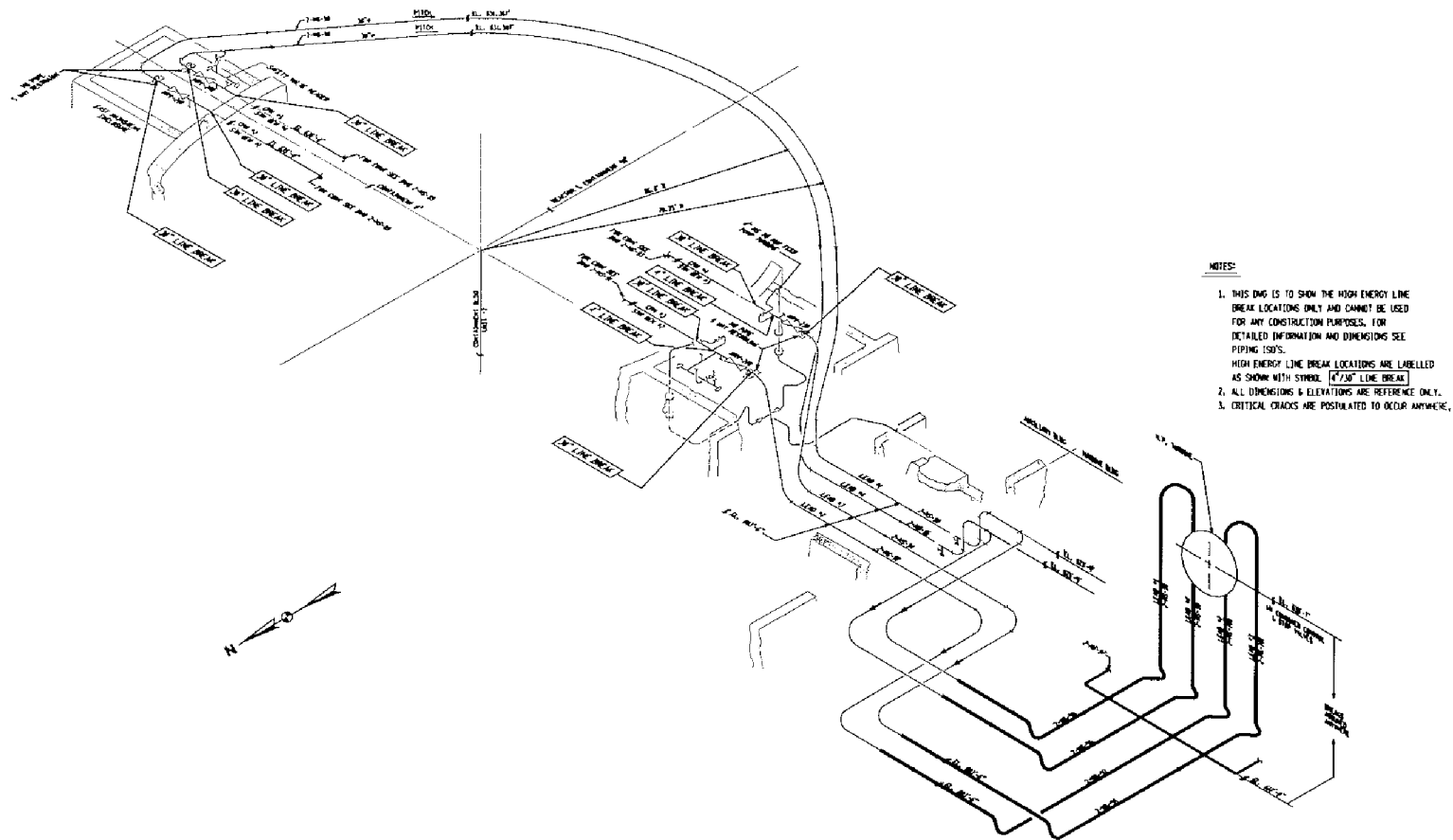
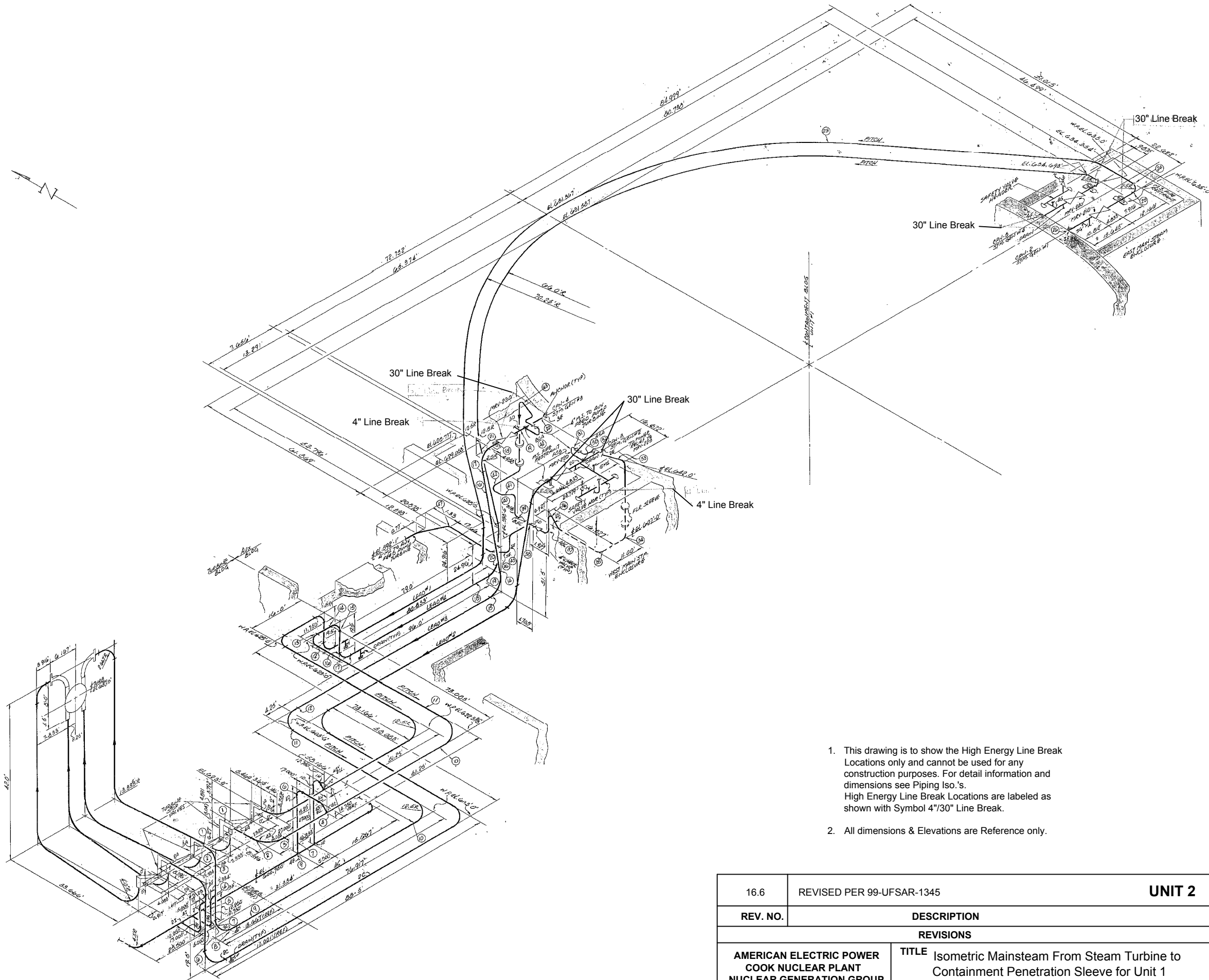


UFSAR Revision 30.0



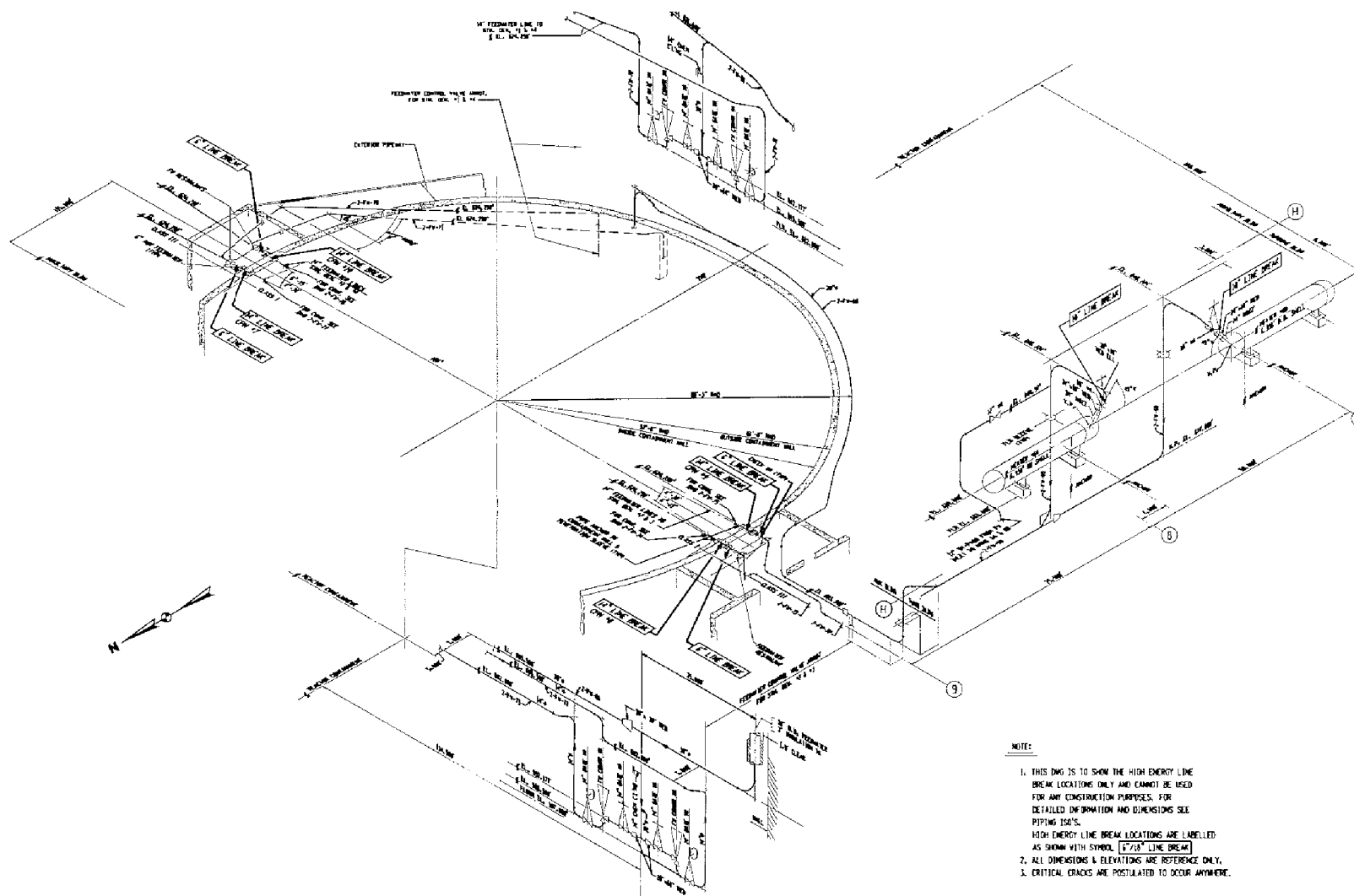
	16.4	REVISED PER 98-UFSAR-0779			UNIT 2
	REV. NO.	DESCRIPTION			
	REVISIONS				
	AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN	TITLE			
		Isometric Mainsteam from Steam Turbine to Containment Penetration Sleeve Unit No.2			
	DWG. NO. FSAR FIG. 14.4.2-1			SH 1 of 1	



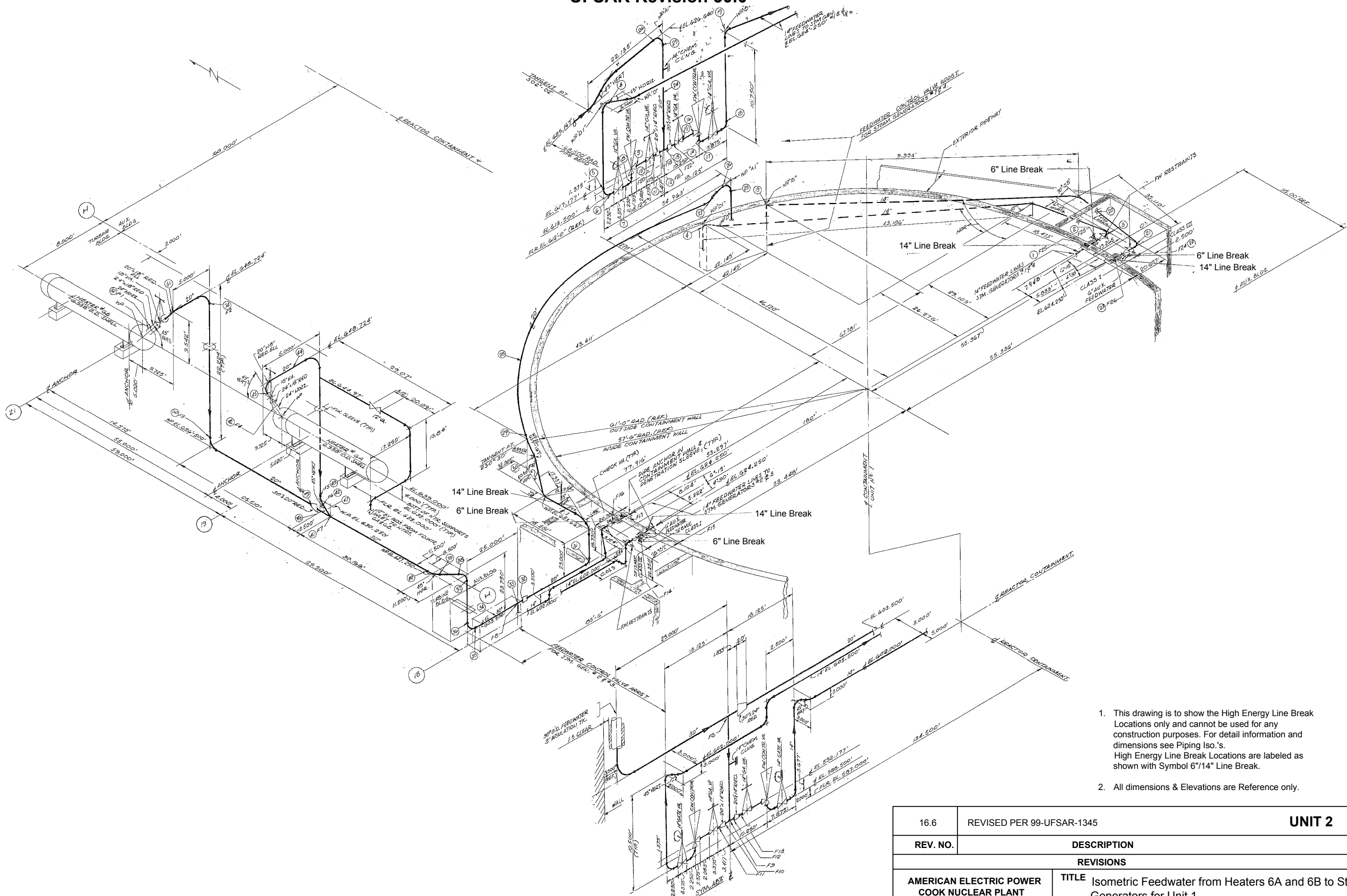
- 1. This drawing is to show the High Energy Line Break Locations only and cannot be used for any construction purposes. For detail information and dimensions see Piping Iso.'s. High Energy Line Break Locations are labeled as shown with Symbol 4"/30" Line Break.
- 2. All dimensions & Elevations are Reference only.

16.6	REVISED PER 99-UFSAR-1345		UNIT 2
REV. NO.	DESCRIPTION		
REVISIONS			
AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN	TITLE Isometric Mainsteam From Steam Turbine to Containment Penetration Sleeve for Unit 1		
	DWG. NO. FSAR FIG. 14.4.2-1A		SH 1 of 1

UFSAR Revision 30.0



	16.4	REVISED PER 98-UFSAR-0779			UNIT 2
	REV. NO.	DESCRIPTION			
	REVISIONS				
	AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN	TITLE Isometric of Feedwater from Heaters # 6A & 6B to Steam Generators Unit No. 2			
		DWG. NO. FSAR FIG. 14.4.2-2			SH 1 of 1



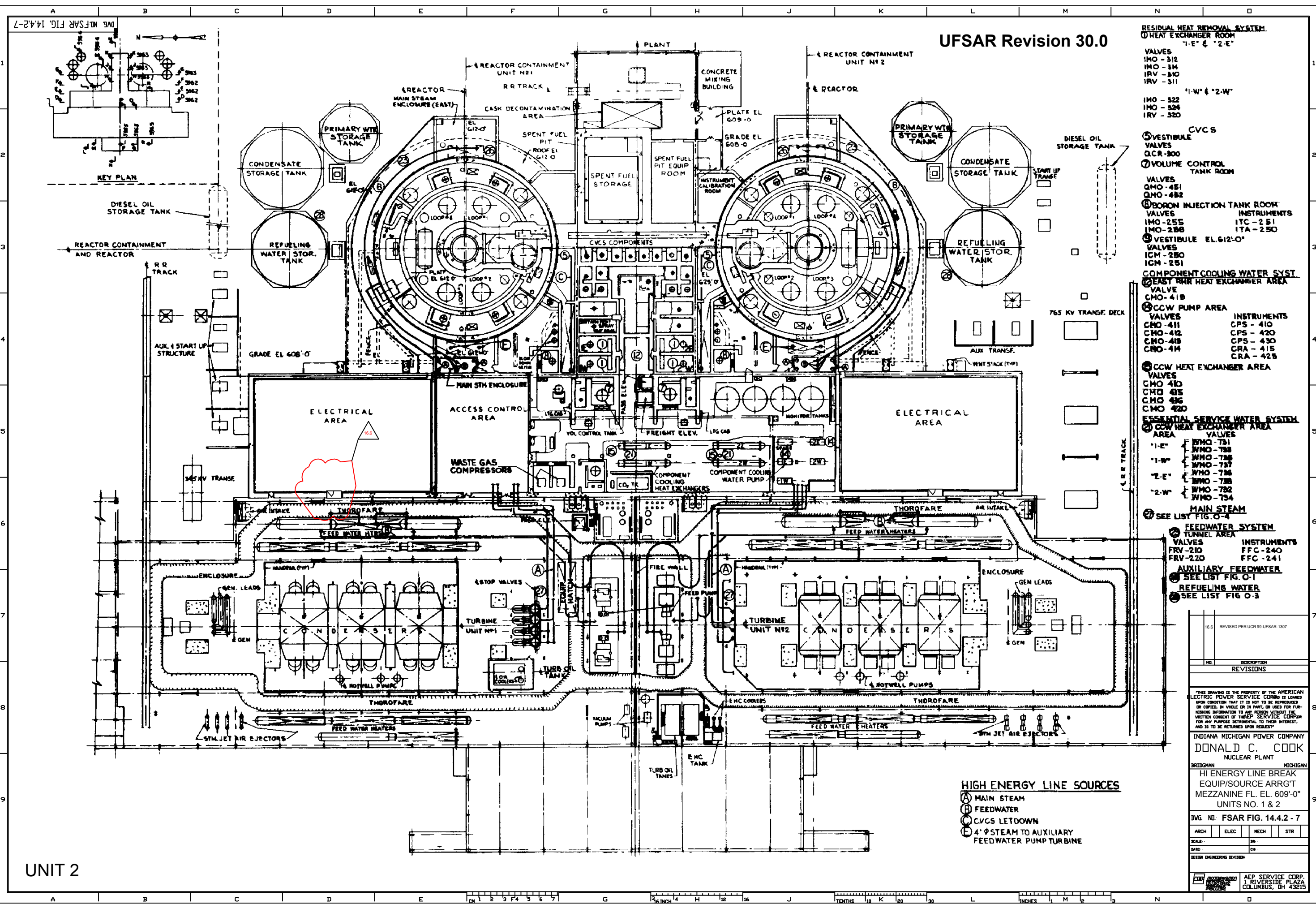
- 1. This drawing is to show the High Energy Line Break Locations only and cannot be used for any construction purposes. For detail information and dimensions see Piping Iso.'s. High Energy Line Break Locations are labeled as shown with Symbol 6"/14" Line Break.
- 2. All dimensions & Elevations are Reference only.

16.6	REVISED PER 99-UFSAR-1345		UNIT 2
REV. NO.	DESCRIPTION		
REVISIONS			
AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN	TITLE Isometric Feedwater from Heaters 6A and 6B to Steam Generators for Unit 1		
	DWG. NO. FSAR FIG. 14.4.2-2A		SH 1 of 1

DWG. NO. FSAR FIG. 14.4.2-7

UFSAR Revision 30.0

- RESIDUAL HEAT REMOVAL SYSTEM**
① HEAT EXCHANGER ROOM
"1-E" & "2-E"
- VALVES
IMO - 312
IMO - 314
IRV - 310
IRV - 311
- "1-W" & "2-W"
- IMO - 322
IMO - 324
IRV - 320
- CVCS**
⑤ VESTIBULE
VALVES
QCR - 300
⑦ VOLUME CONTROL TANK ROOM
VALVES
QMO - 451
QMO - 452
⑧ BORON INJECTION TANK ROOM
VALVES
IMO - 255
IMO - 256
ITC - 251
ITA - 250
⑨ VESTIBULE EL. 612'-0"
VALVES
ICM - 250
ICM - 251
- COMPONENT COOLING WATER SYST.**
② EAST MAIN HEAT EXCHANGER AREA
VALVE
CMO - 418
③ CCW PUMP AREA
VALVES
CPS - 410
CPS - 420
CPS - 430
CPS - 415
CPS - 425
④ CCW HEAT EXCHANGER AREA
VALVES
CMO - 410
CMO - 415
CMO - 416
CMO - 420
- ESSENTIAL SERVICE WATER SYSTEM**
⑥ CCW HEAT EXCHANGER AREA
VALVES
"1-E" JMO - 731
"1-W" JMO - 733
"1-W" JMO - 735
"1-W" JMO - 737
"2-E" JMO - 736
"2-E" JMO - 738
"2-W" JMO - 732
"2-W" JMO - 734
- MAIN STEAM**
⑦ SEE LIST FIG. O-4
- FEEDWATER SYSTEM**
TUNNEL AREA
VALVES
FRV - 210
FRV - 220
INSTRUMENTS
FFC - 240
FFC - 241
- AUXILIARY FEEDWATER**
⑧ SEE LIST FIG. O-1
- REFUELING WATER**
⑨ SEE LIST FIG. O-3



UNIT 2

HIGH ENERGY LINE SOURCES

- ① MAIN STEAM
- ② FEEDWATER
- ③ CVCS LETDOWN
- ④ 4" Ø STEAM TO AUXILIARY FEEDWATER PUMP TURBINE

16.6 REVISED PER UCR 99-UPSR-1307

NO.	DESCRIPTION	REVISIONS

"THIS DRAWING IS THE PROPERTY OF THE AMERICAN ELECTRIC POWER SERVICE CORP. IT IS LOANED TO YOU ON THE CONDITION THAT IT IS NOT TO BE REPRODUCED OR COPIED, IN WHOLE OR IN PART, OR USED FOR FURNISHING INFORMATION TO ANY PERSON WITHOUT THE WRITTEN CONSENT OF THE AMERICAN ELECTRIC POWER SERVICE CORP. FOR ANY PURPOSE, RETENTION, OR FOR ANY OTHER USE, AND IS TO BE RETURNED UPON REQUEST."

INDIANA MICHIGAN POWER COMPANY
DONALD C. COOK
NUCLEAR PLANT
BRIDGMAN MICHIGAN
HI ENERGY LINE BREAK
EQUIP/SOURCE ARRGT
MEZZANINE FL. EL. 609'-0"
UNITS NO. 1 & 2

DWG. NO. FSAR FIG. 14.4.2 - 7

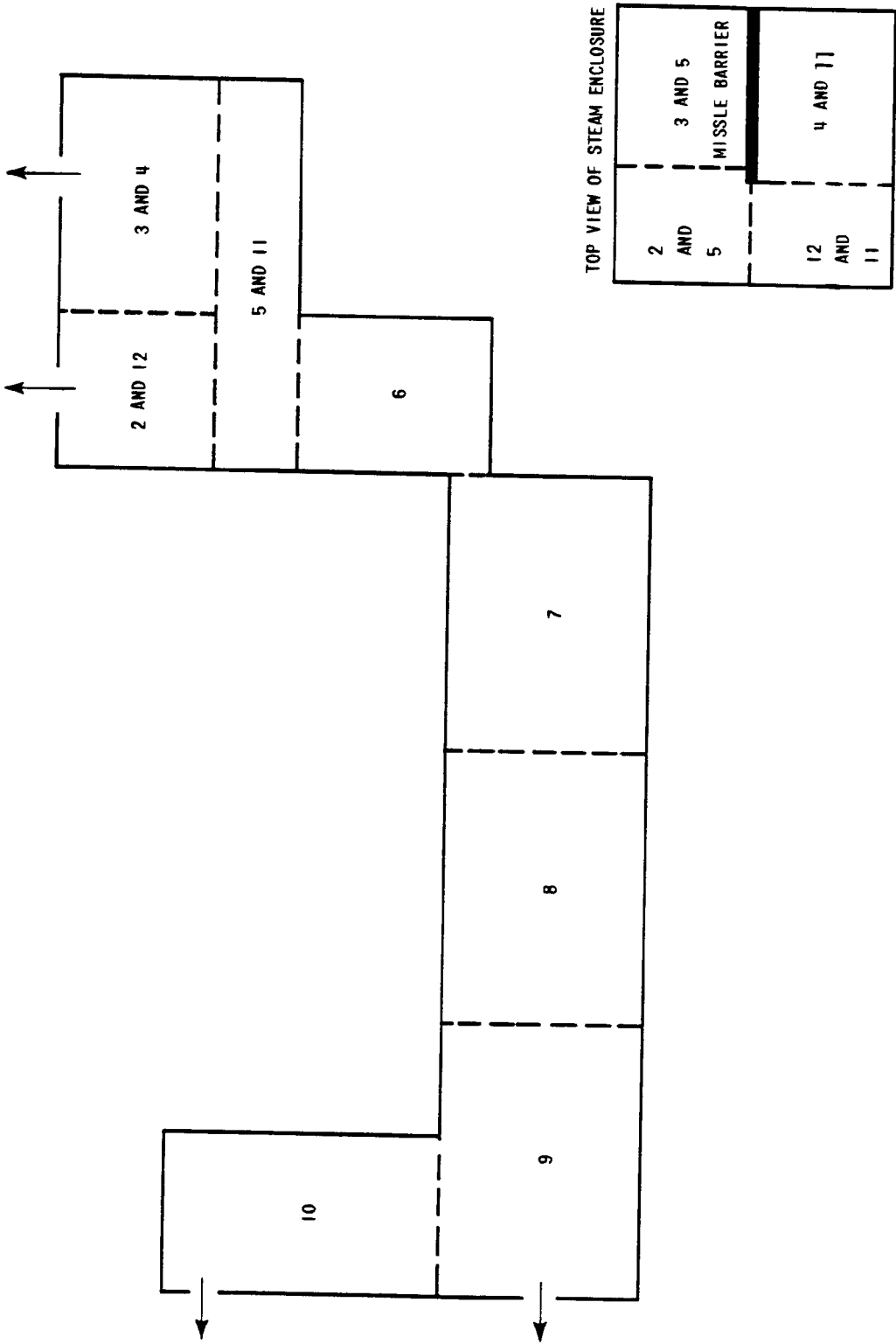
ARCH	ELEC	MECH	STR

SCALE: 3/8" = 1'-0"

DATE: 01-01-80

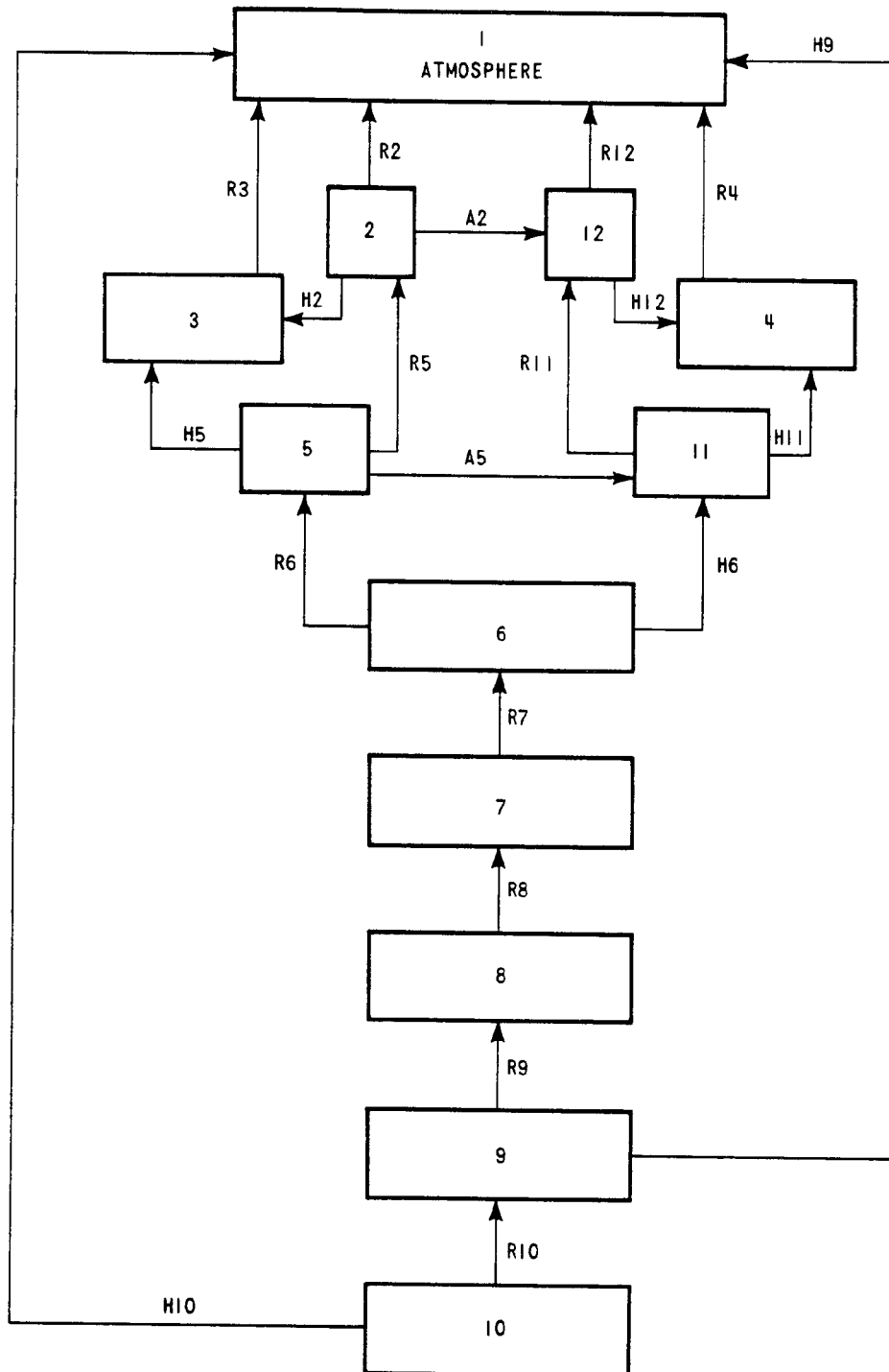
DESIGN ENGINEERING DIVISION

APP. [Signature] AEP SERVICE CORP.
RIVERSIDE PLAZA
COLUMBUS, OH 43215



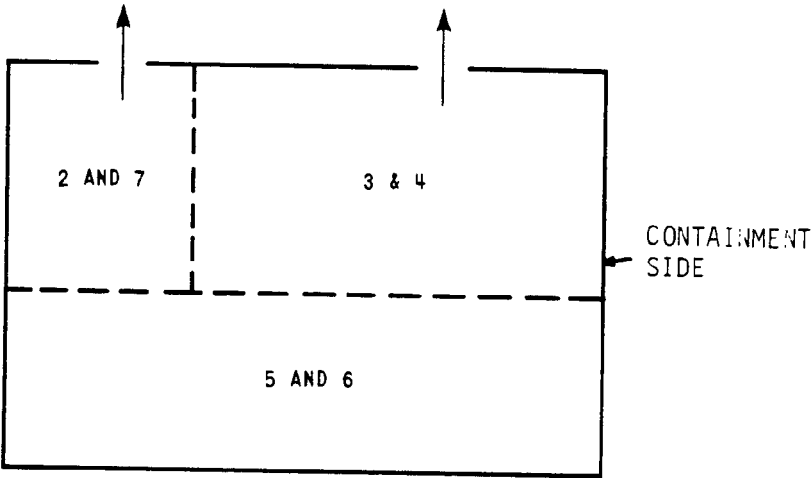
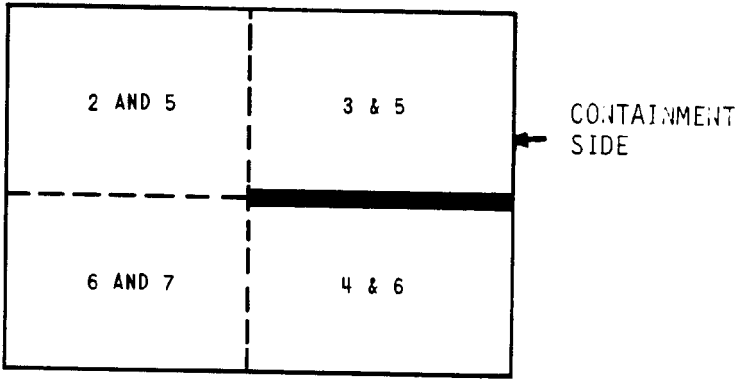
16.6	REVISED PER 99-UFSAR-1345		UNIT 2
REV. NO.	DESCRIPTION		
REVISIONS			
AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN	TITLE Schematic of West Steam Enclosure/Main Steam Accessway		
	DWG. NO. FSAR FIG. 14.4.6-1		SH 1 of 1

UFSAR Revision 30.0

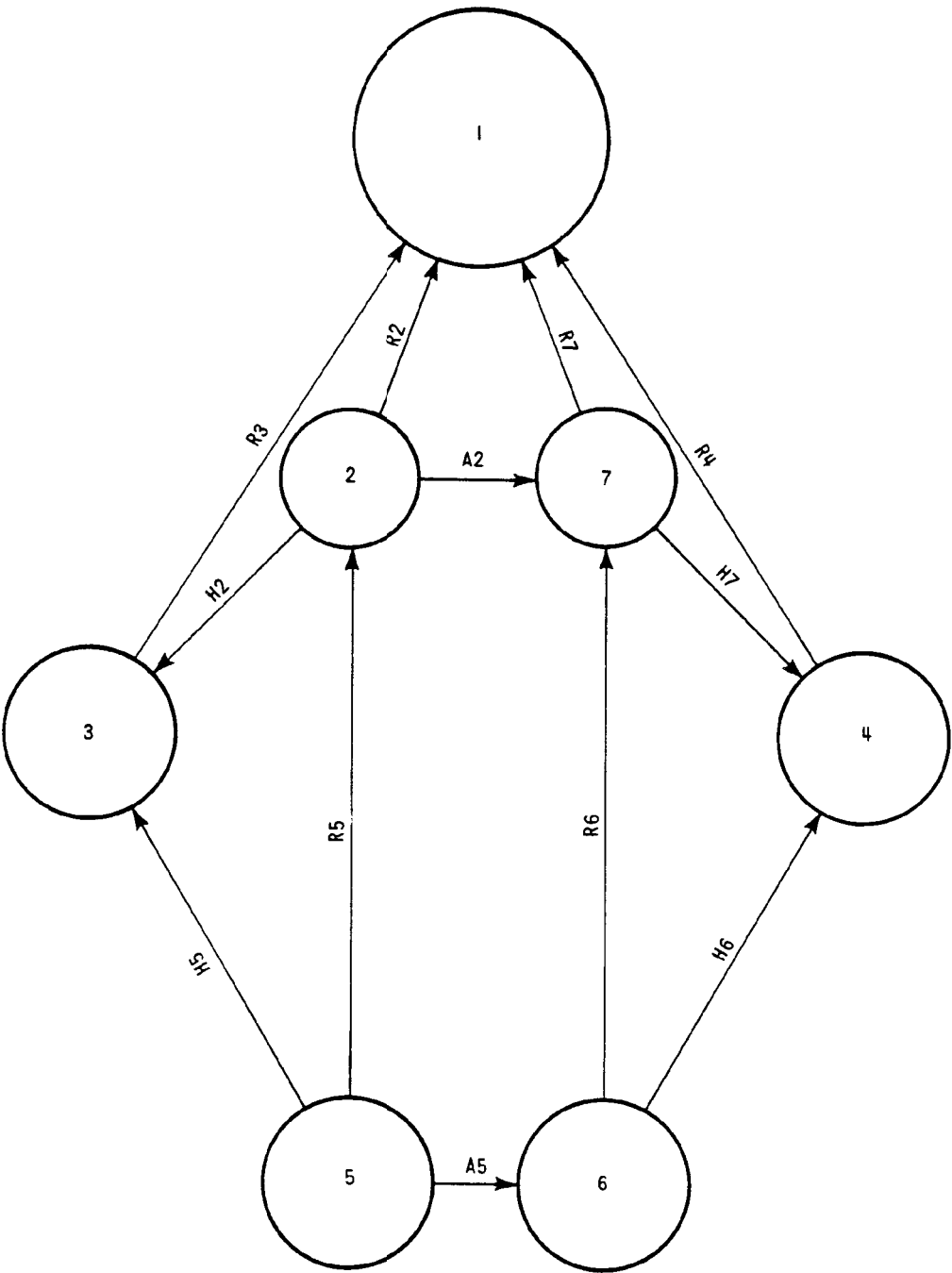


16.6	REVISED PER 99-UFSAR-1345		UNIT 2
REV. NO.	DESCRIPTION		
REVISIONS			
AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN	TITLE TMD Network for West Steam Enclosure/Main Steam Accessway		
	DWG. NO. FSAR FIG. 14.4.6-2		SH 1 of 1

UFSAR Revision 30.0

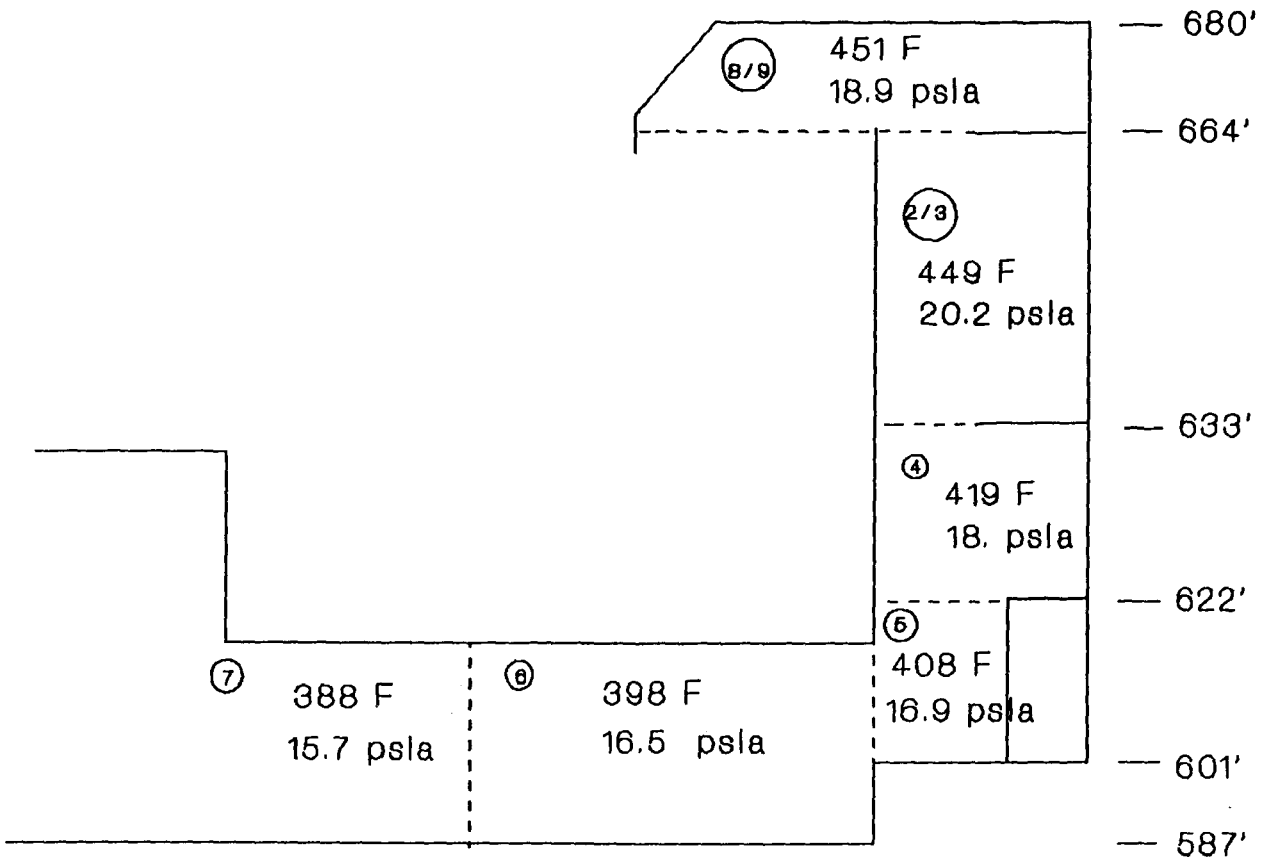


16.6	REVISED PER 99-UFSAR-1345		UNIT 2
REV. NO.	DESCRIPTION		
REVISIONS			
AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN	TITLE Schematic of East Steam Enclosure		
	DWG. NO. FSAR FIG. 14.4.6-3		SH 1 of 1



16.6	REVISED PER 99-UFSAR-1345		UNIT 2
REV. NO.	DESCRIPTION		
REVISIONS			
AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN	TITLE TMD Network for East Steam Enclosure		
	DWG. NO. FSAR FIG. 14.4.6-4		SH 1 of 1

UFSAR Revision 30.0



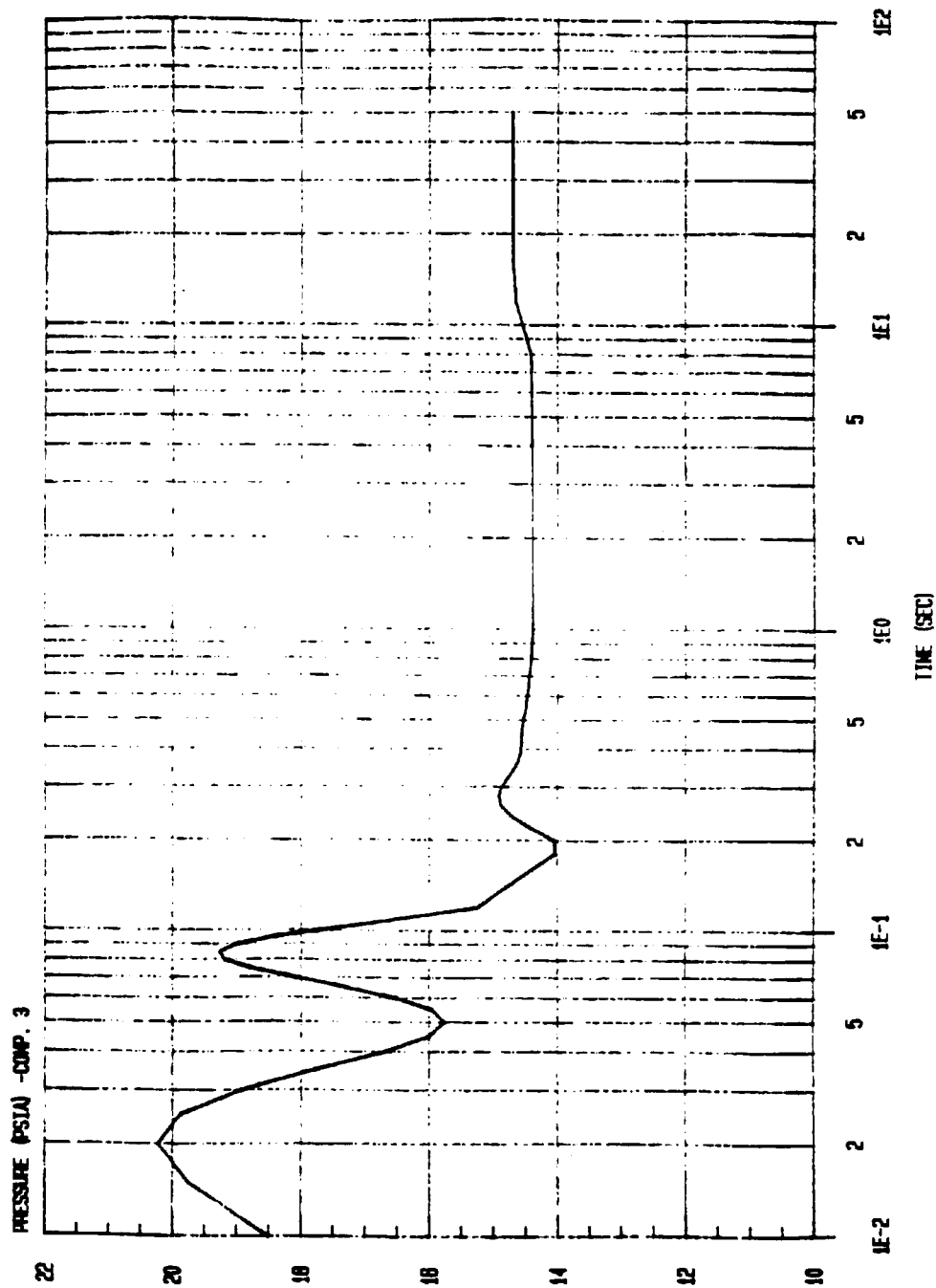
16.6	REVISED PER 99-UFSAR-1345		UNIT 2
REV. NO.	DESCRIPTION		
REVISIONS			
AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN	TITLE Peak Environmental Parameters (West Main Steam Enclosure and Accessway) (Structural Qualification)		
	DWG. NO. FSAR FIG. 14.4.6-5		SH 1 of 1

UFSAR Revision 30.0

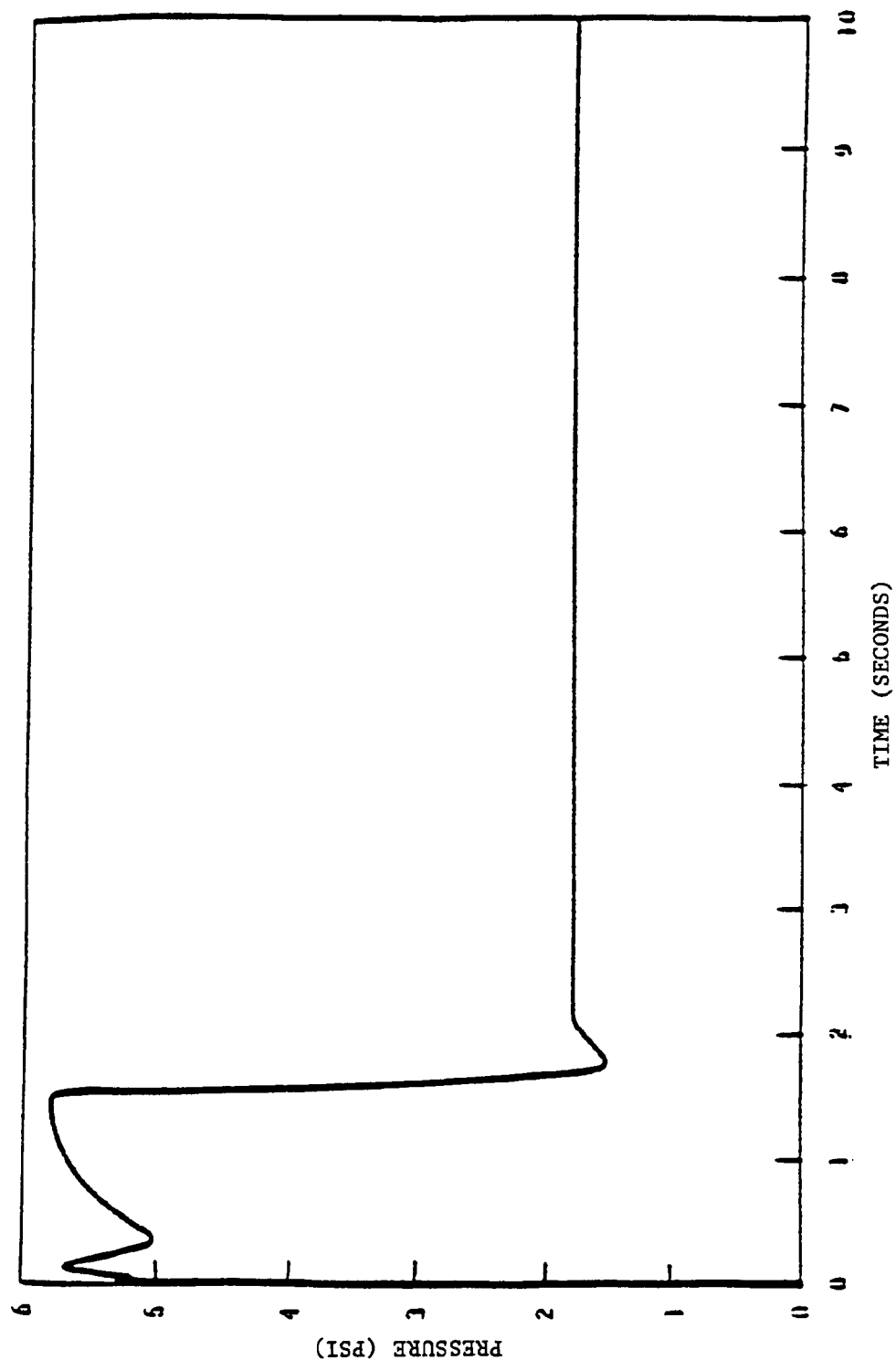
7/8	488 F 20.4 psia	- 683'
2/3	488 F 20.4 psia	- 664'
4	431 F 19.8 psia	- 633'
5	378 F 16.9 psia	- 662'
6	170 F 15.5 psia	- 596'

16.6	REVISED PER 99-UFSAR-1345		UNIT 2
REV. NO.	DESCRIPTION		
REVISIONS			
AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN	TITLE Peak Environmental Parameter (East Main Steam Enclosure) (Structural Qualification)		
	DWG. NO. FSAR FIG. 14.4.6-6		SH 1 of 1

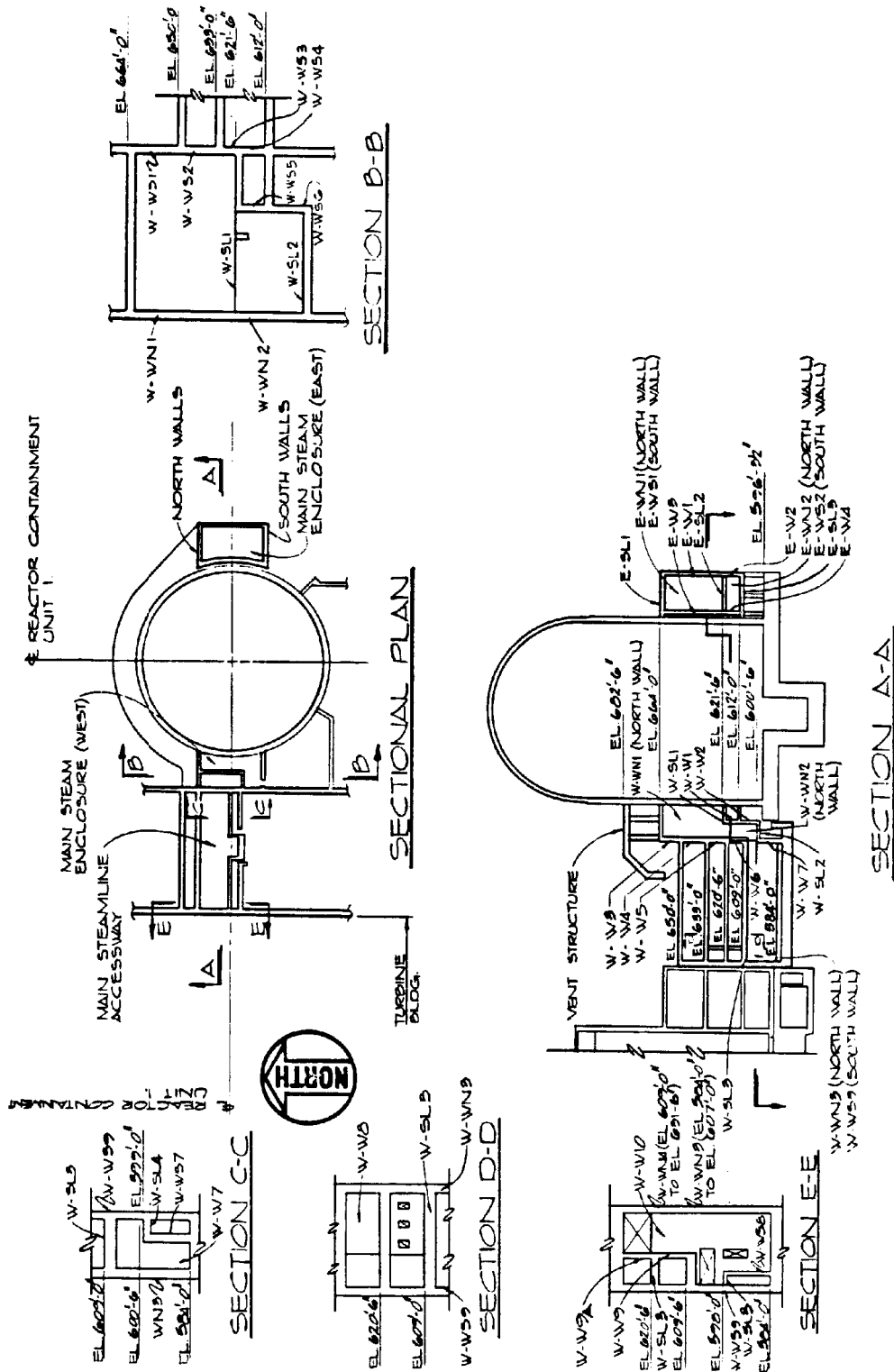
AEPSC/DC COOK UNITS 1&2
MAIN STEAM ENCLOSURE PRESSURE PROFILE



16.6	REVISED PER 99-UFSAR-1345		UNIT 2
REV. NO.	DESCRIPTION		
REVISIONS			
AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN	TITLE East Main Steam Enclosure Pressure Profile in Elements 2 and 3		
	DWG. NO. FSAR FIG. 14.4.6-8		SH 1 of 1



16.6	REVISED PER 99-UFSAR-1345		UNIT 2
REV. NO.	DESCRIPTION		
REVISIONS			
AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN	TITLE Feedwater Line Break in Main Steam Accessway (Element 7) Pressure VS. Time		
	DWG. NO. FSAR FIG. 14.4.6-11		SH 1 of 1



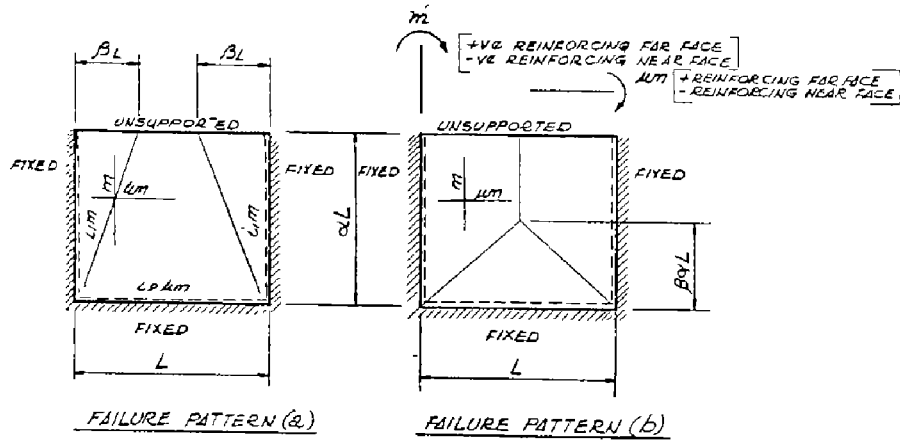
16.6	Revised per 99-UFSAR-1345		UNIT 2
REV. NO.	DESCRIPTION		
REVISIONS			
AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN	TITLE	LAYOUT AND IDENTIFICATION OF WALLS AND SLABS FOR EAST MAIN STEAM ENCLOSURE, WEST MAIN STEAM ENCLOSURE, MAIN STEAM ACCESSWAY	
	DWG. NO.	FSAR FIG. 14.4.8-1	SH 1 of 1

Isometric view of the building structure showing various levels and components. Key labels include:

- EL 600'-0"
- EL 620'-0"
- EL 640'-0"
- EL 660'-0"
- EL 680'-0"
- EL 700'-0"
- EL 720'-0"
- EL 740'-0"
- EL 760'-0"
- EL 780'-0"
- EL 800'-0"
- EL 820'-0"
- EL 840'-0"
- EL 860'-0"
- EL 880'-0"
- EL 900'-0"
- EL 920'-0"
- EL 940'-0"
- EL 960'-0"
- EL 980'-0"
- EL 1000'-0"
- EL 1020'-0"
- EL 1040'-0"
- EL 1060'-0"
- EL 1080'-0"
- EL 1100'-0"
- EL 1120'-0"
- EL 1140'-0"
- EL 1160'-0"
- EL 1180'-0"
- EL 1200'-0"
- EL 1220'-0"
- EL 1240'-0"
- EL 1260'-0"
- EL 1280'-0"
- EL 1300'-0"
- EL 1320'-0"
- EL 1340'-0"
- EL 1360'-0"
- EL 1380'-0"
- EL 1400'-0"
- EL 1420'-0"
- EL 1440'-0"
- EL 1460'-0"
- EL 1480'-0"
- EL 1500'-0"
- EL 1520'-0"
- EL 1540'-0"
- EL 1560'-0"
- EL 1580'-0"
- EL 1600'-0"
- EL 1620'-0"
- EL 1640'-0"
- EL 1660'-0"
- EL 1680'-0"
- EL 1700'-0"
- EL 1720'-0"
- EL 1740'-0"
- EL 1760'-0"
- EL 1780'-0"
- EL 1800'-0"
- EL 1820'-0"
- EL 1840'-0"
- EL 1860'-0"
- EL 1880'-0"
- EL 1900'-0"
- EL 1920'-0"
- EL 1940'-0"
- EL 1960'-0"
- EL 1980'-0"
- EL 2000'-0"
- EL 2020'-0"
- EL 2040'-0"
- EL 2060'-0"
- EL 2080'-0"
- EL 2100'-0"
- EL 2120'-0"
- EL 2140'-0"
- EL 2160'-0"
- EL 2180'-0"
- EL 2200'-0"
- EL 2220'-0"
- EL 2240'-0"
- EL 2260'-0"
- EL 2280'-0"
- EL 2300'-0"
- EL 2320'-0"
- EL 2340'-0"
- EL 2360'-0"
- EL 2380'-0"
- EL 2400'-0"
- EL 2420'-0"
- EL 2440'-0"
- EL 2460'-0"
- EL 2480'-0"
- EL 2500'-0"
- EL 2520'-0"
- EL 2540'-0"
- EL 2560'-0"
- EL 2580'-0"
- EL 2600'-0"
- EL 2620'-0"
- EL 2640'-0"
- EL 2660'-0"
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- EL 2740'-0"
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- EL 2800'-0"
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- EL 2840'-0"
- EL 2860'-0"
- EL 2880'-0"
- EL 2900'-0"
- EL 2920'-0"
- EL 2940'-0"
- EL 2960'-0"
- EL 2980'-0"
- EL 3000'-0"
- EL 3020'-0"
- EL 3040'-0"
- EL 3060'-0"
- EL 3080'-0"
- EL 3100'-0"
- EL 3120'-0"
- EL 3140'-0"
- EL 3160'-0"
- EL 3180'-0"
- EL 3200'-0"
- EL 3220'-0"
- EL 3240'-0"
- EL 3260'-0"
- EL 3280'-0"
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- EL 3320'-0"
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- EL 3360'-0"
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- EL 3960'-0"
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- EL 6220'-0"
- EL 6240'-0"
- EL 6260'-0"
- EL 6280'-0"
- EL 6300'-0"
- EL 6320'-0"
- EL 6340'-0"
- EL 6360'-0"
- EL 6380'-0"
- EL 6400'-0"

16.6	REVISED PER 99-UFSAR-1345		UNIT 2
REV. NO.	DESCRIPTION		
AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN	REVISIONS TITLE Isometric View of Main Steam Enclosure Accessway West of Containment		
	DWG. NO. FSAR FIG. 14.4.8-2	SH 1 of 1	

UFSAR Revision 30.0



FOR PATTERN (a):

$$\beta = \frac{\alpha^2 (1 + i_1)}{\mu (3 + i_2)} \left[\sqrt{4 + 3 \frac{\mu (3 + i_2)}{\alpha^2 (1 + i_1)}} - 2 \right] < 0.5 \text{ FOR PATTERN (a) TO BE VALID.}$$

$$p_{max} = m \frac{6\mu (4\beta + i_2)}{\alpha^2 L^2 (3 - 4\beta)}$$

FOR PATTERN (b):

$$\beta = \frac{1}{4} \frac{\mu (1 + i_2)}{\alpha^2 (1 + i_1)} \left[\sqrt{1 + 12 \frac{\alpha^2 (1 + i_1)}{\mu (1 + i_2)}} - 1 \right] < 1.0 \text{ FOR PATTERN (b) TO BE VALID.}$$

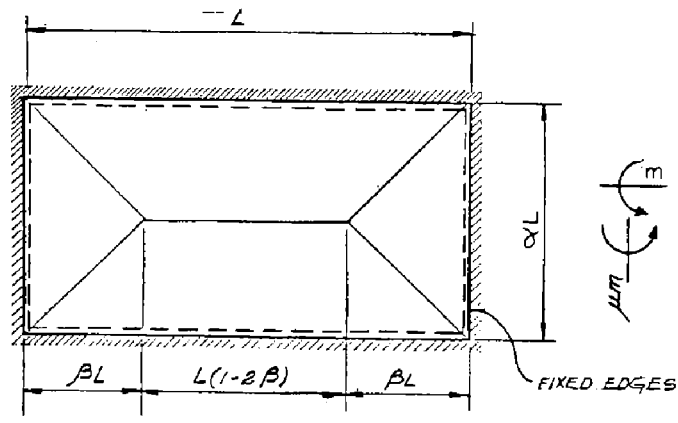
$$p_{max} = m \frac{24 (1 + i_1)}{L^2 (3 - 2\beta)}$$

EVALUATE BOTH CASES AND USE MINIMUM VALUE FOR p_{max} .

———— POSITIVE YIELD LINE
 - - - - - NEGATIVE YIELD LINE

16.6	REVISED PER 99-UFSAR-1345		UNIT 2
REV. NO.	DESCRIPTION		
REVISIONS			
AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN	TITLE Yield Line Pattern for Panels with Three Edges Fixed & One Edge Unsupported Subjected to Uniformly Distributed Load		
	DWG. NO. FSAR FIG. 14.4.8-3		SH 1 of 1

UFSAR Revision 30.0



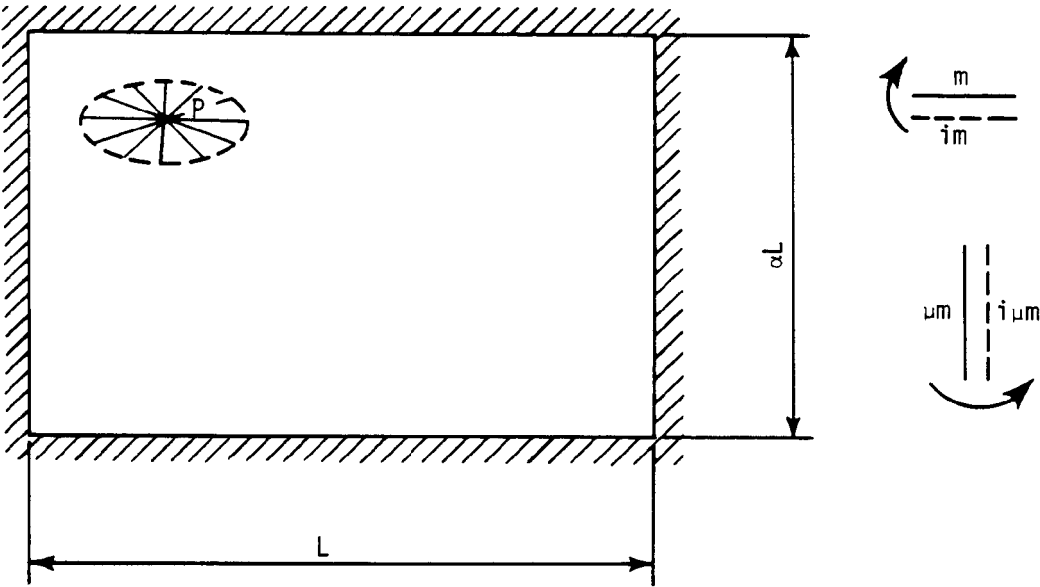
— POSITIVE YIELD LINE
--- NEGATIVE YIELD LINE
 m = YIELD MOMENT (+) & (-) (SHORT DIRECTION)
 μm = YIELD MOMENT (+) & (-) (LONG DIRECTION)

$$\beta = \frac{\mu \alpha^2}{2} \left\{ \sqrt{1 + \frac{3}{\mu \alpha^2}} - 1 \right\}$$

IF $\beta > 0.5$ INTERCHANGE 'L' & ' αL '

$$p_{max} = \frac{24m \left[\frac{2}{\alpha} + \frac{\alpha}{\beta} \right]}{\alpha L^2 (3 - 2\beta)}$$

16.6	REVISED PER 99-UFSAR-1345		UNIT 2
REV. NO.	DESCRIPTION		
REVISIONS			
AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN	TITLE Yield Line Pattern for Panels with Four Edges Fixed Subjected to Uniformly Distributed Load		
	DWG. NO. FSAR FIG. 14.4.8-4		SH 1 of 1

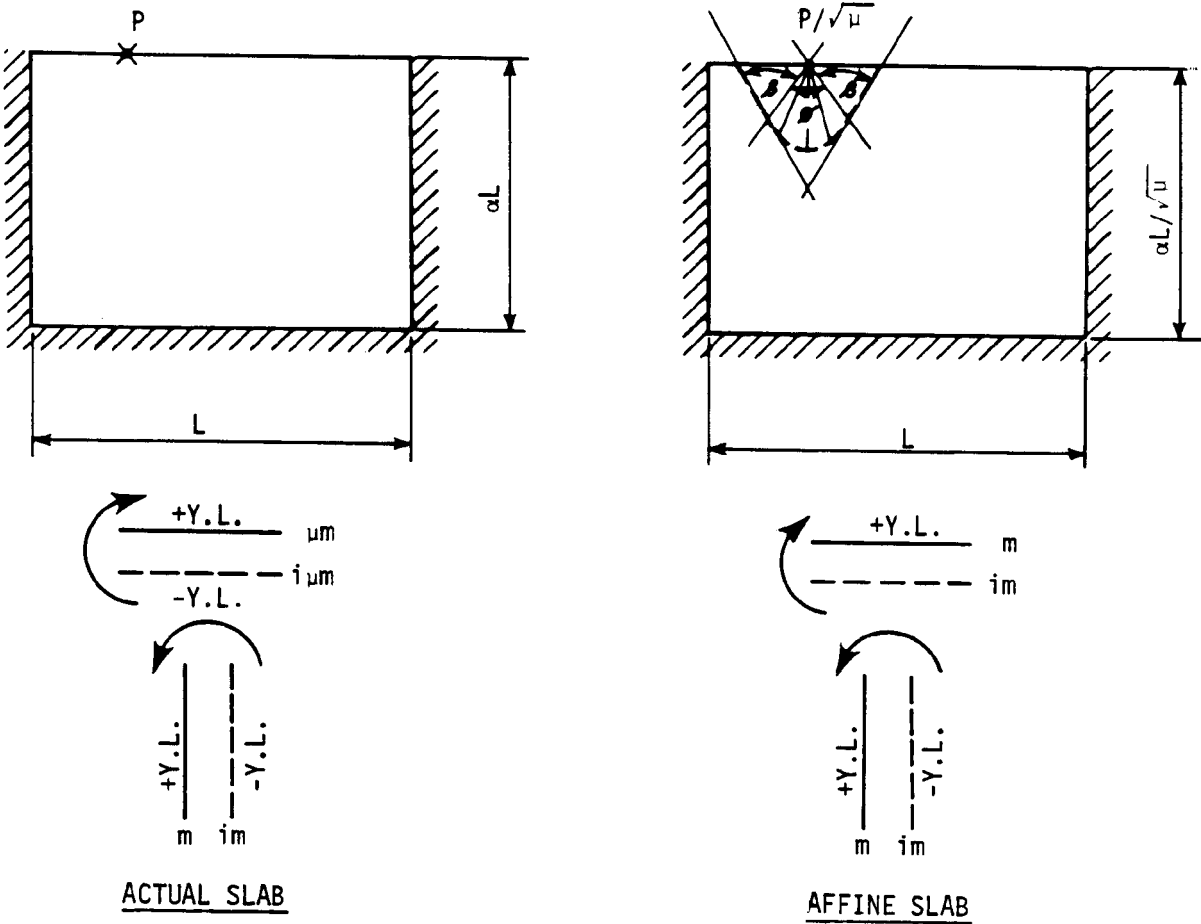


—— POSITIVE YIELD LINE
---- NEGATIVE YIELD LINE

m = +YIELD MOMENT
 $i m$ = -YIELD MOMENT
 μm = +YIELD MOMENT
 $i \mu m$ = -YIELD MOMENT

$$P_{max} = 2\pi\sqrt{\mu} (1+i) m$$

16.6	REVISED PER 99-UFSAR-1345		UNIT 2
REV. NO.	DESCRIPTION		
REVISIONS			
AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN	TITLE Yield Line Pattern for Panels with Four Edges Fixed Subjected to Concentrated Point Load		
	DWG. NO. FSAR FIG. 14.4.8-5		SH 1 of 1

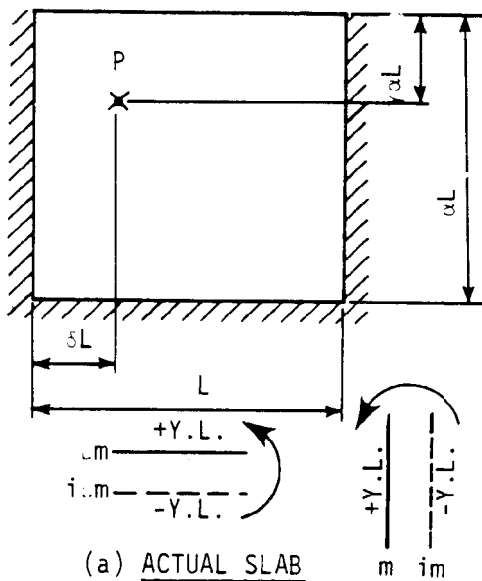


Y.L. = YIELD LINE

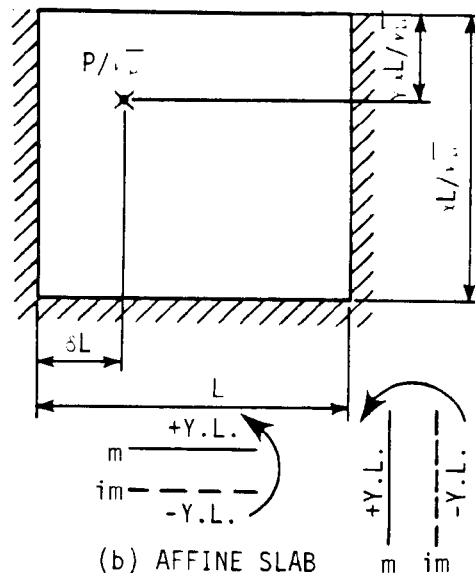
FOR $(P/m) \text{ min.}, \beta = 90^\circ, \tan \left(\frac{\theta}{2}\right) = \sqrt{1}$

$$P_{\text{max}} = \sqrt{\mu} \, m \{ (1+i)\phi + 2\sqrt{1} \}$$

16.6	REVISED PER 99-UFSAR-1345		UNIT 2
REV. NO.	DESCRIPTION		
REVISIONS			
AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN	TITLE	Yield Line Pattern for Panels with Three Edges Fixed and Fourth Edge Free Subjected to a Concentrated Point Load at the Free Edge	
	DWG. NO. FSAR FIG. 14.4.8-6		SH 1 of 1

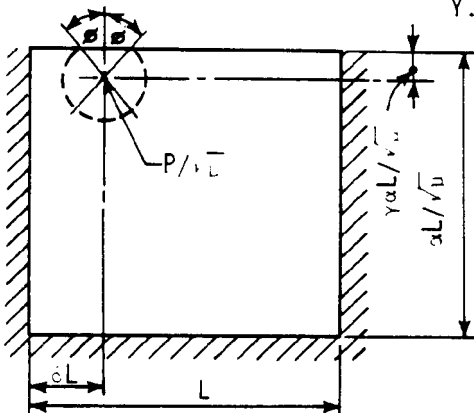


(a) ACTUAL SLAB



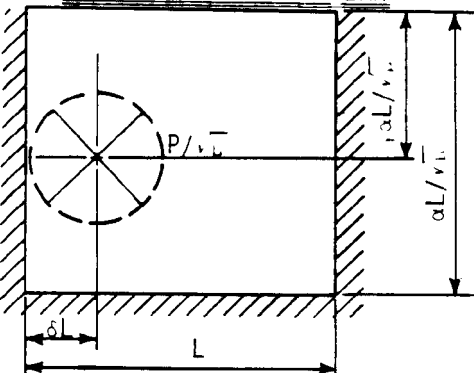
(b) AFFINE SLAB

Y.L.=YIELD LINE


MIN=MINIMUM OF THE QUANTITIES
 $L, (1-\gamma)L, (1-\gamma)\alpha L/\sqrt{i}$

$$R = \frac{\gamma \alpha L}{\sqrt{i} \cos \psi}$$

(c) POSSIBLE YIELD PATTERN



(d) POSSIBLE YIELD PATTERN

POSSIBLE YIELD PATTERNS

FIND $R = \frac{\gamma \alpha L}{\sqrt{i} \cos \psi}$ WHERE $\psi = \tan^{-1} \sqrt{i}$

(i) $R < \text{MIN}$ USE $\psi = \tan^{-1} \sqrt{i}$

$$P = 2\sqrt{i} m \tan \phi + (1+i)(\pi - \phi)$$

FIG. (c) REPRESENTS THIS CASE

(ii) $R > \text{MIN}$, MIN $\leq \frac{\gamma \alpha L}{\sqrt{i}}$

$$\text{SET } R' = \text{MIN} \quad \cos \psi' = \frac{\gamma \alpha L}{\sqrt{i} R'}$$

$$P = 2\sqrt{i} m \tan \psi' + (1+i)(\pi - \psi')$$

FIG. (c) REPRESENTS THIS CASE

(iii) $R > \text{MIN}$, MIN $\leq \frac{\gamma \alpha L}{\sqrt{i}}$

$$\phi = 0$$

$$P = 2\pi(1+i)m \sqrt{i}$$

FIG. (d) REPRESENTS THIS CASE
WHEN MIN = δL

16.6

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UNIT 2

REV. NO.

DESCRIPTION

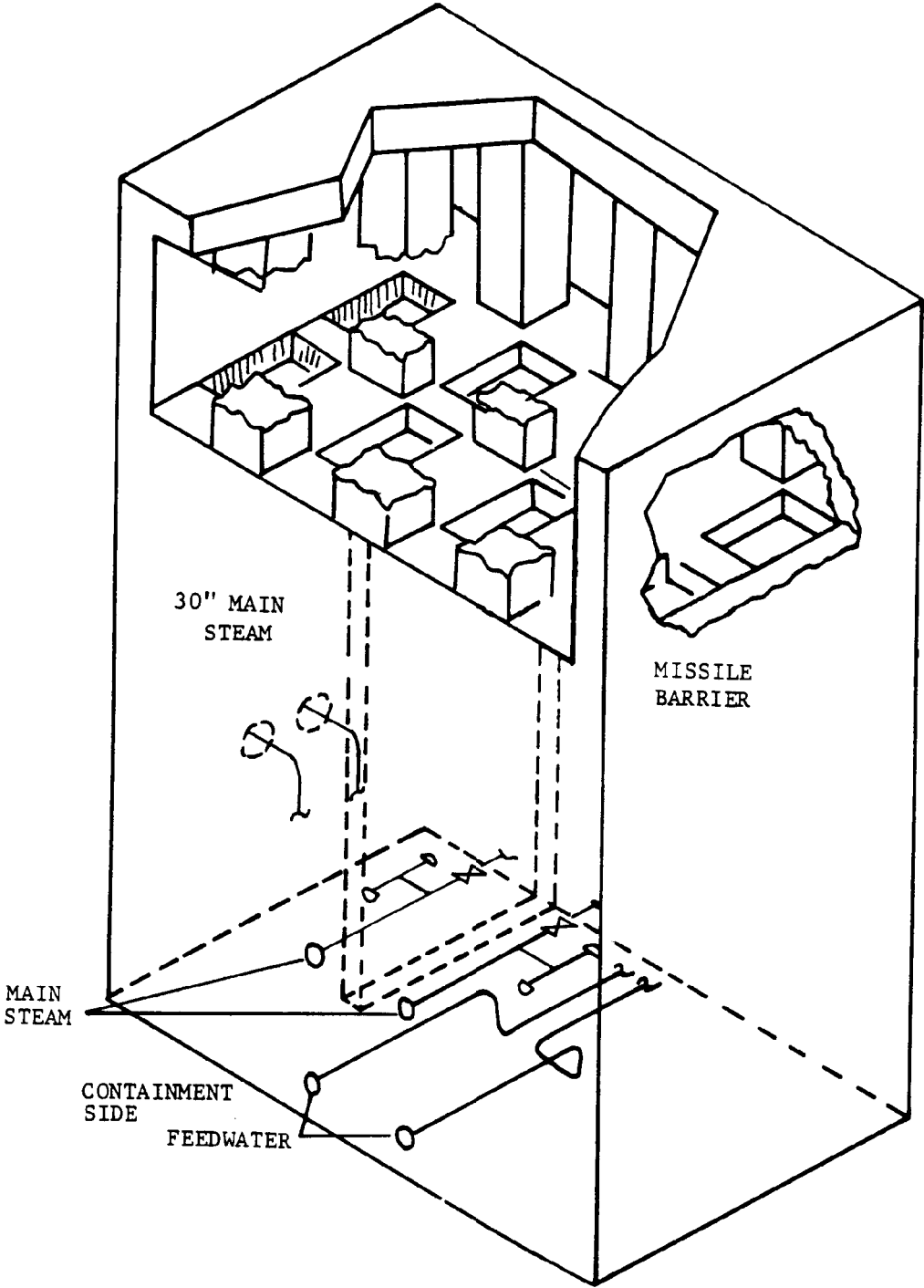
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AMERICAN ELECTRIC POWER
COOK NUCLEAR PLANT
NUCLEAR GENERATION GROUP
BRIDGMAN, MICHIGAN

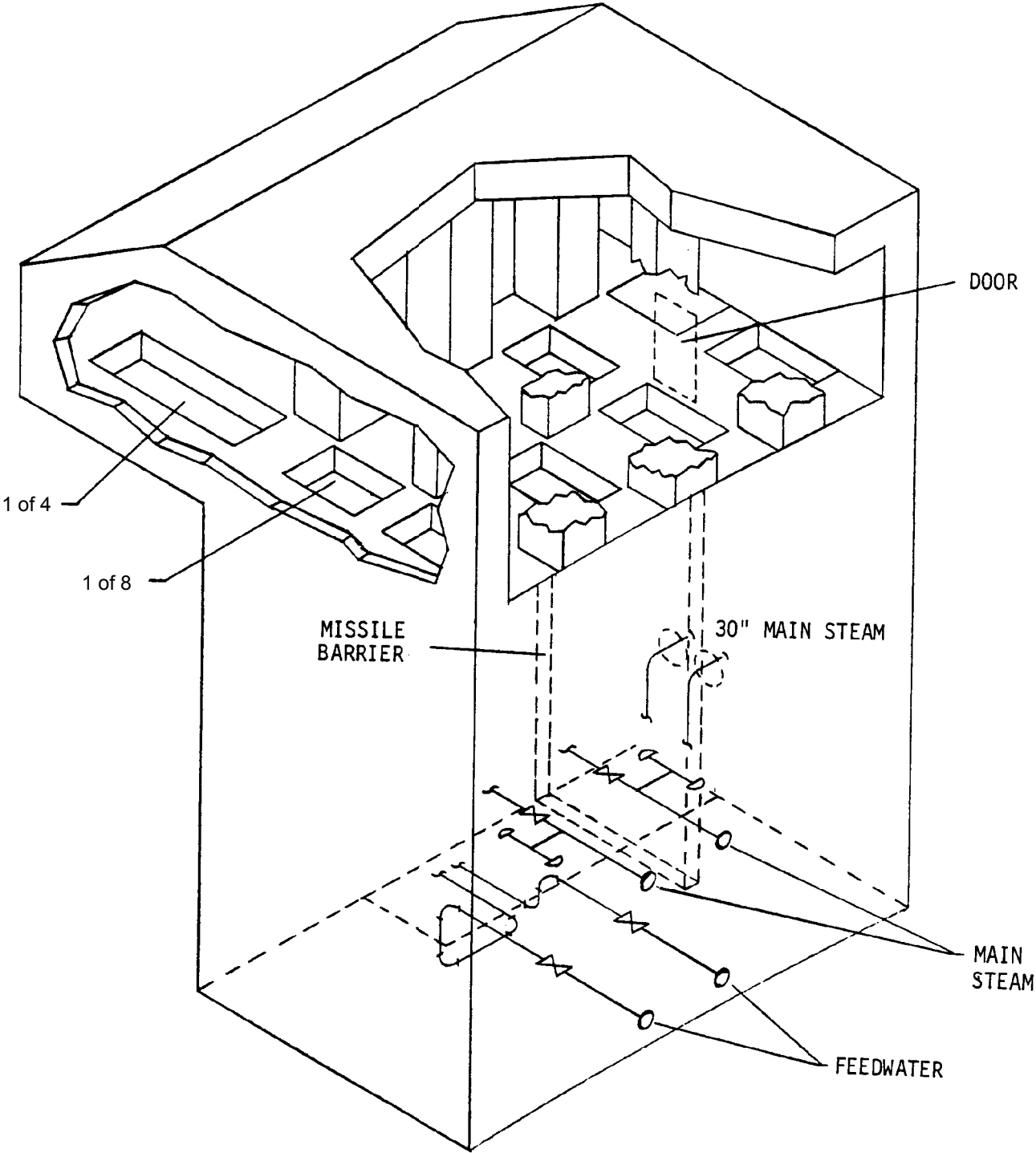
TITLE Yield Line Patterns for Panels with Three Edges Fixed and Fourth
Edge Free Subjected to a Concentrated Point Load at Interior

DWG. NO. FSAR FIG. 14.4.8-7

SH 1 of 1



16.6	REVISED PER 99-UFSAR-1345	UNIT 2	
REV. NO.	DESCRIPTION		
REVISIONS			
AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN	TITLE East Steam Enclosure		
	DWG. NO. FSAR FIG. 14.4.9-1		SH 1 of 1



16.6	REVISED PER 99-UFSAR-1345		UNIT 2
REV. NO.	DESCRIPTION		
REVISIONS			
AMERICAN ELECTRIC POWER COOK NUCLEAR PLANT NUCLEAR GENERATION GROUP BRIDGMAN, MICHIGAN	TITLE West Steam Enclosure		
	DWG. NO. FSAR FIG. 14.4.9-2		SH 1 of 1