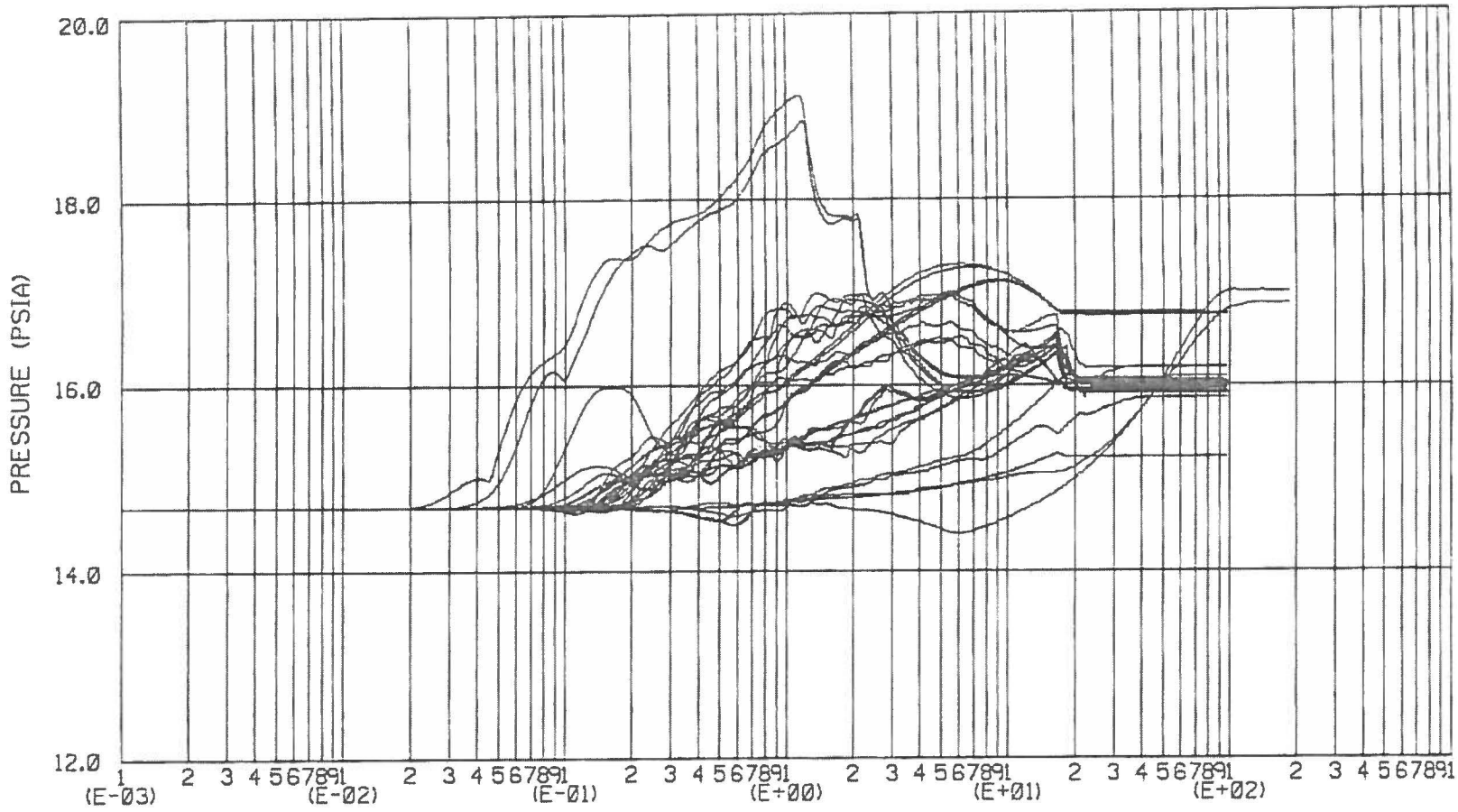
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-25

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 240-2. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

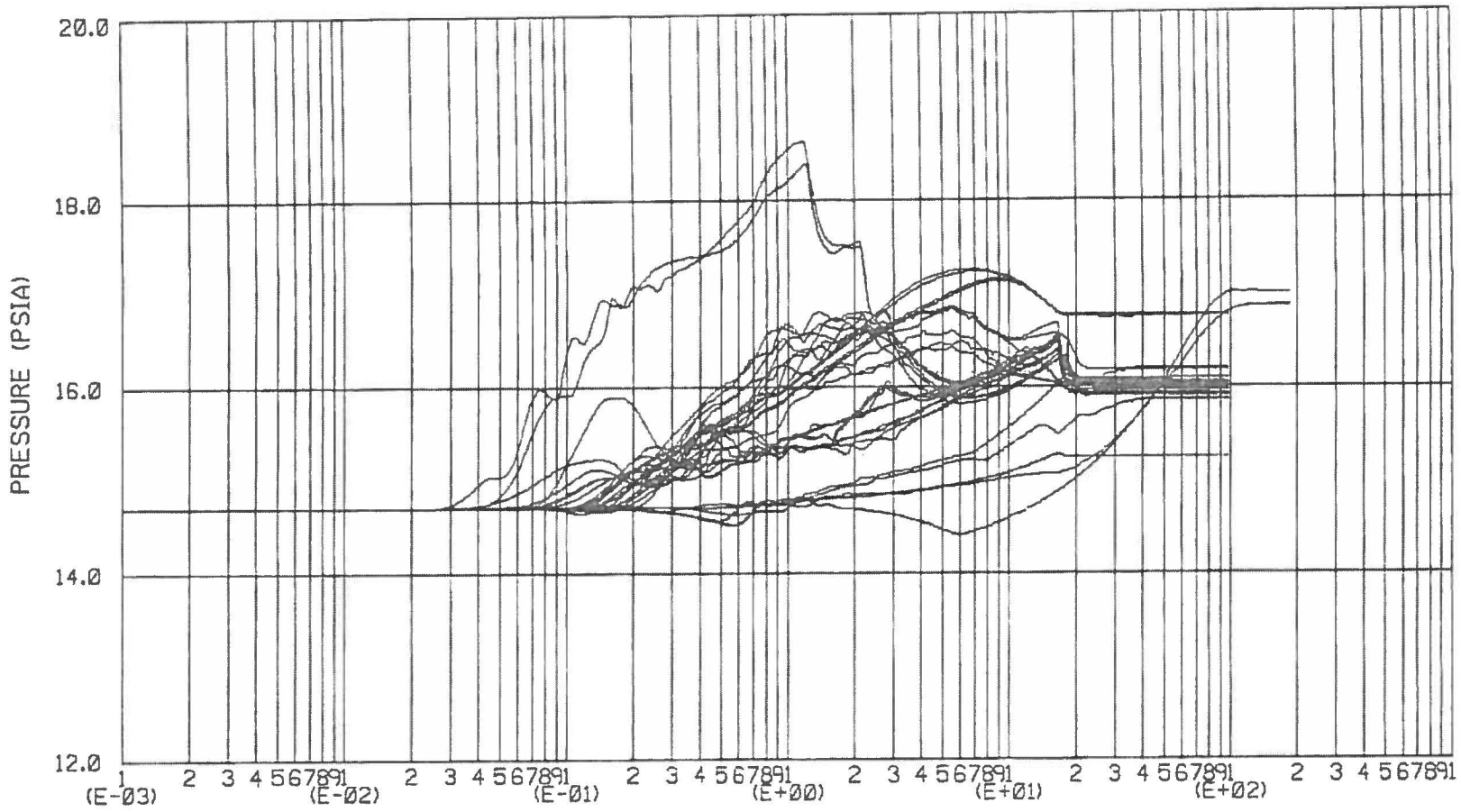
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-26

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 240-3. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

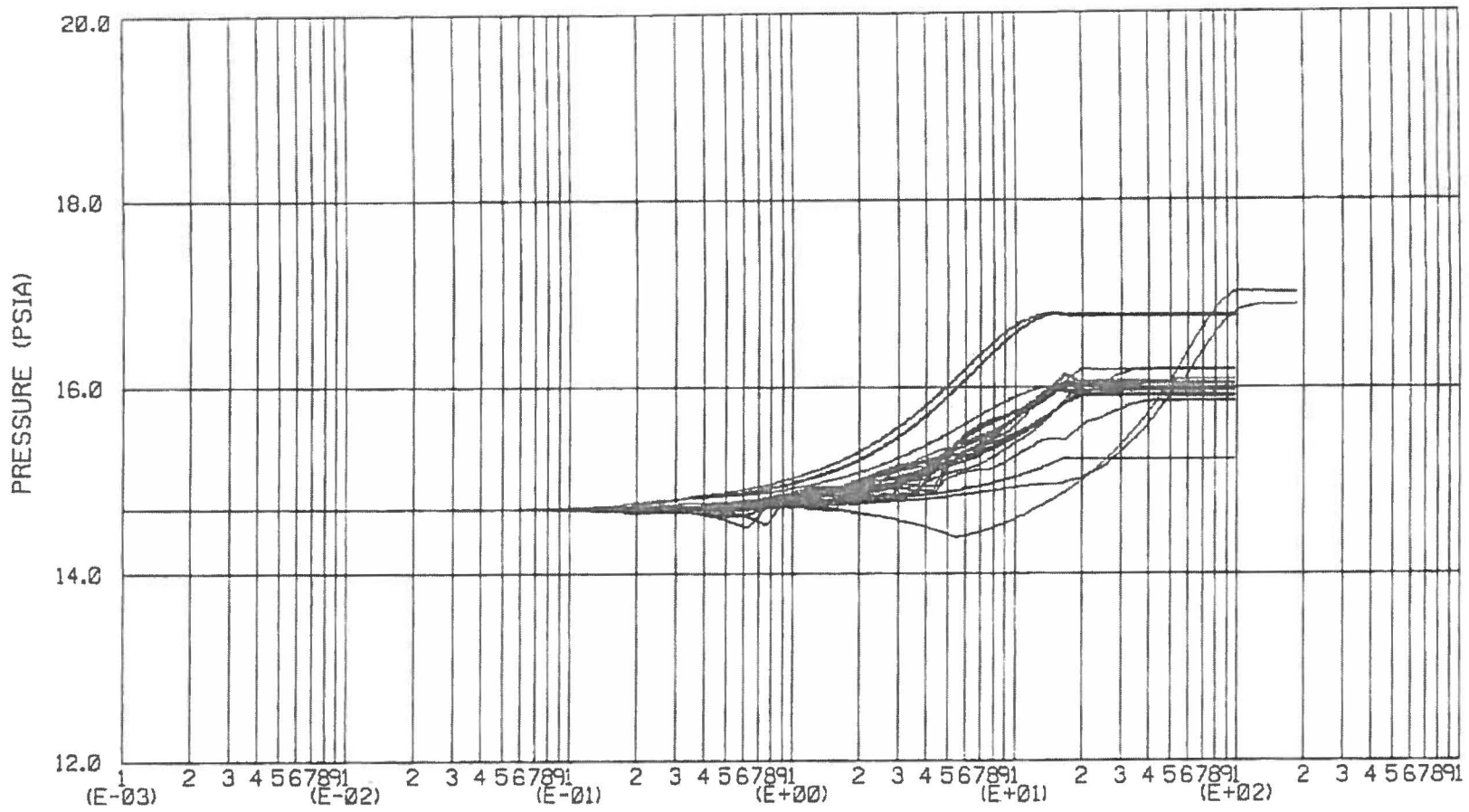
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 38.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-27

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 240-4. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

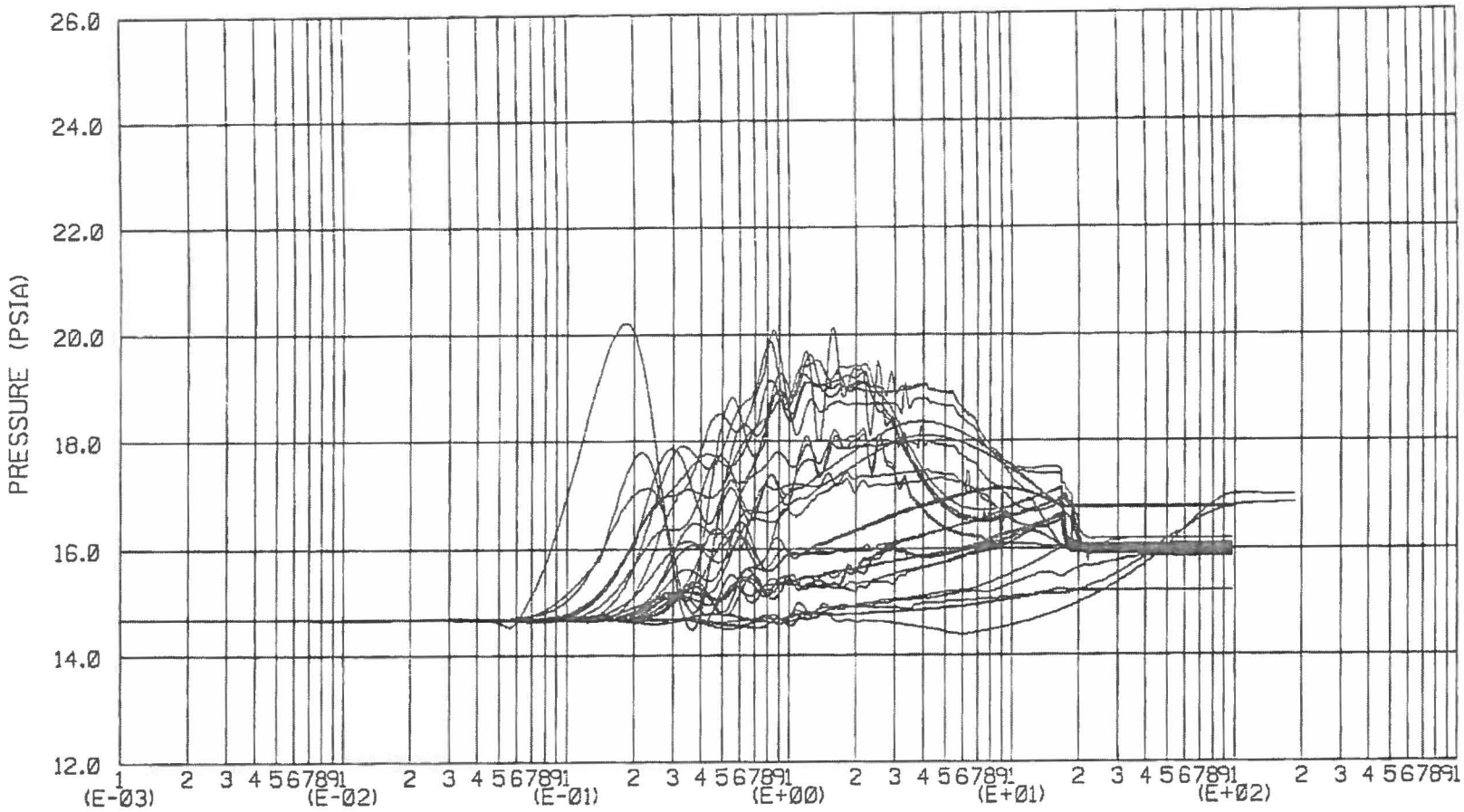
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-28

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 240-5. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

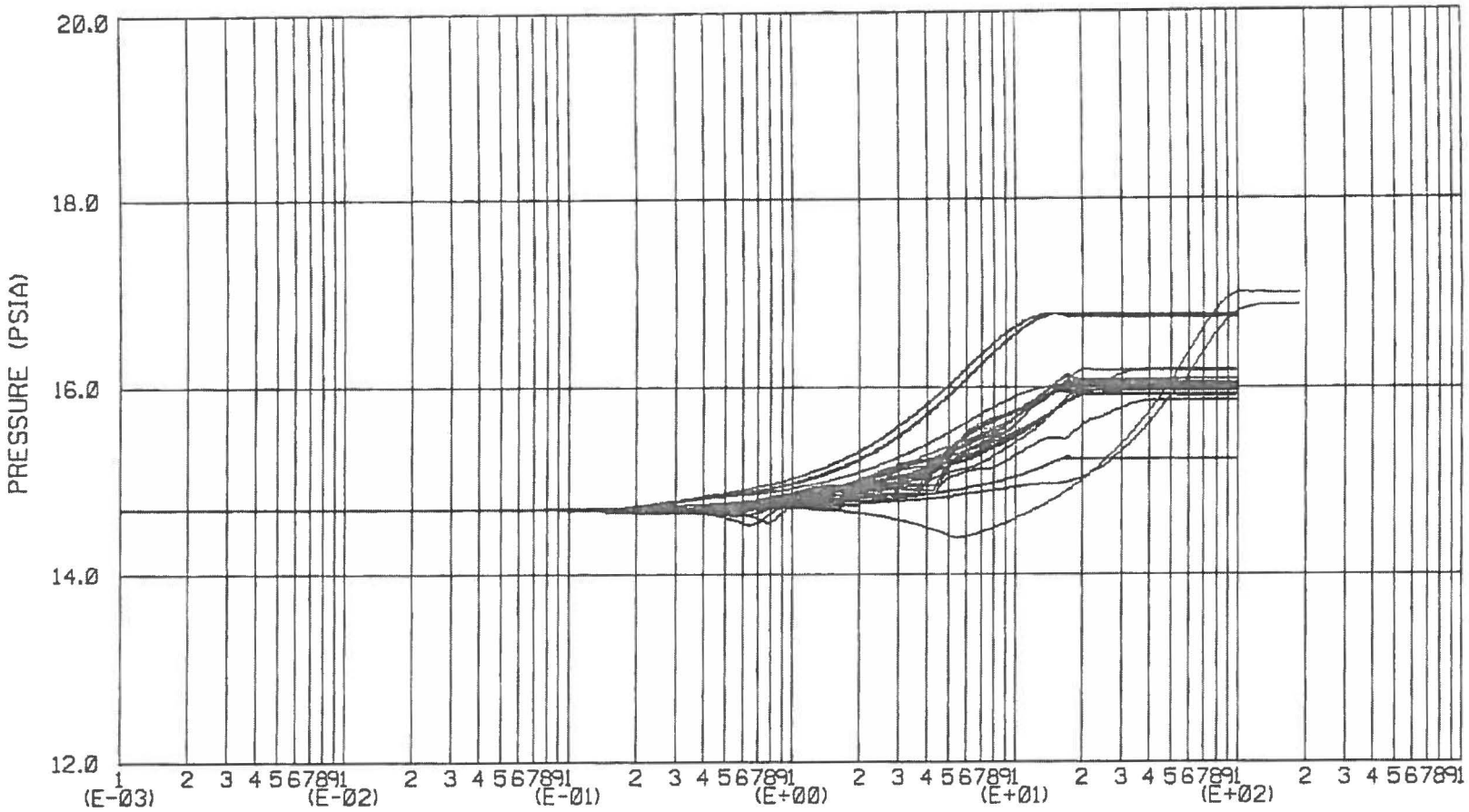
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-29

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 240-6. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

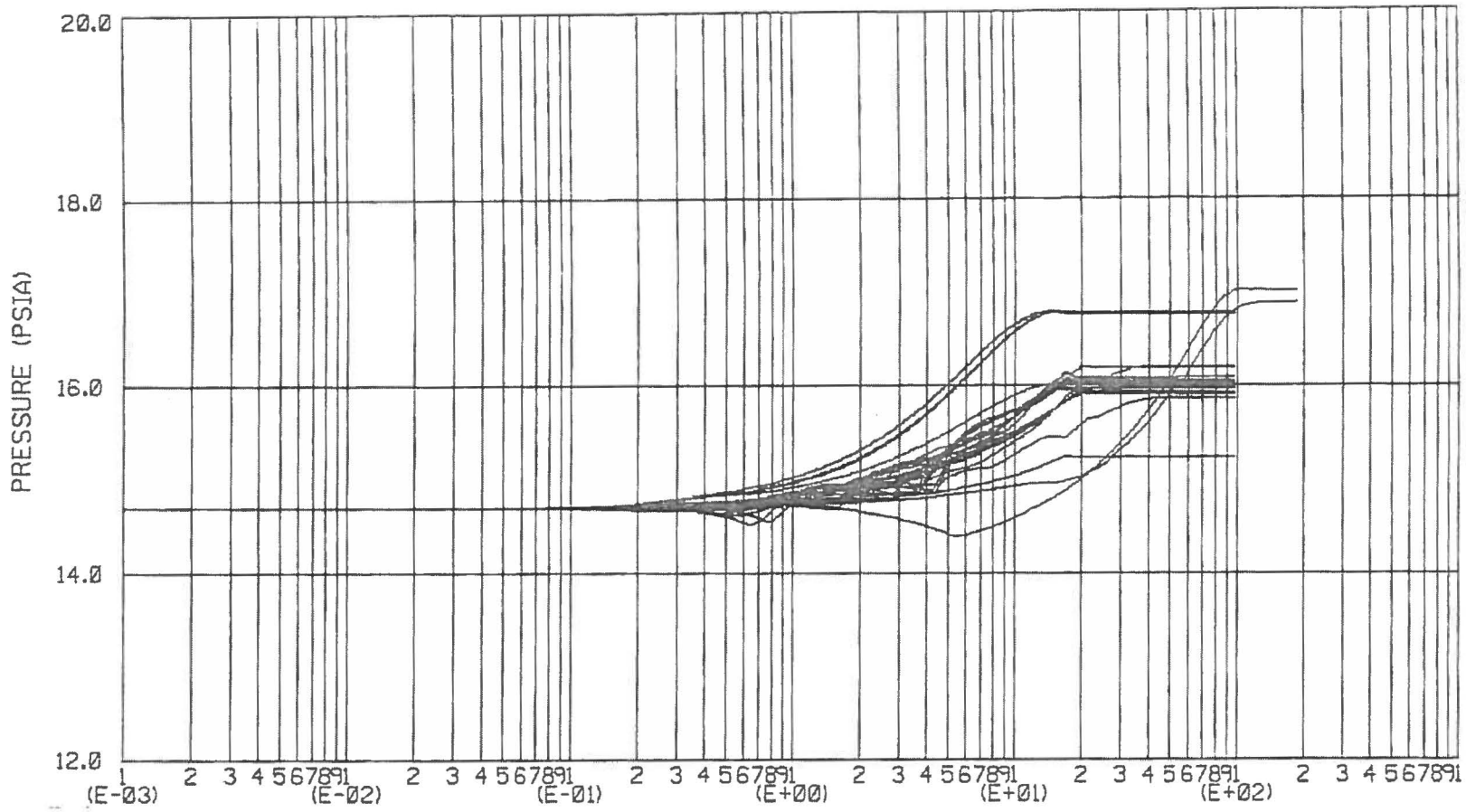
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial 'cold' water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-30

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 240-7. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

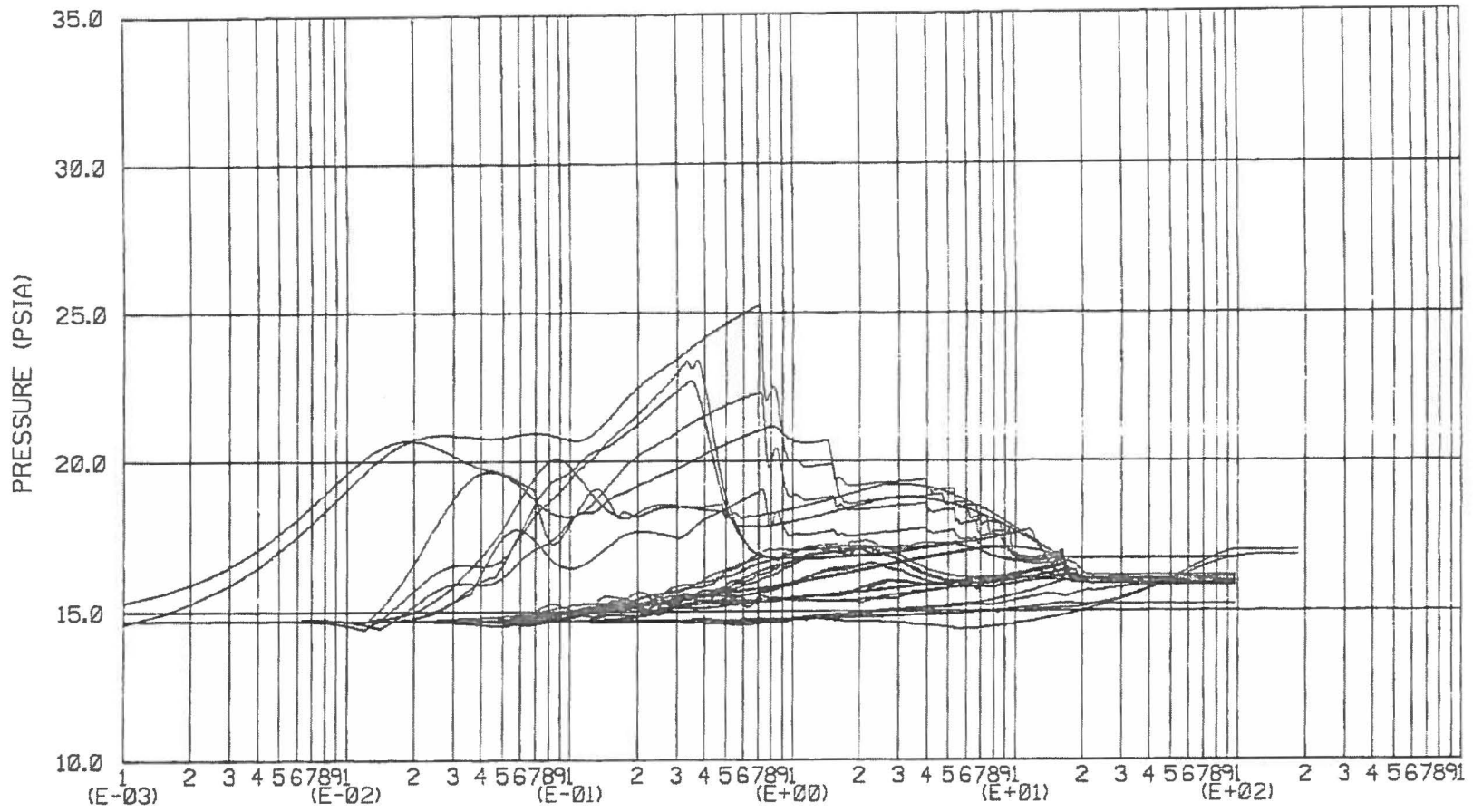
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-31

ABSOLUTE PRESSURE TRANSIENTS:
VOLUME 240-8. SECONDARY
CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

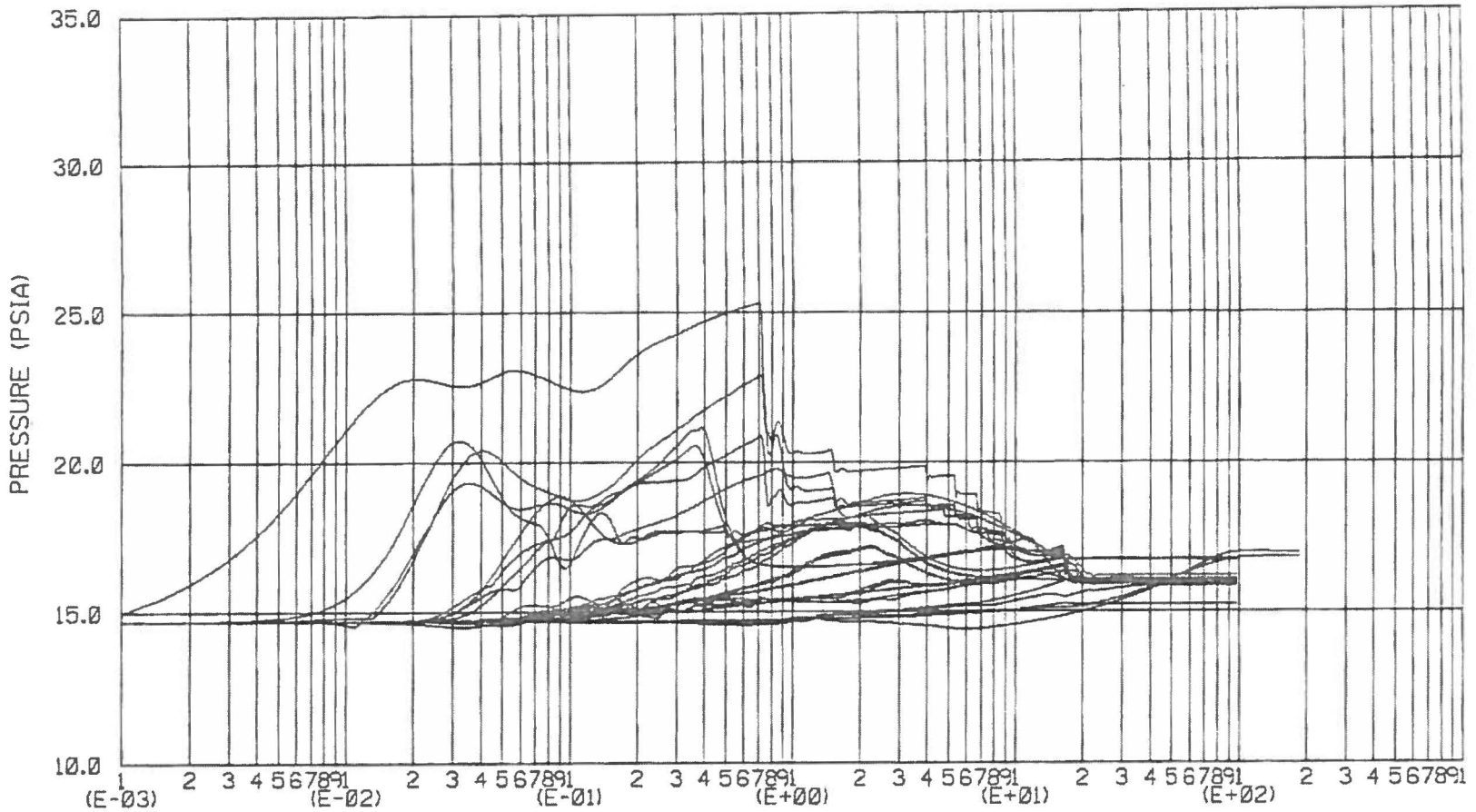
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial 'cold' water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-32

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 261-1. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

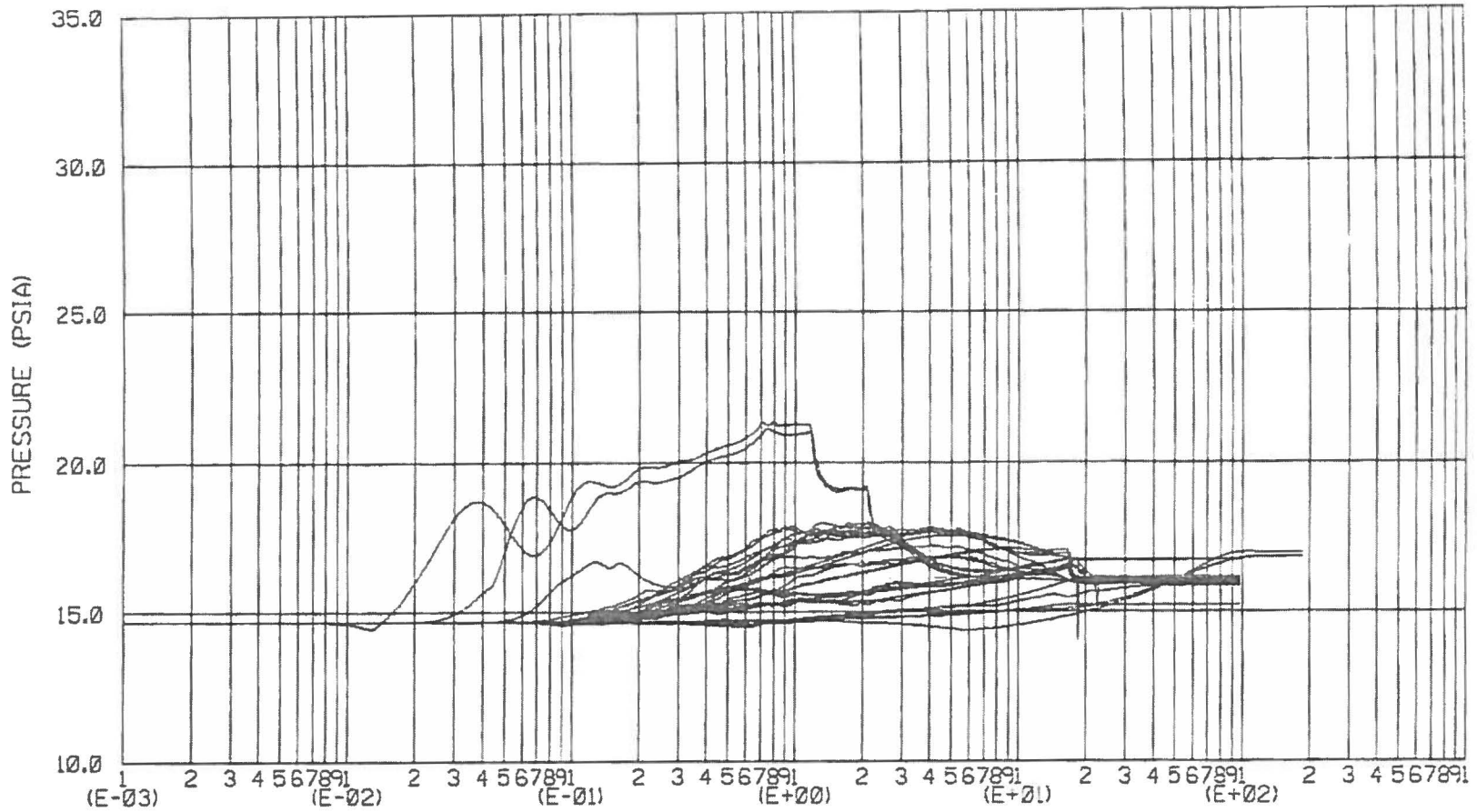
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-33

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 261-2. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

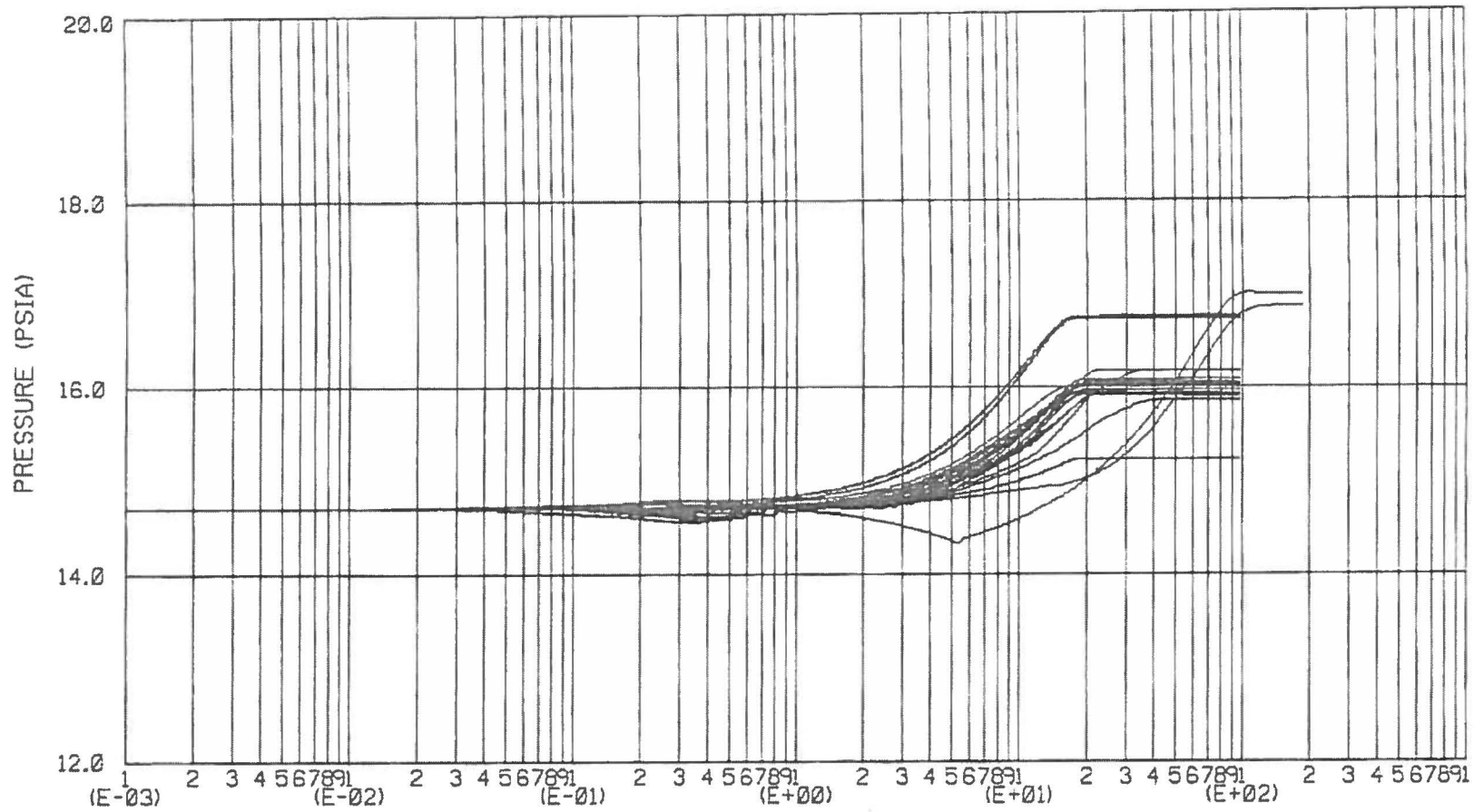
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-34

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 261-3. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

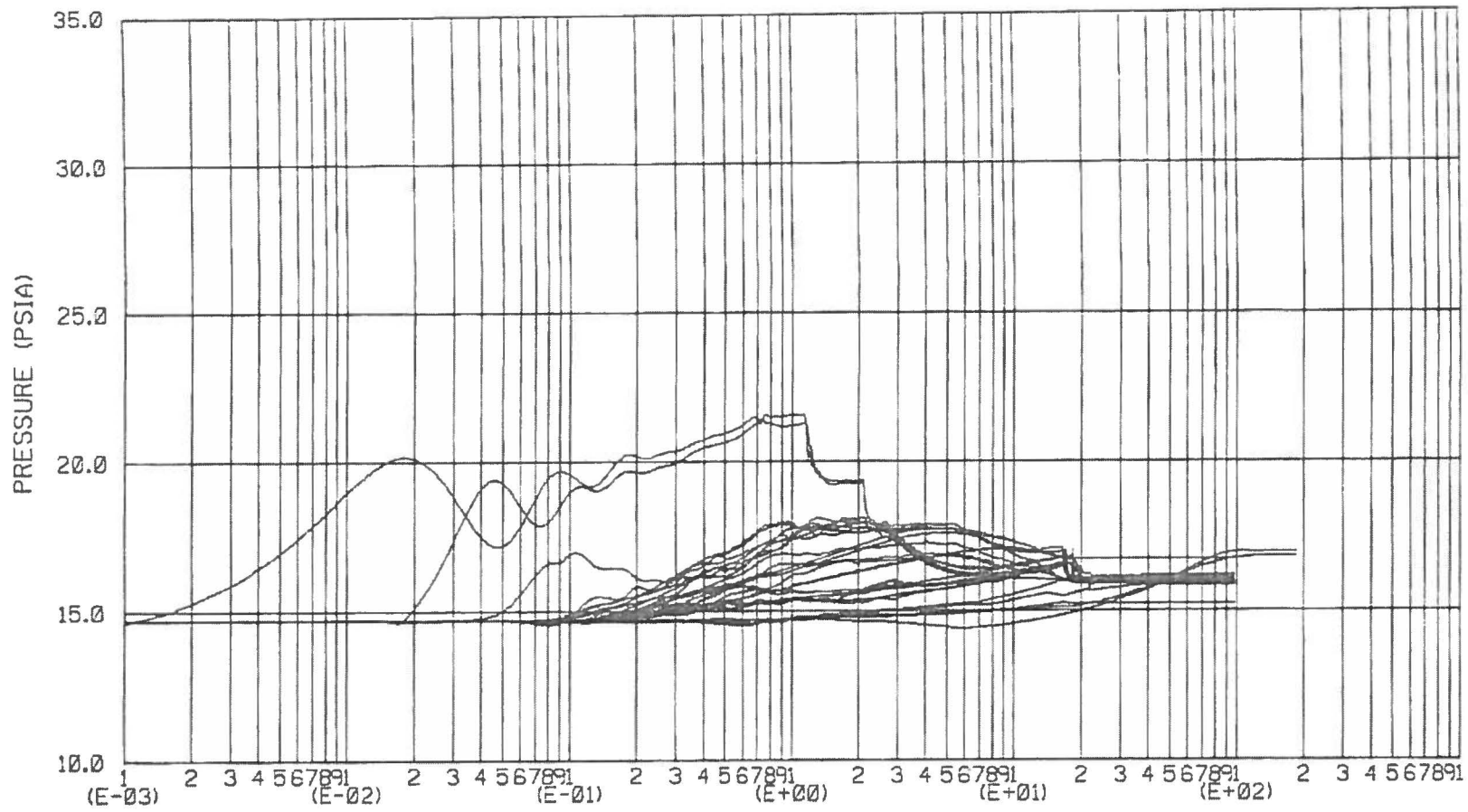
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial 'cold' water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-35

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 261-4. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

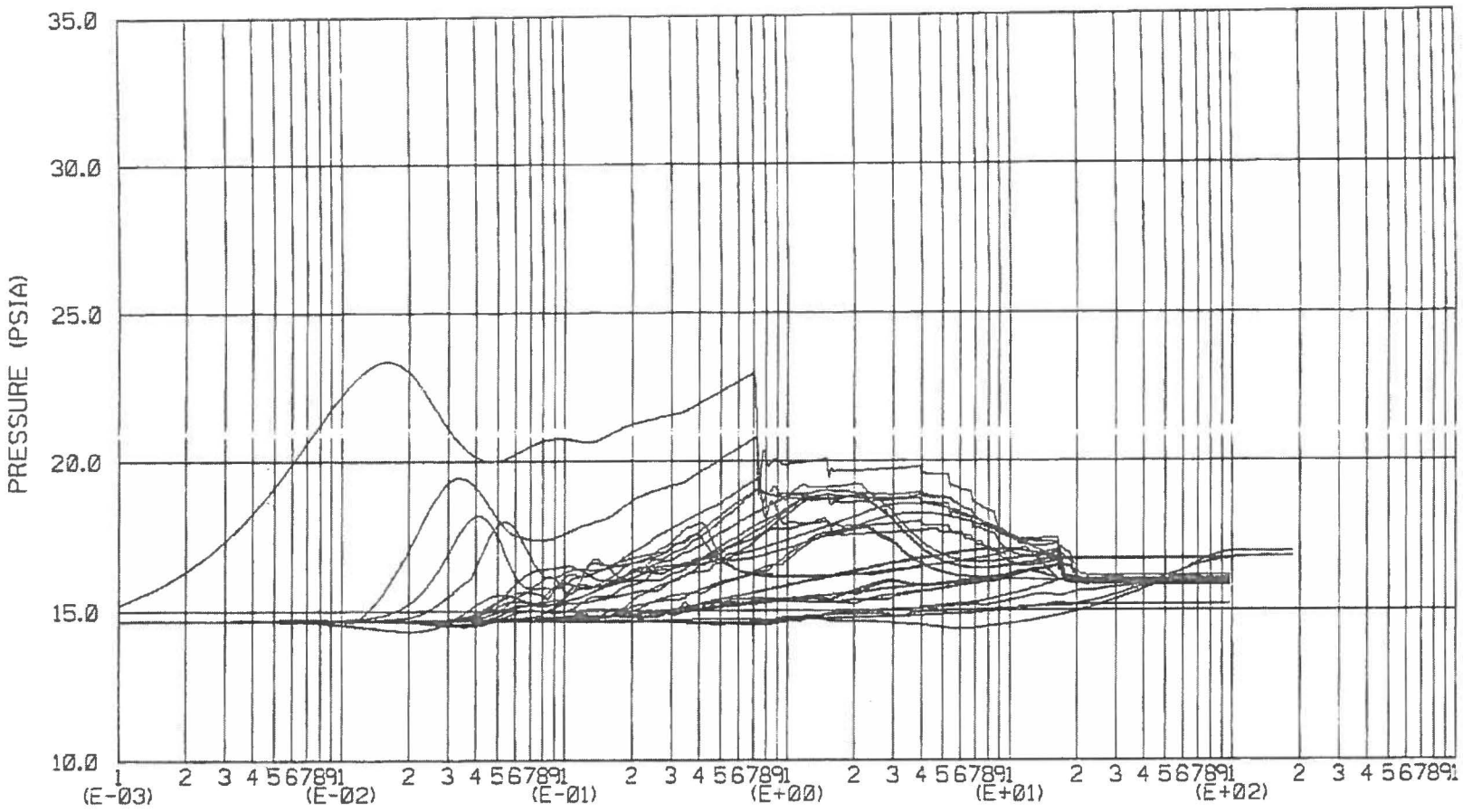
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-36

ABSOLUTE PRESSURE TRANSIENTS:
VOLUME 261-5. SECONDARY
CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



TIME AFTER ACCIDENT (SECONDS)

Note: All breaks are shown on this figure.

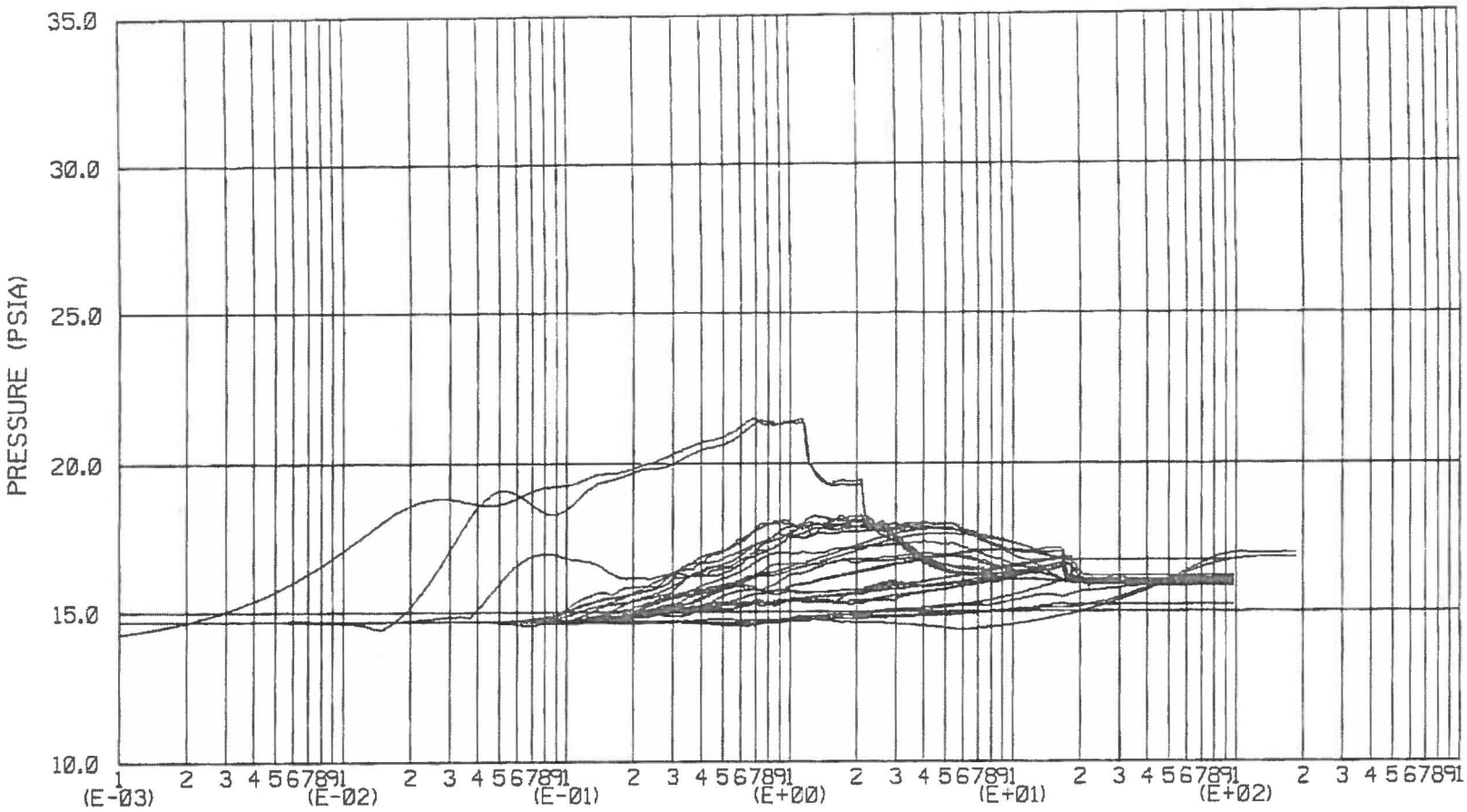
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-37

ABSOLUTE PRESSURE TRANSIENTS:
VOLUME 289-1. SECONDARY
CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



TIME AFTER ACCIDENT (SECONDS)

Note: All breaks are shown on this figure.

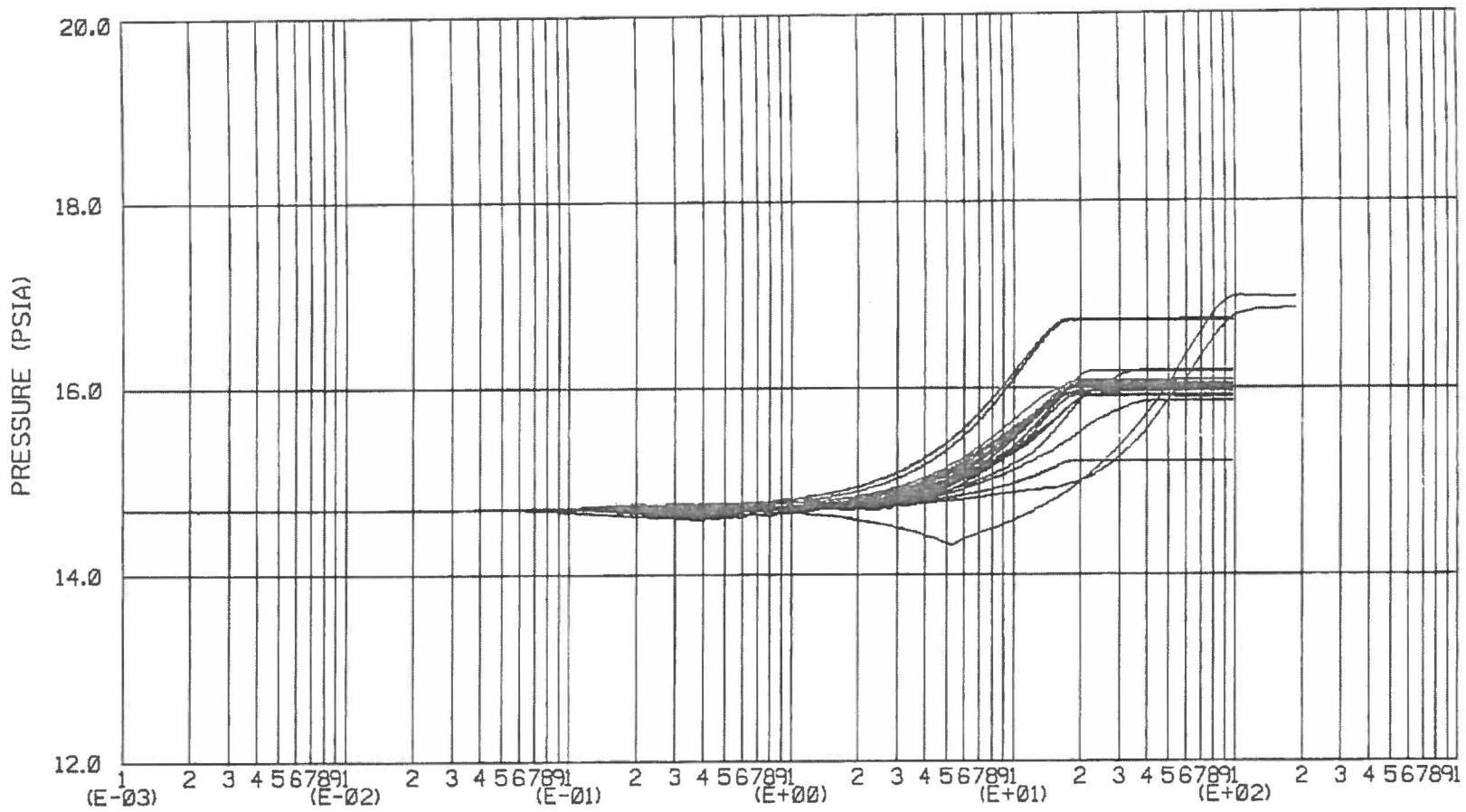
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-38

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 289-2. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

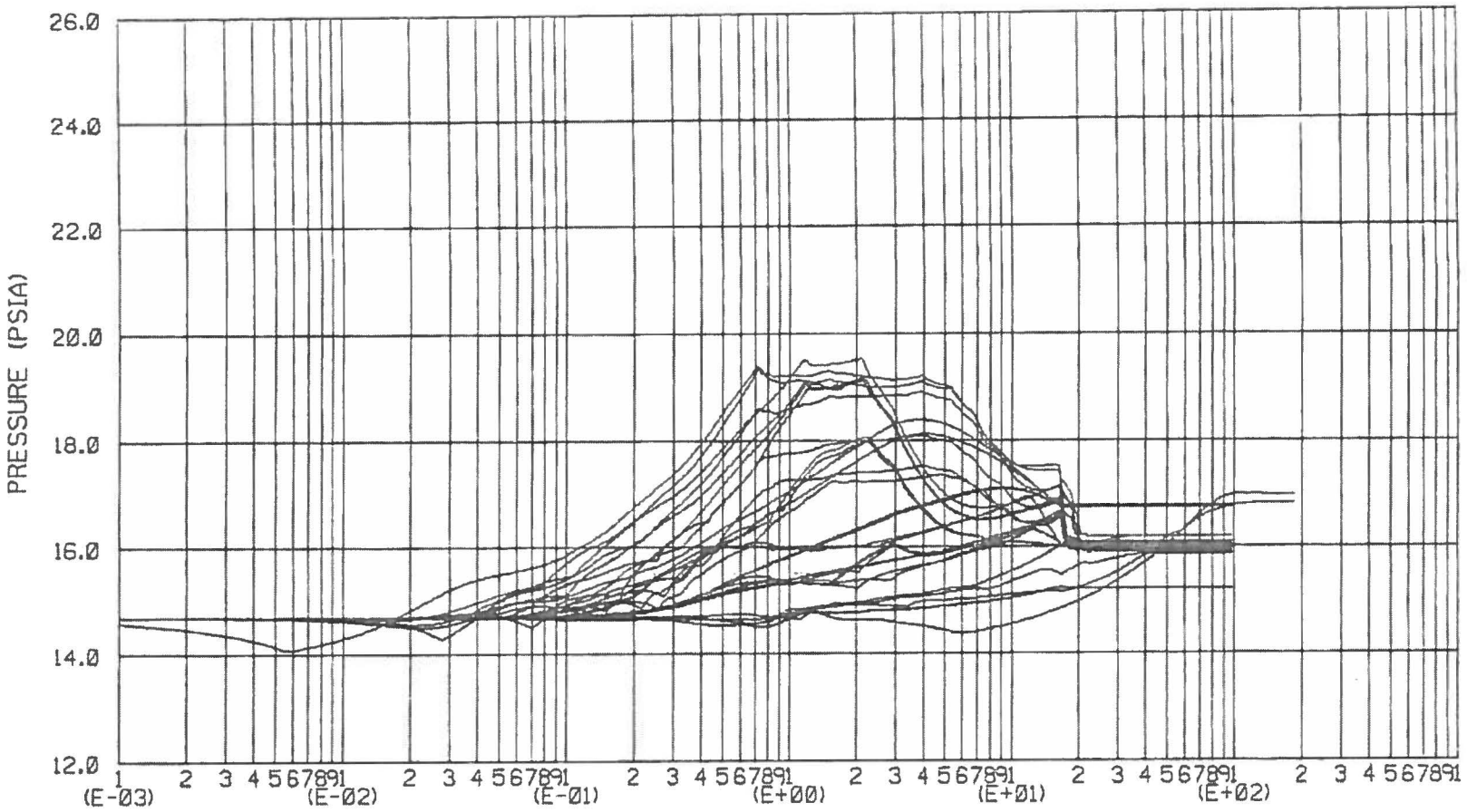
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-39

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 289-3. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

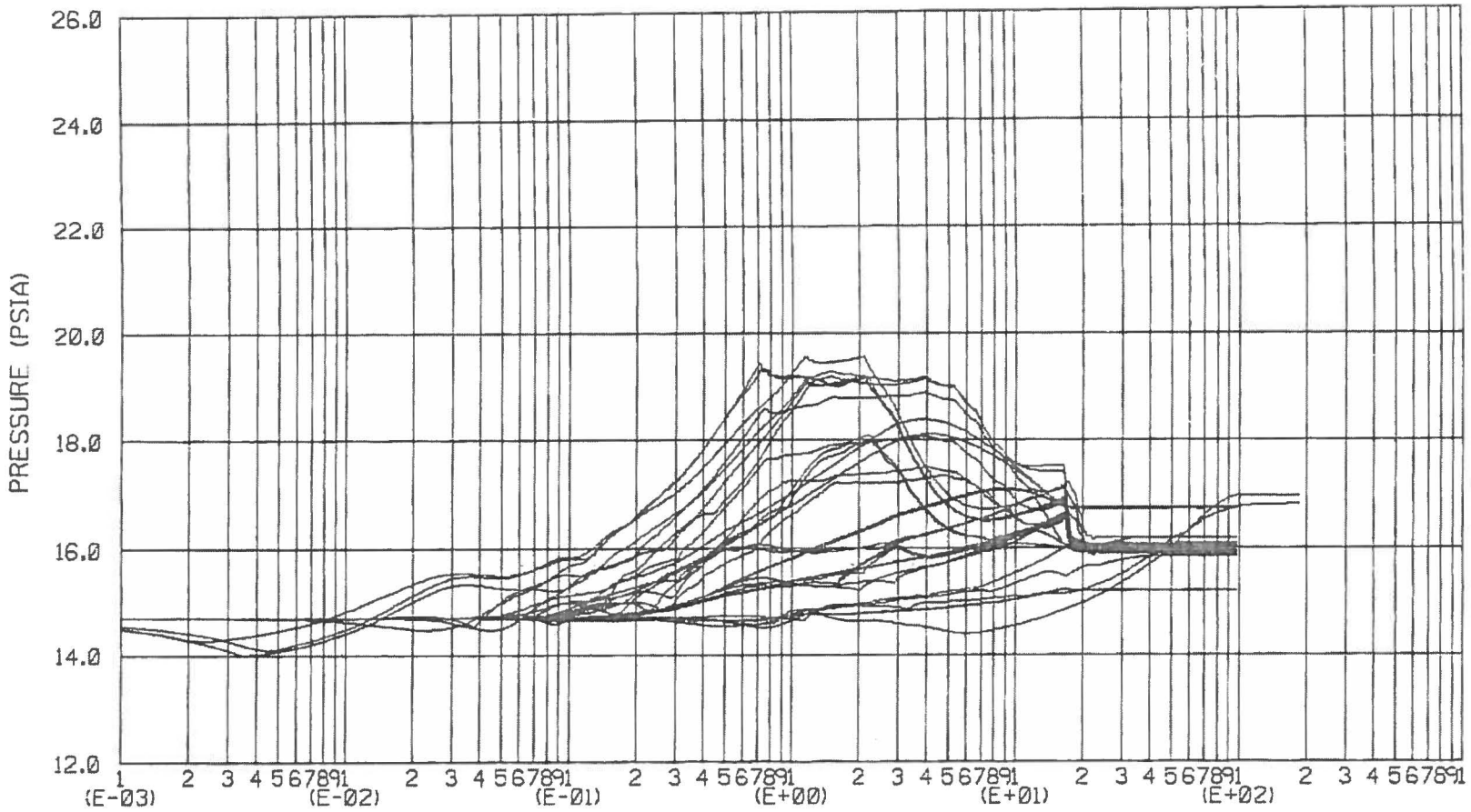
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-40

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 306-1. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

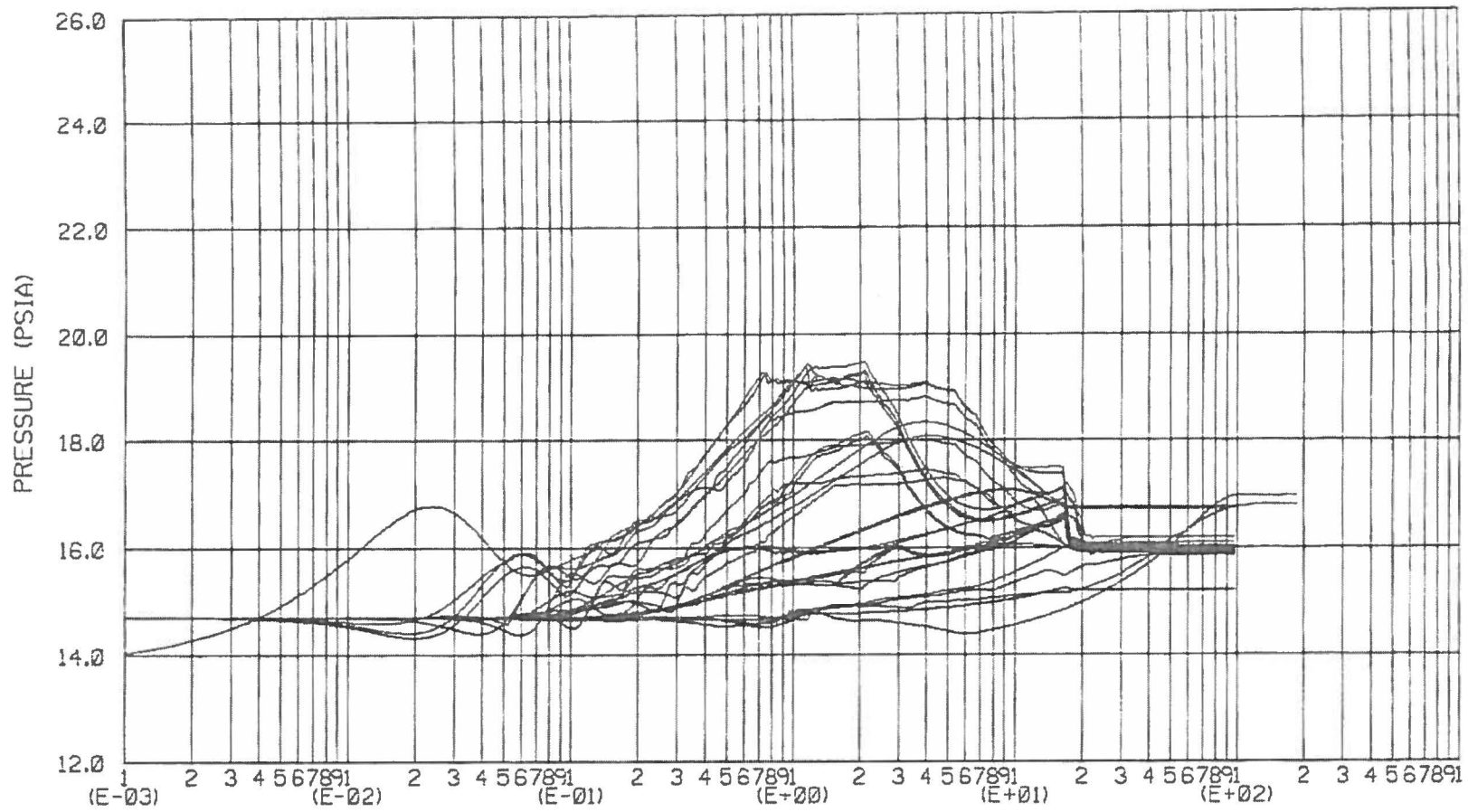
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial 'cold' water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend post 100 seconds.

FIGURE 3B-41

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 306-2. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

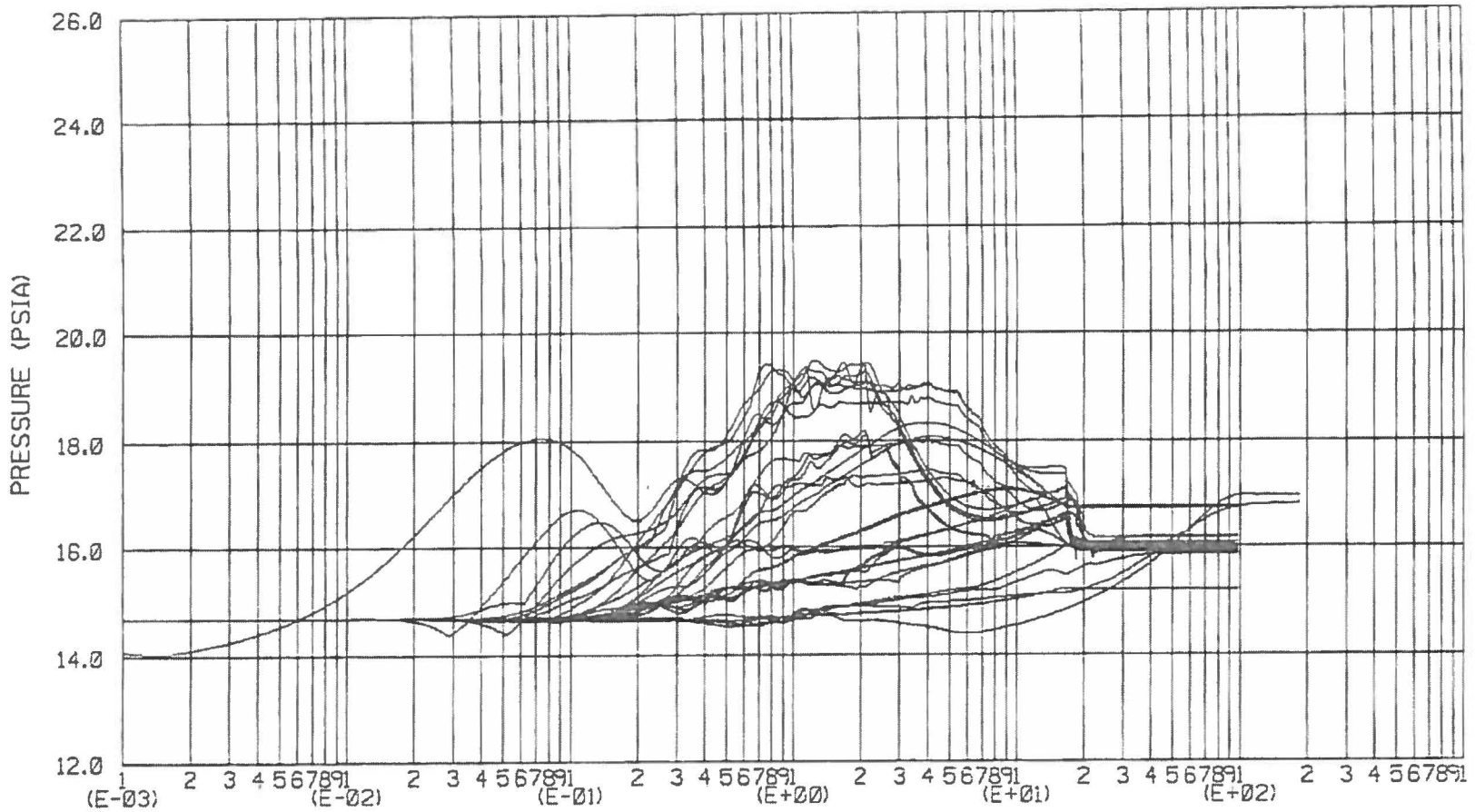
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-42

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 306-3. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



TIME AFTER ACCIDENT (SECONDS)

Note: All breaks are shown on this figure.

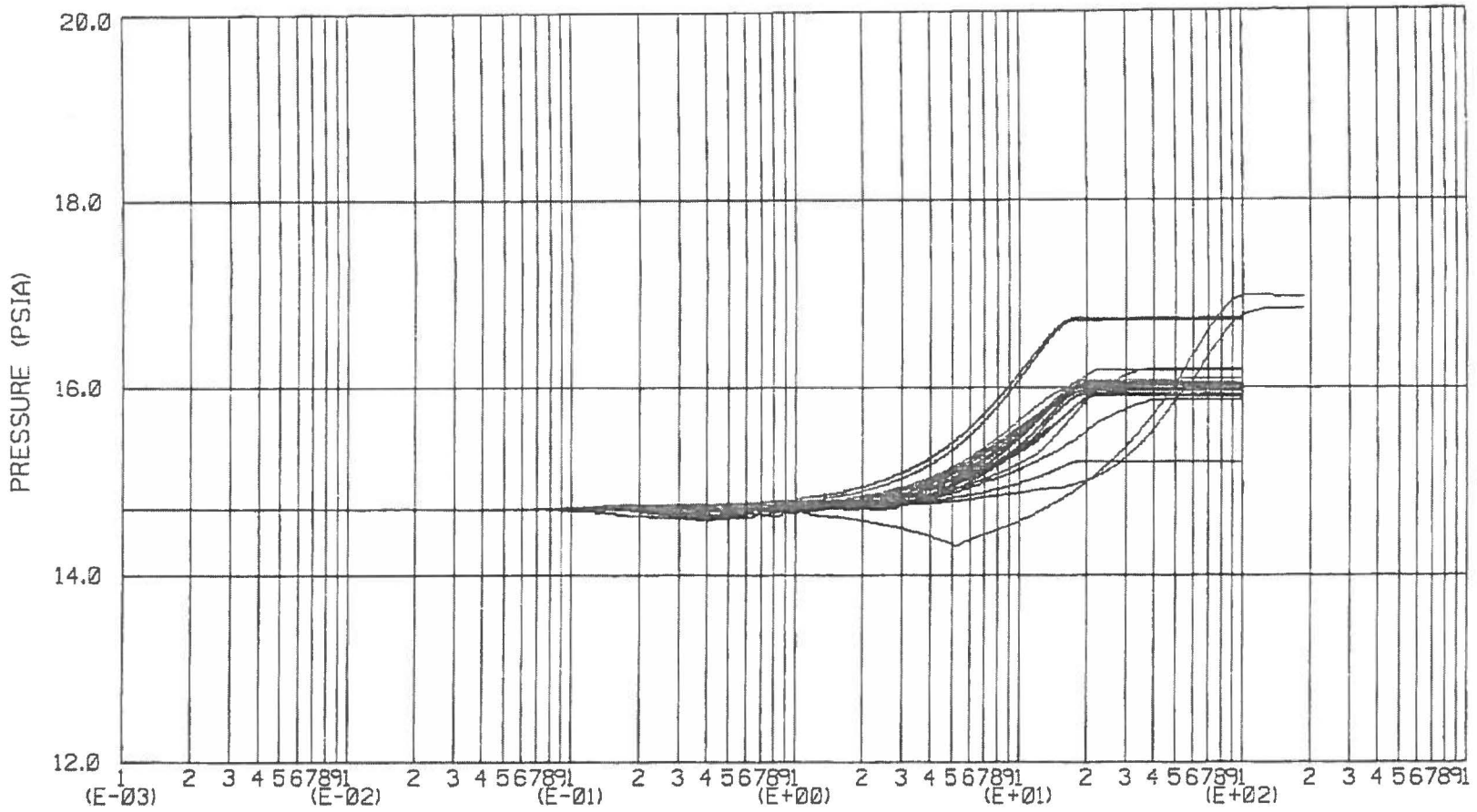
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-43

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 306-4. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

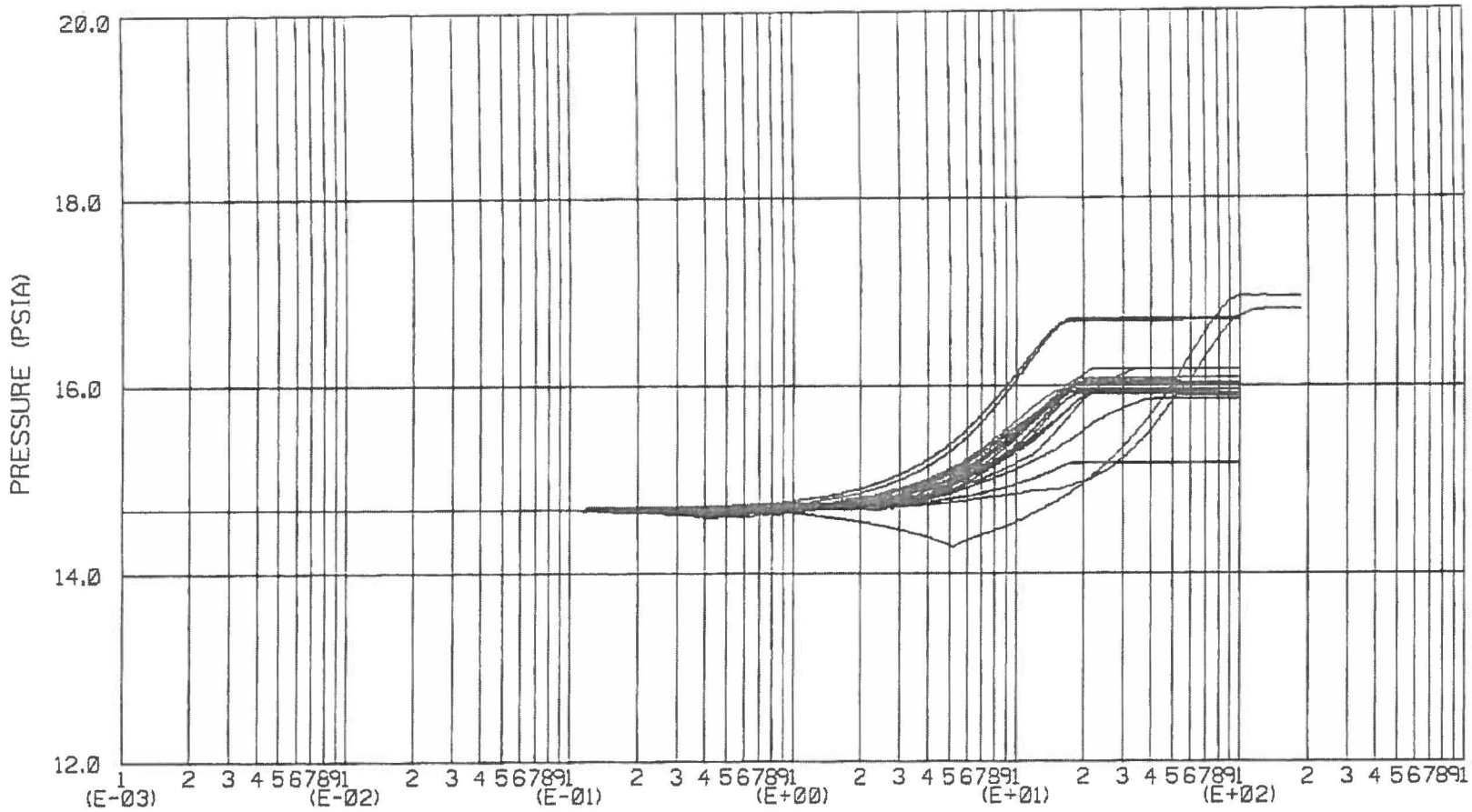
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial 'cold' water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-44

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 306-5. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

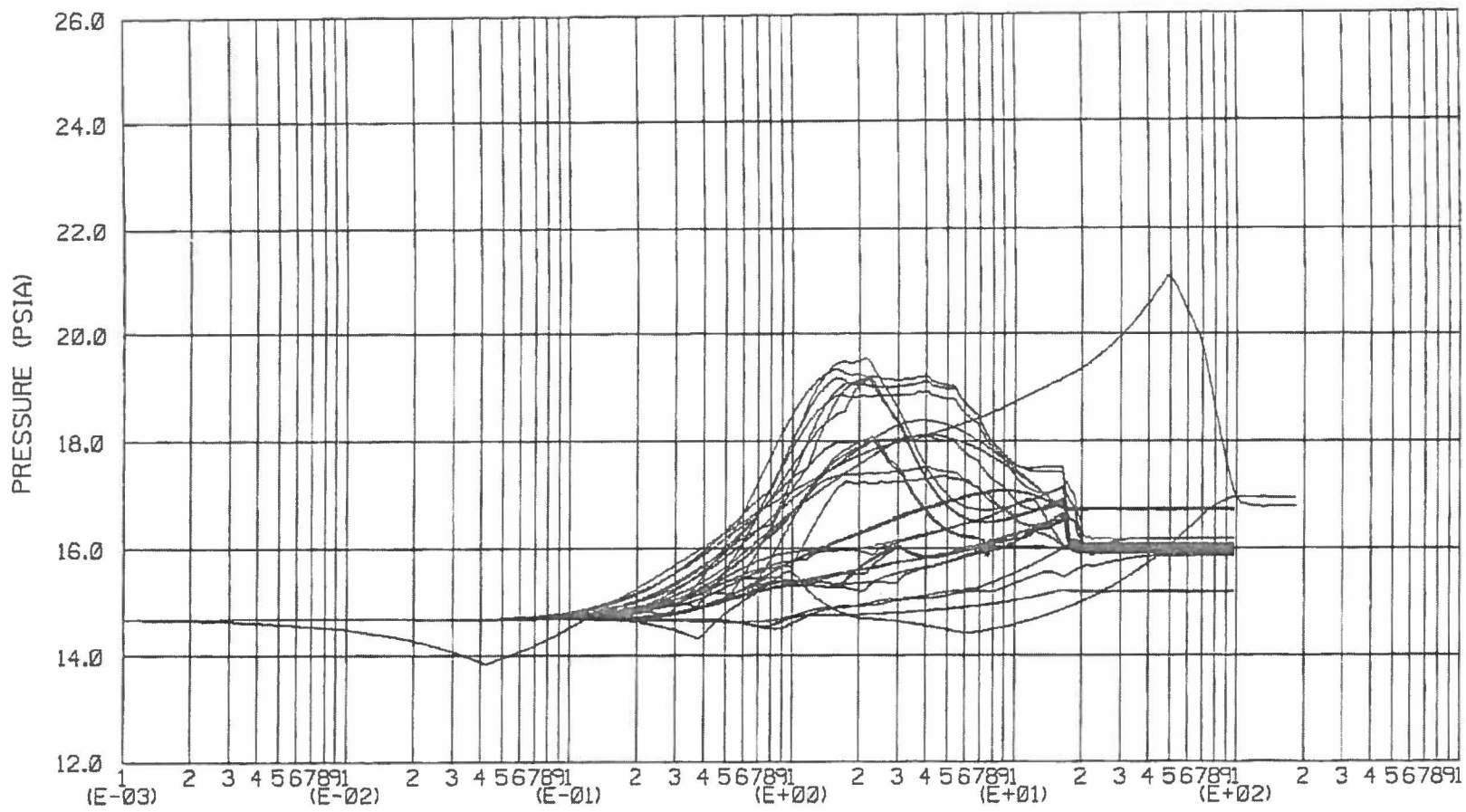
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial 'cold' water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-45

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 328-1. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

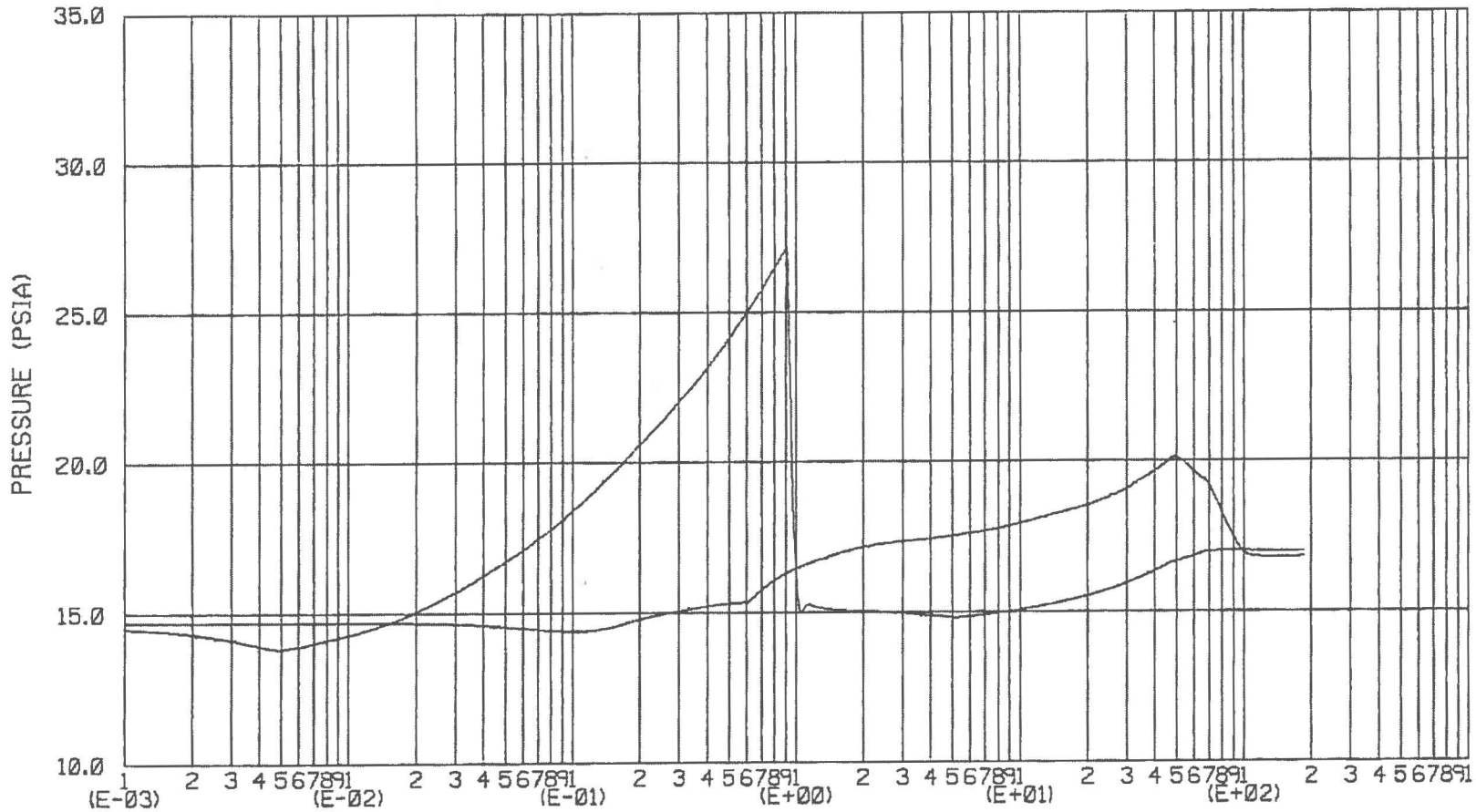
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-46

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 328-2. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



TIME AFTER ACCIDENT (SECONDS)

Note: Break numbers 34 and 35 are shown on this figure.

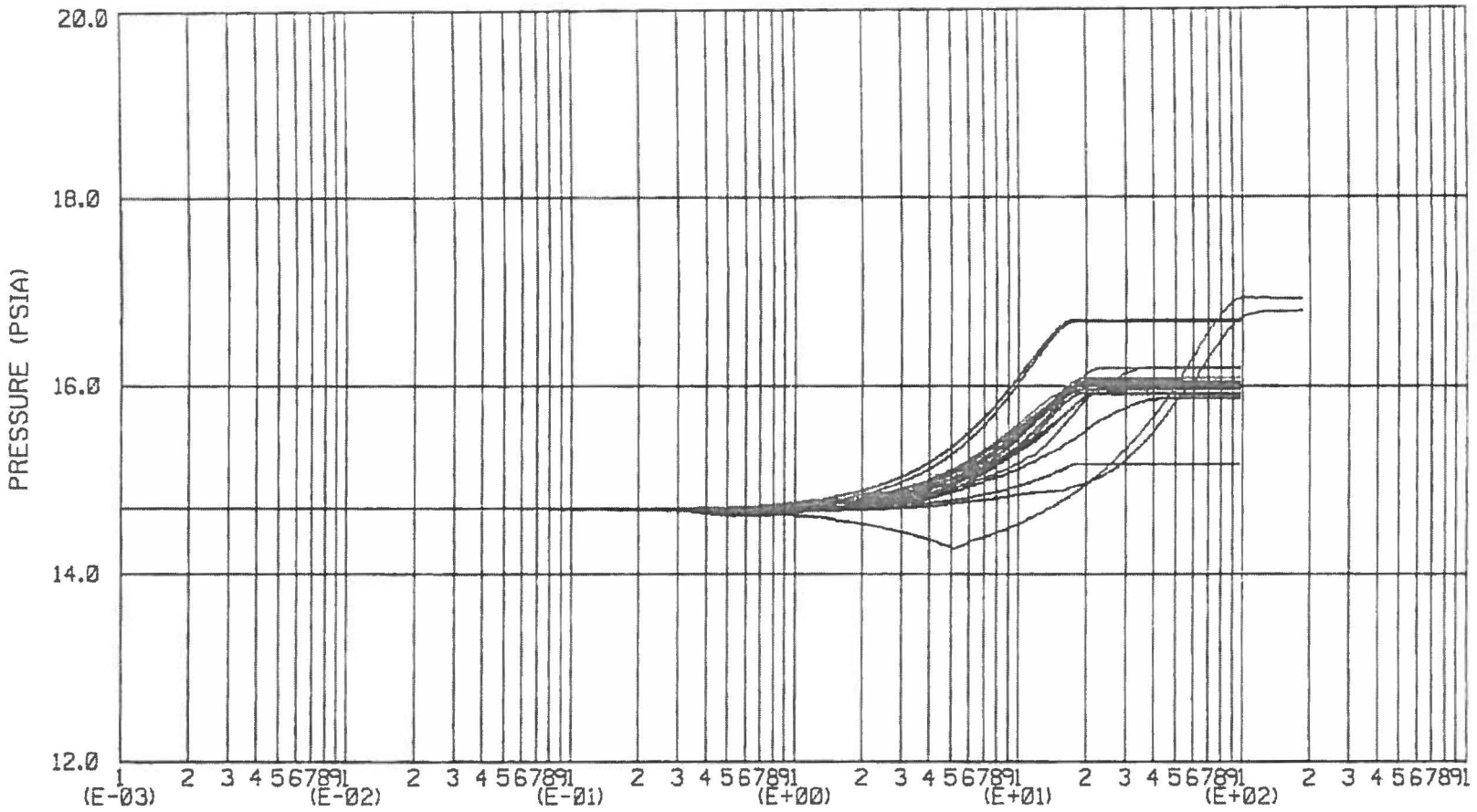
Add 13.40 seconds to these plots to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Volume SC328190 is used only in the 46 node model.

FIGURE 3B-47

ABSOLUTE PRESSURE TRANSIENTS: VOLUME SC328190. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



Note: All breaks are shown on this figure.

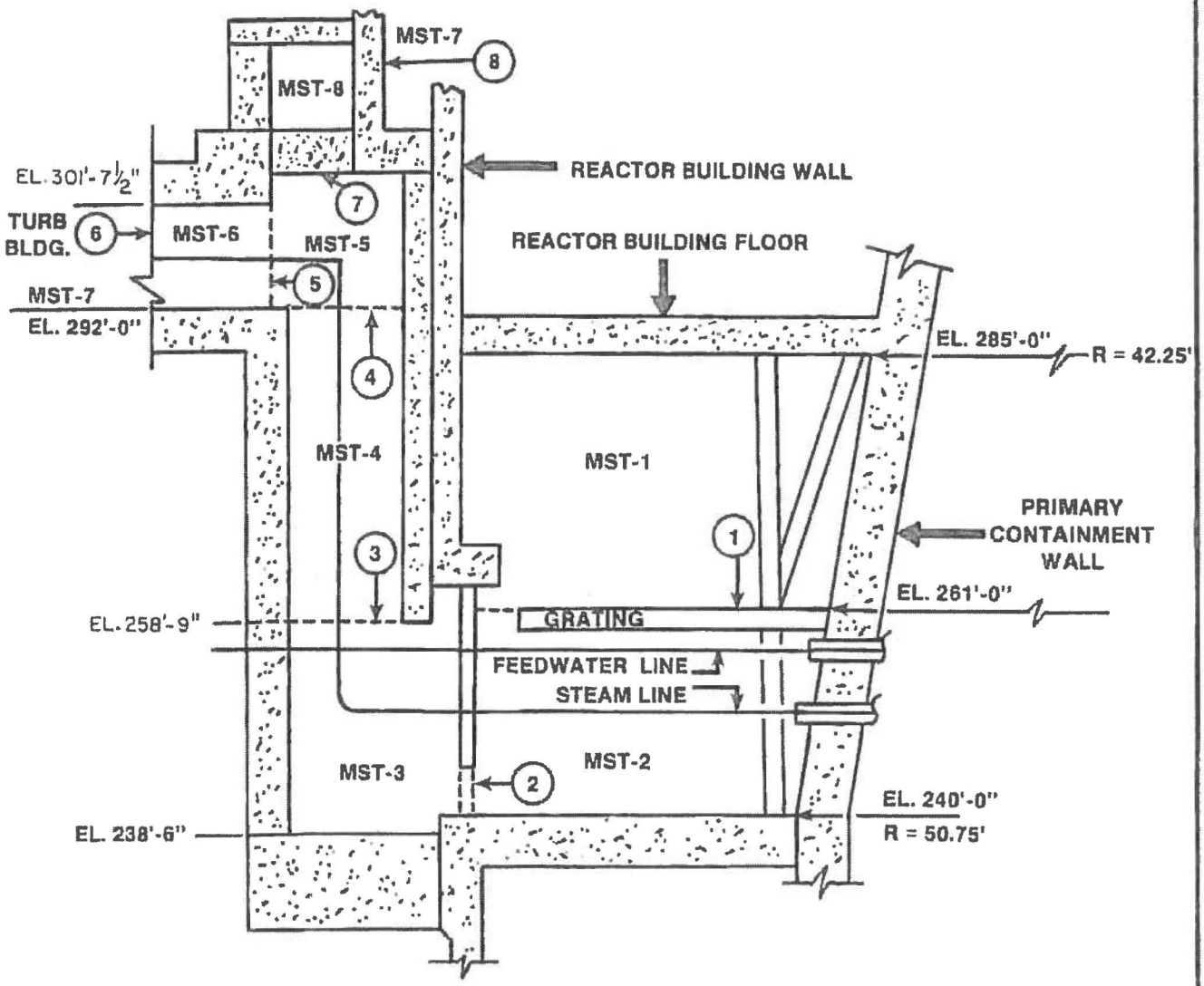
Add 13.40 seconds to the plots of break numbers 34 and 35 to account for the initial "cold" water blowdown (see USAR Section 3B.1: Design Bases).

Break numbers 34 and 35 are the plots that extend past 100 seconds.

FIGURE 3B-48

ABSOLUTE PRESSURE TRANSIENTS: VOLUME 353-1. SECONDARY CONTAINMENT HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



JUNCTION *'S

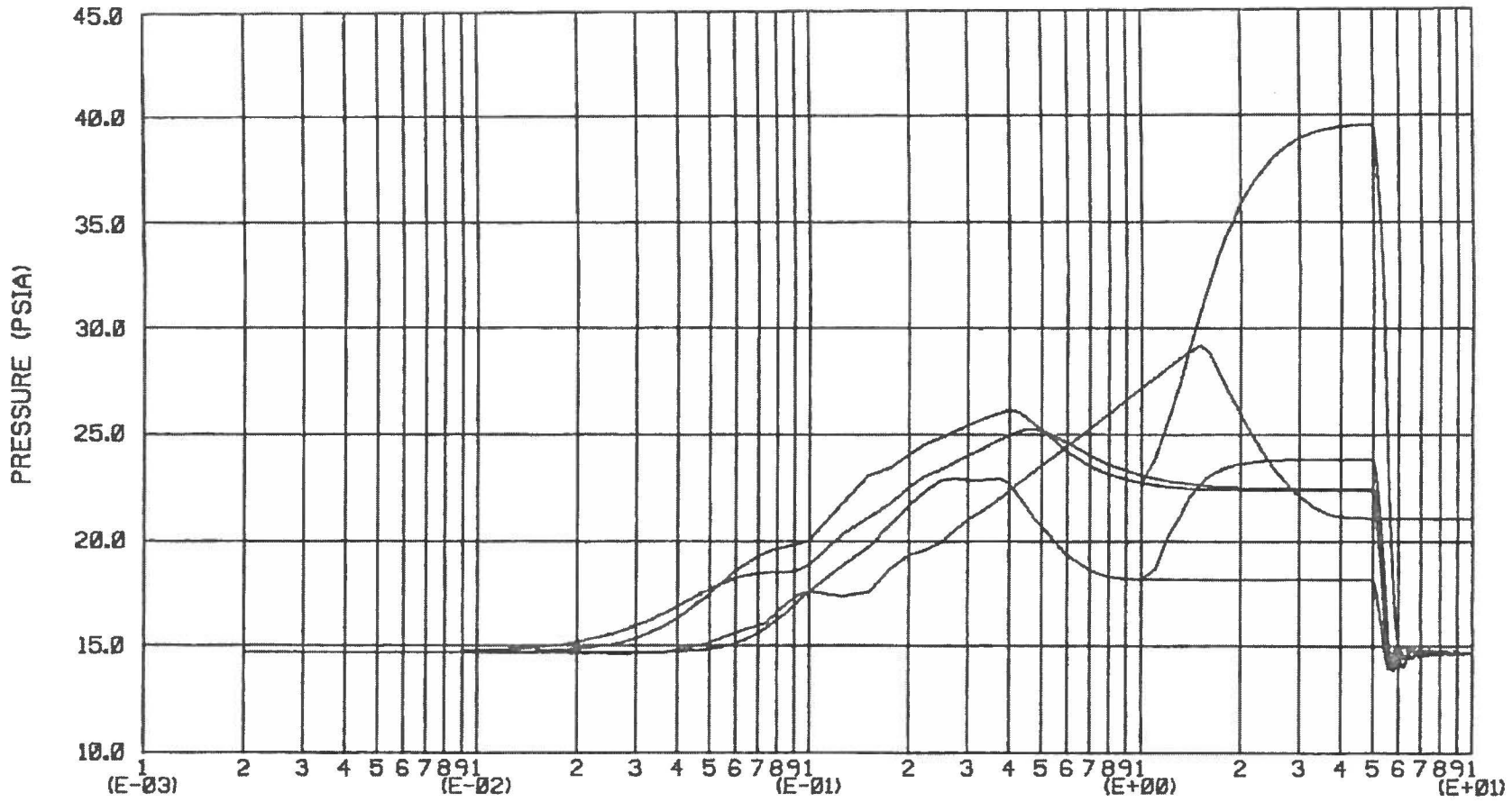
NOTE NODES MST-5 AND MST-6 ARE KNOWN AS MAIN STEAM LINE TUNNEL LEAD ENCLOSURE

FIGURE 3B-49

NODALIZATION DIAGRAM
MAIN STEAM TUNNEL
HIGH ENERGY LINE BREAK ANALYSIS

ExelonGeneration.

NINE MILE POINT
NUCLEAR STATION - UNIT 2
SCRIBA, N.Y.

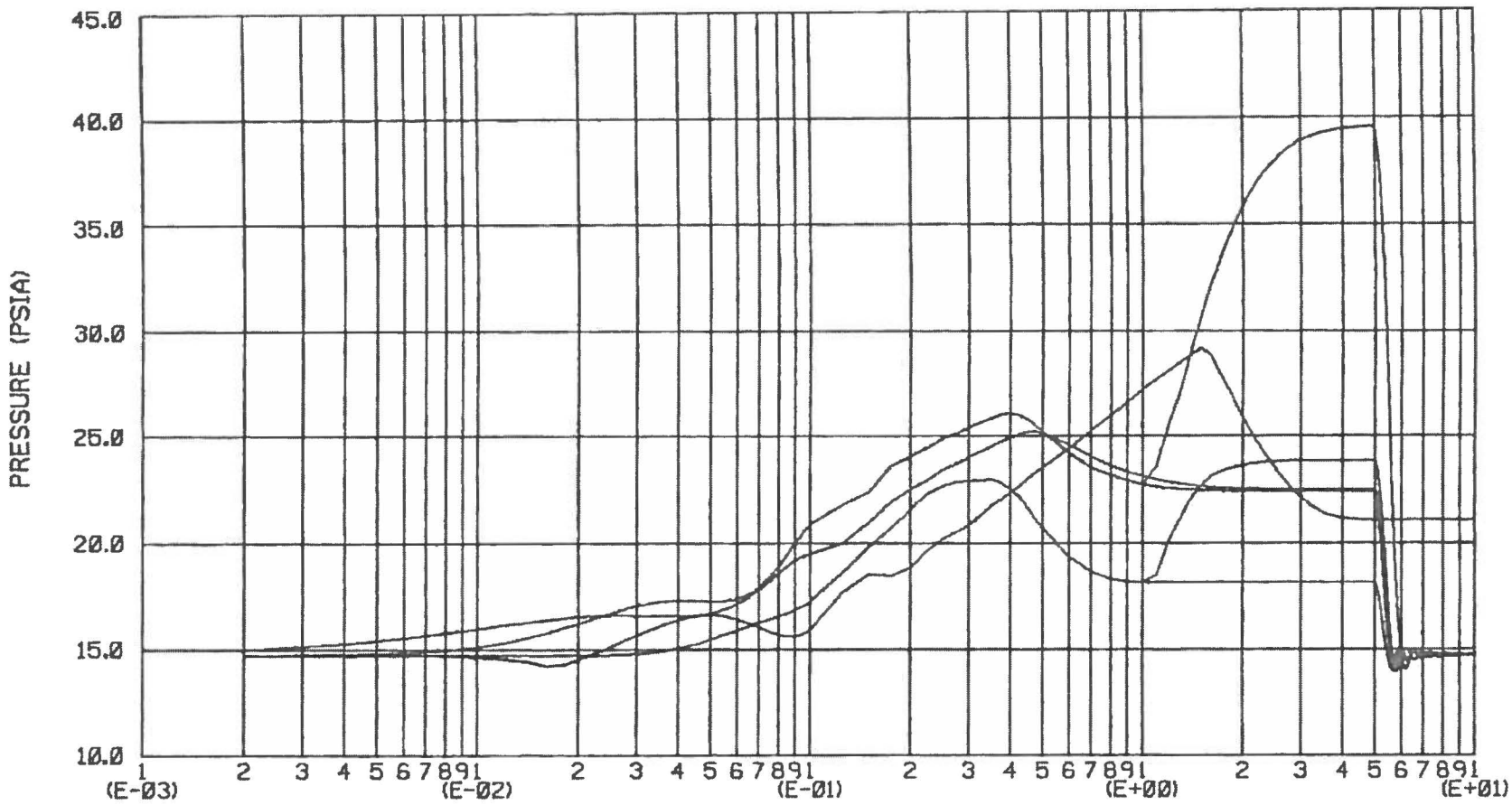


Note: All breaks are shown on this figure.

FIGURE 3B-50

ABSOLUTE PRESSURE TRANSIENTS: VOLUME MST-1. MAIN STEAM TUNNEL HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT

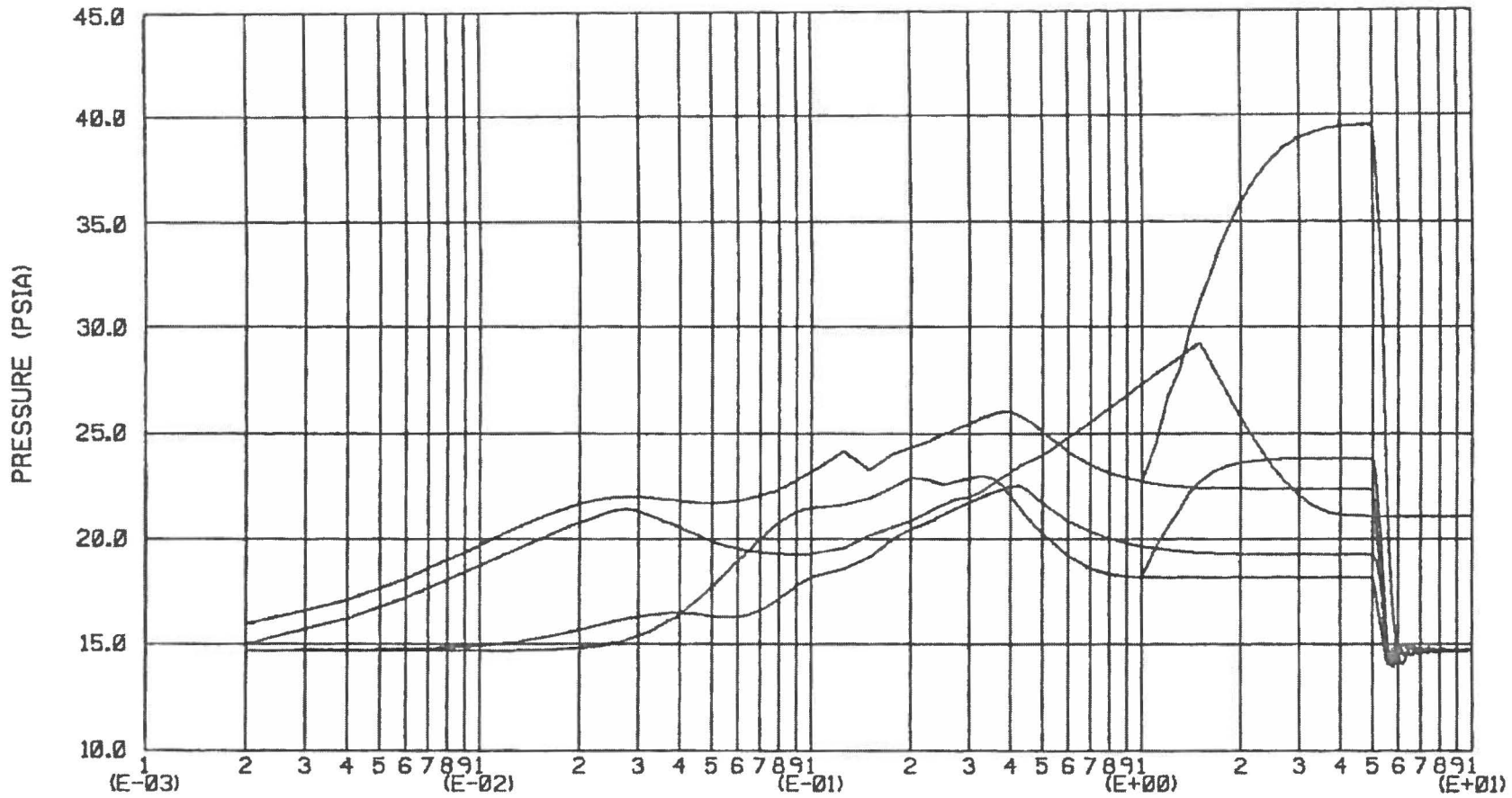


Note: All breaks are shown on this figure.

FIGURE 3B-51

ABSOLUTE PRESSURE TRANSIENTS:
VOLUME MST-2. MAIN STEAM
TUNNEL HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT

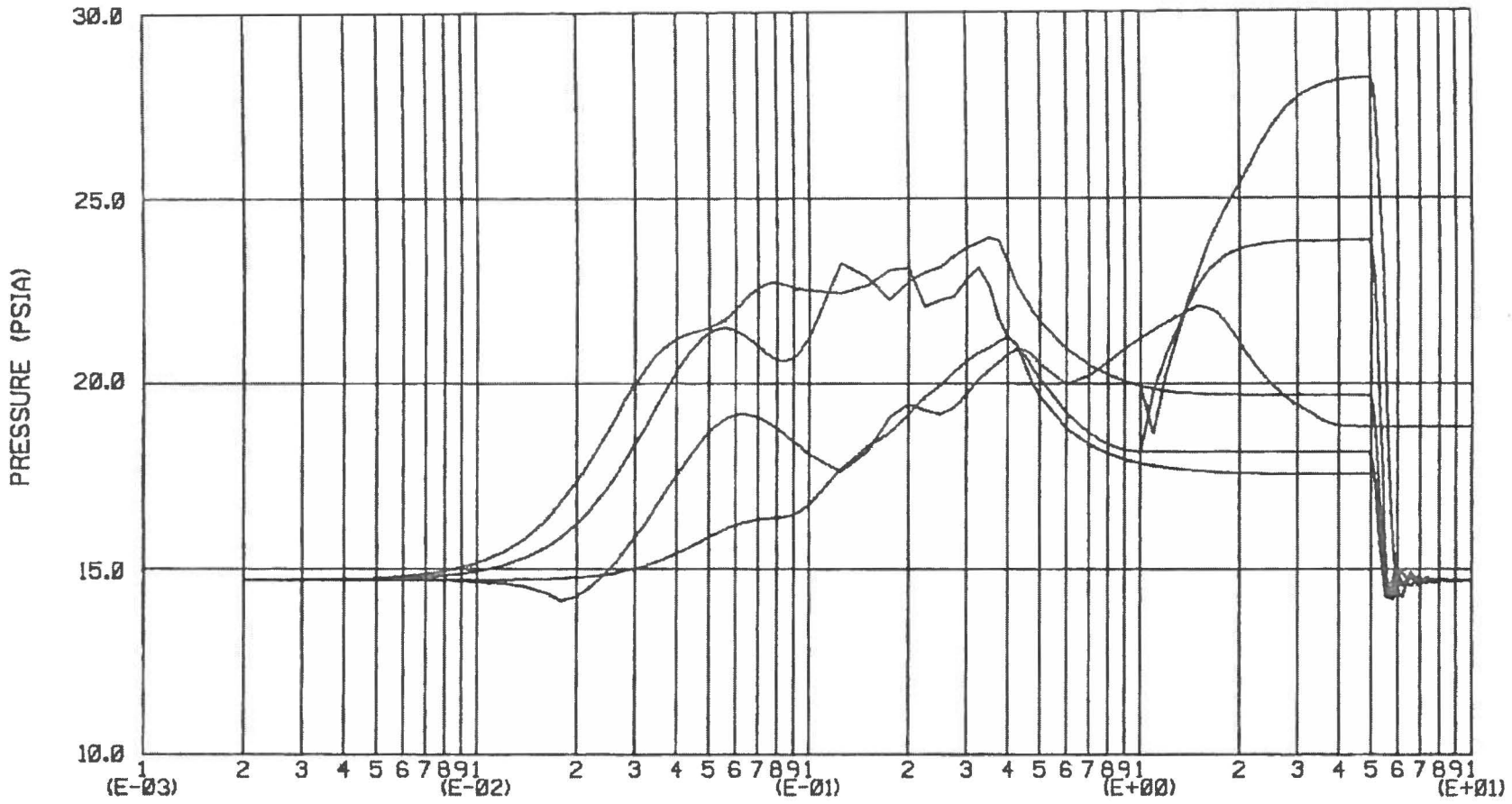


Note: All breaks are shown on this figure.

FIGURE 3B-52

ABSOLUTE PRESSURE TRANSIENTS:
VOLUME MST-3. MAIN STEAM
TUNNEL HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT

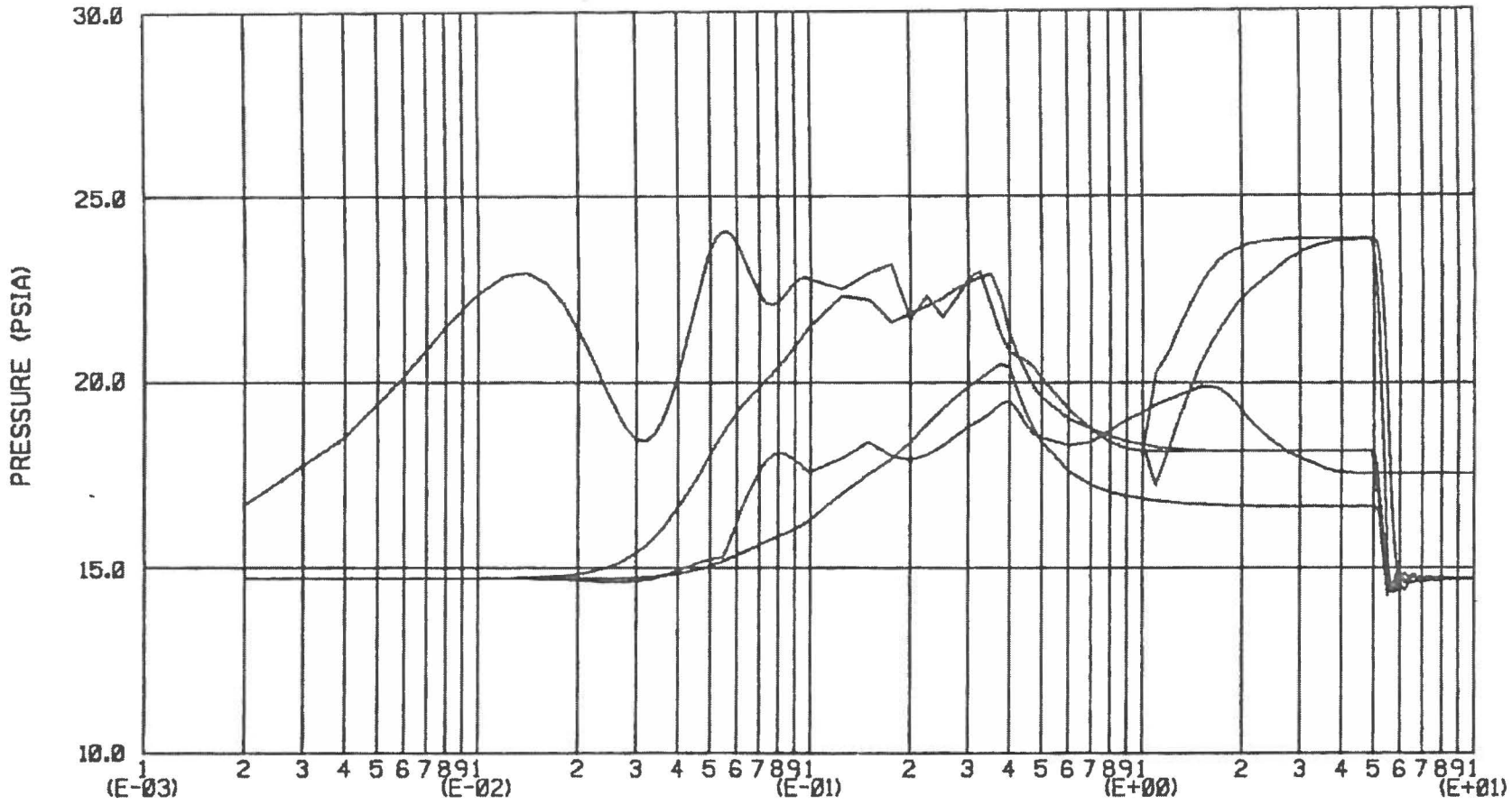


Note: All breaks are shown on this figure.

FIGURE 3B-53

ABSOLUTE PRESSURE TRANSIENTS:
VOLUME MST-4. MAIN STEAM
TUNNEL HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT

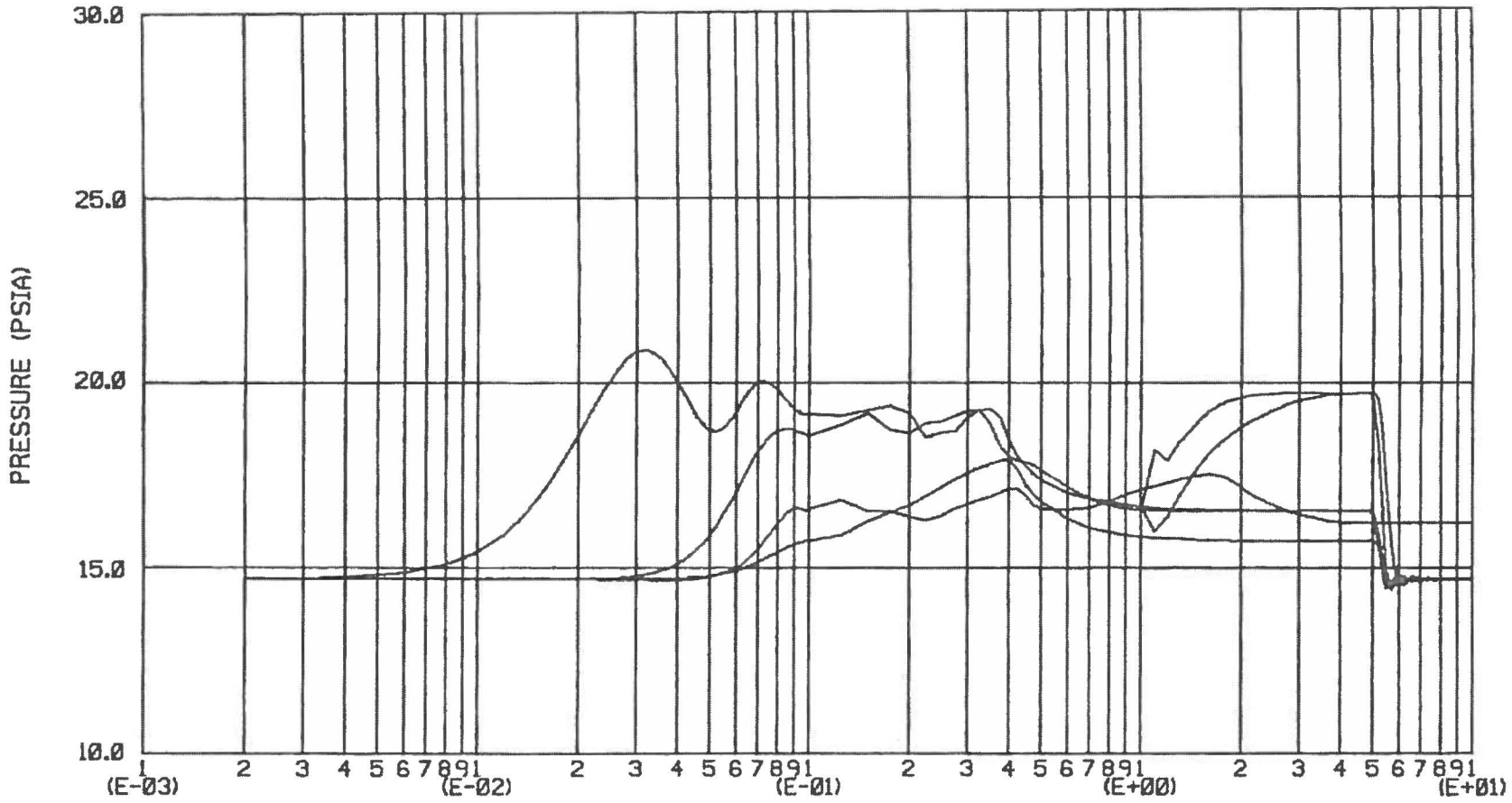


Note: All breaks are shown on this figure.

FIGURE 3B-54

ABSOLUTE PRESSURE TRANSIENTS: VOLUME MST-5. MAIN STEAM TUNNEL HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT

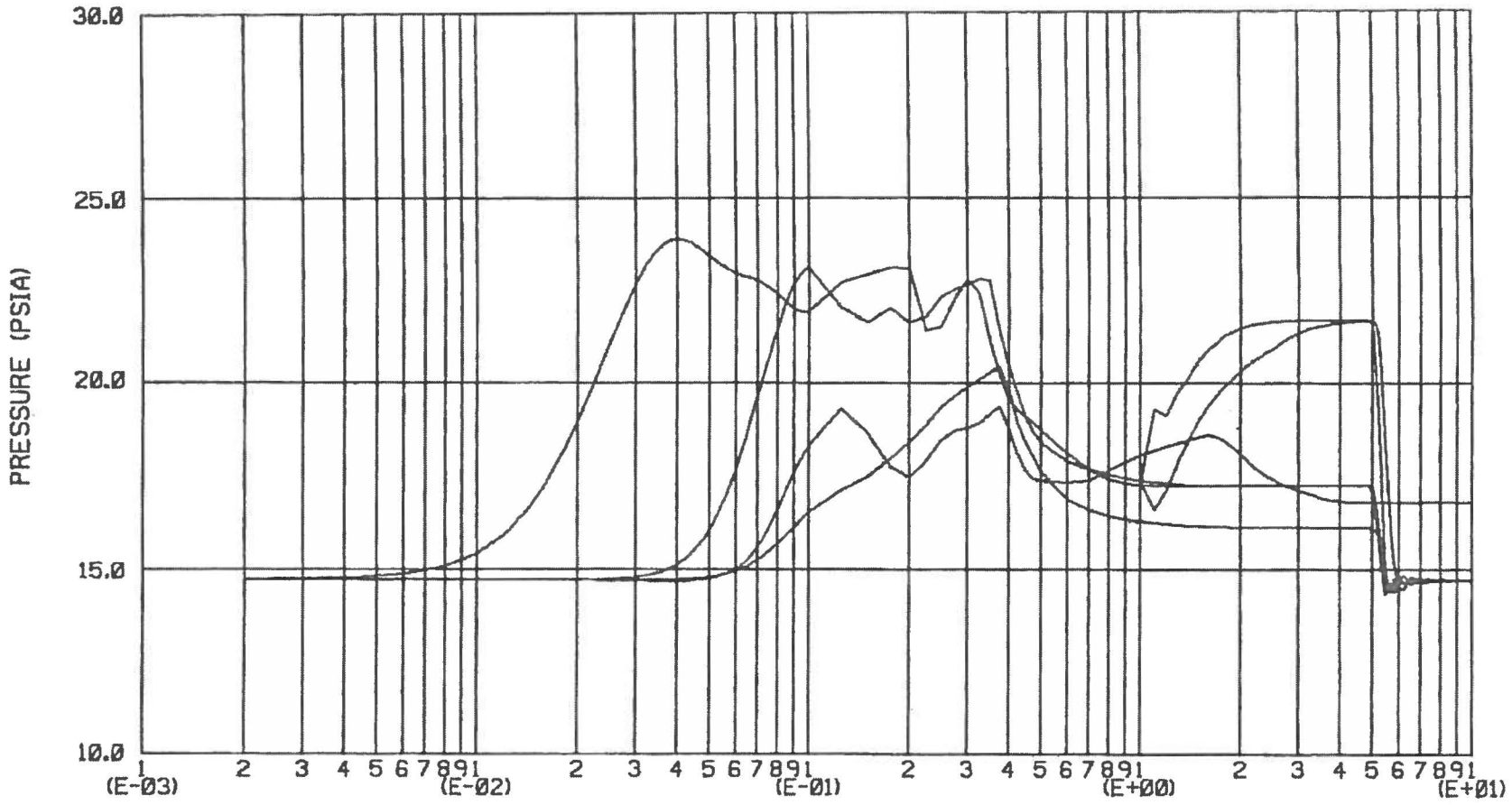


Note: All breaks are shown on this figure.

FIGURE 3B-55

ABSOLUTE PRESSURE TRANSIENTS:
VOLUME MST-6. MAIN STEAM
TUNNEL HELB ANALYSIS.

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT

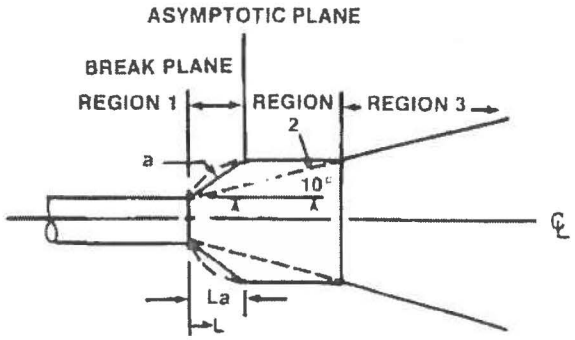


Note: All breaks are shown on this figure.

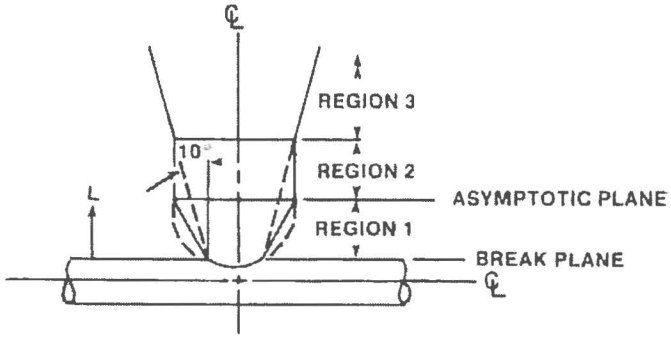
FIGURE 3B-56

ABSOLUTE PRESSURE TRANSIENTS: VOLUME MST-8. MAIN STEAM TUNNEL HELB ANALYSIS.

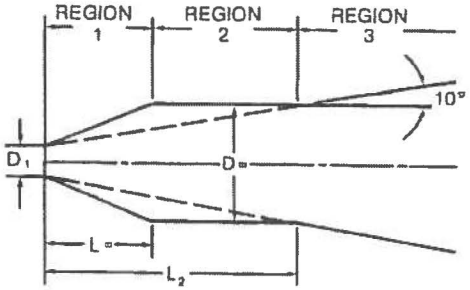
NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - UNIT 2
UPDATED SAFETY ANALYSIS REPORT



CIRCUMFERENTIAL BREAK WITH FULL SEPARATION



LONGITUDINAL BREAK



FLUID JET GEOMETRY
SATURATED WATER AND STEAM BLOWDOWN

NOTE:
REGION 1 EXTENDS FROM THE BREAK TO THE ASYMPTOTIC EXPANSION PLAN. THE DISTANCE TO THE ASYMPTOTIC PLAN IS A FUNCTION OF FLUID PROPERTIES. WITH P_0 = 1050 psia AND fl/D = 0. MOODY FOUND THAT THIS JET ASYMPTOTIC DISTANCE IS 4.5 DISCHARGE PIPE DIAMETERS FOR SATURATED WATER BLOWDOWN, AND 2 PIPE DIAMETERS FOR SATURATED STEAM BLOWDOWN. FALETTI'S DATA FOR THE CRITICAL DISCHARGE OF STEAM-WATER MIXTURES INDICATE THAT FULLY EXPANDED PROPERTIES ARE APPROACHED CLOSELY IN LESS THAN 5 PIPE DIAMETERS. THEREFORE, THE EXTENT OF REGION 1 IS TAKEN AS 5 PIPE INSIDE DIAMETERS.

IN REGION 2, THE JET IS ASSUMED TO REMAIN CONSTANT.

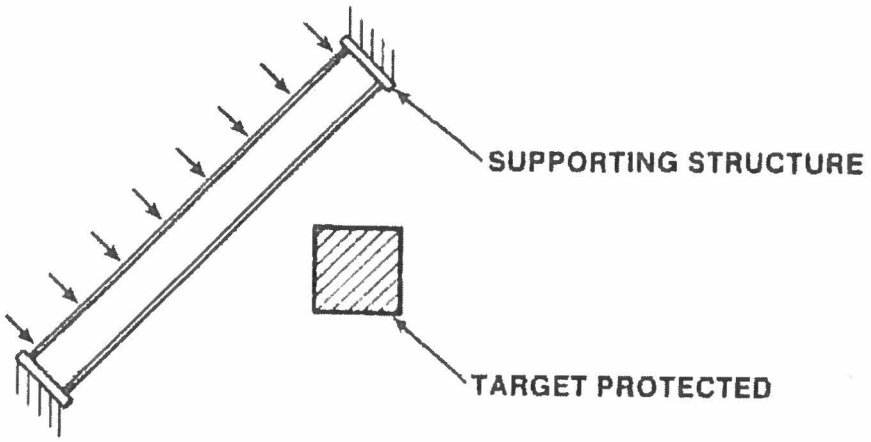
IN REGION 3, INTERACTION WITH THE SURROUNDING ENVIRONMENT IS ASSUMED TO START AND THE JET EXPANDS AT A HALF ANGLE OF 10 DEGREES.

FIGURE 3C.3-1

JET GEOMETRY

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

FLAT PLATE DESIGN



WEDGE DESIGN

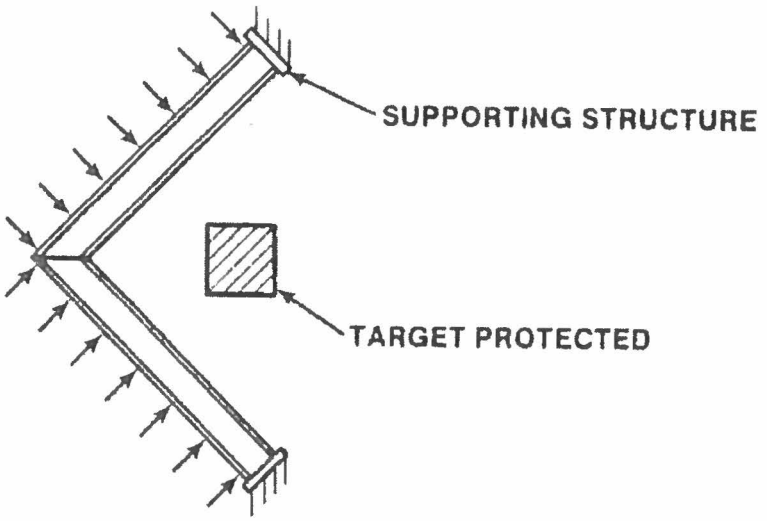


FIGURE 3C.3-2

JET IMPINGEMENT
TARGET SHIELDS

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT

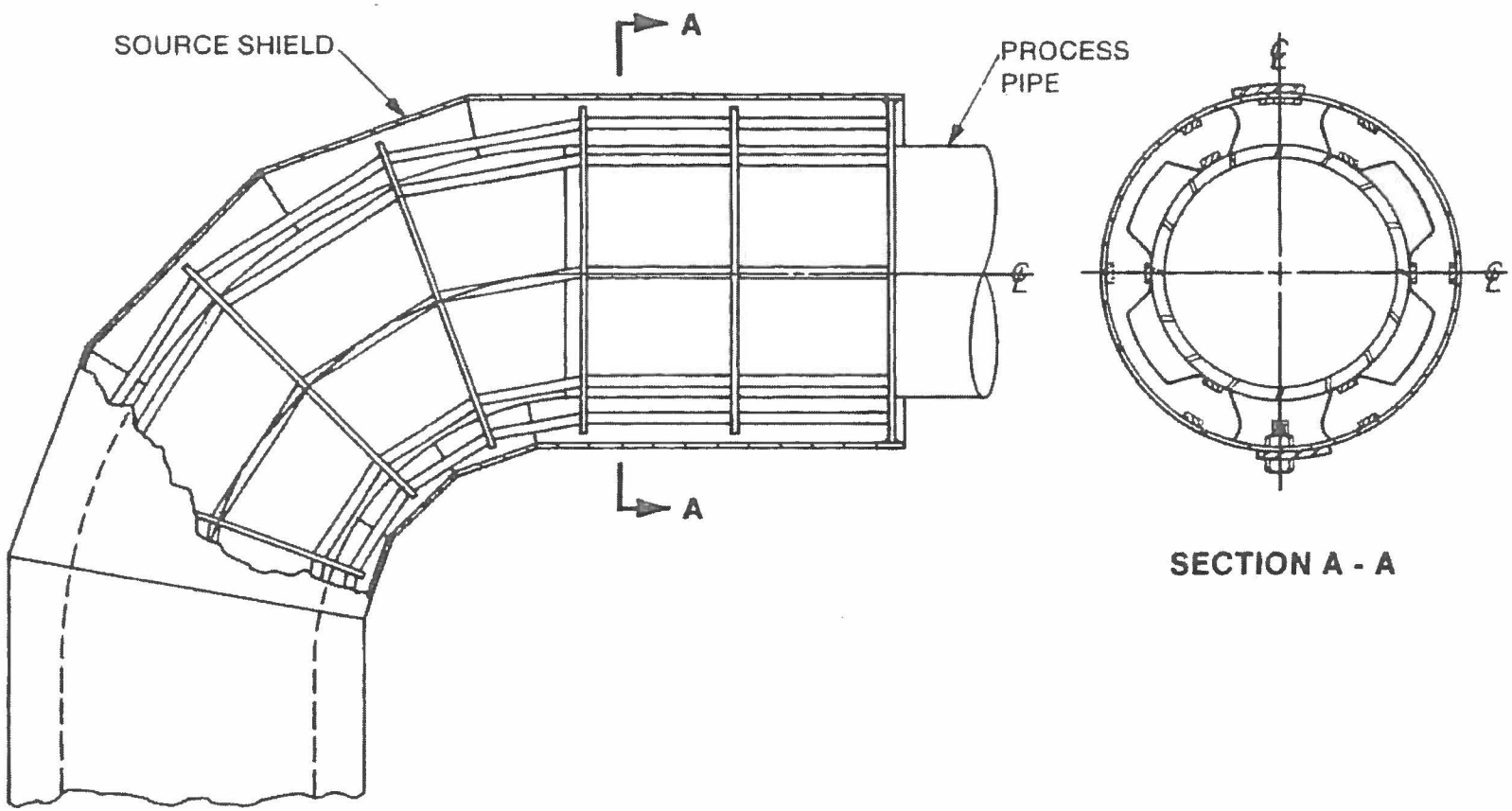


FIGURE 3C.3-3

SOURCE SHIELD

NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
FINAL SAFETY ANALYSIS REPORT