

# REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8607240245      DOC. DATE: 86/07/18      NOTARIZED: YES      DOCKET #  
 FACIL: 50-410 Nine Mile Point Nuclear Station, Unit 2, Niagara Moha      05000410  
 AUTH. NAME      AUTHOR AFFILIATION  
 LEMPGES, T. E.      Niagara Mohawk Power Corp.  
 RECIP. NAME      RECIPIENT AFFILIATION  
 ADENSAM, E. G.      BWR Project Directorate 3

SUBJECT: <sup>see RDS</sup> Forwards revs to analyses results in FSAR Section 3.6,  
 "Protection Against Dynamic Effects Associated W/Postulated  
 Rupture of Piping," reflecting updated info re piping  
 stresses, jet impingement & pipe whip effects.

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On 12/14/2010, the FBI received a letter from the U.S. Attorney General, Eric Holder, regarding the FBI's handling of the 9/11 attacks. The letter stated that the FBI had failed to properly investigate the attacks and that the FBI had not properly protected the public from the attacks. The letter also stated that the FBI had not properly protected the privacy of the public and that the FBI had not properly protected the security of the public. The letter was signed by Eric Holder, U.S. Attorney General.

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NIAGARA MOHAWK POWER CORPORATION/300 ERIE BOULEVARD WEST, SYRACUSE, N.Y. 13202/TELEPHONE (315) 474-1511

July 18, 1986  
(NMP2L 0787)

Ms. Elinor G. Adensam, Director  
BWR Project Directorate No. 3  
U.S. Nuclear Regulatory Commission  
7920 Norfolk Avenue  
Washington, DC 20555

Dear Ms. Adensam:

Re: Nine Mile Point Unit 2  
Docket No. 50-410

Enclosed for your use and information are revisions to the analyses results provided in the Nine Mile Point Unit 2 Final Safety Analysis Report, Section 3.6, "Protection Against Dynamic Effects Associated With the Postulated Rupture of Piping."

These revisions reflect updated information with respect to piping stresses, jet impingement and pipe whip effects due to high energy line breaks. This information was obtained by actual plant walkdowns and reviews of data and drawings. Because of the extensive amount of detail provided in these calculations, we have deleted this information from the Final Safety Analysis Report (Amendment 26) and are providing it with this correspondence.

Very truly yours,

T. E. Lempges  
Vice President  
Nuclear Generation

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Enclosure  
xc: R. A. Gramm, NRC Resident Inspector  
Project File (2)

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

In the Matter of )  
Niagara Mohawk Power Corporation )  
(Nine Mile Point Unit 2) )

Docket No. 50-410

AFFIDAVIT

T. E. Lempges, being duly sworn, states that he is Vice President of Niagara Mohawk Power Corporation; that he is authorized on the part of said Corporation to sign and file with the Nuclear Regulatory Commission the documents attached hereto; and that all such documents are true and correct to the best of his knowledge, information and belief.

T. E. Lempges

Subscribed and sworn to before me, a Notary Public in and for the State of New York and County of Onondaga, this 18th day of July, 1986.

Jamie P. [Signature]  
Notary Public in and for  
Onondaga County, New York

My commission expires:

Notary Public in the State of New York  
Qualified in Onondaga County No. 478455  
My Commission Expires March 27, 1987

TABLE 3.6A-2

## SUMMARY OF STRESSES IN HIGH-ENERGY ASME SAFETY CLASS 1 PIPING

Main Steam System - Inside Containment - North Inner Loop

Break Point	Location			Maximum Stress Range		Cumulative Usage Factor	Pipe Break Stress Limit 2.4 S (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	Azimuth (deg)	r (ft-in)	Eq. 10 (psi)	Eq. 12 or 13 (psi)					
1	322-0 1/8	72	13-2 3/4	-	-	-	49651	TP	C	1.29
7	318-8 3/4	72	19-3	39434	21105	0.018	49651	IP (elbow)	C	1.30
33	293-5 7/8	13	23-1 3/4	51885	27183	0.0052	49651	IP (elbow)	C	1.31
41	256-6 5/8	7	25.0	-	-	-	49651	TP	C	1.32
										1.34
										1.35
										1.36
										1.37

KEY: IP = Intermediate point  
 TP = Terminal point  
 C = Circumferential break  
 L = Longitudinal break  
 \* = Integral attachment

NOTES: See Figure 3.6A-12 for break locations.

Stresses were calculated in accordance with Equations 10 and 12 or 13 of ASME Section III, subparagraphs NB-3653.6(a) and NB-3653.6(b), respectively. Cumulative usage factors were calculated in accordance with ASME Section III, subarticle NB-3650.



TABLE 3.6A-3

## SUMMARY OF STRESSES IN HIGH-ENERGY ASME SAFETY CLASS 1 PIPING

## Main Steam System - Inside Containment - North Outer Loop

Break Point	Location			Maximum Stress Range		Cumulative Usage Factor	Pipe Break Stress Limit 2.4 S (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	Azimuth (deg)	r (ft-in)	Eq. 10 (psi)	Eq. 12 or 13 (psi)					
20	322-0 5/16	108	13-2 7/16	-	-	-	49651	TP	C	2.9
28	299-9 1/2	108	19-3	36845	22340	0.0007	49651	IP (elbow)	C	2.10
72	293-9 1/8	72	23-5 5/8	53288	18057	0.0032	49651	IP (integral attach.)	C	2.11
115	256-4 15/16	25	28-8 1/26	-	-	-	49651	TP	C	2.12

KEY: IP = Intermediate point  
 TP = Terminal point  
 C = Circumferential break  
 L = Longitudinal break  
 \* = Integral attachment

NOTES: See Figure 3.6A-12 for break locations.

Stresses were calculated in accordance with Equations 10 and 12 or 13 of ASME Section III, subparagraphs NB-3653.6(a) and NB-3653.6(b), respectively. Cumulative usage factors were calculated in accordance with ASME Section III, subarticle NB-3650.





TABLE 3.6A-4

## SUMMARY OF STRESSES IN HIGH-ENERGY ASME SAFETY CLASS 1 PIPING

## Main Steam System - Inside Containment - South Inner Loop

Break Point	Location			Maximum Stress Range		Cumulative Usage Factor	Pipe Break Stress Limit 2.4 S (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	Azimuth (deg)	r (ft-in)	Eq. 10 (psi)	Eq. 12 or 13 (psi)					
1	321-11 78	288	13-1' 15/16	-	-	-	49651	TP	C	2.48
13	296-11 15/16	288	13-3 1/16	47613	26539	0.0027	49651	IP (elbow)	C	2.49
33	293-5 7/8	347	23-2 15/16	48465	26876	0.0025	49651	IP (elbow)	C	2.50
41	256-6 5/8	353.3	25-1 1/4	-	-	-	49651	TP	C	2.51
										2.53
										2.54
										2.55
										2.56

KEY: IP = Intermediate point  
 TP = Terminal point  
 C = Circumferential break  
 L = Longitudinal break  
 \* = Integral attachment

NOTES: See Figure 3.6A-13 for break locations.

Stresses were calculated in accordance with Equations 10 and 12 or 13 of ASME Section III, subparagraphs NB-3653.6(a) and NB-3653.6(b), respectively. Cumulative usage factors were calculated in accordance with ASME Section III, subarticle NB-3650.



TABLE 3.6A-5

## SUMMARY OF STRESSES IN HIGH-ENERGY ASME SAFETY CLASS 1 PIPING

Main Steam System - Inside Containment - South Outer Loop

Break Point	Location			Maximum Stress Range		Cumulative Usage Factor	Pipe Break Stress Limit 2.4 S (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	Azimuth (deg)	r (ft-in)	Eq. 10 (psi)	Eq. 12 or 13 (psi)					
20	322-0 1/4	252	13-1 3/4	-	-	-	-	TP	C	3.28
28	299-9 1/2	253	19-3	40236	25069	0.0010	49651	IP (elbow)	C	3.29
66	293-9 1/8	281	23-10	62463	17926	0.0026	49651	IP (integral attach.)	C	3.30
115	256-4 13/16	335	28-8 1/2	-	-	-	-	TP	C	3.31
										3.33
										3.34
										3.35
										3.36
										3.37

KEY: IP = Intermediate point  
 TP = Terminal point  
 C = Circumferential break  
 L = Longitudinal break  
 \* = Integral attachment

NOTES: See Figure 3.6A-13 for break locations.

Stresses were calculated in accordance with Equations 10 and 12 or 13 of ASME Section III, subparagraphs NB-3653.6(a) and NB-3653.6(b), respectively. Cumulative usage factors were calculated in accordance with ASME Section III, subarticle NB-3650.



TABLE 3.6A-6

## SUMMARY OF STRESSES IN HIGH ENERGY NON-ASME SAFETY CLASS 4 PIPING

## Main Steam System - Outside Containment - North Outer Loop

Break Point	Location			Stress		Total Additive Stress (psi)	Pipe Break Stress Limit 0.8(1.2S + S ) (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	X (ft-in)	Z (ft-in)	Eq. 9 (psi)	Eq. 10 (psi)					
131	250-4 5/8	-85-4 7/16	-12-9 7/8	-	-	-	37800	TP	C	1.26
133A	262-0 7/16	-98-6 7/8	-12-2	26317	5575	31892	37800	IP (Int. Att.)	C	1.27
136	294-11 5/16	-113-7 1/2	-10-3	-	-	-	37800	TP	C	1.28
										1.29
										1.31
										1.32
										1.33

KEY: IP = Intermediate point  
 TP = Terminal point  
 C = Circumferential break  
 L = Longitudinal break

NOTES: See Figure 3.6A-14 for break locations.

Stresses were calculated in accordance with Equations 9 and 10 of ASME Section III, paragraph NC-3652.



TABLE 3.6A-7

## SUMMARY OF STRESSES IN HIGH ENERGY NON-ASME SAFETY CLASS 4 PIPING

## Main Steam System - Outside Containment - North Inner Loop

Break Point	Location			Stress		Total Additive Stress (psi)	Pipe Break Stress Limit 0.8(1.2S + S ) (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	X (ft-in)	Z (ft-in)	Eq. 9 (psi)	Eq. 10 (psi)					
121	250-4 5/8	-81-10	-2-11	-	-	-	37800	TP	C	1.25
123A	277-10 7/32	-98-9 9/16	-3-4 3/4	22898	9002	31900	37800	IP (Int. Att.)	C	1.26
126	294-11 5/16	-113-7 1/2	-3-8 7/16	-	-	-	37800	TP	C	1.27
										1.28
										1.30
										1.31
										1.32

KEY: IP = Intermediate point  
 TP = Terminal point  
 C = Circumferential break  
 L = Longitudinal break

NOTES: See Figure 3.6A-14 for break locations.

Stresses were calculated in accordance with Equations 9 and 10 of ASME Section III, paragraph NC-3652.





TABLE 3.6A-8

## SUMMARY OF STRESSES IN HIGH ENERGY NON-ASME SAFETY CLASS 4 PIPING

## Main Steam System - Outside Containment - South Outer Loop

Break Point	Location			Stress		Total Additive Stress (psi)	Pipe Break Stress Limit 0.8(1.2S + S ) (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	X (ft-in)	Z (ft-in)	Eq. 9 (psi)	Eq. 10 (psi)					
111	250-1 15/16	-85-7	12-3	-	-	-	37800	TP	C	1.26
113A	261-10 5/16	-98-9 5/8	11-5 5/8	26317	5575	31892	37800	IP (Int. Att.)	C	1.27
116	294-11 5/16	-113-7 1/2	9-3 1/2	-	-	-	37800	TP	C	1.28
										1.29
										1.31
										1.32
										1.33

KEY: IP = Intermediate point  
 TP = Terminal point  
 C = Circumferential break  
 L = Longitudinal break

NOTES: See Figure 3.6A-14 for break locations.

Stresses were calculated in accordance with Equations 9 and 10 of ASME Section III, paragraph NC-3652.



TABLE 3.6A-9

## SUMMARY OF STRESSES IN HIGH ENERGY NON-ASME SAFETY CLASS 4 PIPING

## Main Steam System - Outside Containment - South Inner Loop

Break Point	Location			Stress		Total Additive Stress (psi)	Pipe Break Stress Limit 0.8(1.2S + S ) (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	X (ft-in)	Z (ft-in)	Eq. 9 (psi)	Eq. 10 (psi)					
101	250-4	-85-8 5/16	2-6 1/4	-	-	-	37800	TP	C	1.25
103A	277-9 1/16	-98-10	2-8 1/4	22898	9002	31900	37800	IP (Int. Att.)	C	1.26
106	294-11 5/16	-113-7 1/2	2-9 1/2	-	-	-	37800	TP	C	1.27
										1.28
										1.30
										1.31
										1.32

KEY: IP = Intermediate point  
 TP = Terminal point  
 C = Circumferential break  
 L = Longitudinal break

NOTES: See Figure 3.6A-14 for break locations.

Stresses were calculated in accordance with Equations 9 and 10 of ASME Section III, paragraph NC-3652.



TABLE 3.6A-10

## SUMMARY OF STRESSES IN HIGH-ENERGY ASME SAFETY CLASS 1 PIPING

## Main Steam Vent Line

Break Point	Location			Maximum Stress Range		Cumulative Usage Factor	Pipe Break Stress Limit 2.4 S (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	Azimuth (deg)	Radius (ft-in)	Eq. 10 (psi)	Eq. 12 or 13 (psi)					
1	341-10 3/16	0	0-0	-	-	-	-	TP	C	1.28
3	342-9	90	0-0	34,164	14,993	.0002	43,440	IP	C	1.29
7	342-9	85	2-0	34,205	17,357	.0002	43,440	IP	C	1.30
20	330-3 5/8	0	15-6 9/16	-	-	-	-	TP	C	1.35
21	330-3 5/8	0	15-6 9/16	-	-	-	-	TP	C	1.36
29	318-3/8	58	17-4 1/4	27,172	16,337	.0001	43,440	IP	C	1.37
32	318-4	27	15-1/2	35,937	20,248	.0099	43,440	IP	C	1.38
35	314-10	69	18-9 3/8	-	-	-	-	TP	C	1.39
37	318-4	27	15-1	35,937	20,248	.0099	43,440	IP	C	1.40
40	307-0	14	17-1/2	-	-	-	-	TP	C	1.41
										1.42

KEY: IP = Intermediate point  
 TP = Terminal point  
 C = Circumferential break  
 L = Longitudinal break

NOTES: See Figure 3.6A-15 for break locations.

Stresses are calculated in accordance with Equations 10 and 12 or 13 of ASME Section III, subparagraphs NB-3653.6(a) and NB-3653.6(b), respectively. Cumulative usage factors are calculated in accordance with ASME Section III, subarticle NB-3650.

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TABLE 3.6A-11

## SUMMARY OF STRESSES IN HIGH ENERGY ASME SAFETY CLASS 1 PIPING

Main Steam System - SRV (Inside Containment)

Break Point	Location			Maximum Stress Range		Cumulative Usage Factor	Pipe Break Stress Limit 2.4 S (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	Azimuth (deg)	r (ft-in)	Eq. 10 (psi)	Eq. 12 or 13 (psi)					
1A	293-10 7/8	93	23-6 3/8	---	---	---	---	TP	C	1.20
1B	296-9	93	23-6 3/8	---	---	---	---	TP	C	1.21
2A	293-10 7/8	87	23-10 1/8	---	---	---	---	TP	C	1.23
2B	296-9	87	23-10 1/8	---	---	---	---	TP	C	1.24
3A	293-10 7/8	81.5	24-1 5/16	---	---	---	---	TP	C	1.26
3B	296-9	81.5	24-1 5/16	---	---	---	---	TP	C	1.27
4A	293-10 7/8	75.6	24-4 3/8	---	---	---	---	TP	C	1.29
4B	296-9	75.6	24-4 3/8	---	---	---	---	TP	C	1.30
5A	293-10 7/8	70	24-6 13/16	---	---	---	---	TP	C	1.32
5B	296-8 1/2	70	24-6 13/16	---	---	---	---	TP	C	1.33
6A	293-6 1/4	37.5	19-9 1/8	---	---	---	---	TP	C	1.35
6B	296-6 1/8	37.5	19-9 1/8	---	---	---	---	TP	C	1.36
7A	293-6 1/4	29	20-3 3/4	---	---	---	---	TP	C	1.38
7B	296-5 3/4	29	20-3 3/4	---	---	---	---	TP	C	1.39
8A	293-6 1/4	22	14-2	---	---	---	---	TP	C	1.41
8B	296-5 7/16	22	14-2	---	---	---	---	TP	C	1.42
9A	293-6 1/4	15	11-4 3/4	---	---	---	---	TP	C	1.44
9B	296-5 1/8	15	11-4 3/4	---	---	---	---	TP	C	1.45
10A	293-6 1/4	322.5	19-9 1/8	---	---	---	---	TP	C	1.47
10B	296-6 1/8	322.5	19-9 1/8	---	---	---	---	TP	C	1.48
11A	293-6 1/4	330.5	20-3 3/4	---	---	---	---	TP	C	1.50
11B	296-5 3/4	330.5	20-3 3/4	---	---	---	---	TP	C	1.51
12A	293-6 1/4	338	14-2	---	---	---	---	TP	C	1.53
12B	296-5 7/16	338	14-2	---	---	---	---	TP	C	1.54
13A	293-6 1/4	344.5	11-4 3/4	---	---	---	---	TP	C	1.56
13B	296-5 1/8	344.5	11-4 3/4	---	---	---	---	TP	C	1.57
14A	293-10 7/8	266.5	23-6 3/8	---	---	---	---	TP	C	2.1

1 of 2





TABLE 3.6A-11

**SUMMARY OF STRESSES IN HIGH ENERGY ASME SAFETY CLASS 1 PIPING**  
**Main Steam System - SRV (Inside Containment)**

Break Point	Location			Maximum Stress Range		Cumulative Usage Factor	Pipe Break Stress Limit 2.4 S (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	Azimuth (deg)	r (ft-in)	Eq. 10 (psi)	Eq. 12 or 13 (psi)					
14B	296-8 7/8	266.5	23-6 3/8	---	---	---	---	TP	C	2.2
15A	293-10 7/8	273	23-10 1/8	---	---	---	---	TP	C	2.4
15B	296-8 1/2	273	23-10 1/8	---	---	---	---	TP	C	2.5
16A	293-10 7/8	278.5	24-1 5/16	---	---	---	---	TP	C	2.7
16B	296-8 3/16	278.5	24-1 5/16	---	---	---	---	TP	C	2.8
17A	293-8 15/16	284	24-4 3/8	---	---	---	---	TP	C	2.10
17B	296-7 7/8	284	24-4 3/8	---	---	---	---	TP	C	2.11
18A	293-8 15/16	290	24-6 13/16	---	---	---	---	TP	C	2.13
18B	296-7 9/16	290	24-6 13/16	---	---	---	---	TP	C	2.14

KEY: IP = Intermediate point  
 TP = Terminal point  
 C = Circumferential break  
 L = Longitudinal break

NOTES: See Figures 3.6A-16 and 17 for break locations.

2.16

2.19

2.20

2.21

2.22

2.24



TABLE 3.6A-12

## SUMMARY OF STRESSES IN HIGH ENERGY NON-ASME SAFETY CLASS 4 PIPING

## MAIN STEAM DRAINS - INSIDE CONTAINMENT

Break Point	Location			Maximum Stress Range		Cumulative Usage Factor	Pipe Break Stress Limit 2.4 Sm(psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	Azimuth (deg)	r (ft-in)	Eq. 10 (psi)	Eq. 12 or 13 (psi)					
1	250-3 7/8	337	32-5 3/8	-	-	-	43363	TP	C	1.36
13	248-11 3/16	17	24-5 1/16	80529	34134	0.1200	43363	IP	C	1.38
14	248-10 9/16	19	24-8 11/16	82920	35954	0.1415	43363	IP	C	1.40
15	248-10 1/2	21	24-7 5/16	-	-	-	43363	TP	C	2.3
16	250-3 5/8	355	33-0 1/2	-	-	-	43363	TP	C	2.5
23	250-3 5/8	5	33-0 5/8	-	-	-	43363	TP	C	2.7
30	250-3 7/8	23	32-5 3/4	-	-	-	43363	TP	C	2.9
40	263-1 5/8	185	33-4 1/8	-	-	-	43363	TP	C	2.11
45	261-9 3/4	182	31-11	-	-	-	43363	TP	C	2.13

KEY: IP = Intermediate point  
 TP = Terminal point  
 C = Circumferential break  
 L = Longitudinal break

NOTES: See Figure 3.6A-18 for break locations.

Stresses were calculated in accordance with Equations 10 and 12 or 13 of ASME Section III, subparagraphs NB-3653.6(a) and NB-3653.6(b), respectively. Cumulative usage factors were calculated in accordance with ASME Section III, subarticle NB-3650.



TABLE 3.6A-12 (Cont)

Break Point	Location			Stress		Total Additive Stress (psi)	Pipe Break Stress Limit 0.8 (1.2Sh+Sa) (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	Azimuth (deg)	r (ft-in)	Eq. 9 (psi)	Eq. 10 (psi)					
50*	248-11 5/16	8	93-2 3/4	-	-	-	32400	TP	C	2.27
53*	246-7 3/16	8	93-2 3/4	-	-	-	32400	IP	C,L	2.29
54	246-1 11/16	8	93-2 3/4	-	-	-	32400	TP	C	2.31
57	245-8 1/4	7	93-0 13/16	10402	21240	31642	32400	IP	C	2.33
100*	248-11 3/4	2	92-5 1/16	-	-	-	32400	TP	C	2.35
103*	246-7 5/8	2	92-5 1/16	-	-	-	32400	IP	C,L	2.37
104	246-2 1/8	2	92-5 1/16	-	-	-	32400	TP	C	2.50
107	245-8 1/4	3	92-5 5/8	9985	20810	30796	32400	IP	C	2.52
150*	248-11 3/4	358	92-5 1/16	-	-	-	32400	TP	C	2.54
153*	246-7 5/8	358	92-5 1/16	-	-	-	32400	IP	C,L	2.56
154	246-2 1/8	358	92-5 1/16	-	-	-	32400	TP	C	2.58
157	245-8 1/4	357	92-5 5/8	10475	22932	33407	32400	IP	C	3.2

KEY: IP = Intermediate point  
 TP = Terminal point  
 C = Circumferential break  
 L = Longitudinal break

NOTES: See Figure-3.6A-18 for break locations.

Stresses were calculated in accordance with Equations 9 and 10 of ASME Section III, paragraph MC-3652, except the breaks marked \*, since stresses are not available. These breaks are postulated at welded junctions to comply with the requirements of Regulatory Guide 1.46.



TABLE 3.6A-12 (Cont)

Break Point	Location			Stress		Total Additive Stress (psi)	Pipe Break Stress Limit 0.8 (1.2Sh+Sa) (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	Azimuth (deg)	r (ft-in)	Eq. 9 (psi)	Eq. 10 (psi)					
200*	248-11 5/16	352	93-2 3/4	-	-	-	32400	TP	C	3.15
203*	246-7 3/16	352	93-2 3/4	-	-	-	32400	IP	C,L	3.17
204	246-1 11/16	352	93-2 3/4	-	-	-	32400	TP	C	3.19
207	245-8 1/4	353	93-0 13/16	9916	23939	33855	32400	IP	C	3.21
306A	241-6 15/16	358	101-5	-	-	-	32400	TP	C	3.23
313	241-2	349	70-6	-	-	-	32400	TP	C	3.25

KEY: IP = Intermediate point  
 TP = Terminal point  
 C = Circumferential break  
 L = Longitudinal break

NOTES: See Figure 3.6A-18 for break locations.

Stresses were calculated in accordance with Equations 9 and 10 of ASME Section III, paragraph MC-3652, except the breaks marked \*, since stresses are not available. These breaks are postulated at welded junctions to comply with the requirements of Regulatory Guide 1.46.

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TABLE 3.6A-13

## SUMMARY OF STRESSES IN HIGH-ENERGY ASME SAFETY CLASS 1 PIPING

## Feedwater System - Inside Containment - South Loop

Break Point	Location			Maximum Stress Range		Cumulative Usage Factor	Pipe Break Stress Limit 2.4 S (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	Azimuth (deg)	r (ft-in)	Eq. 10 (psi)	Eq. 12 or 13 (psi)					
1	309-1 1/8	210	13-5 5/16	-	-	-	43,440	TP	C	1.29
5	309-1 1/8	270	13-5 5/8	-	-	-	43,440	TP	C	1.30
11	309-1 1/8	330	13-5 7/8	-	-	-	43,440	TP	C	1.31
14B	308-0 5/8	309	18-4	64,552	17,901	.0881	43,440	IP*	C	1.32
18	292-8	340	32-0 7/8	79,813	37,893	.1996	43,440	IP	C, L	1.34
20	266-3 3/4	345.5	31-2 1/2	-	-	-	-	TP	C	1.35
										1.36
										1.37
										1.38
										1.39

KEY: IP = Intermediate point  
 TP = Terminal point  
 C = Circumferential break  
 L = Longitudinal break  
 \* = Integral attachment

NOTES: See Figure 3.6A-20 for break locations.

Stresses were calculated in accordance with Equations 10 and 12 or 13 of ASME Section III, subparagraphs NB-3653.6(a) and NB-3653.6(b), respectively. Cumulative usage factors were calculated in accordance with ASME Section III, subarticle NB-3650.

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TABLE 3.6A-14

## SUMMARY OF STRESSES IN HIGH-ENERGY ASME SAFETY CLASS 1 PIPING

## Feedwater System - Inside Containment - North Loop

Break Point	Location			Maximum Stress Range		Cumulative Usage Factor	Pipe Break Stress Limit 2,4 S (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	Azimuth (deg)	r (ft-in)	Eq. 10 (psi)	Eq. 12 or 13 (psi)					
21	309-1 1/8	150	13-5 7/16	-	-	-	43,440	TP	C	2.11
25	309-1 1/8	90	13-6 3/16	-	-	-	-	TP	C	2.12
36	292-8	19	32-0 7/8	86,520	41,131	.2955	43,440	IP	C,L	2.13
30	309-1 1/8	30	13-6 5/16	-	-	-	43,440	TP	C	2.14
33B	307-7 5/16	45.5	18-1	64,552	17,901*	.0881	43,440	IP*	C	2.16
38	266-3 3/4	14.5	31-2 1/2	-	-	-	43,440	TP	C	2.17
										2.18
										2.19
										2.20
										2.21

KEY: IP = Intermediate point  
 TP = Terminal point  
 C = Circumferential break  
 L = Longitudinal break  
 \* = Integral attachment

NOTES: See Figure 3.6A-19 for break locations.

Stresses were calculated in accordance with Equations 10 and 12 or 13 of ASME Section III, subparagraphs NB-3653.6(a) and NB-3653.6(b), respectively. Cumulative usage factors were calculated in accordance with ASME Section III, subarticle NB-3650.

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TABLE 3.6A-15

## SUMMARY OF STRESSES IN HIGH-ENERGY NON-ASME SAFETY CLASS 4 PIPING

## Feedwater System - Outside Containment - North Loop

Break Point	Location			Stress		Total Additive Stress (psi)	Pipe Break Stress Limit 0.8(1.2 S + S ) (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	X (ft-in)	Z (ft-in)	Eq. 9 (psi)	Eq. 10 (psi)					
21	257-0	-83-5	-7-9	-	-	-	32400	TP	C	1.27
23	260-0	-118-0	-7-9	7950	3136	11086	32400	IP	C	1.28
26	269-10	-118-0	14-3 7/8	8195	5707	13902	32400	IP	C	1.29
32	269-10	-124-0	-19- 11 1/8	-	-	-	32400	TP	C	1.30
										1.32
										1.33
										1.34
										1.35
										1.36

KEY: IP = Intermediate point  
 TP = Terminal point  
 C = Circumferential break  
 L = Longitudinal break

NOTES: See Figure 3.6A-21 for break locations.

Stresses were calculated in accordance with Equations 9 and 10 of ASME Section III, paragraph NC-3652.

1 of 1



TABLE 3.6A-16

## SUMMARY OF STRESSES IN HIGH-ENERGY NON-ASME SAFETY CLASS 4 PIPING

## Feedwater System - Outside Containment - South Loop

Break Point	Location			Stress		Total Additive Stress (psi)	Pipe Break Stress Limit 0.8(1.2 S + S ) (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	X (ft-in)	Z (ft-in)	Eq. 9 (psi)	Eq. 10 (psi)					
1	257-0	-83- 5 3/16	7-9.	-	-	-	32400	TP	C	2.6 2.7 2.8 2.9
6	266-6	-118- 0 1/4	29-8 1/4	8952	4715	13667	32400	IP (elbow)	C	2.11 2.12 2.13 2.14
8	268- 8 11/16	-124- 8 9/16	32-8 1/4	8434	5716	14150	32400	IP (elbow)	C	2.15 2.16 2.17 2.18
12	269-8	-127- 6 3/4	15-0 11/16	-	-	-	32400	TP	C	

KEY: IP = Intermediate point  
 TP = Terminal point  
 C = Circumferential break  
 L = Longitudinal break

NOTES: See Figure 3.6A-21 for break locations.

Stresses were calculated in accordance with Equations 9 and 10 of ASME Section III, paragraph NC-3652.

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TABLE 3.6A-17

## SUMMARY OF STRESSES IN HIGH ENERGY ASME SAFETY CLASS 1 PIPING

## Reactor Core Isolation-Cooling

## Inside Containment

Break Point	Location			Maximum Stress Range		Cumulative Usage Factor	Pipe Break Stress Limit 2.4 S (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	Azimuth (deg)	r (ft)	Eq. 10 (psi)	Eq. 12 or 13 (psi)					
1	302-2	111	19.7					TP	C	1.37
3	302-0 5/16	137.5	26.02	58699	41847	0.0371	43363	IP	C	1.39
9	263-8 1/4	196	29.38	69689	49820	0.0559	52659	IP	C	1.41
12	263-7 5/16	185	31.1					TP	C	1.43

KEY: IP = Intermediate point  
 TP = Terminal point  
 C = Circumferential break  
 L = Longitudinal break

NOTES: See Figures 3.6A-22 and 3.6A-23 for break locations.

Stresses were calculated in accordance with Equations 10 and 12 or 13 of ASME Section III, subparagraphs NB-3653.6 (a) and NB-3653.6 (b), respectively. Cumulative usage factors were calculated in accordance with ASME Section III, subarticle NB-3650.

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TABLE 3.6A-17

**SUMMARY OF STRESSES IN HIGH-ENERGY ASME SAFETY CLASS 1 PIPING**  
**Reactor Core Isolation Cooling Reactor Head Spray**

Break Point	Location		Radius (ft-in)	Maximum Stress Range		Cumulative Usage Factor	Pipe Break Stress Limit 2.4 S (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	Azimuth (deg)		Eq. 10 (psi)	Eq. 12 or 13 (psi)					
1	341-8	360	4-0	-	-	-	-	TP	C	1.35
2	342-1 1/2	360	4-0	98,151	30,273	0.2094	43,440	IP	C,L	1.36
4	342-10 1/2	349	4-10 3/4	92,647	28,717	0.1673	43,440	IP	C,L	1.37
5	342-10 1/2	345	5-3	90,152	29,491	0.1588	43,440	IP	C,L	1.38
6	342-10 1/2	340	6-1 7/8	87,442	33,089	0.1117	43,440	IP	C,L	1.39
11	338-9 1/16	330	9-3 3/4	-	-	-	-	TP	C	1.40

KEY: IP = Intermediate point  
 TP = Terminal point  
 C = Circumferential break  
 L = Longitudinal break

NOTES: See Figure 3.6A-23 for break locations.

Stresses are calculated in accordance with Equations 10 and 12 or 13 of ASME Section III, subparagraphs NB-3653.6(a) and NB-3653.6(b), respectively. Cumulative usage factors are calculated in accordance with ASME Section III, subarticle NB-3650.

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TABLE 3.6A-18

SUMMARY OF STRESSES IN HIGH-ENERGY ASME SAFETY CLASS 2 PIPING  
Reactor Core Isolation Cooling and RHS - Outside Containment

Break Point	Location			Stress		Total Additive Stress (psi)	Pipe Break Stress Limit 0.8(1.2 S + S ) (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	X (ft-in)	Z (ft-in)	Eq. 9 (psi)	Eq. 10 (psi)					
10	257-2 7/8	54-3 3/4	4-9.	-	-	-	32400	TP (elbow)	C	1.27
12	255-11	60-6 1/8	9-0	6373	6561	12934	32400	IP (elbow)	C	1.28
17	240-9 1/4	55-0 3/8	9-8 7/16	7741	8548	16289	32400	IP (elbow)	C	1.29
48	234-0	51-	26-5	-	-	-	32400	TP (valve)	C	1.30
		10 15/16								1.32
60	233-6 1/2	47-11 3/8	-36-3 7/8	-	-	-	32400	TP (valve)	C	1.33
72	234-0	55-4 1/2	7-8 5/8	-	-	-	32400	TP (tee)	C	1.34
27B	191-7 1/2	55-	-2-6	13996	12367	26363	32400	IP (int attach)	C	1.35
		2 11/16								1.36
63A	190-8 7/8	51-	-3-	15668	11406	27074	32400	IP (int attach)	C	1.37
		10 3/16	11 15/16							1.38
68	187-11 1/8	51-	-8-	-	-	-	32400	TP (valve)	C	1.39
		10 3/16	5 15/16							1.40
										1.41
										1.42
										1.43
										1.44

KEY: IP = Intermediate point  
TP = Terminal point  
C = Circumferential break  
L = Longitudinal break

NOTES: See Figure 3.6A-24 for break locations.

Stresses were calculated in accordance with Equations 9 and 10 of ASME Section III, paragraph NC-3652.



TABLE 3.6A-19

**SUMMARY OF STRESSES IN HIGH ENERGY ASME SAFETY CLASS 1 PIPING**  
**High-Pressure Core Spray - Inside Containment**

Break Point	Location		r (ft-in)	Maximum Stress Range		Cumulative Usage Factor	Pipe Break Stress Limit 2.4 S (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	Azimuth (deg)		Eq. 10 (psi)	Eq. 12 or 13 (psi)					
1	307-11 1/8	240	13-6 1/2	-	-	-	43440	TP	C	1.36
3A	307-11 1/8	240	17-0 1/2	90393	40642	0.312	43440	IP(Integral Att.)	C,L	1.37
6	307-11 1/8	236.5	19-3 3/4	108390	36899	0.7002	43440	IP	C,L	1.38
7	307-11 1/8	231	21-5 1/4	90901	34877	0.2279	43440	IP	C,L	1.39
10	307-11 1/8	217.5	27-10 7/8	-	-	-	43440	TP	C	1.40

KEY: IP = Intermediate point  
 TP = Terminal point  
 C = Circumferential break  
 L = Longitudinal break

NOTES: See Figure 3.6A-25 for break locations.

Stresses were calculated in accordance with Equations 10 and 12 or 13 of ASME Section III, subparagraphs NB-3653.6 (a) and NB-3653.6 (b), respectively. Cumulative usage factors were calculated in accordance with ASME Section III, subarticle NB-3650.

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TABLE 3.6A-20

**SUMMARY OF STRESSES IN HIGH ENERGY ASME SAFETY CLASS 1 PIPING**  
**Low-Pressure Core Spray - Inside Containment**

Break Point	Location			Maximum Stress Range		Cumulative Usage Factor	Pipe Break Stress Limit 2.4 S (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	Azimuth (deg)	r (ft-in)	Eq. 10 (psi)	Eq. 12 or 13 (psi)					
1	307-11 1/4	120	13-6 15/16	-	-	-	42480	TP	C	1.34
5	307-11 1/8	120	22-9 1/2	88214	41958	0.0555	42480	IP	C	1.35
8	307-11 1/8	130	27-2 1/8	-	-	-	42480	TP	C	1.36

KEY: IP = Intermediate point  
 TP = Terminal point  
 C = Circumferential break  
 L = Longitudinal break

NOTES: See Figure 3.6A-26 for break locations.

Stresses were calculated in accordance with Equations 10 and 12 or 13 of ASME Section III, subparagraphs NB-3653.6 (a) and NB-3653.6 (b), respectively. Cumulative usage factors were calculated in accordance with ASME Section III, subarticle NB-3650.

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TABLE 3.6A-21

**SUMMARY OF STRESSES IN HIGH ENERGY ASME SAFETY CLASS 1 PIPING**  
**Residual Heat Removal System - Shutdown Mode - Inside Containment**

Break Point	Elevation (ft-in)	Location		Maximum Stress Range		Cumulative Usage Factor	Pipe Break Stress Limit 2.4 S (psi)	Description of Break Points	Break Type	
		Azimuth (deg)	r (ft-in)	Eq. 10 (psi)	Eq. 12 or 13 (psi)					
1	266-10 7/8	270	20-9 1/4	-	-	-	-	TP	C	1.36
5	262-6	270	22-10	64927	38088	0.0646	42,000	IP (valve)	C	1.37
8	255-1	270	26-7	-	-	-	42,000	TP	C	1.38
10	271-1 7/8	182	21-7 15/16	-	-	-	-	TP	C	1.39
18	257-6	182	24-3 1/2	63007	28392	0.0175	42,000	IP (elbow)	C	1.40
20	256-0	174	24-6	-	-	-	42,000	TP	C	1.41
30	266-10 7/8	90	20-9 1/4	-	-	-	-	TP	C	1.42
37	261-10	90	22-10	61454	36362	0.0580	42,000	IP (valve)	C	1.43
42	255-1	90	26-7	-	-	-	42,000	TP	C	1.44

KEY: IP = Intermediate point  
 TP = Terminal point  
 C = Circumferential break  
 L = Longitudinal break

NOTES: See Figure 3.6A-27 for break locations.

Stresses were calculated in accordance with Equations 10 and 12 or 13 of ASME Section III, subparagraphs NB-3653.1 and NB-3653.6 (a) or NB-3653.6 (b), respectively. Cumulative usage factors were calculated in accordance with ASME Section III, subarticle NB-3650.

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TABLE 3.6A-22

**SUMMARY OF STRESSES IN HIGH ENERGY ASME SAFETY CLASS 1 PIPING**  
**Residual Heat Removal System (LPCI Mode) - Inside Containment**

Break Point	Location			Maximum Stress Range		Cumulative Usage Factor	Pipe Break Stress Limit 2.4 S (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	Azimuth (deg)	r (ft)	Eq. 10 (psi)	Eq. 12 or 13 (psi)					
1	299-0 3/8	45	13,375	-	-	-	43,440	TP	C	1.28
7	299-0 3/8	46	17.75	35,580	22,638	0.0039	43,440	IP (elbow)	C	1.29
13	311-0	51	19.87	76,085	34,510	0.0207	43,440	IP (HCV line)	C	1.30
19	316-9	57	20.93	77,906	32,954	0.0239	43,440	TP	C	1.31
33	299-0 3/8	135	13.375	-	-	-	42,480	TP	C	1.33
35	299-0 3/8	315	13.375	-	-	-	43,440	TP	C	1.34
39	299-0 3/8	314	17.25	37,787	21,670	0.0014	43,440	IP (elbow)	C	1.35
47	310-2	306	20.72	72,524	32,673	0.0154	43,440	TP (HCV line)	C	1.36
53	315-6	312	21.2	-	-	-	43,440	TP	C	1.37
55	311-8	147	18.6	79,653	40,390	0.0379	42,480	IP (valve)	C	1.38
56	311-8	178	17.25	51,142	31,412	0.003	42,480	IP (elbow)	C	1.39
60	293-2 7/8	208	20.87	-	-	-	42,480	TP (valve)	C	1.40
										1.41
										1.42
										1.43
										1.44

KEY: IP = Intermediate point  
 TP = Terminal point  
 C = Circumferential break  
 L = Longitudinal break

NOTES: See Figure 3.6A-28 for break locations.  
 Stresses are calculated in accordance with Equations 10 and 12 or 13 of ASME Section III, subparagraphs NB-3653.6 (a) and NB-3653.6 (b), respectively. Cumulative usage factors were calculated in accordance with ASME Section III, subarticle NB-3650.

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Nine Mile Point Unit 2 FSAR

TABLE 3.6A-23

SUMMARY OF STRESSES IN HIGH ENERGY ASME SAFETY CLASS 1 PIPING  
Reactor Recirculation Piping System (RCS)

See Section 3.6B





TABLE 3.6A-24

**SUMMARY OF STRESSES IN HIGH-ENERGY ASME SAFETY CLASS 1 PIPING**  
**Reactor Water Cleanup System - Inside Containment**

Break Point	Location		Radius (ft)	Maximum Stress Range		Cumulative Usage Factor	Pipe Break Stress Limit 2.4 S (psi)	Description of Break Points	Break Type	
	Elevation (ft-in.)	Azimuth (deg)		Eq. 10 (psi)	Eq. 12 or 13 (psi)					
1	266'-0"	0°	0.0'	-	-	-	-	TP	C	1.31
228	242'-0"	191°	27.5'	-	-	-	-	TP	C	1.32
23	245'-3"	186°	28.2'	68,852	49,381	.1014	42,480	IP	C,L	1.33
243	245'-3"	185°	28.8'	68,852	49,381	.1014	42,480	IP	C,L	1.34
244	245'-3"	185°	27.7'	68,852	49,381	.1014	42,480	IP	C,L	1.35
24	245'-3"	185°	37.0'	-	-	-	-	TP	C	1.36
44	244'-0"	193°	22.9'	57,688	42,648	.0084	42,480	IP	C,L	1.37
55	247'-5"	153°	22.0'	61,109	34,579	.4436	32,940	IP	C,L	1.38
52	247'-5"	152°	21.4'	52,999	34,475	.0192	32,940	IP	C,L	1.39
53	248'-9"	151°	21.1'	-	-	-	-	TP	C	1.40
54	247'-9"	151°	21.1'	52,999	34,475	.0192	32,940	IP	C,L	1.41
56	247'-1"	151°	21.1'	52,999	34,475	.0192	32,940	IP	C,L	1.42
66	244'-5"	155°	20.2'	-	-	-	-	TP	C	1.43
411	247'-5"	334°	20.1'	57,827	31,770	.1789	32,940	IP	C,L	1.44
42	248'-9"	331°	21.1'	-	-	-	-	TP	C	1.45
422	244'-5"	334°	22.4'	-	-	-	-	TP	C	1.46

KEY: IP = Intermediate point  
 TP = Terminal point  
 C = Circumferential break  
 L = Longitudinal break

NOTES: See Figures 3.6A-31 through 33 for break locations.

Stresses are calculated in accordance with Equations 10 and 12 or 13 of ASME Section III, subparagraphs NB-3653.6 (a) and NB-3653.6 (b), respectively. Cumulative usage factors are calculated in accordance with ASME Section III, subarticle NB-3650.



TABLE 3.6A-25

SUMMARY OF STRESSES IN HIGH ENERGY ASME SAFETY CLASS 3 PIPING  
Reactor Water Cleanup System - Outside Containment

Break Point	Location			Stress		Total Additive Stress (psi)	Pipe Break Stress Limit 0.8 (1.2Sh+Sa) (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	Azimuth (deg)	r (ft-in)	Eq. 9 (psi)	Eq. 10 (psi)					
1	245-3	185	60-0	-	-	-	-	TE	C	1.21
5	243-0	185	60-6	6,087	11,008	17,095	32,400	IP	C	1.22
7A	242-0	185	57-6	13,157	4,417	17,574	32,400	IP	C	1.23
13A	238-9	179	53-2	-	-	-	-	TE	C	1.24
51	218-6	158	58-0	-	-	-	-	TE	C	1.25
52	232-2	167	57-7	10,965	11,057	22,022	32,400	IP	C	1.26
68	219-7	169	60-10	9,837	7,805	17,643	32,400	IP	C	1.27
77	218-6	174	58-3	-	-	-	-	TE	C	1.28
78	218-6	173	57-6	-	-	-	-	TE	C	1.29
102	230-8	164	57-8	5,280	22,662	27,942	32,400	IP	C	1.30
103	218-6	157	57-1	-	-	-	-	TE	C	1.31
98A	223-11	164	55-0	19,438	12,293	31,731	32,400	IP	C	1.32
139A	237-9	178	51-10	-	-	-	-	TE	C	1.33
173A	313-9	255	56-9	18,639	6,638	26,227	32,400	IP	C	1.34
180	314-9	284	54-10	-	-	-	-	TE	C	1.35
204	315-5	282	54-4	-	-	-	-	TE	C	1.36
228	316-10	299	39-8	11,257	13,705	24,962	32,400	IP	C	1.37
231A	316-9	11	34-5	-	-	-	-	TE	C	1.38
234A	283-0	36	40-7	17,047	1,620	18,667	32,400	IP	C	1.39
235A	310-10	19	48-6	18,997	2,337	21,334	32,400	IP	C	1.40
262	263-0	17	47-11	-	-	-	-	TE	C	1.41

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TABLE 3.6A-25

## SUMMARY OF STRESSES IN HIGH ENERGY ASME SAFETY CLASS 3 PIPING

## Reactor Water Cleanup System - Outside Containment

Break Point	Location			Stress		Total Additive Stress (psi)	Pipe Break Stress Limit 0.8 (1.2Sh+Sa) (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	Azimuth (deg)	r (ft-in)	Eq. 9 (psi)	Eq. 10 (psi)					
304	310-6 3/8	284	54-9 3/4	-	-	-	-	TE	C	1.42
312	309-0	288	48-3 11/16	5,529	5,881	11,409	32,400	IP	C	1.43
315	310-0	281	45-9 11/16	5,921	6,255	12,176	32,400	IP	C	1.44
327	314-7 5/8	287	43-5 7/8	-	-	-	-	TE	C	1.45
328	310-0	284	54-10	-	-	-	-	TE	C	1.46
333	308-5	264	51-1	5,227	4,475	9,702	32,400	IP	C	1.47
343	310-0	287	43-6	-	-	-	-	TE	C	1.48
357	308-9	275	44-2	5,998	4,074	10,072	32,400	IP	C	1.49
374A	308-9	259	44-9	-	-	-	-	TE	C	1.50
423A	322-10	239	39-9	-	-	-	-	TE	C	1.51
1014A	322-11	240	38-0	-	-	-	-	TE	C	1.52
393	318-6	245	36-11	11,315	1,235	12,550	32,400	IP	C	1.53
413	313-6	282	34-3	-	-	-	-	TE	C	1.54
416A	316-0	279	32-11	20,308	3,733	24,041	32,400	IP	C	1.55
419	316-0	283	32-3	-	-	-	-	TE	C	1.56
450	337-8	151	40-0	-	-	-	-	TE	C	1.57
430A	322-10	262	42-8	-	-	-	-	TE	C	1.58
479	331-0	159	35-6	-	-	-	-	TE	C	2.1
484	334-0	150	38-1	6,168	11,589	17,757	32,400	IP	C	2.2
490	334-0	163	46-10	-	-	-	-	TE	C	2.3
511	330-3	160	47-0	-	-	-	-	TE	C	2.4

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TABLE 3.6A-25

SUMMARY OF STRESSES IN HIGH ENERGY ASME SAFETY CLASS 3 PIPING  
Reactor Water Cleanup System - Outside Containment

Break Point	Location			Stress		Total Additive Stress (psi)	Pipe Break Stress Limit 0.8 (1.2Sh+Sa) (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	Azimuth (deg)	r (ft-in)	Eq. 9 (psi)	Eq. 10 (psi)					
512	337-8	174	35-4	-	-	-	-	TE	C	2.5
542	331-0	171	33-7	-	-	-	-	TE	C	2.6
546	334-0	185	33-1	8,949	13,203	22,152	32,400	IP	C	2.7
552	334-0	176	45-0	-	-	-	-	TE	C	2.8
574	330-0	179	44-1	-	-	-	-	TE	C	2.9
575	337-8	202	37-10	-	-	-	-	TE	C	2.10
605	331-0	202	35-11	-	-	-	-	TE	C	2.11
610	334-0	194	34-0	7,269	12,028	19,297	32,400	IP	C	2.12
616	334-0	197	46-11	-	-	-	-	TE	C	2.13
638	330-3	194	45-6	-	-	-	-	TE	C	2.14
639	337-8	215	43-0	-	-	-	-	TE	C	2.15
669	331-0	213	39-10	-	-	-	-	TE	C	2.16
673	334-0	223	45-2	7,774	13,750	21,524	32,400	IP	C	2.17
679	334-0	208	50-8	-	-	-	-	TE	C	2.18
701	330-3	212	52-1	-	-	-	-	TE	C	2.19
702	334-2	219	43-7	-	-	-	-	TE	C	2.20
702C	324-2	216	45-11	11,535	1,434	12,969	32,400	IP	C	2.21
703	322-6	214	48-2	-	-	-	-	TE	C	2.22
704	334-2	199	36-0	-	-	-	-	TE	C	2.23
704C	324-2	198	38-9	11,535	1,434	12,969	32,400	IP	C	2.24
705	322-6	196	41-5	-	-	-	-	TE	C	2.25

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TABLE 3.6A-25

## SUMMARY OF STRESSES IN HIGH ENERGY ASME SAFETY CLASS 3 PIPING

## Reactor Water Cleanup System - Outside Containment

Break Point	Location			Stress		Total Additive Stress (psi)	Pipe Break Stress Limit 0.8 (1.2Sh+Sa) (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	Azimuth (deg)	r (ft-in)	Eq. 9 (psi)	Eq. 10 (psi)					
706	334-2	178	34-1	-	-	-	-	TE	C	2.26
706C	324-2	178	36-11	11,471	1,434	12,905	32,400	IP	C	2.27
707	322-6	178	39-9	-	-	-	-	TE	C	2.28
708	334-2	154	38-0	-	-	-	-	TE	C	2.29
708C	324-2	156	40-6	11,912	3,067	14,979	32,400	IP	C	2.30
709	322-6	157	43-2	-	-	-	-	TE	C	2.31
750	343-0	152	39-3	-	-	-	-	TE	C	2.32
765	338-6	161	48-8	-	-	-	-	TE	C	2.33
778	332-0	158	50-9	-	-	-	-	TE	C	2.34
788	329-10	159	47-0	-	-	-	-	TE	C	2.35
802	335-6	161	43-10	-	-	-	-	TE	C	2.36
804	338-6	165	42-6	8,673	3,739	12,412	32,400	IP	C	2.37
809	332-0	166	42-3	8,881	2,259	11,140	32,400	IP	C	2.38
1000A	322-11	262	41-5	-	-	-	-	TE	C	2.39
813	343-0	181	34-7	-	-	-	-	TE	C	2.40
829	338-6	182	46-0	-	-	-	-	TE	C	3.2
842	332-0	181	47-0	-	-	-	-	TE	C	3.3
849	329-10	179	44-0	-	-	-	-	TE	C	3.4
859	335-6	179	41-6	-	-	-	-	TE	C	3.5
874	343-0	196	36-0	-	-	-	-	TE	C	3.6
890	338-6	195	47-5	-	-	-	-	TE	C	3.7

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TABLE 3.6A-25

**SUMMARY OF STRESSES IN HIGH ENERGY ASME SAFETY CLASS 3 PIPING**  
**Reactor Water Cleanup System - Outside Containment**

Break Point	Location			Stress		Total Additive Stress (psi)	Pipe Break Stress Limit 0.8 (1.2Sh+Sa) (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	Azimuth (deg)	r (ft-in)	Eq. 9 (psi)	Eq. 10 (psi)					
902	332-0	191	47-11	-	-	-	-	TE	C	3.8
912	329-10	194	45-6	-	-	-	-	TE	C	3.9
931	334-0	204	44-10	7,314	14,064	21,378	32,400	IP	C	3.10
915	338-6	192	41-10	9,130	8,766	17,897	32,400	IP	C	3.11
922	335-6	198	42-11	-	-	-	-	TE	C	3.12
938	343-0	230	45-0	-	-	-	-	TE	C	3.13
954	338-6	211	53-5	-	-	-	-	TE	C	3.14
967	332-0	212	55-8	-	-	-	-	TE	C	3.15
974	329-10	212	52-1	-	-	-	-	TE	C	3.16
981C	335-6	210	47-5	-	-	-	-	TE	C	3.17

KEY: TP = Terminal point  
 TE = Terminal end  
 C = Circumferential  
 IP = Intermediate point  
 L = Longitudinal

NOTES: For break locations, see Figures 3.6A-34 to 41

Stresses are calculated in accordance with Equations 9 and 10 of ASME Section III, paragraph NC-3650.

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TABLE 3.6A-26

## SUMMARY OF STRESSES IN HIGH-ENERGY ASME SAFETY CLASS 1 PIPING

Standby Liquid Control - Inside Containment

Break Point	Location		Radius (ft-in)	Maximum Stress Range		Cumulative Usage Factor	Pipe Break Stress Limit 2.4 S (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	Azimuth (deg)		Eq. 10 (psi)	Eq. 12 or 13 (psi)					
1	307-11 3/16	236.5	17-0 1/2	-	-	-	42,787	TP	C	1.34
7	307-11 3/16	228	17-3 11/16	139,108	37,069	0.3143	42,787	IP	C	1.35
9	307-11 3/16	226	17-6 1/4	-	-	-	42,787	TP	C	1.36

KEY: IP = Intermediate point  
 TP = Terminal point  
 C = Circumferential break  
 L = Longitudinal break

NOTES: See Figure 3.6A-42 for break locations.

Stresses were calculated in accordance with Equations 10 and 12 or 13 of ASME Section III, subparagraphs NC-3653.6(a) and NB-3653.6(b), respectively. Cumulative usage factors were calculated in accordance with ASME Section III, subarticle NB-3650.

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TABLE 3.6A-27

## SUMMARY OF STRESSES IN HIGH ENERGY NON-ASME SAFETY CLASS 4 PIPING

## Control Rod Drive - Outside Containment

Break Point	Location			Stress		Total Additive Stress (psi)	Pipe Break Stress Limit 0.8 (1.2Sh+Sa) (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	Azimuth (deg)	r (ft)	Eq. 9 (psi)	Eq. 10 (psi)					
1	217-1 1/2	34.38	57.0	-	-	-	32400	TP	C	1.33
2	217-1 1/2	46.32	57.0	-	-	-	32400	TP	C	1.34
3	217-1 1/2	47.45	59.375	6654	5554	12208	32400	IP	C	1.35
4	217-1 1/2	35.95	59.375	6799	5847	12646	32400	IP	C	1.36
6	269-0 1/2	25.16	78.88	-	-	-	32400	TP	C	1.37
10	262-6	22.22	75.89	4188	16191	20379	39812	IP	C	1.38
15	262-6	21.35	78.83	-	-	-	39812	TP	C	1.39
20	272-8 7/8	21.51	78.28	4288	14454	18742	39812	IP	C	1.40
25	262-6	22.33	74.68	21918	636	22554	39812	IP	C	1.41
30	262-6	23.37	73.08	28332	3016	31348	39812	IP	C	1.42
35	262-6	19.53	70.65	-	-	-	39812	TP	C	1.43
40	262-6	26.18	66.95	-	-	-	39812	TP	C	1.44
45	263-6 1/4	22.05	64.82	7647	28860	36507	39812	IP	C	1.45
50	273-11	26.09	62.91	5881	11050	16932	29812	IP	C	1.46
55	262-8	19.94	69.23	2584	19560	22144	39812	IP	C	1.47
60	262-6	26.35	69.00	11088	8178	19266	39812	IP	C	1.48

KEY: IP = Intermediate point  
 TP = Terminal point  
 C = Circumferential break

NOTES: For break locations, see Figures 3.6A-43 to 49

Stresses are required to be calculated in accordance with Equations 9 and 10 of ASME Section III, paragraph NC-3652.





TABLE 3.6A-27

## SUMMARY OF STRESSES IN HIGH ENERGY NON-ASME SAFETY CLASS 4 PIPING

## Control Rod Drive - Outside Containment

Break Point	Location			Stress		Total Additive Stress (psi)	Pipe Break Stress Limit 0.8 (1.2Sh+Sa) (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	Azimuth (deg)	r (ft)	Eq. 9 (psi)	Eq. 10 (psi)					
65A	274-2	21.84	70.56	-	-	-	39812	TP	C	1.49
65B	274-2	22.05	64.82	-	-	-	39812	TP	C	1.50
70A	278-11	18.64	82.11	-	-	-	39812	TP	C	1.51
70B	278-11	19.48	81.95	-	-	-	39812	TP	C	1.52
75A	272-1	39.09	52.37	-	-	-	39812	TP	C	1.53
75B	273-1	38.79	51.90	-	-	-	39812	TP	C	1.54
80A	271-5 7/8	58.36	53.70	4940	14076	19016	39812	IP	C	1.55
80B	272-5 7/8	58.82	53.44	4940	14076	19016	39812	IP	C	1.56
85A	271-5 7/8	291.06	62.60	-	-	-	39812	TP	C	1.57
85B	272-5 7/8	291.06	62.60	-	-	-	39812	TP	C	1.58
90C	272-11 7/8	287.10	56.68	-	-	-	39812	TP	C	2.1
90D	271-11 7/8	287.10	56.68	-	-	-	39812	TP	C	2.2
95A	271-4 1/8	271.30	54.95	5858	18533	24391	39812	IP	C	2.3
95B	272-4 1/8	271.30	54.95	5858	18533	24391	39812	IP	C	2.4
97C	272-9 1/16	268.70	54.95	10609	1903	12512	39812	IP	C	2.5
97D	271-9 1/16	268.70	54.95	10609	1903	12512	39812	IP	C	2.6

KEY: IP = Intermediate point  
 TP = Terminal point  
 C = Circumferential break

NOTES: For break locations, see Figures 3.6A-43 to 49

Stresses are required to be calculated in accordance with Equations 9 and 10 of ASME Section III, paragraph NC-3652.



TABLE 3.6A-27

## SUMMARY OF STRESSES IN HIGH ENERGY NON-ASME SAFETY CLASS 4 PIPING

## Control Rod Drive - Outside Containment

Break Point	Location			Stress		Total Additive Stress (psi)	Pipe Break Stress Limit 0.8 (1.25S+Sa) (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	Azimuth (deg)	r (ft)	Eq. 9 (psi)	Eq. 10 (psi)					
100A	271-3 1/16	268.68	54.18	6557	9976	16533	39812	IP	C	2.7
100B	272-3 1/16	268.68	54.18	6557	9976	16533	39812	IP	C	2.8
105C	272-9 1/16	266.48	54.27	12477	1364	13841	39812	IP	C	2.9
105D	271-9 1/16	266.48	54.27	12477	1364	13841	39812	IP	C	2.10
110A	271-5 7/8	65.37	59.59	-	-	-	39812	TP	C	2.11
110B	272-5 7/8	65.37	59.59	-	-	-	39812	TP	C	2.12
112C	272-11 7/8	69.27	57.92	-	-	-	39812	TP	C	2.13
112D	271-11 7/8	69.27	57.92	-	-	-	39812	TP	C	2.14
115A	271-3 1/4	88.63	52.39	5858	18533	24391	39812	IP	C	2.15
115B	272-3 1/4	88.63	52.39	5858	18533	24391	39812	IP	C	2.16
117C	272-8	91.37	52.39	10609	1903	12512	39812	IP	C	2.17
117D	271-8	91.37	52.39	10609	1903	12512	39812	IP	C	2.18
120A	271-2	91.32	54.18	6557	9976	16533	39812	IP	C	2.19
120B	272-2	91.32	54.18	6557	9976	16533	39812	IP	C	2.20
125C	272-8	93.52	54.27	12477	1364	13841	39812	IP	C	2.21
125D	271-8	93.52	54.27	12477	1364	13841	39812	IP	C	2.22

KEY: IP = Intermediate point  
 TP = Terminal point  
 C = Circumferential break

NOTES: For break locations, see Figures 3.6A-43 to 49

Stresses are required to be calculated in accordance with Equations 9 and 10 of ASME Section III, paragraph NC-3652.



TABLE 3.6A-27

## SUMMARY OF STRESSES IN HIGH ENERGY NON-ASME SAFETY CLASS 4 PIPING

## Control Rod Drive - Outside Containment

Break Point	Location			Stress		Total Additive Stress (psi)	Pipe Break Stress Limit 0.8 (1.2Sh+Sa) (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	Azimuth (deg)	r (ft)	Eq. 9 (psi)	Eq. 10 (psi)					
130A	271-5 7/8	62.94	60.83	4226	10265	14491	39812	IP	C	2.23
130B	272-5 7/8	62.94	60.83	4226	10265	14491	39812	IP	C	2.24
135A	280-7	344.00	82.53	15010	4677	19687	39812	IP	C	2.25
135B	281-7	344.00	82.53	15010	4677	19687	39812	IP	C	2.26
140A	270-0 1/2	342.4	75.23	16303	4952	21255	39812	IP	C	2.27
140B	271-0 1/2	342.4	75.23	16303	4952	21255	39812	IP	C	2.28
145A	270-0 1/2	341.04	73.58	-	-	-	39812	TP	C	2.29
145B	271-0 1/2	341.04	73.58	-	-	-	39812	TP	C	2.30
150A	269-0 1/2	322.44	80.50	8280	10847	19127	39812	IP	C	2.31
150B	270-0 1/2	322.44	80.50	8280	10847	19127	39812	IP	C	2.32
155A	268-10 1/2	305.01	84.18	11176	13184	24360	39812	IP	C	2.33
155B	269-10 1/2	305.01	84.18	11178	13184	24360	39812	IP	C	2.34
160A	264-10 1/4	291.25	81.34	-	-	-	39812	TP	C	2.35
160B	265-10 1/4	291.25	81.34	-	-	-	39812	TP	C	2.36
165A	264-10 1/4	288.03	79.93	4440	6645	11085	39812	IP	C	2.37
165B	265-10 1/4	288.03	79.93	4440	6645	11085	39812	IP	C	2.38

KEY: IP = Intermediate point  
 TP = Terminal point  
 C = Circumferential break

NOTES: For break locations, see Figures 3.6A-43 to 49

Stresses are required to be calculated in accordance with Equations 9 and 10 of ASME Section III, paragraph NC-3652.



TABLE 3.6A-27

## SUMMARY OF STRESSES IN HIGH ENERGY NON-ASME SAFETY CLASS 4 PIPING

## Control Rod Drive - Outside Containment

Break Point	Location			Stress		Total Additive Stress (psi)	Pipe Break Stress Limit 0.8 (1.2Sh+Sa) (psi)	Description of Break Points	Break Type	
	Elevation (ft-in)	Azimuth (deg)	r (ft)	Eq. 9 (psi)	Eq. 10 (psi)					
170A	271-7 3/8	287.01	72.87	5982	4435	10417	39812	IP	C	2.39
170B	272-7 3/8	287.01	72.87	5982	4435	10417	39812	IP	C	2.40

KEY: IP = Intermediate point  
 TP = Terminal point  
 C = Circumferential break

NOTES: For break locations, see Figures 3.6A-43 to 49

Stresses are required to be calculated in accordance with Equations 9 and 10 of ASME Section III, paragraph NC-3652.

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TABLE 3.6A-28

## SUMMARY OF ANALYSIS OF PIPING FAILURE AS A RESULT OF PIPE WHIP

Main Steam System (Inside Containment)

## PART I

## North Loop

Piping Line Numbers: 2MSS-026-43-1 (Inner Loop)

Break Point	Break Location		Break Type	Blowdown Source	Targets		Protection Measure	Remarks	1.20
	El	AZ							1.21
1	322'- 0 1/8"	72°	13'-2 3/4"	C	RPV			No whip	1.24
				C	Turbine	1)Cont. liner 2)2RHS-012-8-1	2MSS*PRR021A	1.25	
7	318'- 8 3/4"	72°	19'-3"	C	RPV	1)Cont. liner 2)RPV	Analysis		1.27
				C	Turbine	1)BSW	2)PI El 288'- 3 1/4"	2MSS*PRR023	1.28
33	293'- 5 7/8"	13°	23'-6 3/4"	C	RPV	1)Cont. liner	2)2FWS-012-52-1 3)2MSS-026-44-1	2MSS*PRR022, 2MSS*PRR023	1.43
				C	Turbine	1)Cont. liner		2MMS*PRR024A 2MMS*PRR025	1.44
41	256'- 6 5/8"	7°	25'-0"	C	RPV	1)Cont. liner 2)2RHS-012-8-1	3)PI El 305'-9"	2MSS*PRR024	1.47
				C	Turbine	1)Pen. Z-1A		2MSS*PRR026	1.48
									1.52
									1.53
									1.54
									1.57
									1.58
									2.3
									2.4
									2.7

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TABLE 3.6A-28 (Cont)

## PART I (Cont)

Piping Line Numbers: 2MSS-026-44-1 (Outer Loop)

Break Point	Break Location		Break Type	Blowdown Source	Targets		Protection Measure	Remarks
	EL	AZ						
20	322'- 0 5/16"	108°	13'-2 7/16"	C	RPV			No whip 2.24
				C	Turbine	1)Cont. liner 2)2RHS-012-8-1	2MSS*PRR031A	2.25 2.26 2.27
28	299'- 9 1/2"	108°	19'-3"	C	RPV	1)Cont. liner 2)2RHS-012-8-1	Analysis	2.30 2.31
				C	Turbine	1)BSW 2)PI EI 288'- 3 1/4"	2MSS*PRR032B	2.34 2.35
72	293'- 9 1/8"	72°	23'-5 5/8"	C	RPV	1)Cont. liner 2)2FWS-024-61-1 3)2IAS*TK14, 16,34	2MSS*PRR032B 2MSS*PRR033	2.38 2.39 2.40
				C	Turbine	1)Cont. liner 2)2IAS*TK18, 19,20,33,34 3)2FWS-018-36-1 4)2FWS-012-52-1	2MSS*PRR034 2MSS*PRR035A 2MSS*PRR036	2.43 2.44 2.45 2.46
115	256'- 4 13/16"	25°	28'-8 1/2"	C	RPV	1)Cont. liner 2)SVV Lines	2MSS*PRR035	2.49
				C	Turbine	1)Pen. Z-1B	2MSS*PRR037	2.50 2.51



TABLE 3.6A-28 (Cont)

## PART II

## South Loop

Piping Line Numbers: 2MSS-026-46-1 (Inner Loop)

Break Point	Break Location		r	Break Type	Blowdown Source	Targets		Protection Measure	Remarks
	El	AZ							
1	322'-0 5/16"	288°	13'-1 15/16"	C	RPV	1)Cont. liner	2)Monorail	2MSS*PRR001A	No whip 3.12
				C	Turbine				3.13
13	296'-11 15/16"	288°	13'-3 1/16"	C	RPV	1)Cont. liner	2)RPV	Analysis & 2MSS*PRR002	3.17
						3)PI El 305'-9"			3.18
				C	Turbine	1)PI El 288'-3 1/4"		2MSS*PRR003	3.21
									3.22
33	293'-5 7/8"	347°	23'-2 15/16"	C	RPV	1)Cont. liner	2)2FWS-012-37-1	2MSS*PRR002	3.25
							3)2MSS-026-45-1	2MSS*PRR003	3.26
				C	Turbine	1)Cont. liner		2MSS*PRR004A	3.29
						2)FWS*V12B		2MSS*PRR005	3.30
41	256'-6 5/8"	353°	25'-0"	C	RPV	1)2RHS-012-125-1	2)PI El 305'-9"	2MSS*PRR004	3.33
				C	Turbine	1)Pen. Z-1D		2MSS*PRR006	3.34
									3.35



TABLE 3.6A-28 (Cont)

## PART II (Cont)

Piping Line Numbers: 2MSS-026-45-1 (Outer Loop)

Break Point	Break Location			Break Type	Blowdown Source	Targets		Protection Measure	Remarks
	El	AZ	R						
20	322'-0 1/4"	252°	13'-1 3/4"	C	RPV				No whip 3.52
				C	Turbine	1)Cont. Liner	2)Monorail	2MSS*PRR011A	3.54
28	299'-9 1/2"	253°	19'-3"	C	RPV	1)Cont. Liner	2)RPV 3)PI El 305'-9"	2MSS*PRR012 Analysis	3.57 3.58
				C	Turbine	1)BSW	2)Platform Steel 3)IAS Tanks	2MSS*PRR012B	4.2 4.3
66	293'-9 1/8"	281°	23'-10"	C	RPV	1)PI El 305'-9"		2MSS*PRR012B 2MSS*PRR013	4.6 4.7
				C	Turbine	1)Cont. Liner	2)2FWS-024-060-1	2MSS*PRR016A 2MSS*PRR014 2MSS*PRR017	4.9 4.10 4.11
115	256'- 4 13/16"	335°	28'-8 1/2"	C	RPV	1)2RHS-012-125-1		2MSS*PRR016	4.14
				C	Turbine	1)Pen. Z-1C		2MSS*PRR018	4.15 4.16

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TABLE 3.6A-29

SUMMARY OF ANALYSIS OF PIPING FAILURE AS A RESULT OF PIPE WHIP  
Main Steam System (Outside Containment)

Piping Line Number: 2MSS-028-7-4

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measures	Remarks	
	EI	X	Z						
101	250'-4"	-85'-8 5/16"	2'-6 1/4"	C	RPV		2MSS*PRR102	No whip	1.22
				C	Manifold	1)Tunnel wall	2MSS*PRR104		1.24
103A	277'-9 1/16"	-98'-10"	2'-8 1/4"	C	RPV	1)Tunnel Floor 2)Electric tunnel	2MSS*PRR103		1.26 1.27 1.28
				C	Manifold	1)Tunnel roof	2MSS*PRR106		1.30
106	294'-11 5/16"	-113'-7 1/2"	2'-9 1/2"	C	RPV	1)Secondary containment	2MSS*PRR105		1.32 1.33
				C	Manifold			No whip	1.35



TABLE 3.6A-29 (Cont)

Piping Line Number: 2MSS-028-5-4

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measures	Remarks
	EI	X	Z					
111	250'- 1' 15/16"	-85'-7"	12'-3"	C	RPV		2MSS*PRR112	1.51
				C	Manifold	1)Tunnel wall	2MSS*PRR114	1.52
								1.53
113A	261'- 10' 5/16"	-98'-9 5/8"	11'-5 5/8"	C	RPV	1)Tunnel floor 2)Electric tunnel	2MSS*PRR113	1.55
								1.56
								1.57
116	294'- 11' 5/16"	-113'- 7' 1/2"	9'-3 1/2"	C	Manifold	1)Tunnel roof	2MSS*PRR116	2.1
				C	RPV	1)Secondary containment	2MSS*PRR115	2.3
				C	Mainfold			2.4
								No whip 2.5



TABLE 3.6A-29 (Cont)

Piping Line Number: 2MSS-028-1-4

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measures	Remarks	
	EI	X	Z						
121	250'- 4 5/8"	-81'-10"	-2'-11"	C	RPV		2MSS*PRR122	No whip	2.20
				C	Manifold	1)Tunnel wall	2MSS*PRR124		2.21 2.22
123A	277'- 10 7/32"	-98'-9 9/16"	-3'-4 3/4"	C	RPV	1)Tunnel floor 2)Electric tunnel	2MSS*PRR123		2.24 2.25 2.26
				C	Manifold	1)Tunnel roof	2MSS*PRR126		2.28
				C	RPV	1)Secondary containment	2MSS*PRR125		2.30 2.31
126	294'- 11 5/16"	-113'- 7 1/2"	-3'-8 7/16"	C	Manifold			No whip	2.33

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(



TABLE 3.6A-29 (Cont)

Piping Line Number: 2MSS-028-3-4

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measures	Remarks
	EI	X	Z					
131	250'- 4 5/8"	-85'- 4 7/16"	-12'-9 7/8"	C	RPV		2MSS*PRR132	2.48
				C	Manifold	1)Tunnel wall	2MSS*PRR134	2.49 2.50
133A	262'- 0 7/16"	-98'- 6 7/8"	-12'-2"	C	RPV	1)Tunnel floor 2)Electric tunnel	2MSS*PRR133	2.52 2.53 2.54
				C	Manifold	1)Tunnel roof	2MSS*PRR136	2.56
136	294'- 11 5/16"	-113'- 7 1/2"	-10'-3"	C	RPV	1)Secondary containment	2MSS*PRR135	2.58 3.1
				C	Manifold			No whip 3.2

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TABLE 3.6A-30  
MAIN STEAM VENT LINE

Piping Line Numbers: 2MSS-002-107-1, 2MSS-002-106-1

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measure	Remarks	
	EL	AZ	E						
1	341'-10 3/16"	0°	0'-0"	C	RPV	None			1.15
				C	MSS	Drywell head	None Required		1.16
3	342'-9"	90°	0'-0"	C	RPV	None			1.19
				C	MSS	Insulation Support Structure	None Required		1.21
7	342'-9"	85°	2'-0"	C	RPV	None			1.36
				C	MSS	Vessel Dome	None Required		1.38
20	330'-3 5/8"	0°	15'-6 9/16"	C	RPV	Insulation Support Structure	None Required		1.40
				C	MSS	Vent duct	None Required	Nonessential	1.42
21	330'-3 5/8"	0°	15'-7"	C	RPV	Insulation Support Structure	None Required		1.44
				C	MSS	Vent duct	None Required	Nonessential	1.46
29	318'-3/8"	58°	17'-4 1/4"	C	RPV	2MSS-026-43-1	None Required		1.49
				C	MSS	2RHS*PRR014	None Required		1.51
32	318'-4"	27°	15'-1/2"	C	RPV	None	None Required		1.54
				C	MSS	None	None Required		1.56
35	314'-10"	69°	18'-9 3/8"	C	RPV	2RHS*PRR014	None Required		2.1
				C	MSS	None	None Required		2.3
37	318'-4"	27°	15'-1"	C	RPV	None	None Required		2.6
				C	MSS	None	None Required		2.8
					RPV	None	None Required		2.11
					MSS	None	None Required		2.13



TABLE 3.6A-30 (Cont)

Piping Line Number: 2MSS-002-54-1

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measure	Remarks
	El	AZ	R					
40	307'-0"	14°	17'-0"	C	RPV/MSS	None	None Required	2.28

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TABLE 3.6A-31

## SUMMARY OF ANALYSIS OF PIPING FAILURE AS A RESULT OF PIPE WHIP

## Main Steam Safety Relief Valve

Piping Line Numbers: SVV North Loops

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measures	Remarks
	EL	AZ	R					
1a	293'- 10 7/8"	93°	23'-6 3/8"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	1.21 1.22
2a	293'- 10 7/8"	87°	23'-10 1/8"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	1.24 1.25
3a	293'- 10 7/8"	81.5°	24'-1 5/16"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	1.27 1.28
4a	293'- 8 15/16"	76°	24'-4 3/8"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	1.30 1.31
5a	293'- 8 15/16"	70°	24'- 6 13/16"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	1.33 1.34
6a	293'- 6 1/4"	37.5°	19'-9 1/8"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	1.36 1.37
7a	293'- 6 1/4"	29°	20'-3 3/4"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	1.39 1.40
8a	293'- 6 1/4"	22°	14'-2"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	1.43 1.44
9a	293'- 6 1/4"	15°	11'-4 3/4"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	1.47 1.48
1b	296'-9"	93°	23'-6 3/8"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	1.50 1.51
2b	296'- 8 3/4"	87°	23'-10 1/8"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	1.53 1.54
3b	296'- 8 3/4"	81.5°	24'-1 5/16"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	1.56 1.57
4b	296'- 8 5/8"	76°	24'-4 3/8"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	2.2 2.3
5b	296'- 8 1/2"	70°	24'- 6 13/16"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	2.6 2.7

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TABLE 3.6A-31

## SUMMARY OF ANALYSIS OF PIPING FAILURE AS A RESULT OF PIPE WHIP

## Main Steam Safety Relief Valve

Piping Line Numbers: SVV North Loops

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measures	Remarks
	EL	AZ	R					
6b	296'-	37.5°	19'-9 1/8"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	2.10
	6 1/8"							2.11
7b	296'-	29°	20'-3 3/4"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	2.15
	5 3/4"							2.16
8b	296'-	22°	14'-2"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	2.20
	5 7/16"							2.21
9b	296'-	15°	11'-4 3/4"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	2.24
	5 1/8"							2.25

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TABLE 3.6A-31 (Cont)

## Piping Line Numbers: SVV South Loops

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measures	Remarks
	EL	AZ	R					
10a	293'- 6 1/4"	322.5°	19'-9 1/8"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	2.38 2.39
11a	293'- 6 1/4"	330.5°	20'-3 3/4"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	2.41 2.42
12a	293'- 6 1/4"	338°	14'-2"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	2.44 2.45
13a	293'- 6 1/4"	344.5°	11'-4 3/4"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	2.47 2.48
14a	293'- 10 7/8"	266.5°	23'-6 3/8"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	2.50 2.51
15a	293'- 10 7/8"	273°	23'-10 1/8"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	2.53 2.54
16a	293'- 10 7/8"	278.5°	24'-1 5/16"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	2.56 2.57
17a	293'- 8 15/16"	284°	24'-4 3/8"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	3.1 3.2
18a	293'- 8 15/16"	290°	24'- 6 13/16"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	3.5 3.6
10b	296'- 6 1/8"	322.5°	19'-9 1/8"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	3.9 3.10
11b	296'- 5 3/4"	330.5°	20'-3 3/4"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	3.12 3.13
12b	296'- 5 7/16"	338°	14'-2"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	3.15 3.16
13b	296'- 5 1/8"	344.5°	11'-4 3/4"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	3.18 3.19
14b	296'- 8 7/8"	266.5°	23'-6 3/8"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	3.21 3.22
15b	296'- 8 1/2"	273°	23'-10 1/8"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	3.24 3.25

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TABLE 3.6A-31 (Cont)

Piping Line Numbers: SVV South Loops

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measures	Remarks
	EL	AZ	R					
16b	296'- 8 3/16"	278.5°	24'-1 5/16"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	3.28 3.29
17b	296'- 7 7/8"	284°	24'-4 3/8"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	3.33 3.34
18b	296'- 7 9/16"	290°	24'- 6 13/16"	C	MSS	1)2RHS-012-170-2 2)2RHS-012-171-2	None Required	3.37 3.38

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TABLE 3.6A-32

## SUMMARY OF ANALYSIS OF PIPING FAILURE AS A RESULT OF PIPE WHIP

## Main Steam Drains - Inside Containment

Piping Line Numbers: 2-MSS-002-49-1, 2-MSS-002-48-1, 2-MSS-002-47-1, 2-MSS-006-150-1, 2-MSS-002-82-1

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measure	Remarks
	El	Az	R					
<u>2-MSS-002-49-1</u>								
1	250'-3 7/8"	337°	32'-5 3/8"	C	MSS	PL El 247'-6"	2MSS*PRR201	1.21 1.23
<u>2-MSS-002-47-1</u>								
13	248'-11 3/16"	17°	24'-5 1/16"	C	MSS	1) 2-MSS-002-48-1 2) 2-MSS*PRS036	Not Required	1.27 1.29 1.30
<u>2-MSS-002-48-1</u>								
14	248'-10 9/16"	19°	24'-8 11/16"	C	MSS	1) 2-MSS-002-47-1 2) 2-MSS*PRS005	Not Required	1.34 1.36 1.37
<u>2-MSS-006-150-1</u>								
15	248'-10 1/2"	21°	24'-7 5/16"	C	MSS Jet	None Large Deflection	Not Required 2MSS*PRR203	No Whip 1.41 1.43 1.44
<u>2-MSS-002-82-1</u>								
16	250'-3 5/8"	355°	33'-0 1/2"	C	MSS	Structural Steel	Not Required	1.48 1.50
<u>2-MSS-002-47-1</u>								
23	250'-3 5/8"	5°	33'-0 5/8"	C	MSS	Structural Steel	Not Required	1.54 1.56

1 of 2



TABLE 3.6A-32

## SUMMARY OF ANALYSIS OF PIPING FAILURE AS A RESULT OF PIPE WHIP

## Main Steam Drains - Inside Containment

Piping Line Numbers: 2-MSS-002-49-1, 2-MSS-002-48-1, 2-MSS-002-47-1, 2-MSS-006-150-1, 2-MSS-002-82-1

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measure	Remarks	
	El	AZ	r						
<u>2-MSS-002-48-1</u>									2.2
30	250'-3 7/8"	23°	32'-5 3/4"	C	MSS	Structural Steel	Not Required		2.4
<u>2-MSS-002-110-1</u>									2.8
40	263'-1 5/8"	185°	33'-4 1/8"	C	MSS	PI El 261'-0"	2MSS*PRR204B		2.10
45	261'-9 3/4"	182°	31'-11"	C	MSS	Structural Steel	2MSS*PRR204A		2.13

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TABLE 3.6A-33

SUMMARY OF ANALYSIS OF PIPING FAILURE AS A RESULT OF PIPE WHIP  
Main Steam Drain Lines: Piping Outboard of Jet Impingement Wall

Piping Line Numbers: 2-MSS-006-117-4, 2MSS-002-19-4, 2-MSS-006-12-4, 2-MSS-002-22-4

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measure	Remarks		
	El	AZ	r							
<u>2-MSS-006-117-4</u>										1.21
50	248'-11 5/16"	8°	93'-2 3/4"	C	MSS	None	Not Required		1.23	
53	246'-7 3/16"	8°	93'-2 3/4"	C	MSS	None	Not Required		1.25	
<u>2-MSS-002-19-4</u>										1.29
54	246'-1 11/16"	8°	93'-2 3/4"	C	MSS	None	Not Required		1.31	
57	245'-8 1/2"	7°	93'-0 13/16"	C	MSS	2MSS-LS1B	Not Required	Not Essential	1.33	
<u>2-MSS-006-12-4</u>										1.37
100	248'-11 5/16"	2°	92'-5 1/16"	C	MSS	None	Not Required		1.39	
103	246'-7 3/16"	2°	92'-5 1/16"	C	MSS	None	Not Required		1.41	
				L					1.42	



TABLE 3.6A-33

SUMMARY OF ANALYSIS OF PIPING FAILURE AS A RESULT OF PIPE WHIP  
Main Steam Drain Lines: Piping Outboard of Jet Impingement Wall

Piping Line Numbers: 2-MSS-006-117-4, 2MSS-002-19-4, 2-MSS-006-12-4, 2-MSS-002-22-4

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measure	Remarks		
	El	AZ	R							
<u>2-MSS-002-22-4</u>										1.46
104	246'-1 11/16"	2°	92'-5 1/16"	C	MSS	None			1.48	
107	245'-8 1/2"	3°	92'-5 5/8"	C	MSS	1) 2-MSS-LS1A 2) Jet Wall	Not Required Not Required	Not Essential	1.50 1.51	



TABLE 3.6A-33

SUMMARY OF ANALYSIS OF PIPING FAILURE AS A RESULT OF PIPE WHIP  
Main Steam Drain Lines: Piping Outboard of Jet Impingement Wall

Piping Line Numbers: 2-MSS-006-21-4, 2-MSS-002-13-4, 2-MSS-006-18-4, 2-MSS-002-16-4

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measure	Remarks
	EL	AZ	R					
<u>2-MSS-006-21-4</u>								
								1.22
150	248'-11 5/16"	358°	92'-5 1/16"	C	MSS	None	Not Required	1.24
153	246'-7 3/16"	358°	92'-5 1/16"	C	MSS	None	Not Required	1.26
				L	MSS	None		1.27
<u>2-MSS-002-13-4</u>								
								1.31
154	246'-1 11/16"	358°	92'-5 1/16"	C	MSS	None	Not Required	1.33
157	245'-8 1/2"	357°	92'-5 5/8"	C	MSS	2-MSS-LS1D	Not Required	1.35
<u>2-MSS-006-18-4</u>								
								1.39
200	248'-11 5/16"	352°	93'-2 3/4"	C	MSS	None	Not Required	1.41
203	246'-7 3/16"	352°	93'-2 3/4"	C	MSS	None	Not Required	1.43
				L	MSS	None		1.44



TABLE 3.6A-33

SUMMARY OF ANALYSIS OF PIPING FAILURE AS A RESULT OF PIPE WHIP  
Main Steam Drain Lines: Piping Outboard of Jet Impingement Wall

Piping Line Numbers: 2-MSS-006-21-4, 2-MSS-002-13-4, 2-MSS-006-18-4, 2-MSS-002-16-4

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measure	Remarks		
	El	Az	r							
<u>2-MSS-002-16-4</u>										1.48
204	246'-1 11/16"	352°	93'-2 3/4"	C	MSS	None	Not Required		1.50	
207	245'-8 1/2"	353°	93'-0 13/16"	C	MSS	1) 2-MSS-006-119-4 2) 2-MSS-LS1C 3) Jet Wall	Not Required Not Required Not Required	Not Essential	1.52 1.53 1.54	





TABLE 3.6A-33

SUMMARY OF ANALYSIS OF PIPING FAILURE AS A RESULT OF PIPE WHIP  
Main Steam Drain Lines: Piping Outboard of Jet Impingement Wall

Piping Line Numbers: 2-MSS-002-188-4

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measure	Remarks	
	EL	AZ	T						
306A	241'-6	15/16"	358°	101'-5"	C	MSS	None	Not Required	1.21
313	242'-2"	349°	70'-6"	C	MSS	1) CND.2CX9970Y2	Not Required	Not Essential	1.23
						2) CND.2CX9990E		Targets	1.24
						3) Jet Wall			1.25

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TABLE 3.6A-34

SUMMARY OF ANALYSIS OF PIPING FAILURE AS A RESULT OF PIPE WHIP  
Feedwater System (Inside Containment)

## PART 1

## South Loop

Piping Line Numbers: 2FWS-012-54-1

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measure	Remarks	
	El	AZ	r						
1	309'-1 1/8"	210°	13'-5 5/16"	C	RPV		N/Required	No whip	1.21 1.22 1.24
				C	FWP/RPV	1)Cont. liner 2)2CSH-012-15-1 3)BSW 4)Vent duct 5)FI 305'-9"	2FWS*PRR001		1.26 1.27 1.28 1.29 1.30



TABLE 3.6A-34 (Cont)

## PART 1 (Cont)

Piping Line Numbers: 2FWS-012-37-1

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measure	Remarks	
	El	AZ	Γ						
5	309'-1 1/8"	270°	13'-5 5/8"	C	RPV		N/Required	No whip	1.46
				C	FWP/RPV	1)Cont. liner 2)BSW 3)ADS acc. tank 4)ADS acc. relief valve 5)2MSS-PSV 6)FI 305'-9"	2FWS*PRR007		1.48 1.49 1.50 1.51 1.52 1.53



TABLE 3.6A-34 (Cont)

## PART 1 (Cont)

Piping Line Numbers: 2FWS-012-33-1

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measure	Remarks	
	El	AZ	r						
11	309'-1 1/8"	330°	13'-5 7/8"	C	RPV		N/Required	No whip	2.12
				C	FWP/RPV	1)BSW			2.14
						2)2RHS-012-125-1	2FWS*PRR010 2FW*PRR010A		2.15 2.16
*14B	308'-0 5/8"	309°	18'-4"	C	RPV	1)BSW	2FWS*PRR010A	*Integral attachment	2.20
						2)Restraint for 2RHS-012-125-1	2FWS*PRR010		2.21
				C	FWP/RPV	1)2MSS-026-46-1 2)ADS	2FWS*PRR012		2.23 2.24





TABLE 3.6A-34 (Cont)

## PART 1 (Cont)

Piping Line Numbers: 2FWS-024-60-1

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measure	Remarks
	El	Az	r					
18	292'-8"	340°	32'-0 7/8"	C	RPV	1)Cont. liner	2FWS*PRR014	2.41
						2)2RHS-012-125-1		2.42
						3)SVV lines		2.43
				C	FWP	1)Cont. liner	2FWS*PRR016	2.45
						2)MSS*PRR004	2FWS*PRR017	2.46
						3)CTV-60		2.47
						4)Torsion on iso valve		2.48
				L	FWP/RPV	1)Cont. liner	2FWS*PRR016	2.50
						2)MSS-026-45-1		2.51



TABLE 3.6A-34 (Cont)

## PART 1 (Cont)

Piping Line Numbers: 2FWS-024-32-1

<u>Break Point</u>	<u>Break Location</u>			<u>Break Type</u>	<u>Blowdown Source</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>
	<u>EI</u>	<u>AZ</u>	<u>r</u>					
20	266'-3 3/4"	345.5°	31'-2 1/2"	C	RPV	1) Cont. liner	2FWS*PRR015	3.9
						2) 2RHS-012-125-1	2FWS*PRR016	3.10
						3) ADS acc. tank		3.11
						4) FI EI 305'-9"		3.12
				C	FWP	1) Pen. Z-4B	2FWS*PRR018	3.15
						2) Cont. liner	2FWS*PRR017	3.16
						3) Drywell floor		3.17



TABLE 3.6A-34 (Cont)

## PART II

## North Loop

Piping Line Numbers: 2FWS-012-53-1

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measure	Remarks	
	El	Az	r						
21	309'-1 1/8"	150°	13'-5 7/16"	C	RPV			No whip	3.35
				C	FWP/RPV	1)Cont. liner 2)FI El 305'-9" 3)2ICS-010-70-1	2FWS*PRR019		3.37 3.38 3.39



TABLE 3.6A-34 (Cont)

## PART II (Cont)

Piping Line Numbers: 2FWS-012-52-1

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measure	Remarks	
	El	Az	r						
25	309'-1 1/8"	90°	13'-6 3/16"	C	RPV			No whip	3.54
				C	FWP/RPV	1)BSW 2)Cont. liner 3)SVV valves 4)FI El 305'-9"	2FWS*PRR025		3.56 3.57 3.58 4.1





TABLE 3.6A-34 (Cont)

## PART II (Cont)

Piping Line Numbers: 2FWS-012-34-1

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measure	Remarks	
	El	Az	L						
30	309'-1 1/8"	30°	13'-6 5/16"	C	RPV			No whip	4.16
				C	FWP/RPV	1)BSW	2FWS*PRR028		4.18
						2)2RHS-012-8-1	2FWS*PRR28A		4.19
						3)2MSS-PSV			4.20
*33B	307'-7 5/16"	46°	18'-1"	C	RPV	1)BSW	2FWS*PRR028A	*Integral attachment	4.23
						2)RHS-012-8-1	2FWS*PRR028		4.24
						3)2MSS-PSV			4.25
				C	FWP/RPV	1)MSS-026-43-1	2FWS*PRR030		4.27
						2)ADS relief valves			4.28



TABLE 3.6A-34 (Cont)

## PART II (Cont)

Piping Line Numbers: 2FWS-024-61-1

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measure	Remarks
	EL	AZ	R					
36	292'-8"	19°	32'-0 7/8"	C	RPV	1)Cont. liner 2)SVV lines	2FWS*PRR048	4.47 4.48
				C	FWP	1)Cont. liner 2)2MSS*CTV6B 3)2MSS*PRR024 4)2MSS*PRR024A 5)Torsion on iso valve	2FWS*PRR034 2FWS*PRR035	4.50 4.51 4.52 4.53 4.54
				L	FWP/RPV	1)Cont. liner 2)2MSS*CTV6B 3)2MSS-026-44-1	2FWS*PRR034	4.56 4.57 4.58



TABLE 3.6A-34 (Cont)

## PART II (Cont)

Piping Line Numbers: 2FWS-024-31-1

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measure	Remarks
	El	Az	C					
38	266'-3 3/4"	14.5°	31'-2 1/2"	C	RPV	1) Cont. liner	2FWS*PRR033	5.16
						2) SVV lines	2FWS*PRR034	5.17
						3) 2RHS-012-170-2		5.18
						4) 2RHS-012-171-2		5.19
						5) FI El 305'-9"		5.20
				C	FWP	1) Cont. liner	2FWS*PRR036	5.24
						2) BSW	2FWS*PRR035	5.25
						3) Pen. Z-4A		5.26
						4) Drywell floor		5.27

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TABLE 3.6A-35

SUMMARY OF ANALYSIS OF PIPING FAILURE AS A RESULT OF PIPE WHIP  
Feedwater System (Outside Containment)

Piping Line Numbers: 2FWS-024-28-4

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measure	Remarks	
	EI	X	Z						
1	257'-0"	-83'- 5 3/16"	7-9	C	RPV	None			1.15
				C	FWP	1)Cable trays	2FWS*PRR112		1.17 1.18
6	266'-6"	-118'- 0 1/4"	29'- 8 1/4"	C	RPV	Torsion on isolation valve	2FWS*PRR112 2FWS*PRR101		1.21 1.22
				C	FWP	None			1.24
8	268'- 8 11/16"	124'- 8 9/16"	32'- 8 1/4"	C	RPV	1)New 12 line wall	2FWS*PRR113		1.40 1.41 1.42
				C	FWP	1)11 line wall	2FWS*PRR114		1.44
12	269'-8"	-127'- 6 3/4"	15'- 0 11/16"	C	RPV	None			1.48 1.49
				C	FWP	None			1.51
									1.54 1.55
									1.57

1 of 2





TABLE 3.6A-35 (Cont)

Piping Line Numbers: 2FWS-024-27-4

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measure	Remarks
	EI	X	Z					
21	257'-0"	-83'-5"	-7'-9"	C	RPV	None		2.14
				C	FWP	1)Cable trays	2FWS*PRR117	2.16
23	260'-0"	-118'-0"	-7'-9"	C	RPV	1)Moment on isolation valve	2)12 line wall penetration	2.19
							2FWS*PRR104	2.20
						3)FI EI 250'-0"		2.21
								2.22
26	269'-10"	-118'-0"	14'-3 7/8"	C	FWP		1)FI EI 277'-6"	Impact Analysis
								2.24
								2.25
				C	RPV	1)Torsion on isolation valve	2)2FPW-006-165-4	2FWS*PRR117
32	269'-10"	-124'-0"	-19'-11 1/8"	C	FWP	None		2.28
				C	RPV	None		2.29
							Not Required	2.30
				C	FWP	None		2.32
32	269'-10"	-124'-0"	-19'-11 1/8"	C	RPV	None		2.35
				C	FWP	None		2.36
				C	FWP	None		2.38

2 of 2



TABLE 3.6A-36

SUMMARY OF ANALYSIS OF PIPING FAILURE AS A RESULT OF PIPE WHIP  
Reactor Core Isolation Cooling System (Inside Containment)

Piping Line Numbers: 21CS-010-70-1

Break Point	Break Location			Break Type	Blowdown Source	Targets		Protection Measure	Remarks
	EI (ft-in)	AZ (deg)	r (ft)						
1	302-2	111	19.7	C	Turbine	1)Cont. liner	3)2RHS-012-171-2	21CS*PRR001	1.19
				C	MSS	2)2CSL-012-4-1		None Required	1.20
									1.21
3	302-0 5/16	137.5	26.02	C	Turbine	1)2RHS-012-163-1	2)PI EI 305'-9" 3)PI EI 288'-3 1/4"	21CS*PRR003	1.23
				C	MSS	1)2RHS-012-8-1	1)2RHS-012-171-2 2)Vent duct 3)UC3B	None Required	1.24
									1.26
									1.27
									1.28
9	263-8 1/4	196	29.38	C	Turbine	1)21CS*MOV128	2)2RHS-HCV131	21CS*PRR006	1.30
				C	MSS		1)2SVV-010-36-3 2)2WCS-MOV101 3)2WCS-004-3-1	21CS*PRR005	1.32
									1.33
									1.34
12	263-7 5/16	185	31.1	C	Turbine	None			1.36
				C	MSS		1)21CS*PRS004 2)21CS*PRS005	21CS*PRR005A	1.38
									1.39



TABLE 3.6A-37

## SUMMARY OF ANALYSIS OF PIPING FAILURE AS A RESULT OF PIPE WHIP

ICS - Head Spray

Piping Line Numbers: 21CS-006-33-1

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measure	Remarks	
	El	Az	r						
1	341'-8"	360°	4'-0"	C	RPV	1)Insulation Support Structure	Impact Analysis		1.15 1.17 1.18
2	342'-1 1/2"	360°	4'-0"	C	RPV	1)Insulation Support Structure	Impact Analysis		1.20 1.21
				L	RPV	None	Not Required		1.23 1.24
4	342'-10 1/2"	349°	4'-10 3/4"	C	RPV	1)Insulation Support Structure	Impact Analysis		1.26
				L	RPV	None	Not Required		1.28 1.29
5	342'-10 1/2"	345°	5'-3"	C	RPV	1)Insulation Support Structure	Impact Analysis		1.31
				L	RPV	None	Not Required		1.33 1.34
6	342'-10 1/2"	340°	6'-1 7/8"	C	RPV	1)Insulation Support Structure	Impact Analysis		1.36
				L	RPV	None	Not Required		1.38 1.39
11	338'-9 1/16"	330°	9'-3 3/4"	C	RPV	1)Drywell Head	Impact Analysis		1.41
									1.43 1.44

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TABLE 3.6A-38

SUMMARY OF ANALYSIS OF PIPING FAILURE AS A RESULT OF PIPE WHIP  
Reactor Core Isolation Cooling System (Outside Containment)

Piping Line Numbers: 21CS-010-62-2

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measure	Remarks
	EI	X	Z					
10	257'-	54'-	4'-9"	C	RPV	1)21CS*MOV121	21CS*PRR007	1.22
	2 7/8"	3 3/4"		C	Turbine	1)2WCS*MOV112	21CS*PRR009	1.23
12	255'-11"	60'-6 1/8"	9'-0"	C	RPV	1)FI Pen 261'-0"	Protective Structure (21CS*PRR008)	1.27
				C	Turbine	2)21CS*PRR008		1.28
17	240'-9 1/4"	55'-0 3/8"	9'-	C	RPV	1)E. Tunnel wall	21CS*PRR010	1.31
			8 7/16"	C	RPV	2)Cable Trays		1.32
						1)E. tunnel wall	21CS*PRR012	1.34
						2)Instr pen		1.35
						3)Cable trays		1.36

1 of 3





TABLE 3.6A-38 (Cont)

Piping Line Numbers: 2RHS-008-50-2 and 2RHS-008-53-2

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measure	Remarks
	<u>EI</u>	<u>X</u>	<u>Z</u>					
48	234'-0"	51'- 10 15/16"	26'-5"	C	RPV	None		1.51 1.52
60	233'- 6 1/2"	47'- 11 3/8"	-36'- 3 7/8"	C	RPV	None		1.54 1.55

2 of 3



TABLE 3.6A-38 (Cont)

Piping Line Numbers: 21CS-004-36-2 and 21CS-004-61-2

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measure	Remarks
	EL	X	Z					
72	234'-0"	55'- 4 1/2"	7'- 8 5/8"	C	RPV	None		2.12 2.13
27B	191'- 7 1/2"	55'- 2 11/16"	-2'-6"	C	RPV	None		2.15 2.16
63A	190'- 8 7/8"	51'- 10 3/16"	-3'- 11 15/16"	C	RPV	None		2.18 2.19
68	187'- 11 1/8"	51'- 10 3/16"	-8'- 5 15/16"	C	RPV	None		2.21 2.22

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TABLE 3.6A-39

## SUMMARY OF ANALYSIS OF PIPING FAILURE AS A RESULT OF PIPE WHIP

## High-Pressure Core Spray - Inside Containment

Piping Line Numbers: 2CSH-010-27-1, 2CSH-012-46-1, 2CSH-012-15-1

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measures	Remarks	
	El	AZ	r						
1	307'- 11 1/8"	240°	13-6 1/2	C	RPV	None	N/Req'd	No whip	1.20 1.21
3A	307'- 11 1/8"	240°	17-0 1/2	C	RPV	None	N/Req'd	No whip	1.23 1.24
				L	RPV	1)BSW	2CSH*PRR003 2CSH*PRR003B		1.25 1.26
6	307'- 11 1/8"	236.5°	19-3 3/4	C	RPV	1)BSW	2CSH*PRR003A		1.28 1.29
				L	RPV		2CSH*PRR001		1.30
7	307'- 11 1/8"	231°	21-5 1/4	C	RPV	1)BSW	2CSH*PRR003A		1.32 1.33
				L	RPV		2CSH*PRR001		1.34
10	307'- 11 1/8"	217.5°	27-10 7/8	C	RPV	1)Cont. liner	2CSH*PRR001		1.36
				C	RPV	1)Cont. liner	2CSH*PRR002		1.37

1 of 1



TABLE 3.6A-40

## SUMMARY OF ANALYSIS OF PIPING FAILURE AS A RESULT OF PIPE WHIP

## Low-Pressure Core Spray System (Inside Containment)

Piping Line Numbers: 2CSL-012-4-1, 2CSL-010-13-1

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measures	Remarks
	EL	AZ	r					
1	307'-11 1/4"	120°	13'-16 15/16"	C	RPV	None	N/Req'd	No whip 1.20
5	307'-11 1/8"	120°	22'-9 1/2"	C	RPV	None	N/Req'd	No whip 1.22
8	307'-11 1/8"	130°	27'-2 1/8"	C	RPV	1)2CSL*AOV101 2)Cont. liner	2CSL*PRR003	1.24
								1.25
				C	RPV	1)BSW	2CSL*PRR001R 2CSL*PRR002	1.27 1.28

1 of 1





TABLE 3.6A-41

SUMMARY OF ANALYSIS OF PIPING FAILURE AS A RESULT OF PIPE WHIP  
Residual Heat Removal System - Shutdown Mode

Piping Line Numbers: 2RHS-012-200-1, 2RHS-012-30-1

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measures	Remarks	
	<u>EL</u>	<u>AZ</u>	<u>r</u>						
1	266'-10 7/8"	270°	20-9 1/4	C	RPV	None		No whip	1.20 1.21
5	262'-6"	270°	22-10	C	RPV	None			1.23
8	255'-1"	270°	26-7	C	RPV	1) Reactor pedestal 2) 2RCS-024-7-1	2RHS*PRR002		1.25 1.26
				C	RPV	1) Cont. liner	2RHS*PRR003	Pipe whip due to jet imping	1.28 1.29

1 of 3



TABLE 3.6A-41 (Cont)

Piping Line Numbers: 2RHS-020-63-1, 2RHS-020-159-1

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measures	Remarks	
	<u>El</u>	<u>AZ</u>	<u>r</u>						
10	271'-	180°	21'-	C	RPV	None		No whip	1.42
	1 7/8"		7 15/16"						1.43
18	257'-6"	180°	24'-	C	RPV	None			1.45
			3 1/2"						1.46
20	256'-0"	174°	24'-6"	C	RPV	None	2RHS*PRR004	Pipe whip due to jet imping	1.48
				C	RPV	1)Cont. liner	2RHS*PRR006		1.50 1.51

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TABLE 3.6A-41 (Cont)

Piping Line Numbers: 2RHS-012-193-1, 2RHS-012-10-1

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measures	Remarks	
	El	AZ	r						
30	266'-10 7/8"	90°	20'-9 1/4"	C	RPV	None		No whip	2.6 2.7
37	261'-10"	90°	22'-10"	C	RPV	None			2.9
42	255'-1"	90°	26'-7"	C	RPV	1)Cont liner	2RHS*PRR010	Pipe whip due to jet imping	2.11 2.12
				C	RPV	1)Reactor pedestal 2)2RCS-024-1-1	2RHS*PRR009		2.14 2.15

3 of 3



TABLE 3.6A-42

SUMMARY OF ANALYSIS OF PIPING FAILURE AS A RESULT OF PIPE WHIP  
Residual Heat Removal System (Low-Pressure Coolant Injection Mode)

Piping Line Number: 2RHS-012-8-1

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measures	Remarks	1.14
	El	AZ	r						1.17 1.18
1	299'-0 3/8"	45°	13.375	C	RPV		N/required		1.21 1.22
7	299'-0 3/8"	46°	17.75	C	RPV	1)BSW doors 2)2MSS-PSV120	2RHS*PRR014		1.38 1.39
13	311'-0"	51°	19.87	C	RPV	1)Cont. liner 2)BSW	2RHS*PRR012		1.42 1.43 1.44 1.45 1.46
19	316'-9"	57°	20.93	C	RPV	1)Cont. liner 2)Star truss	3)Vent duct 4)SVV lines 5)ADS	2RHS*PRR013 2RHS*PRR022	1.49 1.50 1.51
				C	Jet Imp.	1)Cont. liner 2)Star truss	2RHS*PRR022		1.54 1.55

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TABLE 3.6A-42 (Cont)

Piping Line Number: 2RHS-012-163-1

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measures	Remarks	
	EL	AZ	R						
33	299'- 0 3/8"	135°	13.375	C	RPV		N/required		2.14 2.15
55	311'-8"	147°	18.6	C	RPV	1)2CSL-012-4-1 3)PI EI 305'-9" 2)CSL*PRR001, 002 4)ADS	2RHS*PRS016		2.19 2.20 2.21
56	311'-8"	178°	17.25	C	RPV	None	N/required	No essential targets	2.25 2.26 2.27
60	293'- 2 7/8"	208°	20.87	C	RPV	1)2FWS-012-54-1	N/required		2.31 2.32
				C	Jet imp from RPV	1)2FWS-012-54-1	N/required		2.36 2.37



TABLE 3.6A-42 (Cont)

Piping Line Number: 2RHS-012-125-1

Break Point	Break Location			Break Type	Blowdown Source	Targets		Protection Measures	Remarks
	El	AZ	r						
35	299'-0 3/8"	315°	13.375	C	RPV			N/required	2.54 2.55
39	299'-0 3/8"	314°	17.25	C	RPV	1)BSW doors		N/required	2.58 3.1
47	310'-2"	306°	20.72	C	RPV	1)Cont. liner 5)PI El 305'-9"	2)2FWS*PRR038 3)2MSS*PRR003 4)2MSS-026-46-1	2RHS*PRR018 2RHS*PRR019	3.4 3.5 3.6
53	315'-6"	312°	21.2	C	RPV	1)Cont. liner	2)SVV lines 3)2MSS-026-46-1 4)2MSS*PRR001A	2RHS*PRR020	3.9 3.10 3.11
				C	Jet Imp	1)Cont. liner		2RHS*PRR021	3.14

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Nine Mile Point Unit 2 FSAR

TABLE 3.6A-43

SUMMARY OF ANALYSIS OF PIPING FAILURE AS A RESULT OF PIPE WHIP  
Recirculation System

See Section 3.6B



TABLE 3.6A-44

SUMMARY OF ANALYSIS OF PIPING FAILURE AS A RESULT OF PIPE WHIP  
Reactor Water Cleanup System (Inside Containment)

Piping Line Number: 2WCS-002-217-1

<u>Break Point</u>	<u>Break Location</u>			<u>Break Type</u>	<u>Blowdown Source</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>	
	<u>EI</u>	<u>AZ</u>	<u>r</u>						
1	266'	-0"	0°	C	RPV	None	N/R	No whip	1.22
				C	RCS	1)CRD housing support beams	Impact analysis		1.24 1.25 1.26

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TABLE 3.6A-44 (Cont)

Piping Line Number: 2WCS-002-12-1

<u>Break Point</u>	<u>Break Location</u>	<u>Break Type</u>	<u>Blowdown Source</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>
	<u>E</u> <u>AZ</u> <u>L</u>					
228	242'-0" 194° 27'-6"	C	RPV&RCS	1)2SVV-012-74-3	Impact analysis	1.40 1.41



TABLE 3.6A-44 (Cont)

Piping Line Number: 2WCS-004-3-1

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measure	Remarks
	El	Az	r					
23	245'-3"	186°	28.2'	C	RPV	1)2SVV-011-36-3 2)PI El 249'-0"	2WCS*PRR003A 2WCS*PRR004A	1.55 1.56
				C	RCS	1)None	2WCS*PRR008 2WCS*PRR011	2.1 2.2
				L	RPV&RCS	1)2CCP-004-133-3 2)2CCP-004-531-3 3)PI El 249'-0"	2WCS*PRR008 2WCS*PRR011	2.5 2.6 2.7



TABLE 3.6A-44 (Cont)

Piping Line Number: 2WCS-008-86-1

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measure	Remarks	
	El	Az	L						
24	245'-3"	185°	37.0'	C	WCS pumps	None	N/R	No whip	2.21
				C	RCS	1) Reactor pedestal 2) 2RCS*PRR006	2WCS*PRR012		2.23 2.24
243	245'-3"	185°	28.8'	C	WCS pumps	1) Pen. Z-23	Impact analysis		2.27 2.28
				C	RPV&RCS	1) Reactor pedestal 2) 2RCS*PRR006 3) 2SVV-010-34-3	2WCS*PRR012		2.31 2.32
				L	RPV&RCS	1) PI El 249'-0" 2) 2CCP-004-133-3 3) 2CCP-004-531-3	2WCS*PRR008 2WCS*PRR011		2.35 2.36 2.37
244	245'-3"	185°	27.7'	C	RPV&WCS pumps	1) Pen. Z-23	Impact analysis		2.40 2.41
				C	RCS	1) Reactor pedestal 2) 2RCS*PRR006 3) 2SVV-010-34-3	2WCS*PRR012		2.44 2.45
				L	RPV&RCS	1) PI El 249'-0" 2) 2CCP-004-133-3 3) 2CCP-004-531-3	2WCS*PRR008 2WCS*PRR011		2.48 2.49 2.50



TABLE 3.6A-44 (Cont)

Piping Line Number: 2WCS-004-1-1

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measure	Remarks
	El	Az	r					
44	244'-0"	193°	22.9'	C	RPV&RCS	1)2WCS*MOV102 2)PI El 249'-0"	2WCS*PRR013 2WCS*PRR008 2WCS*PRR018	3.6 3.7 3.8
				C	RCS	1)Downcomers 2)2SVV-025-121-3 3)2SVV-025-122-3 4)PI El 240'-9"	2WCS*PRR018	3.11 3.12 3.13
				L	RPV&RCS	None	2WCS*PRR014 2WCS*PRR018	3.16 3.17





TABLE 3.6A-44 (Cont)

Piping Line Number: 2WCS-004-93-1

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measure	Remarks
	El	Az	r					
52	247'-5"	152°	21.4'	C	RPV&RCS	1)PI El 240'-9"	2WCS*PRR020	3.31
				C	RCS	None	N/R	3.33
				L	RPV&RCS	None	N/R	3.35
55	247'-5"	153°	22.0'	C	RPV&RCS	1)PI El 240'-9"	2WCS*PRR020	3.37
				C	RCS	None	N/R	3.39
				L	RPV&RCS	None	N/R	3.41



TABLE 3.6A-44 (Cont)

Piping Line Number: 2WCS-004-92-1

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measure	Remarks
	EI	Az	r					
56	247'-1"	151°	21.1'	C	RPV&RCS	None	N/R	3.54
				L	RPV&RCS	1)PI EI 249'-0"	2WCS*PRR020	3.56
53	248'-9"	151°	21.1'	C	RPV&RCS	1)PI EI 240'-9"	2WCS*PRR019	3.58
				C	RCS	None	N/R	4.2
54	247'-9"	151°	21.1'	C	RPV&RCS	1)PI EI 240'-9"	2WCS*PRR019	4.4
				C	RCS	None	N/R	4.6
				L	RPV&RCS	None	N/R	4.8

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TABLE 3.6A-44 (Cont)

Piping Line Number: 2WCS-002-94-1

<u>Break Point</u>	<u>Break Location</u>	<u>Break Type</u>	<u>Blowdown Source</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>
	<u>EI</u> <u>AZ</u> <u>R</u>					
66	244'-5" 155° 20.2'	C	RPV&RCS	None	N/R	4.21



TABLE 3.6A-44 (Cont)

Piping Line Number: 2WCS-004-2-1

<u>Break Point</u>	<u>Break Location</u>	<u>Break Type</u>	<u>Blowdown Source</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>
	<u>El</u> <u>Az</u> <u>r</u>					
411	247'-5"   334°   20.1'	C	RPV&RCS	1)2RCS*PRR034	2WCS*PRR017	4.34
		C	RCS	None	N/R	4.36
		L	RPV&RCS	None	N/R	4.38





TABLE 3.6A-44 (Cont)

Piping Line Number: 2WCS-004-98-1

<u>Break Point</u>	<u>Break Location</u>	<u>Break Type</u>	<u>Blowdown Source</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>
	<u>EI</u> <u>AZ</u> <u>R</u>					
42	248'-9" 331° 21.1'	C	RCS	None	N/R	4.51
		C	RCS&RPV	1)PI EI 240'-9" 2)2SVV-025-133-3	2WCS*PRR016	4.53 4.54



TABLE 3.6A-44 (Cont)

Piping Line Number: 2WCS-002-100-1

<u>Break Point</u>	<u>Break Location</u> <u>El</u> <u>Az</u> <u>r</u>	<u>Break Type</u>	<u>Blowdown Source</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>
422	244'-5" 334° 22.4'	C	RPV&RCS	None	N/R	5.9



TABLE 3.6A-45

## SUMMARY OF ANALYSIS OF PIPING FAILURE AS A RESULT OF PIPE WHIP

## Reactor Water Cleanup System (Outside Containment)

Piping Line Numbers: 2-WCS-008-88-3, 2-WCS-010-316-3, 2-WCS-008-301-3

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measures	Remarks
	EL	AZ	R					
1	245'-3"	185°	60'-0"	C	RPV	1. Break Exclusion Region	2WCS*PRR101 (zero gap)	1.20 1.21
5	243'-0"	185°	60'-6"	C	RPV	1. Break Exclusion Region	2WCS*PRR101 (zero gap)	1.23 1.24
				C	P1A,B	1. Floor Elev 240'	2WCS*PRR102	1.26 1.27
234A	283'-0"	36°	40'-7"	C	FWS	None	2WCS*PRR111	1.29
262	263'-0"	17°	47'-11"	C	FWS	1. Break Exclusion Region	2WCS*PRR106 (zero gap)	1.31 1.32

For all other postulated breaks (see Table 3.6A-25) appropriate engineering evaluations have been completed to eliminate the need for additional protection measures.

1.36  
1.37



TABLE 3.6A-46

SUMMARY OF ANALYSIS OF PIPING FAILURE AS A RESULT OF PIPE WHIP  
Standby Liquid Control System

Piping Line Numbers: 2SLS-200-89-1, 2SLS-200-94-1

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measures	Remarks	1.17
	El	AZ	R						1.18
1	307'- 11 3/16"	236.5°	17'-0 1/2"	C	CSH	None		No whip	1.21 1.22
7	307'- 11 3/16"	228°	17'-3 11/16"	C	CSH	None		No whip	1.26 1.27
9	307'- 11 3/16"	226°	17'-6 1/4"	C	CSH	None		No whip	1.29 1.30

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TABLE 3.6A-47

## SUMMARY OF ANALYSIS OF PIPING FAILURE AS A RESULT OF PIPE WHIP

## Control Rod Drive System

Piping Line Numbers: 2-RDS-003-23-4, 2-RDS-003-22-4, 2-RDS-003-28-4, 2-RDS-002-61-4, 2-RDS-002-38-4

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measures	Remarks	
	EL	AZ	R						
<u>Line No. 2-RDS-003-23-4</u>									1.21
1	217'-1 1/2"	34.38°	57.0'	C	RDS Pump	None	Not Required		1.23
4	217'-1 1/2"	35.95°	59.375'	C	RDS Pump	None	Not Required		1.25
<u>Line No. 2-RDS-003-22-4</u>									1.28
2	217'-1 1/2"	46.32°	57.0'	C	RDS Pump	None	Not Required		1.30
3	217'-1 1/2"	47.45°	59.375'	C	RDS Pump	None	Not Required		1.32
<u>Line No. 2-RDS-003-28-4</u>									1.36
6	269'-0 1/2"	25.16°	78.88'	C	RDS Pump	None	Not Required		1.38
<u>Line No. 2-RDS-002-61-4</u>									1.42
10	262'-6"	22.22°	75.89'	C	RDS Pump	None	Not Required		1.44
15	262'-6"	21.35°	78.83'	C	RDS Pump	None	Not Required		1.46
<u>Line No. 2-RDS-002-38-4</u>									1.50
20	272'-8 7/8"	21.51°	78.28'	C	RDS Pump	None	Not Required		1.52



Nine Mile Point Unit 2 FSAR

TABLE 3.6A-47

SUMMARY OF ANALYSIS OF PIPING FAILURE AS A RESULT OF PIPE WHIP

Control Rod Drive System

Piping Line Numbers: 2-RDS-150-160-4, 2-RDS-150-74-4, 2-RDS-002-39-4, 2-RDS-002-51-4, 2-RDS-150-43-4

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measures	Remarks	
	EL	AZ	R						
<u>Line No. 2-RDS-150-160-4</u>									2.13
25	262'-6"	22.33°	74.68'	C	RDS Pump	None	Not Required	2.15	
<u>Line No. 2-RDS-150-74-4</u>									2.19
30	262'-6"	23.37°	73.08'	C	RDS Pump	None	Not Required	2.21	
<u>Line No. 2-RDS-002-39-4</u>									2.25
35	262'-6"	19.53°	70.65'	C	RDS Pump	None	Not Required	2.27	
55	262'-8"	19.94°	69.23'	C	RDS Pump	None	Not Required	2.29	
<u>Line No. 2-RDS-002-51-4</u>									2.33
40	262'-6"	26.18°	66.95'	C	RDS Pump	None	Not Required	2.35	
45	263'-6 1/4"	22.05°	64.82'	C	RDS Pump	None	Not Required	2.37	
<u>Line No. 2-RDS-150-43-4</u>									2.41
60	262'-6"	26.35°	69.00'	C	RDS Pump	None	Not Required	2.43	



TABLE 3.6A-47

## SUMMARY OF ANALYSIS OF PIPING FAILURE AS A RESULT OF PIPE WHIP

## Control Rod Drive System

Piping Line Number: 2-RDS-002-55-4

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measures	Remarks
	EL	AZ	R					
65A	274'-2"	21.84°	70.56'	C	RDS Pump	None	Not Required	3.3
70A	278'-11"	18.64°	82.11'	C	RDS Pump	None	Not Required	3.5
75A	272'-1"	39.09°	52.37'	C	RDS Pump	None	Not Required	3.7
80A	271'-5 7/8"	58.36°	53.70'	C	RDS Pump	None	Not Required	3.9
85A	271'-5 7/8"	291.06°	62.60'	C	RDS Pump	None	Not Required	3.11
95A	271'-4 1/8"	271.30°	54.95'	C	RDS Pump	None	Not Required	3.13
100A	271'-3 1/16"	268.68°	54.18'	C	RDS Pump	None	Not Required	3.15
110A	271'-5 7/8"	65.37°	59.59'	C	RDS Pump	None	Not Required	3.17
115A	271'-3 1/4"	88.63°	52.39'	C	RDS Pump	1/2" K-19, 19B, 138, 68B, 23 Tubing and Associates	2RDS*JTS001	3.20 3.21 3.22 3.23
120A	271'-2"	91.32°	54.18'	C	RDS Pump	None	Not Required	3.26
130A	271'-5 7/8"	62.94°	60.83'	C	RDS Pump	None	Not Required	3.29
135A	280'-7"	344.00°	82.53'	C	RDS Pump	None	Not Required	3.31
140A	270'-0 1/2"	342.4°	75.23'	C	RDS Pump	None	Not Required	3.33
145A	270'-0 1/2"	341.04°	73.58'	C	RDS Pump	None	Not Required	3.35
150A	269'-0 1/2"	322.44°	80.50'	C	RDS Pump	None	Not Required	3.37
155A	268'-10 1/2"	305.01°	84.18'	C	RDS Pump	None	Not Required	3.39
160A	264'-10 1/4"	291.25°	81.34'	C	RDS Pump	None	Not Required	3.41
165A	264'-10 1/4"	288.03°	79.93'	C	RDS Pump	None	Not Required	3.43
170A	271'-7 3/8"	287.01°	72.87'	C	RDS Pump	None	Not Required	3.45

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TABLE 3.6A-47

## SUMMARY OF ANALYSIS OF PIPING FAILURE AS A RESULT OF PIPE WHIP

## Control Rod Drive System

Piping Line Number: 2-RDS-002-57-4

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measures	Remarks
	EL	AZ	R					
50	273'-11"	26.09°	62.91'	C	RDS Pump	None	Not Required	4.4
65B	274'-2"	22.05°	64.82'	C	RDS Pump	None	Not Required	4.6
70B	278'-11"	19.48°	81.95'	C	RDS Pump	None	Not Required	4.23
75B	273'-1"	38.79°	51.90'	C	RDS Pump	None	Not Required	4.25
80B	272'-5 7/8"	58.82°	53.44'	C	RDS Pump	None	Not Required	4.27
85B	272'-5 7/8"	291.06°	62.60'	C	RDS Pump	None	Not Required	4.29
95B	272'-4 1/8"	271.30°	54.95'	C	RDS Pump	None	Not Required	4.31
100B	272'-3 1/16"	268.68°	54.18'	C	RDS Pump	None	Not Required	4.33
110B	272'-5 7/8"	65.37°	59.59'	C	RDS Pump	None	Not Required	4.35
115B	272'-3 1/4"	88.63°	52.39'	C	RDS Pump	1/2" K-19, 19B, 138, 68B, 23 Tubing and Associates	2RDS*JTS001	4.38 4.39 4.40 4.41
120B	272'-2"	91.32°	54.18'	C	RDS Charge	None	Not Required	4.44
130B	272'-5 7/8"	62.94°	60.83'	C	RDS Pump	None	Not Required	4.46
135B	281'-7"	344.00°	82.53'	C	RDS Pump	None	Not Required	4.48
140B	271'-0 1/2"	342.4°	75.23'	C	RDS Pump	None	Not Required	4.50
145B	271'-0 1/2"	341.04°	73.58'	C	RDS Pump	None	Not Required	4.52
150B	270'-0 1/2"	322.44°	80.50'	C	RDS Pump	None	Not Required	4.54
155B	269'-10 1/2"	305.01°	84.18'	C	RDS Pump	None	Not Required	4.56
160B	265'-10 1/4"	291.25°	81.34'	C	RDS Pump	None	Not Required	4.58
165B	265'-10 1/4"	288.03°	79.93'	C	RDS Pump	None	Not Required	5.1
170B	272'-7 3/8"	287.01°	72.87'	C	RDS Pump	None	Not Required	5.3

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TABLE 3.6A-47

## SUMMARY OF ANALYSIS OF PIPING FAILURE AS A RESULT OF PIPE WHIP

## Control Rod Drive System

Piping Line Numbers: 2-RDS-001-58-4 (1 1/2" Exhaust Water), 2-RDS-001-56-4 (1 1/2" Drive Water)

Break Point	Break Location			Break Type	Blowdown Source	Targets	Protection Measures	Remarks	
	EL	AZ	r						
<u>Line No. 2-RDS-001-58-4 (1 1/2" Exhaust Water)</u>									5.21
90C	272'-11 7/8"	287.10°	56.68'	C	RDS Pump	None	Not Required		5.23
97C	272'-9 1/16"	268.70°	54.95'	C	RDS Pump	None	Not Required		5.26
105C	272'-9 1/16"	266.48°	54.27'	C	RDS Pump	None	Not Required		5.28
112C	272'-11 7/8"	69.27°	57.92'	C	RDS Pump	None	Not Required		5.30
117C	272'-8"	91.37°	52.39'	C	RDS Pump	1/2" K-19, 19B, 138, 68B, 23 Tubing and Associates	2RDS*JTS001		5.33 5.34 5.35 5.36
125C	272'-8"	93.52°	54.27'	C	RDS Pump	None	Not Required		5.39
<u>Line No. 2-RDS-001-56-4 (1 1/2" Drive Water)</u>									5.42
90D	271'-11 7/8"	287.10°	56.68'	C	RDS Pump	None	Not Required		5.44
97D	271'-9 1/16"	268.70°	54.95'	C	RDS Pump	None	Not Required		5.46
105D	271'-9 1/16"	266.48°	54.27'	C	RDS Pump	None	Not Required		5.48
112D	271'-11 7/8"	69.27°	57.92'	C	RDS Pump	None	Not Required		5.50
117D	271'-8"	91.37°	52.39'	C	RDS Pump	1/2" K-19, 19B, 138, 68B, 23 Tubing and Associates	2RDS*JTS001		5.53 5.54 5.55 5.56
125D	271'-8"	93.52°	54.27'	C	RDS Pump	None	Not Required		5.59



TABLE 3.6A-48

## SUMMARY OF ANALYSIS OF TARGETS AS A RESULT OF JET IMPINGEMENT

Main Steam System (Inside Containment)  
North Loop

Piping Line Numbers: 2-MSS-026-43-1

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks	
	El	Az					
1	322'-0 1/8"	72°	C	Primary Containment Liner	None	See Note 1	1.21
7	318'-8 1/4"	72°	C	Refueling Bulkhead Containment Liner	None None	See Note 1 See Note 1	1.23 1.24
33	293'-5 7/8"	13°	C	Primary Containment Liner	None	See Note 1	1.26
41	256'-7"	6.7°	C	2MSS*PRR025 2MSS*PRS025 Drywell Floor Structural Steel el 247', 259', 275', and 285'	None None None None	See Note 1 See Note 1 See Note 1 See Note 1	1.28 1.29 1.30 1.31 1.32

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TABLE 3.6A (Cont)

Piping Line Numbers: 2-MSS-026-44-1

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks	
	EI	Az					
20	321'-11 7/8"	108°	C	Primary Containment Liner	None	See Note 1	1.58
28	299'-9 1/2"	108°	C	Structural Steel at 261', 278', 288', 305'	None	See Note 1	2.3
				2MSS*PRR032	None	See Note 1	2.4
				2MSS*PRR032B	None	See Note 1	2.5
72	293'-9 1/8"	72.6°	C	2MSS*PRR034	None	See Note 1	2.6
115	255'-10 13/16"	25°	C	2MSS*PRR036	None	See Note 1	2.8
				2MSS*PRR037	None	See Note 1	2.10
				2MSS*PRS037	None	See Note 1	2.11
				Drywell Floor	None	See Note 1	2.12
				Structural Steel at 247', 259', 275', and 285'	None	See Note 1	2.13
							2.14
							2.15

NOTES: 1. The target has been designed so that it can withstand the Jet Impact and still adequately perform any essential function for which it is intended.

2. The target has been evaluated and determined to be acceptable in accordance with the objectives described in Section 3.6.1.1A.

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TABLE 3.6A-49

## SUMMARY OF ANALYSIS OF TARGETS AS A RESULT OF JET IMPINGEMENT

Main Steam System (Inside Containment)  
South Loop

Piping Line Numbers: 2-MSS-026-46-1

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks	
	El	AZ					
1	321'-11 7/8"	288°	C	Primary Containment Liner	None	See Note 1	1.22
22	392'-7 1/2"	306°	C	None			1.35
33	293'-5 7/8"	347°	C	Primary Containment Liner	None	See Note 1	1.37
41	256'-6 5/8"	353.5°	C	2MSS*PRR005	None	See Note 2	1.39
				2MSS*PRS005	None	See Note 2	1.40
				Drywell Floor	None	See Note 2	1.41
				Structural Steel el 247', 259', 275', and 285'	None	See Note 2	1.42 1.43

1 of 2





TABLE 3.6A-49 (Cont)

Piping Line Numbers: 2-MSS-026-45-1 ..

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks	
	El	AZ					
20	322'-0 1/8"	252°	C	Primary Containment Liner	None	See Note 1	2.13
28	299'-5 13/16"	252°	C	2MSS*PRR012	None	See Note 1	2.15
				2MSS*PRR012B	None	See Note 1	2.16
				Floor Steel	None	See Note 1	2.17
66	293'-9 1/8"	281°	C	2FWS*PRR004	None	See Note 2	2.20
				2FWS*PRR038	None	See Note 1	2.21
				2MSS*PRR003	None	See Note 1	2.22
				2-CMS-750-57-2	2MSS*JTS001A,B	See Note 3	2.23
				2MSS*PRR014	None	See Note 1	2.24
115	256'-7"	335°	C	2MSS*PRR017	None	See Note 1	2.26
				2MSS*PRR018	None	See Note 1	2.27
				2MSS*PRS018	None	See Note 1	2.28
				Drywell Floor	None	See Note 1	2.29
				Structural Steel el 240', 247', 258', 275', and 285'	None	See Note 1	2.30 2.31

Note 1: The target has been designed so that it can withstand the jet impact and still adequately perform any essential function for which it was intended.

Note 2: The target has been evaluated and determined to be acceptable in accordance with the objectives described in Section 3.6.1.1A.

Note 3: The target has been determined to be essential in accordance with the criteria described in Section 3.6.1.1A.

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TABLE 3.6A-50

SUMMARY OF ANALYSIS OF TARGETS AS A RESULT OF JET IMPINGEMENT  
Main Steam System (Outside Containment)

Piping Line Numbers: 2-MSS-028-7-4

Break Point	Break Location			Break Type	Targets	Protection Measures	Remarks	
	EI	X	Z					
101	250'-4"	-85'- 8 5/16"	2'-6 1/4"	C	Jet Wall MSS*PRR103	None None	See Note 1 See Note 1	1.21 1.22
103A	277'- 9 1/16"	-98'- 10"	2'- 8 1/4"	C	Ceiling MSS*PRR105 Structural Steel	None None None	See Note 1 See Note 1 See Note 1	1.24 1.25 1.26
106	294'- 11 5/16"	-113'- 7 1/2"	2'- 9 1/2"	C	None			1.28 1.29

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TABLE 3.6A-50 (Cont)

Piping Line Numbers: 2-MSS-028-5-4

Break Point	Break Location			Break Type	Targets	Protection Measures	Remarks	
	EI	X	Z					
111	250'- 1 15/16"	-85'-7"	12'-3"	C	Structural Steel Jet Wall MSS*PRR113	None None None	See Note 1 See Note 1 See Note 1	1.42 1.43 1.44
113A	261'- 10 5/16"	-98'- 9 5/8"	11'- ..5 5/8"	C	Ceiling MSS*PRR115 Structural Steel 2MSS*PRS113	None None None None	See Note 1 See Note 1 See Note 1 See Note 1	1.46 1.47 1.48 1.49
116	294'- 11 5/16"	-113'- 7 1/2"	9'-3 1/2"	C	No Target			1.51 1.52

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TABLE 3.6A-5 (Cont)

Piping Line Numbers: 2-MSS-028-1-4

Break Point	Break Location			Break Type	Targets	Protection Measures	Remarks	
	<u>EI</u>	<u>X</u>	<u>Z</u>					
121	250'- 4 5/8"	-81'-10"	-2'-11"	C	Jet Wall MSS*PRR123	None None	See Note 1 See Note 1	2.7 2.8
123A	277'- 10 7/32"	-98'- 9 9/16"	-3'-4 3/4"	C	Ceiling MSS*PRR125 Structural Steel	None None None	See Note 1 See Note 1 See Note 1	2.10 2.11 2.12
126	294'- 11 5/16"	-113'- 7 1/2"	-3'-8 7/16"	C	No Target			2.14 2.15

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TABLE 3.6A (Cont)

Piping Line Numbers: 2-MSS-028-3-4

Break Point	Break Location			Break Type	Targets	Protection Measures	Remarks	
	EI	X	Z					
131	250'-	-85'-	-12'-	C	Jet Wall MSS*PRR133	None	See Note 1	2.40
	4 5/8"	4 7/16"	9 7/8"			None	See Note 1	2.41
133A	262'-	-98'-	-12'-2"	C	Ceiling MSS*PRR135 Structural Steel, el 299'	None	See Note 1	2.43
	0 7/16"	6 7/8"				None	See Note 1	2.44
						None	See Note 1	2.45
136	294'-	-113'-	-10'-3"	C	No Target			2.47
	11 5/16"	7 1/2"						2.48

Note 1: The target has been designed so that it can withstand the jet impact and still adequately perform any essential function for which it was intended.

Note 2: The target has been evaluated and determined to be acceptable in accordance with the objectives described in Section 3.6.1.1A.

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TABLE 3.4-51

## SUMMARY OF ANALYSIS OF TARGETS AS A RESULT OF JET IMPINGEMENT

## Main Steam Vent Line

Piping Line Numbers: 2MSS-002-106-1

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>	
	<u>EI</u>	<u>AZ</u>					
1	341'-	0°	C	Drywell Head RPV Dome	None None	See Note 1 See Note 1	1.21 1.22
3	342'-9"	90°	C	Drywell Head	None	See Note 1	1.24
7	342'-9"	85°	C	Drywell Head	None	See Note 1	1.37

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TABLE 3.6A-51 (Cont)

Piping Line Numbers: 2MSS-022-107-1

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>	
	<u>EI</u>	<u>AZ</u>					
20	330' 3 5/8"	0°	C	Refueling Bulkhead	None	See Note 1	1.40
21	330' 3 5/8"	0°	C	Refueling Bulkhead Bulkhead Brace	None None	See Note 1 See Note 1	1.43 1.44
29	318'-	58°	C	Structural Steel Rim of Refueling Bulkhead 2RHS*PRR013	None None None	See Note 1 See Note 1 See Note 1	1.46 1.47 1.48

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TABLE 3.6A-51 (Cont)

Piping Line Numbers: 2MSS-002-107-1

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks	
	El	AZ					
32,37	314'-4"	27°	C	Primary Containment Liner Structural Steel	None None	See Note 1 See Note 1	2.12 2.13
35	314'-10"	69°	C	Structural Steel	None	See Note 1	2.15
40	307'-0"	14°	C	Structural Steel Primary Containment Liner Reactor Pressure Vessel 2FWS*PRR028	None None None None	See Note 1 See Note 1 See Note 1 See Note 1	2.18 2.19 2.20 2.21

Note 1: The target has been designed so that it can withstand the jet impact and still adequately perform the essential function for which it is intended.

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TABLE 3.6A-52

SUMMARY OF ANALYSIS OF TARGETS AS A RESULT OF JET IMPINGEMENT  
MAIN STEAM SAFETY RELIEF VALVE

Piping Line Numbers: 2-MSS-026-44-1 at 2MSS\*PSV124 and 2MSS\*PSV125

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks	
	El	AZ					
1A	293'-	93°	C	Monorail	None	Note 1	1.20
	10 7/8"						1.21
1B	296'-9"	93°	C	Monorail	None	Note 1	1.23
2A	293'-	87°	C	Monorail	None	Note 1	1.25
	10 7/8"						1.26
2B	296'-9"	87°	C	Monorail	None	Note 1	1.29

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TABLE 3.6A-52 (cont)

Piping Line Numbers: 2-MSS-026-44-1 at 2MSS\*PSV126 and 2MSS\*PSV127

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks	
	El	AZ					
3A	293'-10 7/8"	81.5°	C	Monorail	None	Note 1	1.43 1.44
3B	296'-9"	81.5°	C	Monorail	None	Note 1	1.46
4A	293'-10 7/8"	76°	C	None			1.48
4B	296'-9"	76°	C	None			1.50



TABLE 3.6A-52 (cont)

Piping Line Numbers: 2-MSS-026-44-1 at 2-MSS-PSV128

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>
	<u>EI</u>	<u>Az</u>				
5A	293'-10 7/8"	70°	C	None		2.5
5B	296'-8 1/2"	70°	C	None		2.7 2.8

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TABLE 3.6A-52 (Cont)

Piping Line Numbers: 2-MSS-026-43-1 at 2MSS\*PSV120,  
2MSS\*PSV121, and 2MSS\*PSV122

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks	
	El	AZ					
6A	293'- 6 1/4"	37.5°	C	FWS Omni Restraint Monorail Startruss	None	Note 1	2.22
					None	Note 1	2.23
					None	Note 1	2.24
6B	296'- 6 1/8"	37.5°	C	FWS Omni Restraint Monorail Startruss	None	Note 1	2.26
					None	Note 1	2.27
					None	Note 1	2.28
7A	293'- 6 1/4"	29°	C	FWS Omni Restraint Monorail Startruss	None	Note 1	2.30
					None	Note 1	2.31
					None	Note 1	2.32
7B	296'- 5 3/4"	29°	C	FWS Omni Restraint Monorail Startruss	None	Note 1	2.34
					None	Note 1	2.35
					None	Note 1	2.36
8A	293'- 6 1/4"	22°	C	Structural Steel	None	Note 1	2.38
							2.39
8B	296'- 5 7/16"	22°	C	Structural Steel	None	Note 1	2.41
							2.42





TABLE 3.6A-52 (Cont)

Piping Line Numbers: 2-MSS-026-43-1 at 2MSS\*PSV123

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks
	El	Az				
9A	293'-	15°	C	None		2.55
	6 1/4"					2.56
9B	296'-	15°	C	None		2.58
	5 1/8"					3.1



TABLE 3.6A-52 (Cont)

Piping Line Numbers: 2-MSS-026-46-1 at 2-MSS\*PSV134 and 2-MSS\*PSV135

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks	
	El	Az					
10A	293'- 6 1/4"	322.5°	C	2RHS*AOV16C	None	Note 1, Note 3	3.14
				2FWS*PRR010	None	Note 1	3.15
				Monorail	None	Note 1	3.16
				Startruss	None	Note 1	3.17
10B	296'- 6 1/8"	322.5°	C	2RHS*AOV16C	None	Note 1, Note 3	3.19
				FWS*PRR010	None	Note 1	3.20
				Monorail	None	Note 1	3.21
				Startruss	None	Note 1	3.22
11A	293'- 6 1/4"	330.5°	C	Monorail	None	Note 1	3.24
				Startruss	None	Note 1	3.25
11B	296'- 5 3/4"	330.5°	C	Monorail	None	Note 1	3.27
				Startruss	None	Note 1	3.28



TABLE 3.6A-52 (Cont)

Piping Line Numbers: 2-MSS-026-46-1 at 2MSS\*PSV136 and 2MSS\*PSV137

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks	
	El	Az					
12A	293'-	338°	C	Monorail Startruss	None	Note 1	3.41
	6 1/4"				None	Note 1	3.42
12B	296'-	338°	C	Monorail Startruss	None	Note 1	3.44
	5 7/16"				None	Note 1	3.45
13A	293'-	344.5°	C	None			3.47
	6 1/4"						3.48
13B	296'-	344.5°	C	None			3.50
	5 1/8"						3.51



TABLE 3.6A-52 (cont)

Piping Line Numbers: 2-MSS-026-45-1 at 2MSS\*PSV129 and 2MSS\*PSV130

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks	
	EI	AZ					
14A	293'- 10 7/8"	266.5°	C	Structural Steel Monorail Startruss	None	Note 1	4.6
					None	Note 1	4.7
					None	Note 1	4.8
14B	296'- 8 7/8"	266.5°	C	Structural Steel Monorail Startruss	None	Note 1	4.10
					None	Note 1	4.11
					None	Note 1	4.12
15A	293'- 10 7/8"	273°	C	Structural Steel Monorail Startruss	None	Note 1	4.14
					None	Note 1	4.15
					None	Note 1	4.16
15B	296'- 8 1/2"	273°	C	Structural Steel Monorail Startruss	None	Note 1	4.18
					None	Note 1	4.19
					None	Note 1	4.20





TABLE 3.6A-52 (cont)

Piping Line Numbers: 2-MSS-026-45-1 at 2MSS\*PSV131, 2MSS\*PSV132,  
and 2MSS\*PSV133

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks	
	El	Az					
16A	293'- 10 7/8"	278.5°	C	Structural Steel Monorail Startruss	None	Note 1	4.47
					None	Note 1	4.48
					None	Note 1	4.49
16B	296'- 8 3/16"	278.5°	C	Structural Steel Monorail Startruss	None	Note 1	4.51
					None	Note 1	4.52
					None	Note 1	4.53
17A	293'- 8 15/16"	284°	C	Structural Steel Monorail Startruss	None	Note 1	4.56
					None	Note 1	4.57
					None	Note 1	4.58
17B	296'- 7 7/8"	284°	C	Structural Steel Monorail Startruss	None	Note 1	5.2
					None	Note 1	5.3
					None	Note 1	5.4
18A	293'- 8 15/16"	290°	C	Structural Steel Monorail Startruss	None	Note 1	5.7
					None	Note 1	5.8
					None	Note 1	5.9
18B	296'- 7 9/16"	290°	C	Structural Steel Monorail Startruss	None	Note 1	5.12
					None	Note 1	5.13
					None	Note 1	5.14

Note 1: The target has been designed so that it can withstand the jet impact and still adequately perform any essential target for which it is intended.

Note 3: The target has been determined to be essential in accordance with the criteria described in Section 3.6.1.1A.



TABLE 3-3

## SUMMARY OF ANALYSIS OF TARGETS AS A RESULT OF JET IMPINGEMENT

Main Steam Drains - Inside Containment - West Loop

Piping Line Numbers: 2MSS-002-49-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	El	AZ					
1	250'- 4 1/2"	337°	C	Drywell Floor House Steel	None None	Note 1 Note 1	1.20 1.21

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TABLE 3.6A-(Cont)

Piping Line Numbers: 2MSS-002-82-1

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>	
	<u>EL</u>	<u>AZ</u>					
16	250'-0 5/8"	348°	C	Floor House Steel	None None	Note 1 Note 1	1.35 1.36

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TABLE 3.6A-5 (Cont)

Piping Line Numbers: 2MSS-002-47-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	El	AZ					
13	249' - 7 5/8"	17°	C	Primary Containment Liner	None	Note 1	1.49
				House Steel	None	Note 1	1.50
				Biological Shield Wall	None	Note 1	1.51
23	250' - 3 5/8"	5°	C	House Steel	None	Note 1	1.53
				Floor	None	Note 1	1.54

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TABLE 3.6A- (ont)

Piping Line Numbers: 2MSS-002-48-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	EI	AZ					
14	248' - 9 1/4"	19°	C	Biological Shield Wall Primary Containment Liner House Steel	None None None	Note 1 Note 1 Note 1	2.20 2.21 2.22
30	250' - 3 7/8"	5°	C	House Steel Floor	None None	Note 1 Note 1	2.24 2.25

Note 1: The target has been designed so that it can withstand the jet impact and still adequately perform any essential function for which it is intended.

Note 3: The target has been determined to be essential in accordance with the criteria described in Section 3.6.1.1A.

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TABLE 3-54

SUMMARY OF ANALYSIS OF TARGETS AS A RESULT OF JET IMPINGEMENT  
Main Steam Drains - Inside Containment - West Loop Header

Piping Line Numbers: 2MSS-006-150-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks
	EL	AZ				
15	248'- 9 1/4"	20.6°	C	None		

1.21

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TABLE 3.6.1.55

## SUMMARY OF ANALYSIS OF TARGETS AS A RESULT OF JET IMPINGEMENT

Main Steam Drain Line - Inside Containment - East Loop

Piping Line Numbers: 2MSS-002-110-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	E1	AZ					
45	261' - 9 15/16"	185° "	C	Primary Containment Liner Pedestal	None None	Note 1 Note 1	1.27 1.28
40	263' - 1 5/8"	185°	C	2-RHS-750-168-2 House Steel Floor	None None None	Note 1,3 Note 1 Note 1	1.30 1.31 1.32

Note 1: The target has been designed so that it can withstand the jet impact and still adequately perform any essential function for which it is intended.

Note 3: The target has been determined to be essential in accordance with the criteria described in Section 3.6.1.1A.

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TABLE 3 56

## SUMMARY OF ANALYSIS OF TARGETS AS A RESULT OF JET IMPINGEMENT

Main Steam Drain Lines: Piping Outboard of Jet Impingement Wall

Piping Line Numbers: 2MSS-006-117-4

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	EL	AZ					
50	248'-11 5/16"	8°	C	Floor 2MSS*PRS133	None	Note 1	1.20 1.21
53	246'-7 3/16"	8°	C	Floor 2MSS*PRS133	None	Note 1	1.23
			L	None	None	Note 1	1.24 1.25
54	246'-1 11/16"	8°	C	Floor 2MSS*PRS133	None None	Note 1 Note 1	1.27 1.28





TABLE 3.6A-2 (Cont)

Piping Line Numbers: 2MSS-006-12-4

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	EI	AZ					
100	248'-11 3/4"	2°	C	Floor	None	Note 1	1.41
				2MSS*PRS123	None	Note 1	1.42
103	246'-7 3/16"	2°	C	Floor	None	Note 1	1.44
				2MSS*PRS123	None	Note 1	1.45
			L	None			1.46
104	246'-1 11/16"	2°	C	Floor	None	Note 1	1.48
				2MSS*PRS123	None	Note 1	1.49



TABLE 3.6A- (Cont)

Piping Line Numbers: 2MSS-002-22-4

<u>Break Point</u>	<u>Break Location</u>	<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>	
107	E1 245'-8 1/2" AZ	3° C	Jet Impingement Wall	None	Note 1	2.4

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TABLE 3.6A- (cont)

Piping Line Numbers: 2MSS-006-21-4

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	EI	AZ					
150	248'-11 3/4"	358°	C	Floor 2MSS*PRS103	None None	Note 1 Note 1	2.17 2.18
153	246'-7 3/16"	358°	C	Floor 2MSS*PRS103	None None	Note 1 Note 1	2.20 2.21
			L	None			2.22
154	246'-1 11/16"	358°	C	Floor 2MSS*PRS103	None None	Note 1 Note 1	2.24 2.25

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TABLE 3.6A- (Cont)

Piping Line Numbers: 2MSS-002-13-4

<u>Break Point</u>	<u>Break Location</u>	<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>	
157	245'-8 1/2" 357°	C	Jet Impingement Wall	None	Note 1	2.38

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TABLE 3.6A-(cont)

Piping Line Numbers: 2MSS-002-19-4

<u>Break Point</u>	<u>Break Location</u> <u>El</u> <u>AZ</u>	<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>	
57	245'-8 1/2"          7°	C	Jet Impingement Wall	None	Note 1	2.51

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TABLE 3.6A (Cont)

Piping Line Numbers: 2MSS-006-18-4

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	EL	AZ					
200	248'-11 15/16"	352°	C	Floor 2MSS*PRS113	None None	Note 1 Note 1	3.6 3.7
203	246'-7 3/16"	352°	C	Floor 2MSS*PRS113	None None	Note 1 Note 1	3.9 3.10
			L	None			3.11
204	246'-1 11/16"	352°	C	Floor 2MSS*PRS113	None None	Note 1 Note 1	3.13 3.14

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TABLE 3.6A-2 (Cont)

Piping Line Numbers: 2MSS-002-16-4

<u>Break Point</u>	<u>Break Location</u>	<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>	
207	EI 245'-8 1/2" AZ 353°	C	Jet Impingement Wall	None	Note 1	3.27

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TABLE 3.6A- (Cont)

Piping Line Numbers: 2MSS-002-188-4

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	El	AZ					
313	241'-2"	349°	C	Floor 2MSS*PRS113	None None	Note 1 Note 1	3.48 3.49
306A	242'-6 15/16"	355° ..	C	Wall	None	Note 1	3.51

Note 1: The target has been designed so that it can withstand the jet impact and still adequately perform any essential function for which it is intended.

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TABLE 57

SUMMARY OF ANALYSIS OF TARGETS AS A RESULT OF JET IMPINGEMENT  
Feedwater System (Inside Containment)Part I  
South Loop

Piping Line Numbers: 2FWS-012-54-1

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>
	<u>EI</u>	<u>AZ</u>				
1	309'- 1 3/8"	210°	C	Primary Containment Liner	None	Note 1

1.25

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TABLE 3.6A-2 (Cont)

Piping Line Numbers: 2FWS-012-37-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	El	AZ					
5	309'-1 1/8"	270°	C	Primary Containment Liner	None	Note 1	1.38

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TABLE 3.6A- (Cont)

Piping Line Numbers: 2FWS-012-33-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	EL	AZ					
11	309'-1 1/8"	330°	C	Primary Containment Liner 2-CMS-750-57-2	None None	Note 1 Note 1, Note 3	1.51 1.52
14B	308'-0 5/8"	309°	C	2RHS*PRR020	None	Note 1	1.54

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TABLE 3.6A (Cont)

Piping Line Numbers: 2FWS-024-60-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	EL	AZ					
18	292'-8"	340°	C	Primary Containment Liner 2FWS*PRR014	None None	Note 1 Note 1	2.9 2.10
			L	Primary Containment Liner	None	Note 1	2.12

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TABLE 3.6A-5 (Cont)

Piping Line Numbers: 2FWS-024-32-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	El	AZ					
20	266'-3 3/4"	345.5°	C	2MSS*PRR006	None	Note 1	2.36
				2MSS*PRR018	None	Note 1	2.37
				Structural Steel -	None	Note 1	2.38
				el 247'-6", 261', 303'-7 3/4"	None	Note 1	2.39
				2FWS*PRR017	None	Note 1	2.40

Note 1: The target has been designed so that it can withstand the jet impact and still adequately perform any essential function for which it is intended.

Note 3: The target has been evaluated and determined to be essential in accordance with Section 3.6.1.1A.

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TABLE 3-58

SUMMARY OF ANALYSIS OF TARGETS AS A RESULT OF JET IMPINGEMENT  
Feedwater System (Inside Containment)Part II  
North Loop

Piping Line Numbers: 2FWS-012-53-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	EL	AZ					
21	309'- 1 1/8"	150°	C	Primary Containment Liner	None	Note 1	1.24

1 of 5



TABLE 3.6A-2 (Cont)

Piping Line Numbers: 2FWS-012-52-1

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>	
	<u>EI</u>	<u>AZ</u>					
25	309' - 1 1/8"	90°	C	Primary Containment Liner	None	Note 1	1.37

2 of 5



TABLE 3.6A- (Cont)

Piping Line Numbers: 2FWS-012-34-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	El	Az					
30	309'-1 1/8"	30°	C	Primary Containment Liner	None	Note 1	1.50
33B	307'-7 5/16"	46°	C	2FWS*PRS029	None	Note 1	1.52
				2RHS*PRR013	None	Note 1	1.53

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TABLE 3.6A- (Cont)

Piping Line Numbers: 2FWS-024-61-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	<u>E1</u>	<u>AZ</u>					
36	292'-8"	19°	C	Primary Containment Liner	None	Note 1	2.8
				2FWS*PRR033	None	Note 1	2.9
				2FWS*PRR048	None	Note 2	2.10
			L	Primary Containment Liner	None	Note 1	2.12

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TABLE 3.6A-2 (Cont)

Piping Line Numbers: 2FWS-024-31-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	EI	AZ					
38	266'-3 3/4"	14.5°	C	Structural Steel, ei 304', 261' 2FWS*PRR035 2MSS*PRR026 2MSS*PRR037 2MSS*PRR035A 2MSS*PRR024A 2FWS*PRR033	None None None None None None None	Note 1 Note 1 Note 1 Note 1 Note 1 Note 1 Note 1	2.36 2.37 2.38 2.39 2.40 2.41 2.42

Note 1: The target has been designed so that it can withstand the jet impact and still adequately perform any essential function for which it is intended.

Note 2: The target has been evaluated and determined to be acceptable in accordance with the objectives described in Section 3.6.1.1A.

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TABLE 3-59

SUMMARY OF ANALYSIS OF TARGETS AS A RESULT OF JET IMPINGEMENT  
Feedwater System (Outside Containment)

Piping Line Numbers: 2FWS-024-28-4

Break Point	Break Location			Break Type	Targets	Protection Measures	Remarks	
	<u>EI</u>	<u>X</u>	<u>Z</u>					
1	257'-0"	83'-5 3/16"	7'-9"	C	Jet Impingement Wall 12A Line Wall MSS Omni Restraints	None None None	Note 1 Note 1 Note 1	1.20 1.21 1.22
6	266'-6"	-118'-0 1/4"	29'-8 1/4"	C	2FWS*PRR113	None	Note 1	1.24
8	268'-8 11/16"	-124'-8 9/16"	32'-8 1/4"	C	12 Line Wall	None	Note 1	1.26 1.27
12	269'-8"	-127'-6 3/4"	15'-0 11/16"	C	None			1.29

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TABLE 3.6A- (Cont)

Piping Line Numbers: 2FWS-024-27-4

Break Point	Break Location			Break Type	Targets	Protection Measures	Remarks	
	EI	X	Z					
21	257'-0"	-83'-5"	-7'-9"	C	Jet Impingement Wall 12A Line Wall MSS Omni Restraints	None None None	Note 1 Note 1 Note 1	1.50 1.51 1.52
23	260'-0"	-118'-0"	-7'-9"	C	Ceiling Floor	None None	Note 1 Note 1	1.54 1.55
26	269'-10"	-118'-0"	14'-3 7/8"	C	2FWS*PRR118 Structural Steel	None None	Note 1 Note 1	1.57 1.58
32	269'-10"	-124'-0"	-19'-11 1/8"	C	None			2.2

Note 1: The target has been designed so that it can withstand the jet impact and still adequately perform any essential function for which it is intended.

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TABLE 3.00

**SUMMARY OF ANALYSIS OF PIPING FAILURE AS A RESULT OF JET IMPINGEMENT**  
**Reactor Core Isolation Cooling System (Inside Containment)**

Piping Line Numbers: 21CS-010-70-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	EL	AZ					
1	302'- 2"	111°	C	Structural Steel Elev. 305'-9" 2RHS*PRS017 21CS*PRS001	None None None	Note 1 Note 1 Note 1	1.20 1.21 1.22
3	302'- 0 5/16"	137.5°	C	Primary Containment Liner Structural Steel Elev. 306' 21CS*PRR001 21CS*PRS001 21CS*PRS003	None None None None None	Note 1 Note 1 Note 1 Note 1 Note 1	1.35 1.36 1.37 1.38 1.39
9	263' - 8 1/4"	196°	C	Primary Containment Liner Structural Steel 303'-7 3/4" 21CS*PRR005A Monorail	None None None None	Note 1 Note 1 Note 1 Note 1	1.42 1.43 1.44 1.46
12	263' - 7 5/16"	185°	C	Pedestal Restraint Beam	None None	Note 1 Note 1	1.49 1.50

1 of 2



TABLE 3.6A-(Cont)

## ICS - Head Spray

Piping Line Numbers: 21CS-006-33-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	El	AZ					
1	341' - 7"	360°	C	Drywell Head	None	Note 1	2.16
2	342' - 1 1/2"	360°	C	Drywell Head	None	Note 1	2.18
			L	Insulation Frame	None	Note 1	2.20
4	342' - 10 1/2"	349°	C	Drywell Head	None	Note 1	2.22
				Insulation Support Frame	None	Note 1	2.23
			L	Drywell Head	None	Note 1	2.25
				Insulation Support Frame	None	Note 1	2.26
5	342' - 10 1/2"	345°	C	Drywell Head	None	Note 1	2.28
				Insulation Support Frame	None	Note 1	2.29
			L	Drywell Head	None	Note 1	2.31
				Insulation Support Frame	None	Note 1	2.32
6	342' - 10 1/2"	340°	C	Drywell Head	None	Note 1	2.34
				Insulation Support Frame	None	Note 1	2.35
			L	Drywell Head	None	Note 1	2.37
				Insulation Support Frame	None	Note 1	2.38
11	338' - 9 1/16"	330°	C	Drywell Head	None	Note 1	2.41
				Insulation Support Frame	None	Note 1	2.42

Note 1: The target has been designed so that it can withstand the Jet Impact and still adequately perform any essential function for which it is intended.

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TABLE 3.6.1

**SUMMARY OF ANALYSIS OF TARGETS AS A RESULT OF JET IMPINGEMENT**  
**Reactor Core Isolation Cooling System (Outside Containment)**

Piping Line Numbers: 2-ICS-010-62-2

<u>Break Point</u>	<u>Break Location</u>			<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>	
	<u>EI</u>	<u>X</u>	<u>Z</u>					
10	257'-2 7/8"	54'-3 3/4"	4'-9"	C	2WCS*MOV112	None	Note 1, Note 3	1.27
17	240'-9 1/4"	55'-0 3/8"	9'-8 7/16"	C	None			1.41

Note 1: The target has been designed so that it can withstand the jet impact and still adequately perform any essential function for which it is intended.

Note 3: The target has been determined to be essential in accordance with the criteria described in Section 3.6.1.1A.

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TABLE 3.6A- (Cont)

Piping Line Numbers: 2-ICS-010-62-2

<u>Break Point</u>	<u>Break Location</u>			<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>
	<u>EI</u>	<u>X</u>	<u>Z</u>				
12	255'-11"	60'-6 1/8"	9'-0"	C	None		1.54

Note 1: The target has been designed so that it can withstand the jet impact and still adequately perform any essential function for which it is intended.

Note 3: The target has been determined to be essential in accordance with the criteria described in Section 3.6.1.1A.

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TABLE 3.6A (Cont)

Piping Line Numbers: 2-ICS-004-61-2

<u>Break Point</u>	<u>Break Location</u>			<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>	
	<u>EL</u>	<u>X</u>	<u>Z</u>					
68	187'-11 1/8"	51'-10 3/16"	-8'-5 15/16"	C	Structural Steel Column	None	Note 1	2.9

Note 1: The target has been designed so that it can withstand the jet impact and still adequately perform any essential function for which it is intended.

Note 3: The target has been determined to be essential in accordance with the criteria described in Section 3.6.1.1A.

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TABLE 3.6A-2 (Cont)

Piping Line Numbers: 2-RHS-008-53-2 ..

<u>Break Point</u>	<u>Break Location ..</u>			<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>
	<u>EI</u>	<u>X</u>	<u>Z</u>				
60	233'-6 1/2"	47'-11 3/8"	-36'-3 7/8"	C	None		2.23

Note 1: The target has been designed so that it can withstand the jet impact and still adequately perform any essential function for which it is intended.

Note 3: The target has been determined to be essential in accordance with the criteria described in Section 3.6.1.1A.

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TABLE 3.6A-6 (cont)

Piping Line Numbers: 2-RHS-008-50-2

Break Point	Break Location			Break Type	Targets	Protection Measure	Remarks
	EI	X	Z				
48	234'-0"	51'-10 15/16"	26'-5"	C	None		2.36

Note 1: The target has been designed so that it can withstand the jet impact and still adequately perform any essential function for which it is intended.

Note 3: The target has been determined to be essential in accordance with the criteria described in Section 3.6.1.1A.

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TABLE 3.6A- (cont)

Piping Line Numbers: 2-ICS-004-36-2 ..

Break Point	Break Location			Break Type	Targets	Protection Measure	Remarks	
	EI	X	Z					
27B	191'-7 1/2"	55'-2 11/16"	-2'-6"	C	Steel Column	None	Note 2	3.4
63A	190'-8 7/8"	51'-10 3/16"	-3'-11 15/16"	C	Steel Column	None	Note 2	3.6

Note 1: The target has been designed so that it can withstand the jet impact and still adequately perform any essential function for which it is intended.

Note 2: The target has been evaluated and determined to be acceptable in accordance with the objectives described in Section 3.6.1.1A.

Note 3: The target has been determined to be essential in accordance with the criteria described in Section 3.6.1.1A.

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TABLE 3-62

SUMMARY OF ANALYSIS OF TARGETS AS A RESULT OF JET IMPINGEMENT  
High Pressure Core Spray System

Piping Line Number: 2CSH-012-46-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	El	AZ					
1	307'- 11 1/8"	240°	C	Primary Containment Liner	None	Note 1	1.21
3A	307'-11 1/8"	240°	C	Primary Containment Liner	None	Note 1	1.36
				Monorail	None	Note 1	1.37
6	307'-11 1/8"	236.5°	C	Primary Containment Liner	None	Note 1	1.41
			L	Structural Beams, el 288'-3 1/4", 305'-9"	None	Note 1	1.44 1.45

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TABLE 3.6A- (Cont)

Piping Line Numbers: 2CSH-012-15-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	El	AZ					
7	307'-11 1/8"	231°	C	2CSH*PRR001	None	Note 1	2.1
				Primary Containment Liner	None	Note 1	2.2
			L	Structural beams,	None	Note 1	2.4
				el 288'-3 1/4", 305'-9"			2.5
				2-SVV-010-33-3	None	Note 1, Note 3	2.6

2 of 3



TABLE 3.6A-(Cont)

Piping Line Numbers: 2CSH-012-15-1 ..

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>	
	<u>EI</u>	<u>AZ</u>					
10	307'-11 1/8"	217.5°	C	Primary Containment Liner Structural Steel, el 305'-0"	None None	Note 1 Note 1	2.20 2.21 2.22

Note 1: The target has been designed so that it can withstand the jet impact and still adequately perform any essential function for which it is intended.

Note 3: The target has been determined to be essential in accordance with the criteria described in Section 3.6.1.1A.

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TABLE 63

SUMMARY OF ANALYSIS OF TARGETS AS A RESULT OF JET IMPINGEMENT  
Low Pressure Core Spray System (Inside Containment)

Piping Line Numbers: 2CSL-012-4-1 and 2CSL-010-13-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	EL	AZ					
1	307'- 11 1/4"	120°	C	Primary Containment Liner Structural Steel, el 305'-9" 2MSS-PSSH081A1 (2-MSS-026-44-1)	None	Note 1	1.27
					None	Note 1	1.28
							1.29
					None	Note 3, Note 1	1.30
							1.31
5	307'-11 1/8"	120°	C	Primary Containment Liner Structural Steel, el 305'-0"	None	Note 1	1.33
					None	Note 1	1.34
							1.35
8	307'-11 1/8"	130°	C	Primary Containment Liner Structural Steel, el 305'-0"	None	Note 1	1.37
					None	Note 1	1.38
							1.39

Note 1: The target has been designed so that it can withstand the jet impact and still adequately perform any essential function for which it is intended.

Note 3: The target has been determined to be essential in accordance with the criteria described in Section 3.6.1.1A.

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TABLE 3.2.64

## SUMMARY OF ANALYSIS OF TARGETS AS A RESULT OF JET IMPINGEMENT

Residual Heat Removal System - Shutdown Mode

Piping Line Numbers: 2RHS-012-30-1, 2RHS-012-30-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	EL	AZ					
1	266'- 10 7/8"	270°	C	Primary Containment Liner 2RCS*SOV81B 2RCS*SOV82B Penetration Z46D	None 2RHS*JTS007 2RHS*JTS007 None	Note 1 Note 3 Note 3 Note 1, Note 3	1.20 1.21 1.22 1.23

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TABLE 3-54

## SUMMARY OF ANALYSIS OF TARGETS AS A RESULT OF JET IMPINGEMENT

Residual Heat Removal System - Shutdown Mode

Piping Line Numbers: 2RHS-012-30-1, 2RHS-012-30-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	EL	AZ					
5	262'-6"	270°	C	Structural Steel, el 249'	None	Note 1	1.25
				2CC991YH7-2.0	None	Note 1, Note 3	1.26
				2CK998YE3-2.0	None	Note 1, Note 3	1.27
				2RHS*PRR002	None	Note 1	1.28
8	255'-1"	270°	C	Primary Containment Liner	None	Note 1	1.30
				2CC996YY-2.5	None	Note 1, Note 3	1.31
				2CC996YY1-1.5	None	Note 1, Note 3	1.32
				2CC999YF-1.5	None	Note 1, Note 3	1.33

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TABLE 3.6A-(cont)

Piping Line Numbers: 2RHS-020-63-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	EI	AZ					
10	271'-1 7/8"	180.8°	C	Primary Containment Liner	None	Note 1	1.46
				2CC999YU7-2.5	2RHS*JTS002	Note 3	1.47
				Monorail	None	Note 1	1.48
				2CK998YE-2.0	None	Note 1, Note 3	1.49
				2CC996YU6-2.0	None	Note 1, Note 3	1.50
				2CK998YM4-1.5	None	Note 1, Note 3	1.51
				2ICS*MOV128	2RHS*JTS001	Note 3	1.52
				2ICS*MOV170	2RHS*JT5001	Note 3	1.53
				2-ICS-001-080-2	2RHS*JT5001	Note 3	1.54
				2ICS*V144	2RHS*JT5001	Note 3	1.55
				2ICS*V196	2RHS*JT5001	Note 3	1.56
				2ICS*V197	2RHS*JT5001	Note 3	1.57



TABLE 3.6A-6 (cont)

Piping Line Numbers: 2RHS-020-159-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks
	EI	AZ				
18	258'-6"	183.3°	C	None		2.14
20	256'-0"	177.7°	C	None		2.18

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TABLE 3.6A- (Cont)

Piping Line Numbers: 2RHS-012-200-1 and 2RHS-012-193-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	El	AZ					
30	266'-10 7/8"	90°	C	Primary Containment Liner Penetration Z21B 2CC996GJ-3.0 2RCS*SOV81A 2RCS*SOV82A	None None 2RHS*JTS004A,B 2RHS*JTS006 2RHS*JTS006	Note 1 Note 1, Note 3 Note 3 Note 3 Note 3	2.32 2.33 2.34 2.35 2.36



TABLE 3.6A- (Cont)

Piping Line Numbers: 2RHS-012-10-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	El	AZ					
37	261'-10"	90°	C	Drywell Floor Structural Steel, el 249' 2RHS*PRR009	None None None	Note 1 Note 1 Note 1	3.2 3.3 3.4
42	255'-1"	90°	C	Primary Containment Liner 2CC994GE1-2.0 2CK999GW-2.0 2CC996GJ-3.0 2CC994GE4-1.5 2CK999GW1-1.5	None 2RHS*JTS003 2RHS*JTS003 2RHS*JTS004A&B None None	Note 1 Note 3 Note 3 Note 3 Note 1, Note 3 Note 1, Note 3	3.6 3.7 3.8 3.9 3.10 3.11

Note 1: The target has been designed so that it can withstand the jet impact and still adequately perform any essential function for which it is intended.

Note 3: The target has been determined to be essential in accordance with the criteria described in Section 3.6.1.1A.

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TABLE 65

SUMMARY OF ANALYSIS OF TARGETS AS A RESULT OF JET IMPINGEMENT  
Residual Heat Removal System (Low-Pressure Coolant Injection Mode)

Piping Line Numbers: 2-RHS-012-8-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	EL	AZ					
1	299'- 0 3/8"	45°	C	Biological Shield Wall Doors	None	Note 1	1.20
7	299'-0 3/8"	46°	C	Primary Containment Liner	None	Note 1	1.33
13	311'-0"	51°	C	Star Truss	None	Note 1	1.36
				2RHS*PRR013	None	Note 1	1.37
19	316'-9"	57°	C	2RHS*PRR022	None	Note 1	1.40

1 of 3



TABLE 3.6A-6 (Cont)

Piping Line Numbers: 2-RHS-012-163-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	El	AZ					
33	299'-0 3/8"	135°	C	Biological Shield Wall Doors	None	Note 1	1.54
55	311'-8"	147°	C	2RHS*PRS016	None	Note 1	1.56
				2-CMS-750-22-2	None	Note 1, Note 3	1.57
				2-ISC-750-102-2	2RHS*JTS005	Note 3	1.58
56	311'-8"	178°		2-ISC-750-102-2	2RHS*JTS005	Note 3	2.2
60	293'-2 7/8"	208°	C	None			2.5

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TABLE 3.6A (Cont)

Piping Line Numbers: 2-RHS-020-125-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	EL	AZ					
35	299'-0 3/8"	315°	C	Biological Shield Wall Doors Primary Containment Liner	None None	Note 1 Note 1	2.30 2.31
39	299'-0 3/8"	314°	C	2-CMS-750-42-2.	None	Note 3, Note 1	2.34
47	310'-2"	306°	C	Diagonal Brace Refueling Bulkhead SST Cladding	None None None	Note 1 Note 1 Note 1	2.38 2.39 2.40
53	315'-6"	312°	C	Primary Containment Liner	None	Note 1	2.44

Note 1: The target has been designed so that it can withstand the jet impact and still adequately perform any essential function for which it was intended.

Note 3: The target has been determined to be essential in accordance with the criteria described in Section 3.6.1.1A.

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TABLE 66

## SUMMARY OF ANALYSIS OF TARGETS AS A RESULT OF JET IMPINGEMENT

## Recirculation System

## Part I

## North Loop

Piping Line Numbers: 2-RCS-012-7-1

<u>Break Point</u>	<u>Break Location</u>	<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>
	<u>EI</u> <u>AZ</u>				
15A	283'- 0 7/8"      150°	C	Biological Shield Wall Biological Shield Wall Doors	None None	Note 1 Note 1

1.24  
1.25



TABLE 3.6A-(Cont)

Piping Line Numbers: 2RCS-012-8-1

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>	
	<u>EI</u>	<u>AZ</u>					
18A	283'-0 3/8"	120°	C	Biological Shield Wall Biological Shield Wall Doors	None None	Note 1 Note 1	1.38 1.39

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TABLE 3.6A-6 (Cont)

Piping Line Numbers: 2-RCS-012-9-1

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>	
	<u>EI</u>	<u>AZ</u>					
20A	283'-0 7/8"	90°	C	Biological Shield Wall Biological Shield Wall Doors 2CC999YU7-2.5	None None None	Note 1 Note 1 Note 1, Note 3	1.52 1.53 1.54

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TABLE 3.6A-(Cont)

Piping Line Numbers: 2RCS-012-10-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	EI	AZ					
21A	275'-8 7/8"	60°	C	Structural Steel - elevations 249', 261', 276'-10 3/4", 277', 285', 304' 2RCS*PRS017 2RCS*PRS020 2CC999YU7-2.5 2CK998YE-2.0	None None None None None	Note 1 Note 1 Note 1 Note 1, Note 3 Note 1, Note 3	2.9 2.10 2.11 2.12 2.13 2.14 2.15
23A	283'-0 7/8"	60°	C	Biological Shield Wall Biological Shield Wall Door 2CC999YU7-2.5 2CK998YE-2.0	None None None None	Note 1 Note 1 Note 1, Note 3 Note 1, Note 3	2.17 2.18 2.19 2.20

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TABLE 3.6A (Cont)

Piping Line Numbers: 2RCS-012-11-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	EI	AZ					
24A	275'-8 7/8"	30°	C	Structural Steel -	None	Note 1	2.33
				elevations 261', 277', 285'	None	Note 1	2.34
				2RCS*PRS018	None	Note 1	2.35
				2RCS*PRS019	None	Note 1	2.36
26A	283'-0 7/8"	30°	C	2-CMS-750-12-2	None	Note 1, Note 3	2.37
				Biological Shield Wall	None	Note 1	2.39
				Biological Shield Wall Doors	None	Note 1	2.40



TABLE 3.6A- (Cont)

Piping Line Numbers: 2-RCS-024-1-1

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>	
	<u>EL</u>	<u>AZ</u>					
1A	282'-4 3/8"	180°	C	Monorail Steel	None None	Note 1 Note 1	3.6 3.7

Note 1: The target has been designed so that it can withstand the jet impact and still adequately perform any essential function for which it is intended.

Note 3: The target has been determined to be essential in accordance with the criteria described in Section 3.6.1.1A.

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TABLE 5-67

## SUMMARY OF ANALYSIS OF TARGETS AS A RESULT OF JET IMPINGEMENT

## Recirculation System

## Part II

## South Loop

Piping Line Numbers: 2-RCS-012-23-1

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>	
	<u>EI</u>	<u>AZ</u>					
15B	283'- 0 7/8"	330°	C	Biological Shield Wall	None	Note 1	1.24
				Biological Shield Wall Doors	None	Note 1	1.25





TABLE 3.6A (Cont)

Piping Line Numbers: 2-RCS-012-22-1

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>	
	<u>EI</u>	<u>AZ</u>					
188	283'-0 7/8"	300°	C	Biological Shield Wall Biological Shield Wall Doors	None None	Note 1 Note 1	1.38 1.39



TABLE 3.6A- (Cont)

Piping Line Numbers: 2-RCS-012-21-1

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>	
	<u>EI</u>	<u>AZ</u>					
208	283'-0 7/8"	270°	C	Biological Shield Wall Biological Shield Wall Doors	None None	Note 1 Note 1	1.52 1.53

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2



TABLE 3.6A- (Cont)

Piping Line Numbers: 2-RCS-012-26-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	EI	AZ					
21B	275'-8 7/8"	240°	C	Structural Steel - elevations 249', 261', 276', 277', 285', 304', 2-CMS-750-056-2 2RCS*PRS048	None None None	Note 1 Note 1, Note 3 Note 1	2.8 2.9 2.10 2.11 2.12
23B	283'-0 7/8"	240°	C	Biological Shield Wall Biological Shield Wall Doors	None None	Note 1 Note 1	2.14 2.15



TABLE 3.6A (Cont)

Piping Line Numbers: 2-RCS-012-25-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	El	AZ					
24B	275'-8 7/8"	210°	C	Structural Steel - elevations 249', 261', 276'-10 3/4", 277', 285', 304' 2RCS*PRS047 2-CMS-750-56-2	None	Note 1	2.28
					None	Note 1	2.29
					None	Note 1	2.30
					None	Note 1, Note 3	2.31
26B	283'-0 7/8"	210°	C	Biological Shield Wall Biological Shield Wall Doors	None	Note 1	2.32
					None	Note 1	2.34
							2.35





TABLE 3.6A (Cont)

Piping Line Numbers: 2-RCS-024-18-1

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>
	<u>EI</u>	<u>AZ</u>				
1B	282'-4 3/8"	0°	C	Monorail, EI 270'.	None	Note 1

3.1

Note 1: The target has been designed so that it can withstand the jet impact and still adequately perform any essential function for which it is intended.

Note 3: The target has been determined to be essential in accordance with the criteria described in Section 3.6.1.1A.

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TABLE 3-68

SUMMARY OF ANALYSIS OF TARGETS AS A RESULT OF JET IMPINGEMENT  
Reactor Water Cleanup System (Inside Containment)

Piping Line Numbers: 2WCS-002-217-1

<u>Break Point</u>	<u>Break Location</u>	<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>
	<u>EI</u> <u>AZ</u>				
1	266'- 0"	0°	C	None	

1.20

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TABLE 3.6A-8 (Cont)

Piping Line Numbers: 2WCS-004-3-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	EL	AZ					
23	245'-3"	186°	C	Structural Steel -	None	Note 1	1.33
				el 247'	None	Note 1	1.34
				2WCS*PRR004	None	Note 1	1.35
			L	Drywell Floor	None	Note 1	1.37
				Structural Steel -	None	Note 1	1.38
				el 247'			1.39

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TABLE 3.6A-6 (Cont)

Piping Line Numbers: 2WCS-008-86-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	El	AZ					
24	245'-3"	185°	C	2CK999YD-1.5 2CC996YC7-3.0	2WCS*JIR001 None	Note 3 Note 1, Note 3	1.52 1.53
243	245'-3"	185°	C	2CK999YD-1.5 2CC996YC7-3.0	2WCS*JIR001 2WCS*JIR001	Note 3 Note 3	1.55 1.56
			L	Structural Steel - el 247'	None	Note 1	1.58
				Drywell floor	None	Note 1	2.1 2.2
244	245'-3"	185°	C	2CK999YD-1.5 2CC996YC7-3.0	2WCS*JIR001 2WCS*JIR001	Note 3 Note 3	2.4 2.5
			L	Drywell floor	None	Note 1	2.7
				Structural Steel - el 247'	None	Note 1	2.8 2.9





TABLE 3.6A-6 (cont)

Piping Line Numbers: 2WCS-004-92-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	<u>El</u>	<u>AZ</u>					
56	247'-1"	151°	C	Drywell floor	None	Note 1	2.22
			L	2RCS*PRR007	None	Note 1	2.24
53	248'-9"	151°	C	Drywell floor	None	Note 1	2.26
			L	None	None	Note 2	2.28
54	247'-9"	151°	C	Drywell floor	None	Note 1	2.30
			L	2RCS*PRR007	None	Note 1	2.32



TABLE 3.6A-(cont)

Piping Line Numbers: 2WCS-004-1-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	El	AZ					
55	247'-5"	153°	C	2RCS*PRR007	None	Note 1	2.45
			L	None			2.47
44	244'-0"	193°	C	Drywell Floor	None	Note 1	2.49
				Structural Steel -	None	Note 1	2.50
				el 247'			2.51
			L	None			2.53



TABLE 3.6A (Cont)

Piping Line Numbers: 2WCS-002-100-1

<u>Break Point</u>	<u>Break Location</u>	<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>	
	<u>EI</u>	<u>AZ</u>				
422	244'-5"	334°	C	Biological Shield Wall	None	Note 1
						3.8

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TABLE 3.6A (Cont)

Piping Line Numbers: 2WCS-004-98-1

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>	
	<u>EL</u>	<u>AZ</u>					
42	248'-9"	331°	C	Drywell Floor	None	Note 1	3.21
				Structural Steel -	None	Note 1	3.22
				el 247'			3.23
				2CK998YE3-2.0	None	Note 1, Note 3	3.24
				2CC991YH7-2.0	None	Note 1, Note 3	3.25
				Downcomer Cover Plate -	None	Note 1	3.26
				el 240'			3.27

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TABLE 3.6A-6 (Cont)

Piping Line Numbers: 2WCS-004-2-1

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>	
	<u>EI</u>	<u>AZ</u>					
411	247'-5"	334°	C	Structural Steel, ei 247'-6"	None	Note 1	3.40
				2RCS*PRR007	None	Note 1	3.41
			L	None			3.43



TABLE 3.6A-(cont)

Piping Line Numbers: 2WCS-004-93-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	EI	AZ					
52.	247'-5"	152°	C	RCS Limit Stop	None	Note 1	3.56
			L	None			3.58



TABLE 3.6A- (Cont)

Piping Line Numbers: 2WCS-002-12-1

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>
	<u>EI</u>	<u>AZ</u>				
228	242'-0"	191°	C	None		

4.13



TABLE 3.6A (Cont)

Piping Line Numbers: 2WCS-002-94-1

<u>Break Point</u>	<u>Break Location</u>	<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>
	<u>EI</u> <u>AZ</u>				
66	244'-5"      155°	C	2RCS*PRR007	None	Note 1

4.40

Note 1: The target has been designed so that it can withstand the jet impact and still adequately perform any essential function for which it is intended.

Note 2: The target has been evaluated and determined to be acceptable in accordance with the objectives described in Section 3.6.1.1A.

Note 3: The target has been determined to be essential in accordance with the criteria described in Section 3.6.1.1A.

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TABLE 3-69

SUMMARY OF ANALYSIS OF TARGETS AS A RESULT OF JET IMPINGEMENT  
Reactor Water Cleanup System (Outside Containment)

Piping Line Numbers: 2-WCS-150-359-3

<u>Break Point</u>	<u>Break Location</u>	<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>
	<u>EI</u> <u>AZ</u>				
701	330'-3"	212° "	C	None	

1.29

## NOTES:

1. The target has been designed so that it can withstand the jet impact and still adequately perform any essential function for which it is intended.
3. The target has been evaluated and determined to be essential in accordance with the criteria described in Section 3.6.1.1A.

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TABLE 3.6A (Cont)

Piping Line Numbers: 2-WCS-150-382-3

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>	
	<u>EI</u>	<u>AZ</u>					
574	330'-0"	179°	C	Floor	None	Note 1	1.46

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TABLE 3.6A (Cont)

Piping Line Numbers: 2-WCS-150-389-3

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>	
	<u>El</u>	<u>AZ</u>					
511	330'-3"	160°	C	Floor	None	Note 1	2.1

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TABLE 3.6A (Cont)

Piping Line Numbers: 2-WCS-150-452-3

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>
	<u>EL</u>	<u>AZ</u>				
638	330'-3"	194°	C	None		

2.14





TABLE 3.6A-8 (Cont)

Piping Line Numbers: 2-WCS-002-350-3

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>	
	<u>EI</u>	<u>AZ</u>					
912	329'-10"	194°	C	Cubical Wall	None	Note 1	2.27



TABLE 3.6A- (Cont)

Piping Line Numbers: 2-WCS-002-356-3

Break Point	Break Location		Break Type:	Targets	Protection Measures	Remarks	
	El	AZ					
974	329'-10"	212°	C	Cubical Wall	None	Note 1	2.40



TABLE 3.6A-8 (Cont)

Piping Line Numbers: 2-WCS-002-387-3

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>	
	<u>EI</u>	<u>AZ</u>					
788	329'-10"	159°	C	Wall	None	Note 1	2.53



TABLE 3.6A (Cont)

Piping Line Numbers: 2-WCS-003-32-3

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>	
	<u>EI</u>	<u>AZ</u>					
103	218'-6"	157°	C	Cubical Ceiling	None	Note 1	3.8





TABLE 3.6A-6 (Cont)

Piping Line Numbers: 2-WCS-003-42-3

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>
	<u>EI</u>	<u>AZ</u>				
78	218°-6"	173°	C	None		3.21



TABLE 3.6A (Cont)

Piping Line Numbers: 2-WCS-003-59-3

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks	
	El	AZ					
829	338'-6"	179°	C	Cubical Walls	None	Note 1	3.34
849	329'-10"	179°	C	Cubical Wall	None	Note 1	3.36



TABLE 3.6A (Cont)

Piping Line Numbers: 2-WCS-004-19-3

<u>Break Point</u>	<u>Break Location</u>	<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>	
804	338'-6" 163°	C	None	None	Note 1	3.49



TABLE 3.6A- (Cont)

Piping Line Numbers: 2-WCS-004-25-3

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>
	<u>El</u>	<u>AZ</u>				
51	218'-6"	158°	C	Cubical Ceiling	None	Note 1 4.4





TABLE 3.6A- (Cont)

Piping Line Numbers: 2-WCS-004-31-3

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>	
	<u>EI</u>	<u>AZ</u>					
52	232'-2"	167°	C	Structural Steel Column Concrete Wall	None None	Note 1 Note 1	4.17 4.18
68	219'-7"	169°	C	Cubical Wall	None	Note 1	4.20
77	218'-6"	174°	C	None			4.22



TABLE 3.6A (Cont)

Piping Line Numbers: 2-WCS-004-27-3

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>
	<u>EL</u>	<u>AZ</u>				
393	318'-6"	245°	C	None		4.35



TABLE 3.6A-82 (Cont)

Piping Line Numbers: 2-WCS-004-77-3

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>
	<u>El</u>	<u>AZ</u>				
98A	223'-11"	164°	C	None		4.48



TABLE 3.6A (Cont)

Piping Line Numbers: 2-WCS-004-77-3

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>	
	<u>EI</u>	<u>AZ</u>					
102	230'-8"	164°	C	Structural Steel Column Concrete Wall	None None	Note 1 Note 1	5.3 5.4





TABLE 3.6A-(Cont)

Piping Line Numbers: 2-WCS-004-110-3

<u>Break Point</u>	<u>Break Location</u> <u>El</u> <u>Az</u>	<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>	
931	334'-0"	204°	C	Cubical Wall	None	Note 1

5.17

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TABLE 3.6A (Cont)

Piping Line Numbers: 2-WCS-004-169-3

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks	
	El	AZ					
765	338'-6"	161°	C	Cubical Wall	None	Note 1	5.30



TABLE 3.6A (Cont)

Piping Line Numbers: 2-WCS-004-182-3

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks	
	El	AZ					
552	334'-0"	176°	C	Cubical Wall	None	Note 1	5.43

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TABLE 3.6A (Cont)

Piping Line Numbers: 2-WCS-004-195-3

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>- Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>	
	<u>EI</u>	<u>AZ</u>					
616	334'-0"	197°	C	Structural Column	None	Note 1	5.56

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TABLE 3.6A-(Cont)

Piping Line Numbers: 2-WCS-004-196-3

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>	
	<u>El</u>	<u>AZ</u>					
890	338'-6"	195°	C	Structural Column B11 Cubical Wall	None None	Note 1 Note 1	6.11 6.12



TABLE 3.6A-8 (Cont)

Piping Line Numbers: 2-WCS-004-207-3

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>
	<u>EI</u>	<u>AZ</u>				
679	334'-0"	208°	C	Cubical Walls	None	Note 1

6.25



Piping Line Numbers: 2-WCS-004-208-3

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks
	EI	AZ				
954	338'-6"	211°	C	Wall	None	Note 1

6.38



TABLE 3.6A-1 (Cont)

Piping Line Numbers: 2-WCS-004-392-3

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>
	<u>EI</u>	<u>AZ</u>				
490	334'-0"	163°	C	None		6.51





TABLE 3.6A (Cont)

Piping Line Numbers: 2-WCS-006-24-3

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks	
	<u>EL</u>	<u>AZ</u>					
413	313'-6"	282°	C	Cubical Wall Platform Steel Outside Wall Vessel	None None None	Note 1 Note 1 Note 1	7.6 7.7 7.8



TABLE 3.6A-3 (Cont)

Piping Line Numbers: 2-WCS-006-29-3

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>	
	<u>El</u>	<u>AZ</u>					
416A	316'-0"	283°	C	Platform Steel	None	Note 1	7.21
				Cubical Wall	None	Note 1	7.22
				Outside Vessel Dome	None	Note 1	7.23
419	316'-0"	283°	C	Platform	None None	Platform fails, no essential items affected	7.26 7.27



TABLE 3.6A (Cont)

Piping Line Numbers: 2-WGS-006-353-3

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>
	<u>EL</u>	<u>AZ</u>				
874	343'-0"	196°	C	- Cubical Walls	None	Note 1

7.41

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TABLE 3.6A (Cont)

Piping Line Numbers: 2-WCS-006-354-3

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>	
	<u>EL</u>	<u>AZ</u>					
575	337'-8"	202°	C	Cubical Walls	None	Note 1	7.54
610	334'-0"	194°	C	Cubical Wall	None	Note 1	7.56





TABLE 3.6A-6 (cont)

Piping Line Numbers: 2-WCS-006-360-3

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>
	<u>EL</u>	<u>AZ</u>				
938	343'-0"	230°	C	Cubical Walls	None	Note 1

8.11



TABLE 3.6A (Cont)

Piping Line Numbers: 2-WCS-006-361-3

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks	
	El	AZ					
673	334'-0"	223°	C	Cubical Wall	None	Note 1	8.24
639	337'-8"	215°	C	Cubical Walls	None	Note 1	8.26

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TABLE 3.6A- (Cont)

Piping Line Numbers: 2-WCS-006-384-3

<u>Break Point</u>	<u>Break Location</u>	<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>	
	<u>El</u> <u>AZ</u>					
813	343'-0"	181°      C	Cubical Walls	None	Note 1	8.39



TABLE 3.6A (Cont)

Piping Line Numbers: 2-WCS-006-385-3

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks	
	<u>EI</u>	<u>AZ</u>					
546	334'-0"	185°	C	Wall	None	Note 1	8.52
512	337'-8"	174°	C	Cubical Walls	None	Note 1	8.54





TABLE 3.6A-6 (Cont)

Piping Line Numbers: 2-WCS-006-391-3

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>	
	<u>EI</u>	<u>AZ</u>					
750	343'-0"	152°	C	Cubical Walls	None	Note 1	9.9



TABLE 3.6A-1 (Cont)

Piping Line Numbers: 2-WCS-006-393-3

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>	
	<u>EI</u>	<u>AZ</u>					
450	337'-8"	151°	C	Cubical Walls	None	Note 1	9.22
484	334'-0"	150°	C	Wall	None	Note 1	9.24



TABLE 3.6A- (Cont)

Piping Line Numbers: 2-WCS-006-403-3

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>
	<u>EI</u>	<u>AZ</u>				
1000A	322'-11"	262°	C	Structural Steel	None	Note 1

9.37



TABLE 3.6A (Cont)

Piping Line Numbers: 2-WCS-006-458-3

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks
	EL	AZ				
430A	322'-10"	262°	C	Structural Steel	None	Note 1

9.50





TABLE 3.6A (Cont)

Piping Line Numbers: 2-WCS-006-491-3

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>	
	<u>EI</u>	<u>AZ</u>					
915	338'-6"	192°	C	Cubical Wall	None	Note 1	10.5



63



TABLE 3.6A (Cont)

Piping Line Numbers: 2-WCS-008-9-3

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks	
	EL	AZ					
180	314'-9"	284°	C	Steel Platform Wall Ceiling Floor	None None None None	Note 1 Note 1 Note 1 Note 1	10.18 10.19 10.20 10.21
173A	313'-9"	255°	C	Cubical Walls Platform Steel	None None	Note 1 Note 1	10.24 10.25



TABLE 3.6A (Cont)

Piping Line Numbers: 2-WCS-008-10-3

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>	
	<u>El</u>	<u>AZ</u>					
204	315'-5"	282°	C	Structural Steel Platform	None	Note 1	10.39
				Cubical Walls	None	Note 1	10.40
				Concrete Ceiling	None	Note 1	10.41
				Floor	None	Note 1	10.42



TABLE 3.6A- (Cont)

Piping Line Numbers: 2-NCS-008-13-3

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks	
	El	AZ					
304	310'-6"	284°	C	Concrete Floor	None	Note 1	10.55
327	314'-7"	287°	C	Ceiling	None	Note 1	10.57
312	309'-0"	288°	C	Cubical Walls	None	Note 1	11.1
315	310'-0"	287°	C	Floor	None	Note 1	11.3





TABLE 3.6A-6A (Cont)

Piping Line Numbers: 2-WCS-008-15-3

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>-- Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>	
	<u>EI</u>	<u>AZ</u>					
374A	308'-9"	259°	C	Cubical Wall	None		11.16
423A	322'-10"	239°	C	None			11.18
343	310'-0"	287°	C	Floor	None	Note 1	11.20
357	308'-9"	275°	C	Cubical Wall	None	Note 1	11.23



TABLE 3.6A-6 (cont)

Piping Line Numbers: 2-WCS-008-23-3

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks	
	<u>EI</u>	<u>AZ</u>					
333	308'-5"	264°	C	None			11.37
328	310'-0"	287°	C	Floor Ceiling	None None	Note 1 Note 1	11.40 11.41



TABLE 3.6A- (Cont)

Piping Line Numbers: 2-WCS-008-023-3

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>
	<u>EI</u>	<u>AZ</u>				
1014A	322'-11"	240°	C	None		11.55



TABLE 3.6A (Cont)

Piping Line Numbers: 2-WCS-008-26-3

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks	
	El	AZ					
228	316'-10"	299°	C	Steel Platform Concrete Wall Primary Containment Wall Structural Steel	None None None None	Note 1 Note 1 Note 1 Note 1	12.10 12.11 12.12 12.13

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TABLE 3.6A-1 (Cont)

Piping Line Numbers: 2-WCS-008-54-3

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks	
	<u>El</u>	<u>AZ</u>					
706	334'-2"	178°	C	Floor	None	Note 1	12.26
707	322'-6"	178°	C	Structural Steel Platform	None	Note 1	12.28
				Floor	None	Note 1	12.29
				Primary Containment Wall	None	Note 1	12.30
706C	324'-2"	178°	C	None			12.32



TABLE 3.6A (Cont)

Piping Line Numbers: 2-WCS-008-88-3

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks	
	EL	AZ					
1	245'-3"	185°	C	2WCS*PRR101 Cubical Wall	None None	Note 1 Note 1	12.45 12.46
5	243'-0"	185°	C	Cubical Ceiling Cubical Floor	None None	Note 1 Note 1	12.48 12.49
7A	242'-0"	185°	C	Cubical Wall Primary Containment Wall Structural Steel - Platform 2CC999GU-2.0 2CK999GK-2.0	None None None None None	Note 1 Note 1 Note 1 Note 1, Note 3 Note 1, Note 3	12.51 12.52 12.53 12.54 12.55
13A	238'-9"	179°	C	Structural Ladder Structural Platform Concrete Floor	None None None	Note 1 Note 1 Note 1	12.58 13.1 13.2



TABLE 3.6A-6 (cont)

Piping Line Numbers: 2-WCS-008-95-3

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>	
	<u>EI</u>	<u>AZ</u>					
139A	237'-9"	178°	C	Primary Containment Wall Floor Structural Steel	None None None	Note 1 Note 1 Note 1	13.16 13.17 13.18



TABLE 3.6A- (Cont)

Piping Line Numbers: 2-WCS-008-111-3

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks	
	EL	AZ					
704	334'-2"	199°	C	Floor	None	Note 1	13.31
705	322'-6"	196°	C	Structural Steel - Platform Cubical Floor	None None	Note 1 Note 1	13.33 13.34
704C	324'-2" None	198° Note 2	C	None			13.36 13.37





TABLE 3.6A (Cont)

Piping Line Numbers: 2-WCS-008-139-3

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks	
	EI	AZ					
702	334'-2"	219°	C	Floor, el 328'-10"	None	Note 1	13.50
703	322'-6"	214°	C	Steel Platform Cubical Floor	None	Note 1	13.52
					None	Note 1	13.53
702C	324'-2"	216°	C	Concrete Wall Structural Columns	None	Note 1	13.55
					None	Note 1	13.56



TABLE 3.6A-(cont)

Piping Line Numbers: 2-WCS-008-203-3

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks	
	EI	AZ					
708	334'-2"	154°	C	Floor	None	Note 1	14.11
709	322'-6"	157°	C	Cubical Floor Platform	None None	Note 1 Note 1	14.13 14.14
708C	324'-2"	156°	C	None			14.16



TABLE 3.6A- (Cont)

Piping Line Numbers: 2-WCS-008-301-3

<u>Break Point</u>	<u>Break Location</u>		<u>Break Type</u>	<u>Targets</u>	<u>Protection Measures</u>	<u>Remarks</u>	
	<u>EI</u>	<u>AZ</u>					
262	263'-0"	17°	C	2WCS*PRR106 Steel Platform Containment Wall Cubical Wall Structural Steel	None None None None None	Note 1 Note 1 Note 1 Note 1 Note 1	14.29 14.30 14.31 14.32 14.33



TABLE 3.6A- (Cont)

Piping Line Numbers: 2-WCS-010-316-3

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks	
	EI	AZ					
235A	310'-10"	19°	C	None			14.46
234A	283'-0"	36°	C	Ceiling	None	Note 1	14.48
				2WCS*PRR110	None	Note 1	14.49
				2WCS*PRR111	None	Note 1	14.50
				Structural Steel	None	Note 1	14.51
231A	316'-9"	11°	C	Containment Wall	None	Note 1	14.53
				Cubical Wall	None	Note 1	14.54
				Structural Steel	None	Note 1	14.55
				Platform Steel	None	Note 1	14.56





TABLE 3.6A-(cont)

Piping Line Numbers: Strainers 2WCS\*STR17A, 17B, 17C, 17D

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks	
	El	AZ					
479	331'-0"	159°	C	None	None	Note 1	15.11
542	331'-0"	171°	C	None	None	Note 1	15.13
605	331'-0"	202°	C	None	None	Note 1	15.15
669	331'-0"	213°	C	None	None	Note 1	15.17



TABLE 3.6A- (cont)

Piping Line Numbers: Strainers 2WCS\*STR8A, 8B, 8C, 8D

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks	
	<u>EI</u>	<u>AZ</u>					
778	332'-0"	158°	C	None	None	Note 1	15.30
842	332'-0"	181°	C	None	None	Note 1	15.32
902	332'-0"	191°	C	None	None	Note 1	15.34
967	332'-0"	212°	C	None	None	Note 1	15.36



TABLE 3.6A- (Cont)

Piping Line Numbers: Strainers 2WCS\*STR5A, 5B, 5C, 5D

Break Point	Break Location		Break Type	Targets	Protection Measures	Remarks	
	EL	AZ					
802	335'-6"	161°	C	None	None	Note 1	15.49
859	335'-6"	179°	C	None	None	Note 1	15.51
922	335'-6"	198°	C	None	None	Note 1	15.53
981C	335'-6"	210°	C	None	None	Note 1	15.55



TABLE 3.6A-70

SUMMARY OF ANALYSIS OF TARGETS AS A RESULT OF JET IMPINGEMENT  
Standby Liquid Control System

Piping Line Numbers: 2-SLS-002-89-1

<u>Break Point</u>	<u>Break Location</u>	<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>	
1	307'-11 3/16" 236.5°	C	2-SFC-150-362-3	None	Note 2	1.25

Note 2: The target has been evaluated and determined to be acceptable in accordance with the objectives described in Section 3.6.1.1A.

1 of 2





TABLE 3.6A-70 (Cont)

Piping Line Numbers: 2-SLS-002-94-1

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	EL	AZ					
7	307'-11 3/16"	229.3°	C	2-SFC-150-362-3	None	Note 2	1.40
9	307'-11 3/16"	226.7°	C	2-SFC-150-362-3	None	Note 2	1.44

Note 2: The target has been evaluated and determined to be acceptable in accordance with the objectives described in Section 3.6.1.1A.

2 of 2



TABLE 3.

## SUMMARY OF ANALYSIS OF TARGETS AS A RESULT OF JET IMPINGEMENT

## Control Rod Drive System

Piping Line Numbers: 2-RDS-003-23-4

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	EL	AZ					
1	217'-1 1/2"	34.4°	C	Tube 1/2"K-096 Tube for 2CSL*PDT132	None None	Notes 1, 3 Notes 1, 3	1.31 1.32

Note 1: The target has been designed so that it can withstand the jet impact and still adequately perform any essential function for which it is intended.

Note 2: The target has been evaluated and determined to be acceptable in accordance with the objectives described in Section 3.6.1.1A.

Note 3: The target has been determined to be essential in accordance with the criteria described in Section 3.6.1.1A.

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TABLE 3.6A-71 (Cont)

Piping Line Numbers: 2-RDS-003-22-4'

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	EL	AZ					
2	217'-1 1/2"	46.32°	C	Tube 1/2"K-96 Tube for 2CSL*PDT132	None None	Notes 1, 3 Notes 1, 3	1.52 1.53



TABLE 3.6A-71 (Cont)

Piping Line Numbers: 2-RDS-003-22-4

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks
	EL	AZ				
3	217'-1 1/2"	47.45°	C	None		

1.57





TABLE 3.6A-7 (cont)

Piping Line Numbers: 2-RDS-003-23-4

<u>Break Point</u>	<u>Break Location</u>	<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>
	<u>EL</u> <u>AZ</u>				
4	217'-1 1/2"	35.9°      C	None		

2.13

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TABLE 3.6A-7 (cont)

Piping Line Numbers: 2-RDS-003-28-4

<u>Break Point</u>	<u>Break Location</u> <u>El</u> <u>AZ</u>	<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>
6	269'-1"	25.16°      C	None		

2.26



TABLE 3.6A- (nt)

Piping Line Numbers: 2-RDS-002-38-4

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	EL	AZ					
15	262°-6 1/4"	21.35°	C	Wall 2RDS*SOV155	None None	Note 1 Notes 1, 3	2.39 2.40



TABLE 3.6A-7 (cont)

Piping Line Numbers: 2-RDS-002-61-4

Break Point	<u>Break Location</u>		Break Type	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>	
	EL	AZ					
10	262'-6 1/4"	22.2°	C	Wall	None	Note 1	2.53





TABLE 3.6A-7 (cont)

Piping Line Numbers: 2-RDS-002-38-4

Break Point	<u>Break Location</u>		Break Type	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>
	<u>El</u>	<u>AZ</u>				
20	272'-7 5/8"	21.5°	C	Wall	None	Note 1

3.8



TABLE 3.6A-(ont)

Piping Line Numbers: 2-RDS-002-55-4

Break Point	<u>Break Location</u>		Break Type	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>
	<u>EL</u>	<u>AZ</u>				
65A	274'-2"	21.8°	C	Wall	None	Note 1

3.21



TABLE 3.6A- (cont)

Piping Line Numbers: 2-RDS-002-55-4

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	<u>El</u>	<u>AZ</u>					
70A	278'-11"	18.6°	C	Q-Decking Floor	None None	Note 1 Note 1	3.34 3.35



TABLE 3.6A-7 (cont)

Piping Line Numbers: 2-RDS-002-39-4

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks
	El	AZ				
35	262'-6 1/4"	19.5°	C	Wall	None	Note 1

3.48





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TABLE 3.6A-7 (at)

Piping Line Numbers: 2-RDS-150-160-4

<u>Break Point</u>	<u>Break Location</u> <u>EL</u> <u>AZ</u>	<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>	
25	262'-6 1/4"	22.3°	C	Wall	None	Note 1

4.5



TABLE 3.6A-7 (cont)

Piping Line Numbers: 2-RDS-150-74-4

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks
	El	AZ				
30	262'-6 1/4"	23.3°	C	Wall	None	Note 1

4.18



TABLE 3.6A-7 (nt)

Piping Line Numbers: 2-RDS-002-51-4

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks
	El	AZ				
40	262'-6 1/4"	26.18°	C	Wall	None	Note 1

4.31





TABLE 3.6A-7 (cont)

Piping Line Numbers: 2-RDS-002-57-4

Break Point	Break Location El	AZ	Break Type	Targets	Protection Measure	Remarks
65B	274'-2"	22.05°	C	Wall	None	Note 1

4.44



TABLE 3.6A-71

Piping Line Numbers: 2-RDS-002-57-4

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	El	AZ					
70B	278'-11"	19.48°	C	Q-Decking Floor	None	Note 1	4.57
					None	Note 1	4.58
75B	273'-1"	38.79°	C	Wall Structural Beam 2CX038GA 2CX038GB	None	Note 1	5.3
					None	Note 1	5.4
					None	Notes 1, 3	5.5
					None	Notes 1, 3	5.6



TABLE 3.6A-71 (t)

Piping Line Numbers: 2-RDS-002-55-4

<u>Break Point</u>	<u>Break Location</u> <u>El</u> <u>AZ</u>	<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>	
50	273'-11"      26°	C	Structural Steel 2RDS*SOV155	None None	Note 1 Notes 1, 3	5.20 5.21



TABLE 3.6A-(ont)

Piping Line Numbers: 2-RDS-001-45-4

<u>Break Point</u>	<u>Break Location</u>	<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>
	<u>El</u> <u>AZ</u>				
45	263'-6 1/4"	22°	C	None	

5.34





TABLE 3.6A-(ont)

Piping Line Numbers: 2-RDS-001-48-4

<u>Break Point</u>	<u>Break Location</u> <u>EA</u> <u>AZ</u>	<u>Break Type</u>	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>	
55	262°-8"	20°	C	Floor	None	Note 1

5.47



TABLE 3.6A- (ont)

Piping Line Numbers: 2-RDS-150-43-4

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	El	AZ					
60	262'-6 1/4"	26°	C	RDS Support NMP-009H	None	Note 1	6.2
				Attachment 12			6.3
				RDS Support NMP-009G	None	Note 1	6.4
				Attachment 6			6.5
				Wall	None	Note 1	6.6



TABLE 3.6A-7 (cont)

Piping Line Numbers: 2-RDS-002-55-4, 2-RDS-002-57-4

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	EL	AZ					
110A	271'-5 7/8"	65°	C	2SWP-150-636-3	None	Notes 1, 3	6.19
				2-SWP-150-637-3	None	Notes 1, 3	6.20
110B	272'-5 7/8"	65°	C	2ISC*Y108	2RDS*JTS003	Note 3	6.21
				CRD Frame Steel	None	Note 1	6.22
				Tube 1/2"K-19B	None	Notes 1, 3	6.23
				Tube 1/2"K-27	None	Notes 1, 3	6.24
				Tube 1/2"K-68B	None	Notes 1, 3	6.25
				Structural Column	None	Note 1	6.26
				2CES*RAK004	None	Notes 1, 3	6.27



TABLE 3.6A-71

Piping Line Numbers: 2-RDS-002-55-4, 2-RDS-002-57-4, 2-RDS-001-58-4, 2-RDS-001-56-4

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	El	AZ					
115A	271'-3 1/4"	88°	C	Structural Steel	None	Note 1	6.40
and				1/2" K - 19B	2RDS*JTS001	Note 3	6.41
115B	272'-3 1/4"	88°	C	1/2" K - 68B	2RDS*JTS001	Note 3	6.42
117C	272'-8"	91.37°	C	1/2" K - 138	2RDS*JTS001	Note 3	6.43
117D	271'-8"	91.37°	C	1/2" K - 89	2RDS*JTS001	Note 3	6.44
				1/2" K - 81	2RDS*JTS001	Note 3	6.45
				1/2" K - 19	2RDS*JTS001	Note 3	6.46
				1/2" K - 27	2RDS*JTS001	Note 3	6.47
				1/2" K - 23	2RDS*JTS001	Note 3	6.48





TABLE 3.6A-7 (t)

Piping Line Numbers: 2-RDS-002-55-4, 2-RDS-002-57-4, 2-RDS-001-58-4

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	El	AZ					
120A	271'-2"	91°	C	Structural Steel	None	Note 1	7.3
and				1/2" K - 19B	2RDS*JTS001	Note 3	7.4
120B	272'-2"	91°	C	1/2" K - 68B	2RDS*JTS001	Note 3	7.5
125C	272'-8"	93.52°	C	1/2" K - 138	2RDS*JTS001	Note 3	7.6
125D	271'-8"	93.52°	C	1/2" K - 89	2RDS*JTS001	Note 3	7.7
				1/2" K - 81	2RDS*JTS001	Note 3	7.8
				1/2" K - 19	2RDS*JTS001	Note 3	7.9
				1/2" K - 27	2RDS*JTS001	Note 3	7.10
				1/2" K - 23	2RDS*JTS001	Note 3	7.11



TABLE 3.6A-7 (nt)

Piping Line Numbers: 2-RDS-002-55-4, 2-RDS-002-57-4

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	El	AZ					
85A	271'-5 7/8"	291.06°	C	Wall	None	Note 1	7.24
and	272'-5 7/8"	291.06°	C	Tube 1/2"K-25A	None	Notes 1, 3	7.25
85B				Tube 1/2"K-68D	None	Notes 1, 3	7.26



TABLE 3.6A-7 (cont)

Piping Line Numbers: 2-RDS-002-55-4, 2-RDS-002-57-4, 2-RDS-001-58-4, 2-RDS-001-56-4

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks
	El	AZ				
95A	271'-4 1/8"	271.3°	C	Structural Column	None	Note 1
and	272'-4 1/8"	271.3°	C			
95B	272'-9 1/16"	268.7°	C			
97C	272'-9 1/16"	268.7°	C			
97D						



TABLE 3.6A-7 (t)

Piping Line Numbers: 2-RDS-002-55-4, 2-RDS-002-57-4, 2-RDS-001-58-4, 2-RDS-001-56-4

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	El	AZ					
100A	271'-3 1/16"	268.68°	C	Tube 1/2"K-31	2RDS*JTS002	Note 3	7.57
and	272'-3 1/16"	268.68°	C	Tube 1/2"K-40	2RDS*JTS002	Note 3	7.58
100B	272'-9 1/16"	266.48°	C	Tube 1/2"K-34	2RDS*JTS002	Note 3	8.1
105C	272'-9 1/16"	266.48°	C	Tube 1/2"K-34A	2RDS*JTS002	Note 3	8.2
105D				Tube 1/2"K-34B	2RDS*JTS002	Note 3	8.3
				Tube 1/2"K-38B	2RDS*JTS002	Note 3	8.4
				Tube 1/2"K-19	2RDS*JTS002	Note 3	8.5
				Tube 1/2"K-68D	2RDS*JTS002	Note 3	8.6
				Tube 1/2"K-68A	2RDS*JTS002	Note 3	8.7
				Tube 1/2"K-25A	2RDS*JTS002	Note 3	8.8
				Tube 1/2"K-68B	2RDS*JTS002	Note 3	8.9
				Structural Column	None	Note 1	8.10





TABLE 3.6A-71

Piping Line Numbers: 2-RDS-001-58-4, 2-RDS-001-56-4

Break Point	<u>Break Location</u>		Break Type	<u>Targets</u>	<u>Protection Measure</u>	<u>Remarks</u>	
	<u>EL</u>	<u>AZ</u>					
90C	272'-11 7/8"	287.10°	C	Structural I Beam	None	Note 1	8.23
and	271'-11 7/8"	287.10°	C				8.24
90D							8.25



TABLE 3.6A-7 (t)

Piping Line Numbers: 2-RDS-001-58-4, 2-RDS-001-56-4

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	E1	A2					
112C and 112D	272'-11 7/8"	69.27°	C	Tube 1/2"R-94	2RDS*JTS003	Note 3	8.27
	271'-11 7/8"	69.27°	C	Tube 1/2"R-95	2PDS*JTS003	Note 3	8.28
				Structural Column	None	Note 1	8.29
				Scram Header Blind Flange (2-RDS-008-75-2)	None	Note 1, 3	8.30
				Tube 1/2"K-19B	None	Notes 1, 3	8.31
				Tube 1/2"K-27	None	Notes 1, 3	8.32
							8.33



TABLE 3.6A-71

Piping Line Numbers: 2-RDS-002-55-4, 2-PDS-002-57-4

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	El	AZ					
145A	270'-1/2"	341.04°	C	Wall	None	Note 2	8.46
and	271'-1/2"	341.04°	C				8.47
145B							8.48



TABLE 3.6A-7 (cont)

Piping Line Numbers: 2-RDS-002-55-4, 2-RDS-002-57-4

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks
	El	AZ				
135A	280'-7"	344.0°	C	None		9.3
and	281'-7"	344.0°	C			9.4
135B						9.5





TABLE 3.6A-71

Piping Line Numbers: 2-RDS-002-55-4, 2-RDS-002-57-4

Break Point	<u>Break Location</u>		Break Type	Targets	Protection Measure	Remarks	
	EL	AZ					
140A	270°-1/2"	342.40	C	Q-Decking	None	Note 1	9.18
and	271°-1/2"	342.40	C	Floor	None	Note 1	9.19
140B							9.20



TABLE 3.6A-71

Piping Line Numbers: 2-RDS-002-55-4, 2-RDS-002-57-4

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	EL	AZ					
165A and 165B	264'-10 1/4"	288.03°	C	Floor	None	Note 1	9.33
	265'-10 1/4"	288.03°	C				9.34
							9.35



TABLE 3.6A-7 (cont)

Piping Line Numbers: 2-RDS-002-55-4, 2-RDS-002-57-4

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	El	AZ					
170A	271'-7 3/8"	287.01°	C	Wall	None	Note 1	9.48
and	272'-7 3/8"	287.01°	C	Tube Steel for Scram	None	Note 1	9.49
170B				Header Support on			9.50
				Group No. 14			9.51



TABLE 3.6A-(ont)

Piping Line Numbers: 2-RDS-002-55-4, 2-RDS-002-57-4

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	El	AZ					
80A	271'-5 7/8"	58.36°	C	Containment Wall	None	Note 1	10.6
and	272'-5 7/8"	58.82°	C	Support Structure for			10.7
80B				2TX038G	None	Notes 1, 3	10.8 X
				2TX037G	None	Notes 1, 3	10.9
				2TX039G	None	Notes 1, 3	10.10
				2-SWP-125-758-3	None	Notes 1, 3	10.11
				2-SWP-125-759-3	None	Notes 1, 3	10.12





TABLE 3.6A-7 (cont)

Piping Line Numbers: 2-RDS-002-55-4

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	E1	AZ					
130A	271'-5 7/8"	62.94°	C	2-SWP-125-758-3	None	Notes 1, 3	10.25
and	272'-5 7/8"	62.94°	C	2-SWP-125-759-3	None	Notes 1, 3	10.26
130B				2TX038GA	None	Notes 1, 3	10.27
				Containment Wall	None	Note 1	10.28
				2CX038GB	None	Notes 1, 3	10.29
				2CX038GA	None	Notes 1, 3	10.30



TABLE 3.62 (Cont)

## Piping Line Numbers:

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	EL	AZ					
75A	272'-1"	39.09°	C	Wall	None	Note 1	10.43
				Structural Column	None	Note 1	10.44
				Structural Beam	None	Note 1	10.45
				2CX038GA	None	Notes 1, 3	10.46
				2CX038GB	None	Notes 1, 3	10.47



TABLE 3.6A-7 (cont)

Piping Line Numbers: 2-RDS-002-55-4

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks
	EL	AZ				
160A	264'-10 1/4"	291.25°	C	None		11.2
and	265'-10 1/4"	291.25°	C			11.3
160B						11.4



TABLE 3.6A-7 (cont)

Piping Line Numbers: 2-RDS-002-55-4, 2-RDS-002-57-4

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks	
	El	AZ					
150A	269°-1/2"	322.44°	C	2-SWP-006-95-3	None	Notes 1, 3	11.17
and	270°-1/2"	322.44°	C				11.18
150B							11.19





TABLE 3.6A- (ont)

Piping Line Numbers: 2-RDS-002-55-4, 2-RDS-002-57-4

Break Point	Break Location		Break Type	Targets	Protection Measure	Remarks
	El	AZ				
155A	268°-10 1/2"	305.01°	C	None		11.32
and	269°-10 1/2"	305.01°	C			11.33
155B						11.34







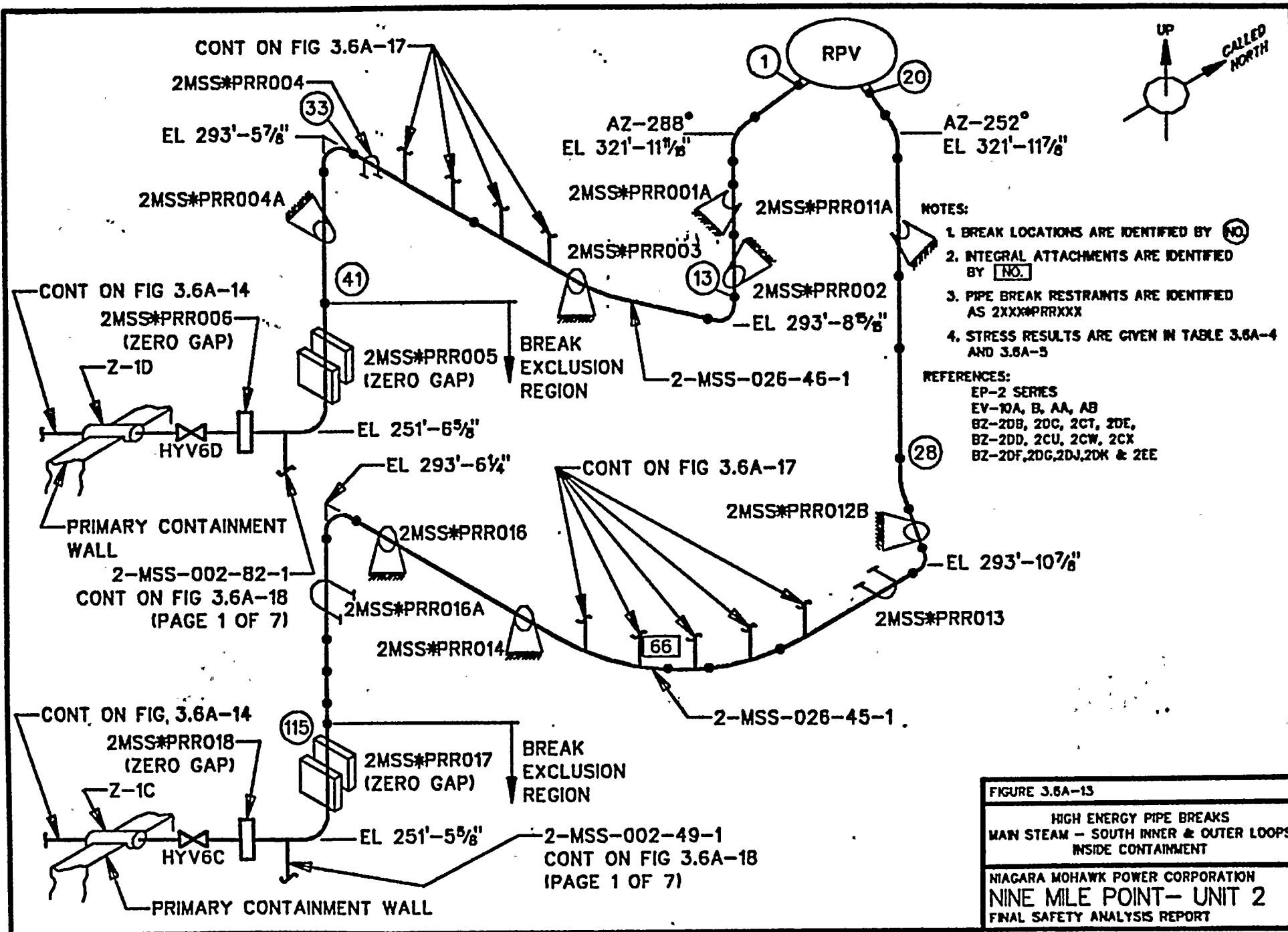


FIGURE 3.6A-13

HIGH ENERGY PIPE BREAKS  
MAIN STEAM - SOUTH INNER & OUTER LOOPS  
INSIDE CONTAINMENT

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









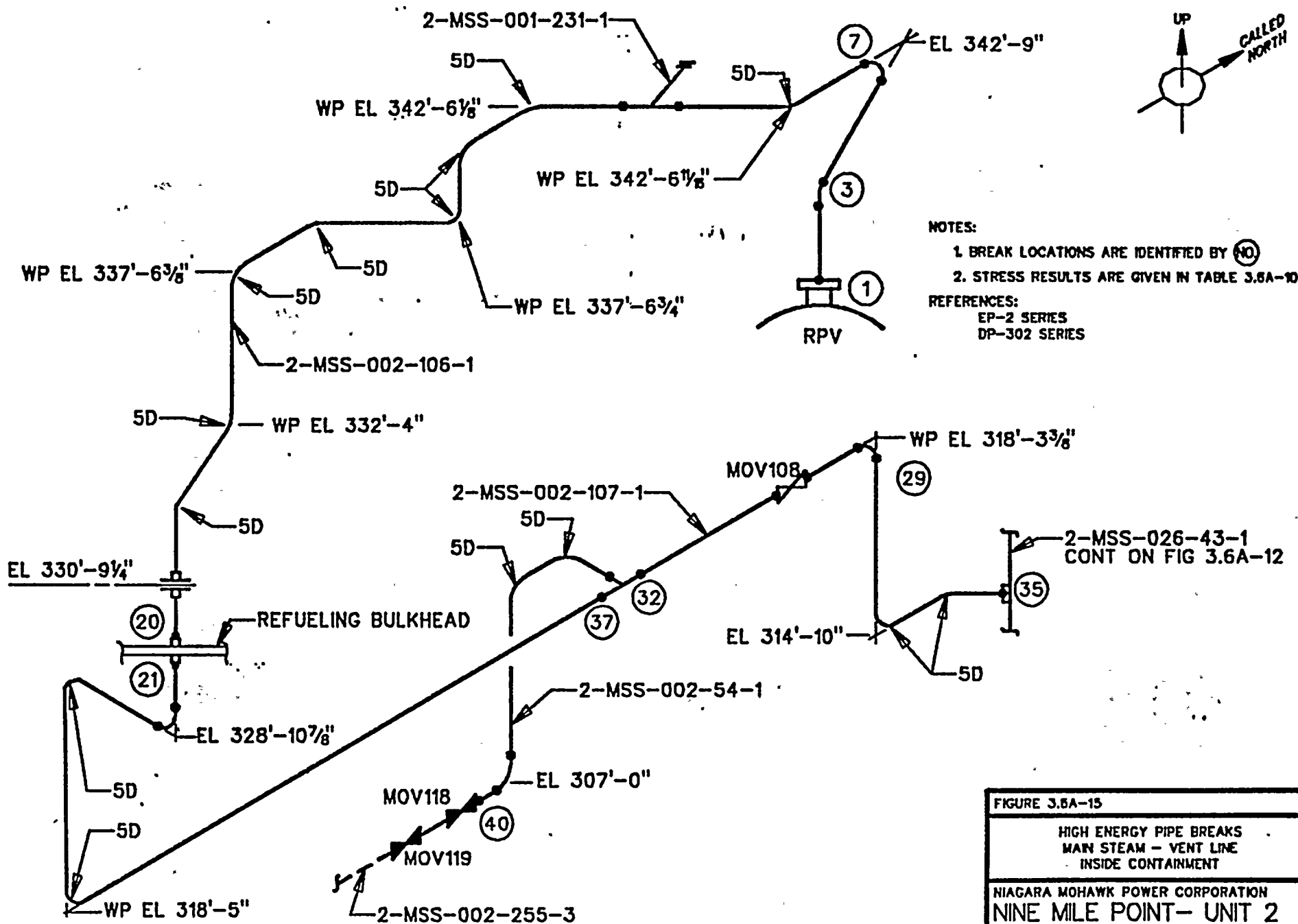
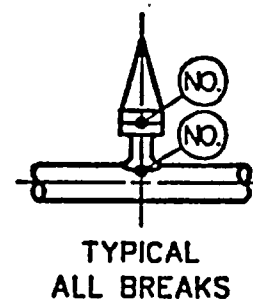
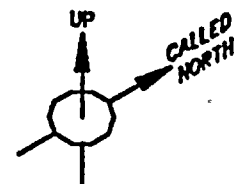
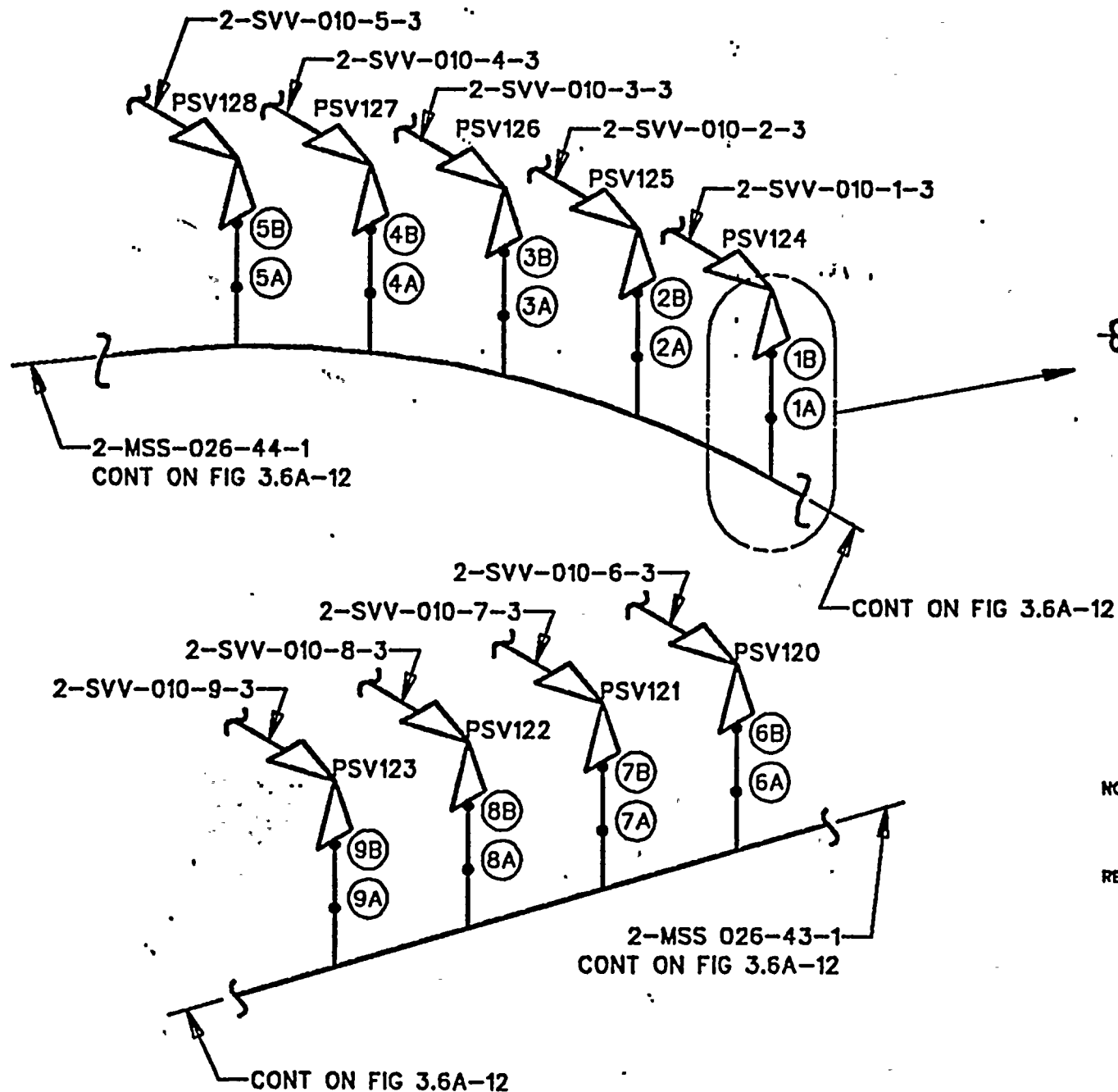


FIGURE 3.6A-15

HIGH ENERGY PIPE BREAKS  
MAIN STEAM - VENT LINE  
INSIDE CONTAINMENT

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





NOTES:

1. BREAK LOCATIONS ARE IDENTIFIED BY (NO)
2. STRESS RESULTS ARE GIVEN IN TABLE 3.6A-11

REFERENCES:

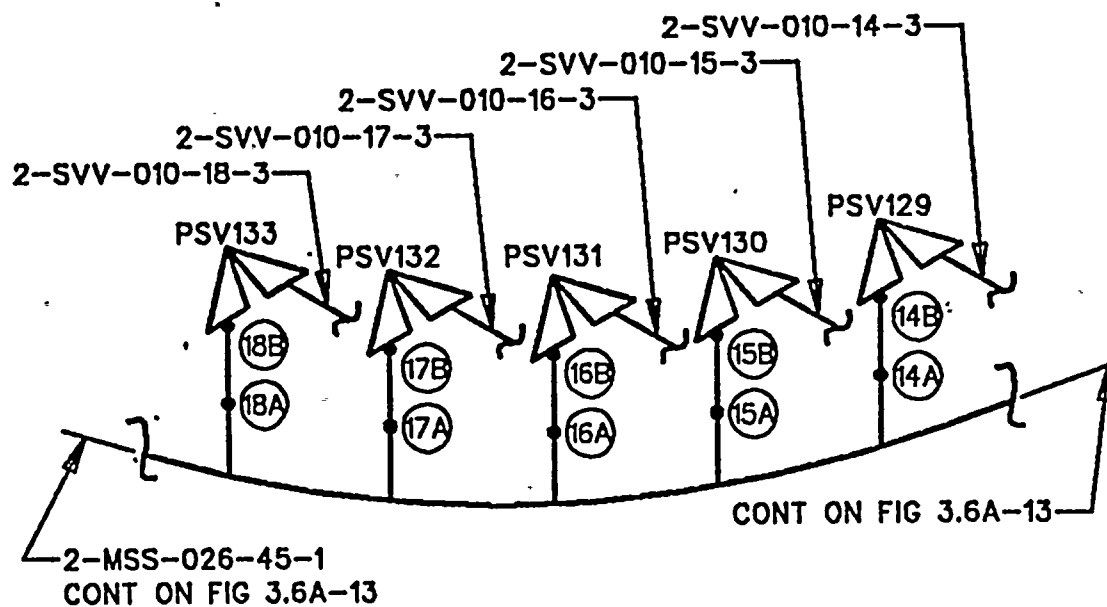
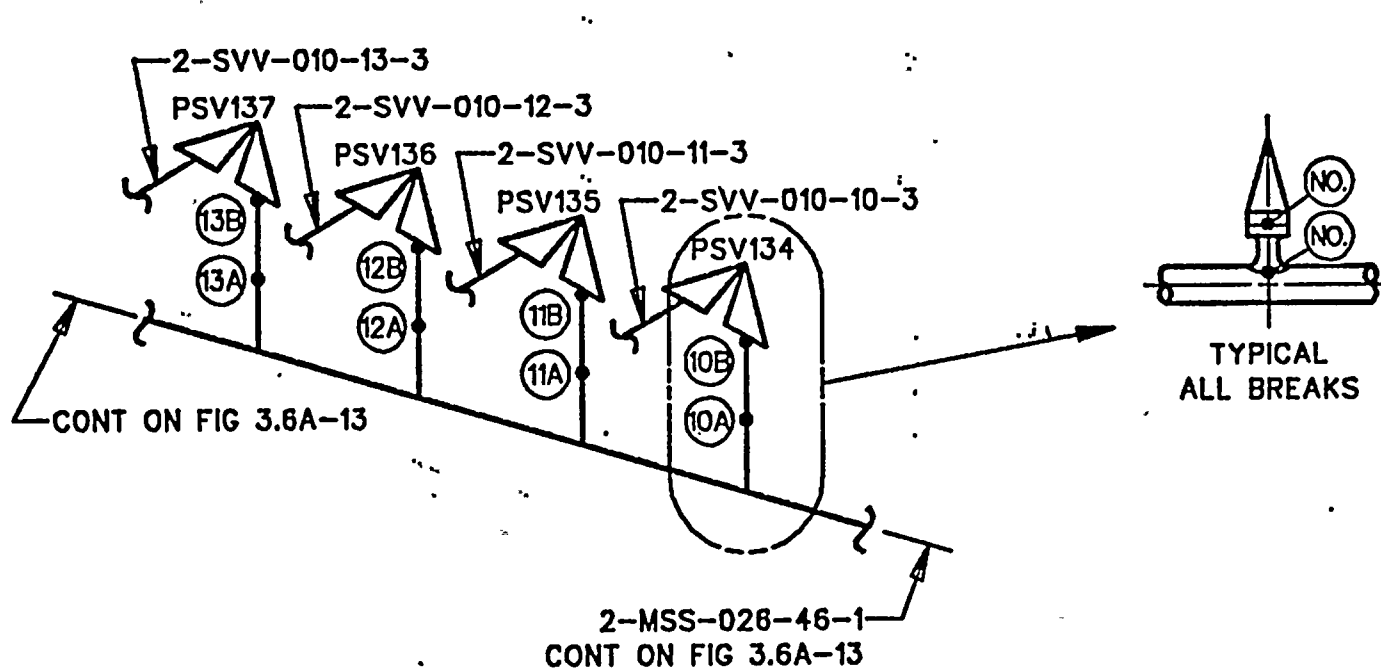
EP-2 SERIES

FIGURE 3.6A-16

HIGH ENERGY PIPE BREAKS  
MAIN STEAM SAFETY RELIEF VALVE SYSTEM  
INNER AND OUTER LOOPS, INSIDE CONTAINMENT

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





NOTES:

1. BREAK LOCATIONS ARE IDENTIFIED BY (NO)
2. STRESS RESULTS ARE GIVEN IN TABLE 3.6A-11

REFERENCES:

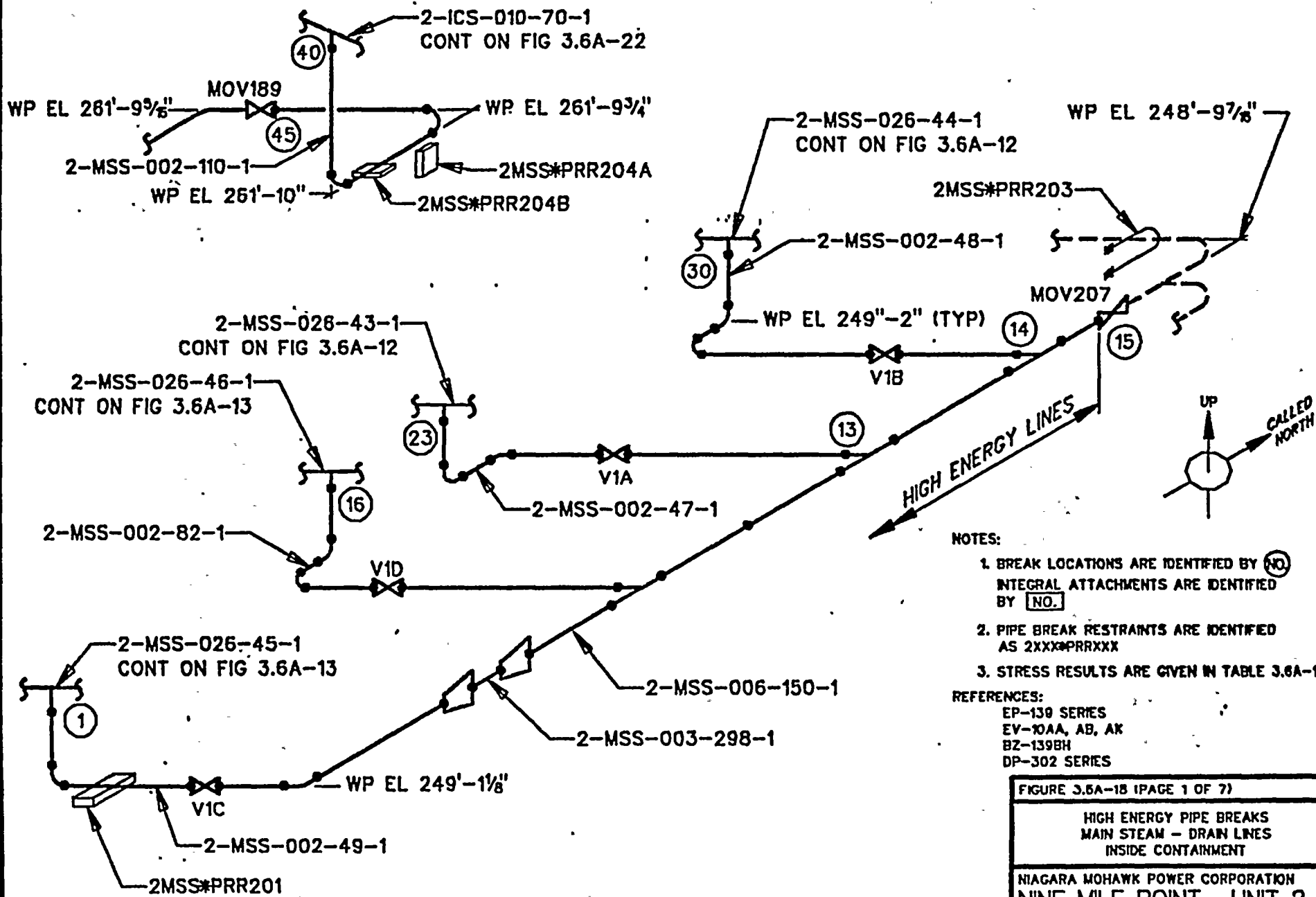
EP-2 SERIES

FIGURE 3.6A-17

HIGH ENERGY PIPE BREAKS  
MAIN STEAM SAFETY RELIEF VALVE SYSTEM  
INNER AND OUTER LOOPS, INSIDE CONTAINMENT

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





- NOTES:
1. BREAK LOCATIONS ARE IDENTIFIED BY (NO.)  
INTEGRAL ATTACHMENTS ARE IDENTIFIED BY [NO.]
  2. PIPE BREAK RESTRAINTS ARE IDENTIFIED AS 2XXX\*PRRXXX
  3. STRESS RESULTS ARE GIVEN IN TABLE 3.6A-12
- REFERENCES:
- EP-139 SERIES
  - EV-10AA, AB, AK
  - BZ-139BH
  - DP-302 SERIES

FIGURE 3.6A-18 (PAGE 1 OF 7)
HIGH ENERGY PIPE BREAKS MAIN STEAM - DRAIN LINES INSIDE CONTAINMENT
NIAGARA MOHAWK POWER CORPORATION NINE MILE POINT- UNIT 2 FINAL SAFETY ANALYSIS REPORT





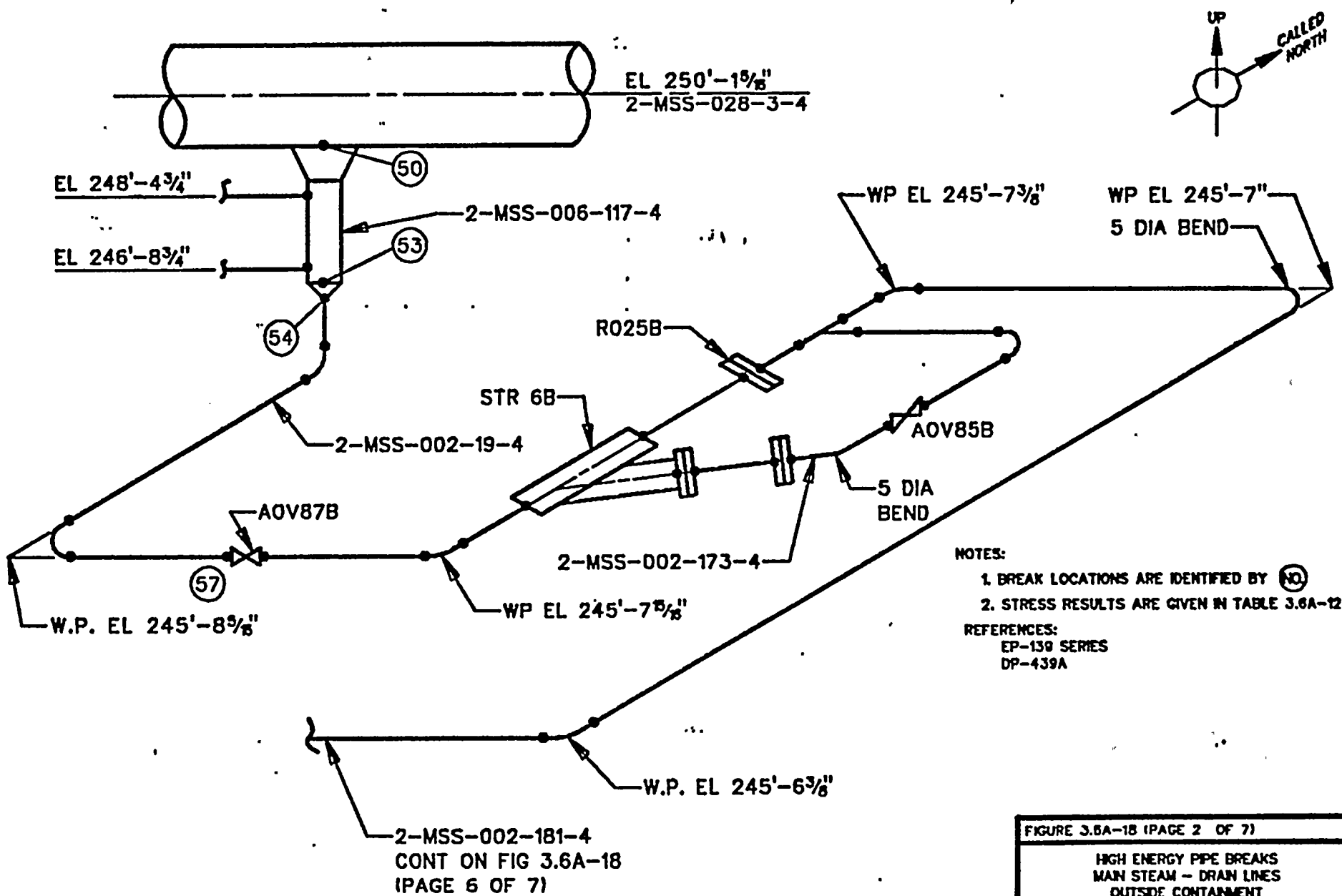


FIGURE 3.6A-18 (PAGE 2 OF 7)

HIGH ENERGY PIPE BREAKS  
MAIN STEAM - DRAIN LINES  
OUTSIDE CONTAINMENT

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



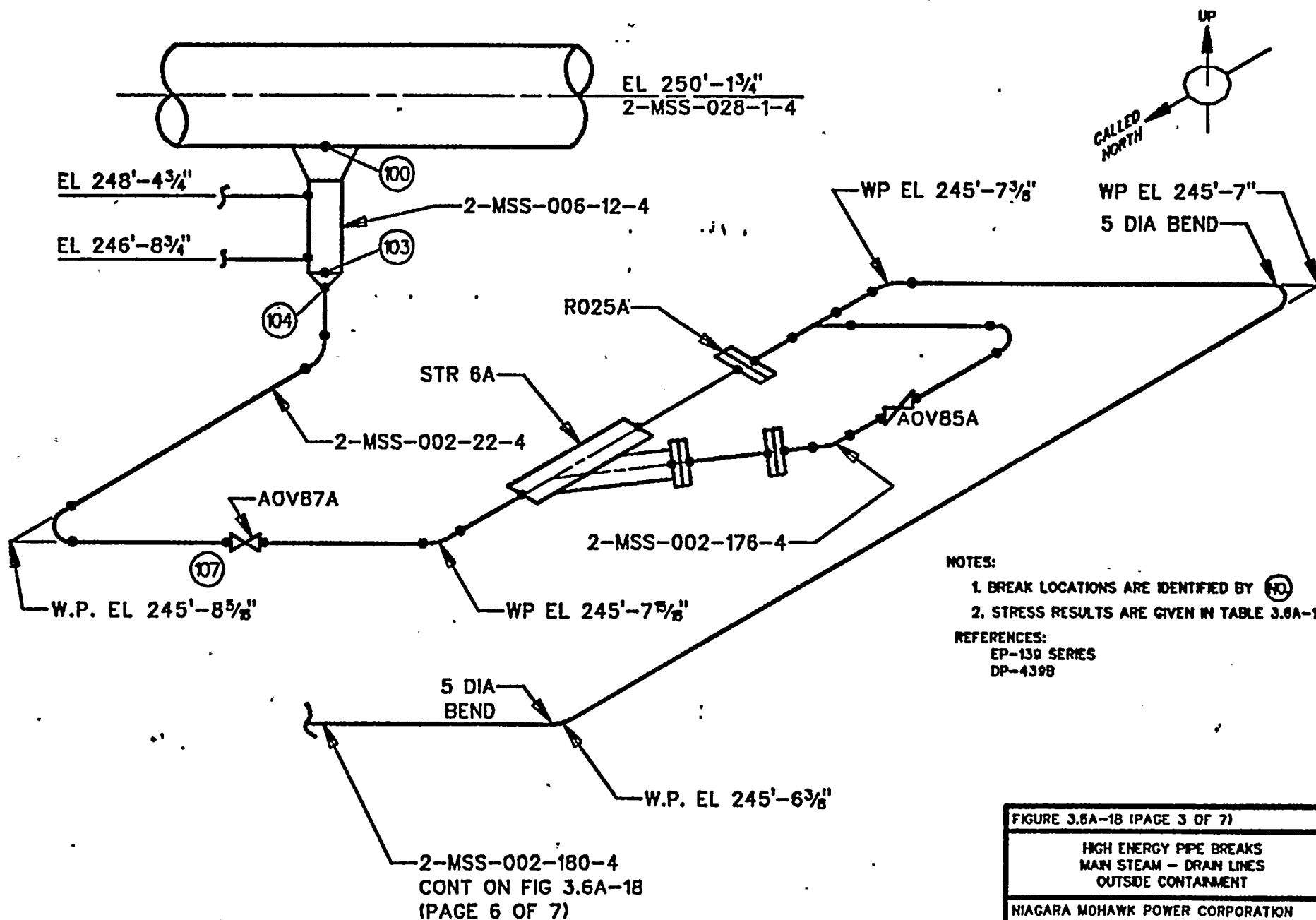


FIGURE 3.6A-18 (PAGE 3 OF 7)

HIGH ENERGY PIPE BREAKS  
MAIN STEAM - DRAIN LINES  
OUTSIDE CONTAINMENT

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



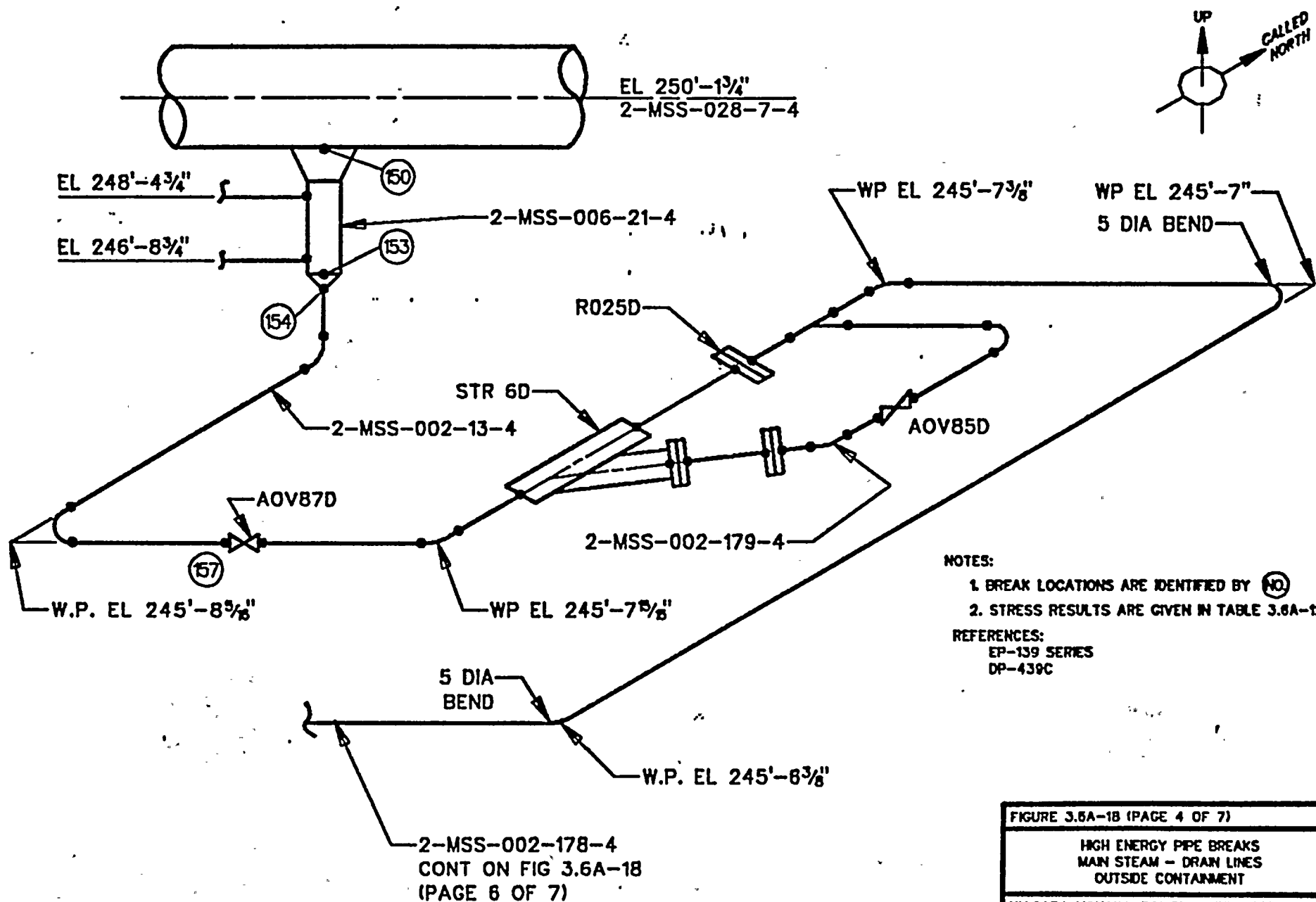


FIGURE 3.6A-1B (PAGE 4 OF 7)

HIGH ENERGY PIPE BREAKS  
MAIN STEAM - DRAIN LINES  
OUTSIDE CONTAINMENT

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



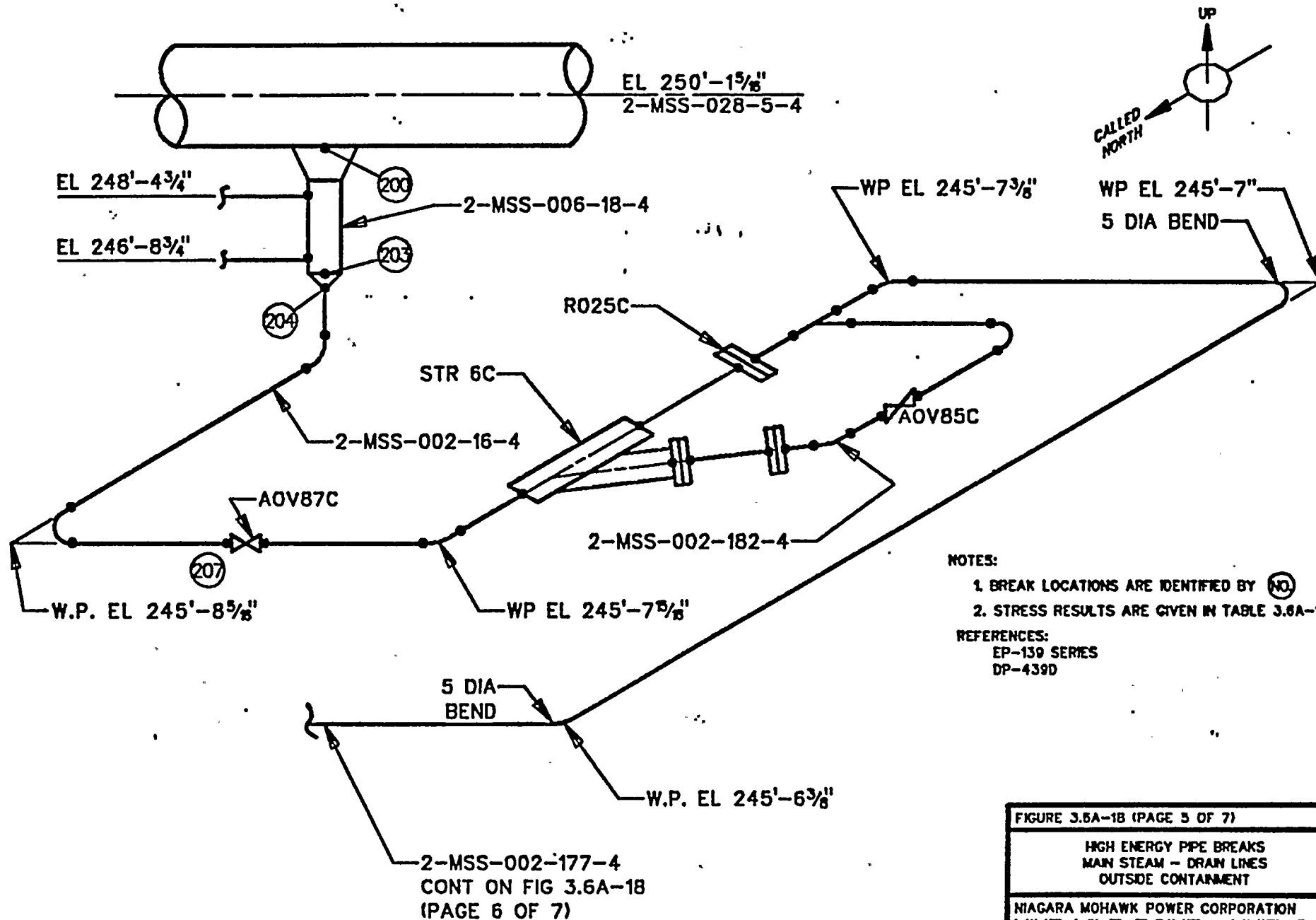


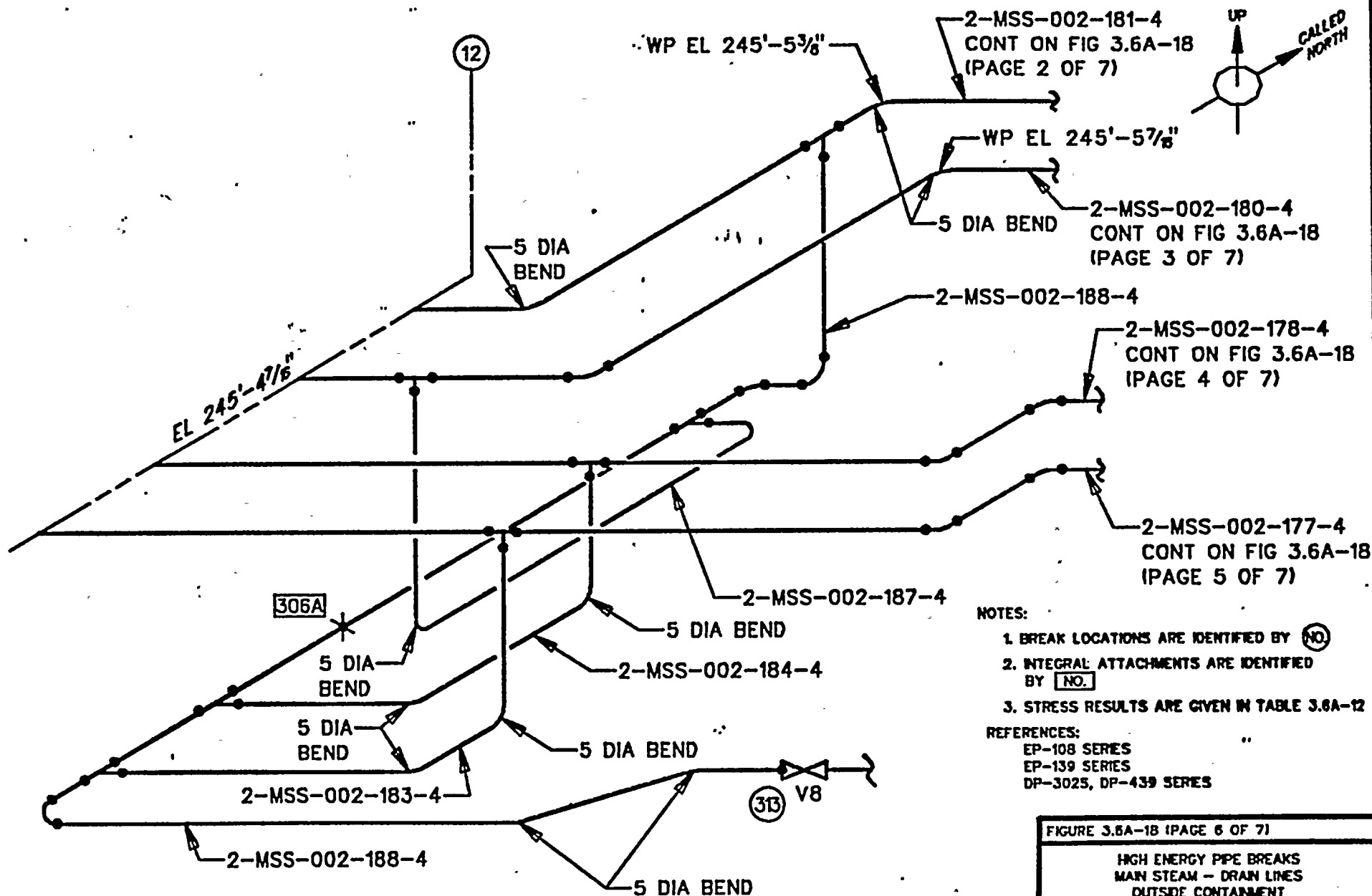
FIGURE 3.6A-1B (PAGE 5 OF 7)

HIGH ENERGY PIPE BREAKS  
MAIN STEAM - DRAIN LINES  
OUTSIDE CONTAINMENT

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







NOTES:

1. BREAK LOCATIONS ARE IDENTIFIED BY (NO)
2. INTEGRAL ATTACHMENTS ARE IDENTIFIED BY (NO.)
3. STRESS RESULTS ARE GIVEN IN TABLE 3.6A-12

REFERENCES:

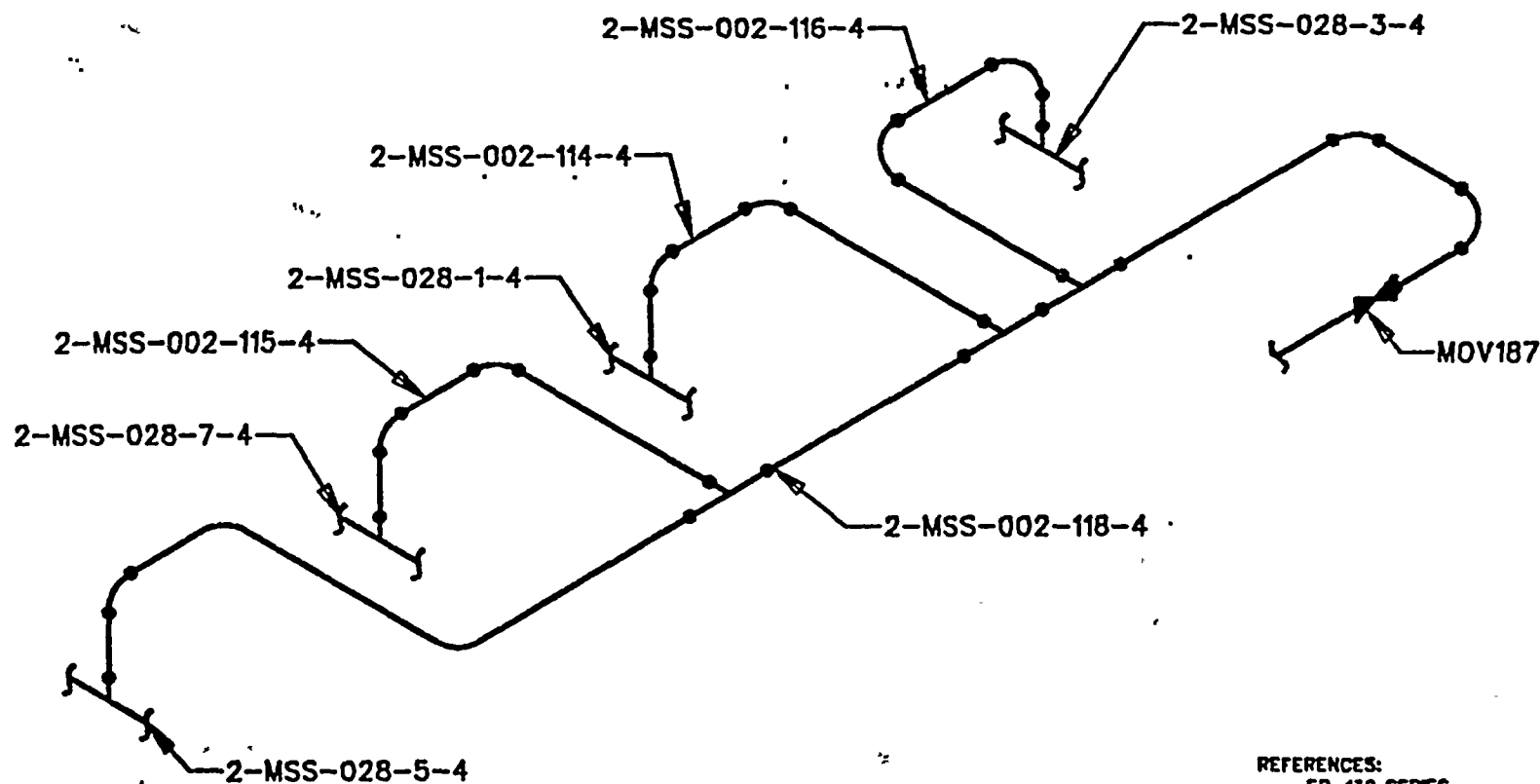
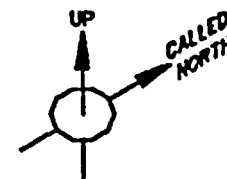
EP-108 SERIES  
EP-139 SERIES  
DP-3025, DP-439 SERIES

FIGURE 3.6A-18 (PAGE 6 OF 7)

HIGH ENERGY PIPE BREAKS  
MAIN STEAM - DRAIN LINES  
OUTSIDE CONTAINMENT

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





BREAK EXCLUSION REGION

REFERENCES:  
EP-130 SERIES

FIGURE 3.6A-18 (PAGE 7 OF 7)

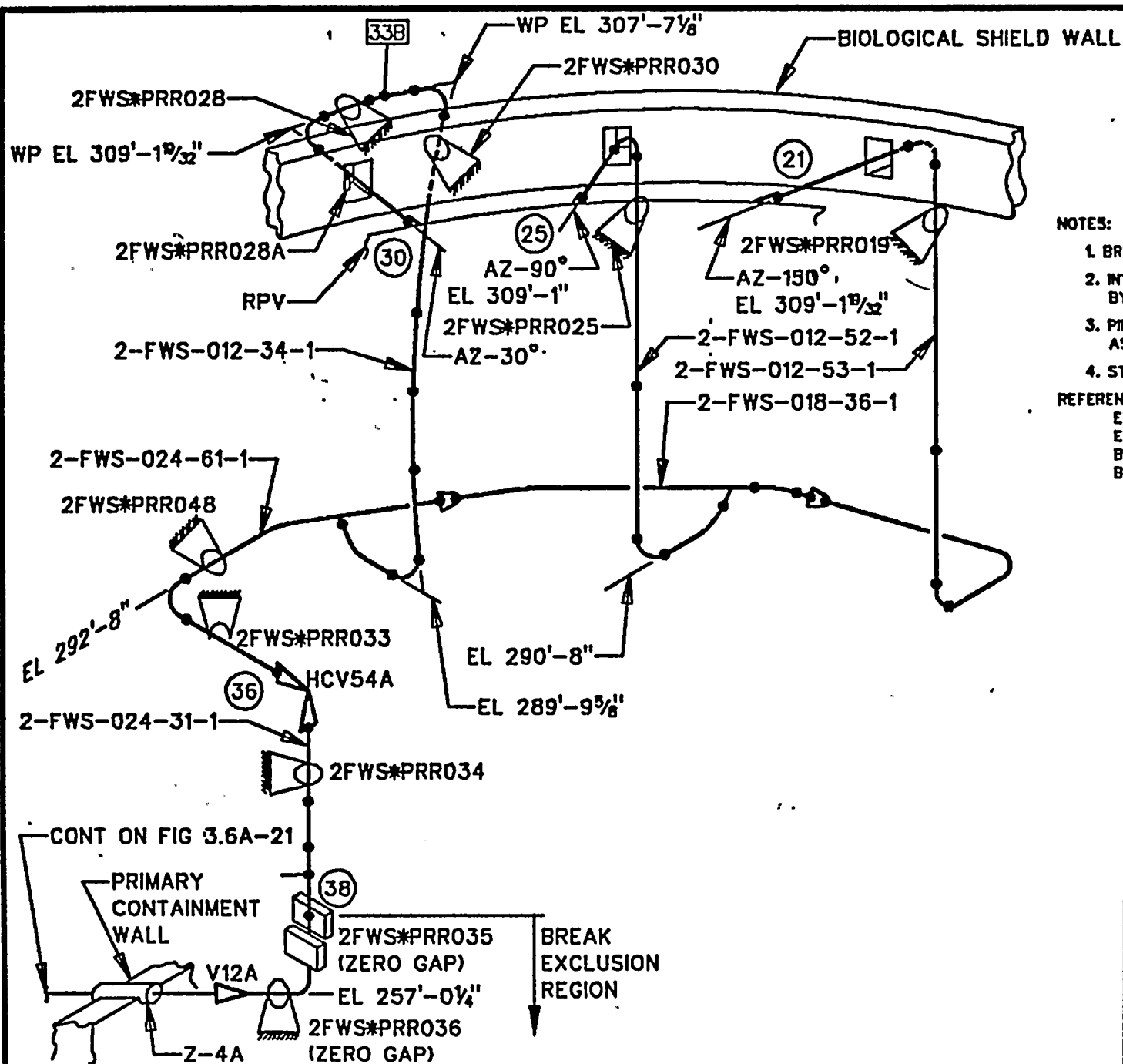
HIGH ENERGY PIPE BREAKS  
MAIN STEAM - DRAIN LINES  
OUTSIDE CONTAINMENT

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

MODEL NO. FSAR36AB REVISED 7-12-85

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NOTES:

1. BREAK LOCATIONS ARE IDENTIFIED BY (NO.)
2. INTEGRAL ATTACHMENTS ARE IDENTIFIED BY [NO.]
3. PIPE BREAK RESTRAINTS ARE IDENTIFIED AS 2XXX\*PRRXXX
4. STRESS RESULTS ARE GIVEN IN TABLE 3.6A-14

REFERENCES:

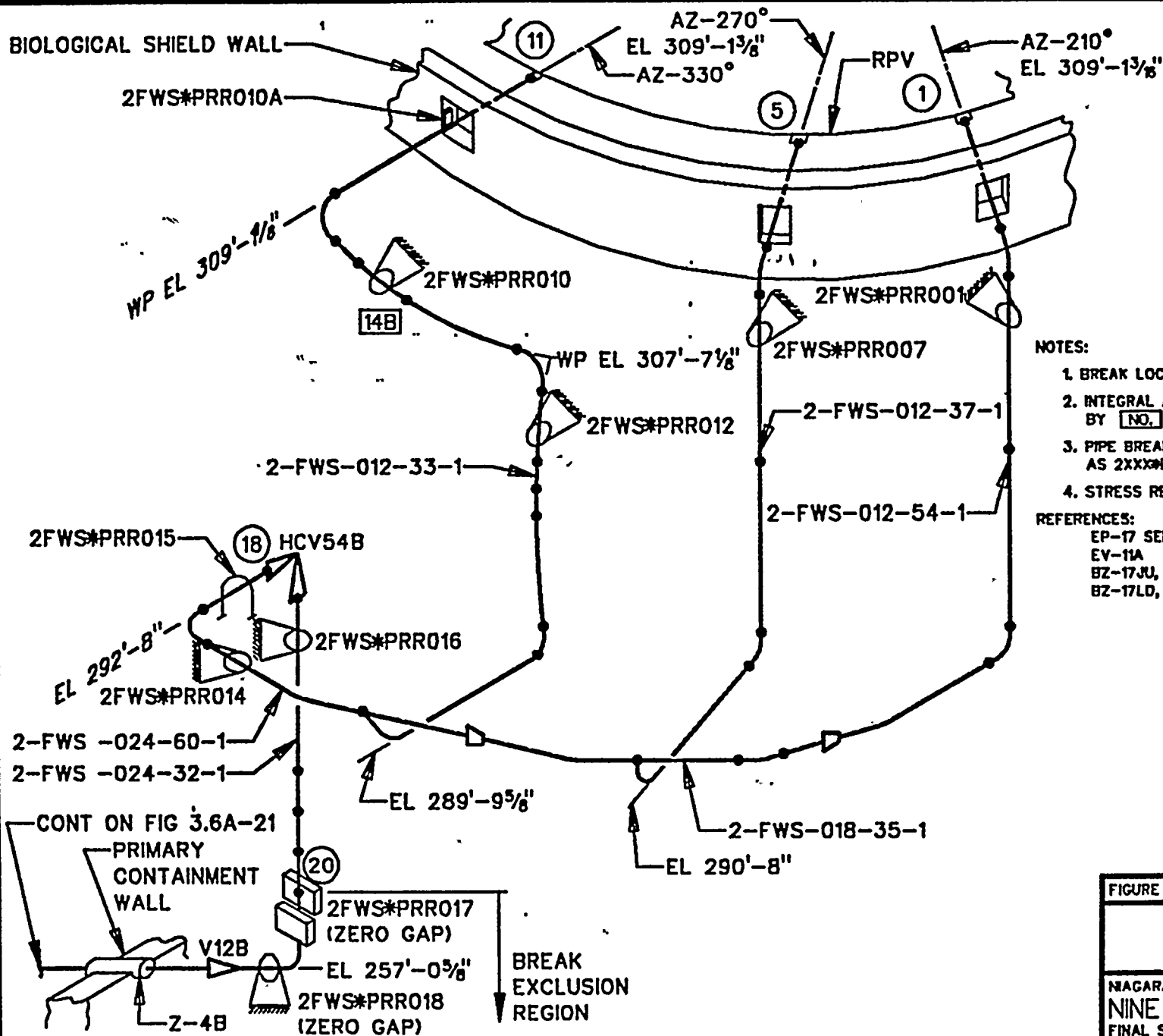
EP-17 SERIES  
 EV-11A  
 BZ-17JA, 17JM, 17JL, 17JO,  
 BZ-17JP, 17JC, 17HD

FIGURE 3.6A-19

HIGH ENERGY PIPE BREAKS  
 FEEDWATER - NORTH LOOP  
 INSIDE CONTAINMENT

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





NOTES:

1. BREAK LOCATIONS ARE IDENTIFIED BY (NO)
2. INTEGRAL ATTACHMENTS ARE IDENTIFIED BY [NO.]
3. PIPE BREAK RESTRAINTS ARE IDENTIFIED AS 2XXX\*PRRXXX
4. STRESS RESULTS ARE GIVEN IN TABLE 3.6A-13

REFERENCES:

EP-17 SERIES  
 EV-11A  
 BZ-17JU, 17KT, 17LE, 17LF  
 BZ-17LD, 17LH, 17LG

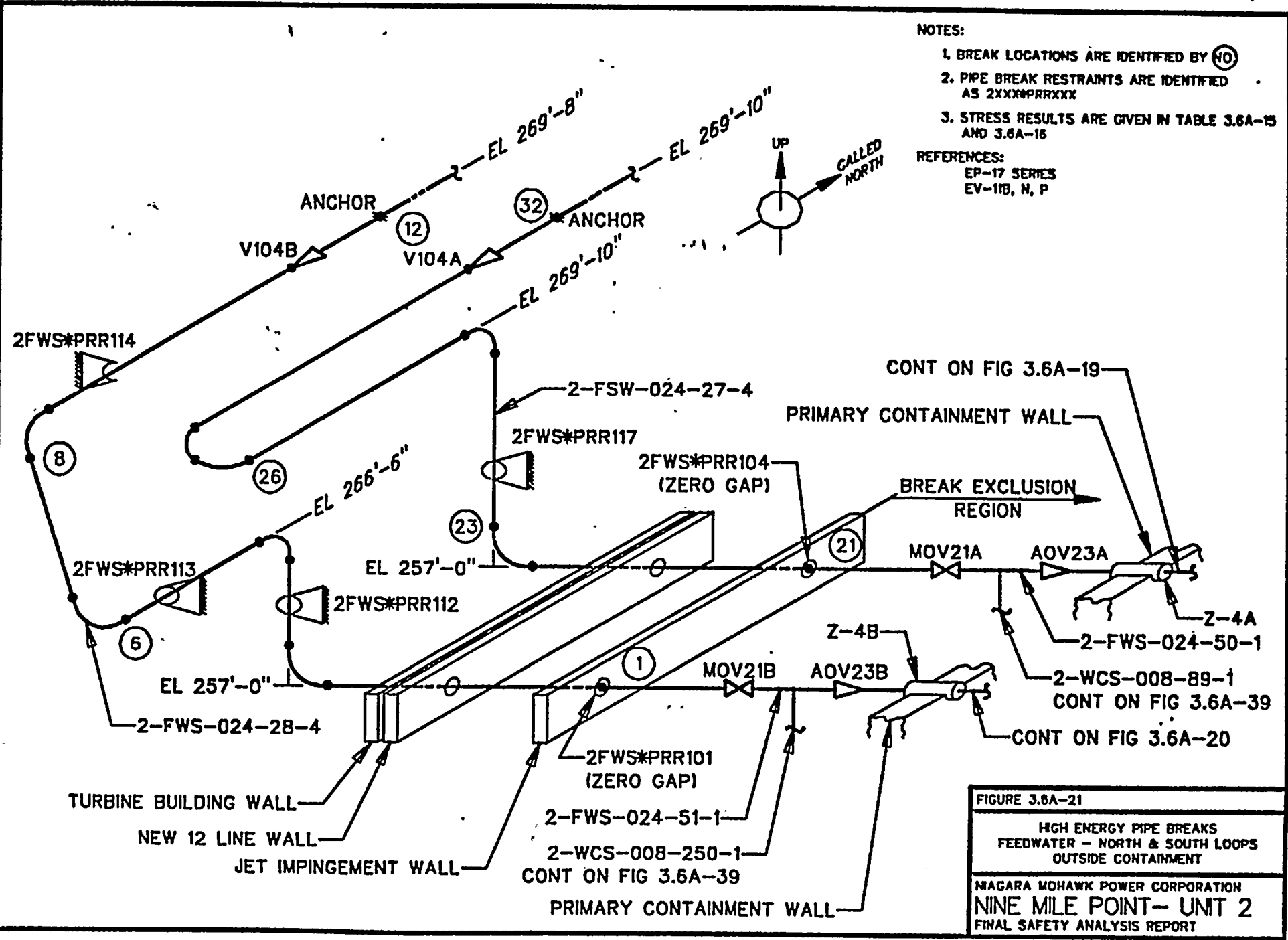
FIGURE 3.6A-20

HIGH ENERGY PIPE BREAKS  
 FEEDWATER - SOUTH LOOP  
 INSIDE CONTAINMENT

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







NOTES:

1. BREAK LOCATIONS ARE IDENTIFIED BY (NO)
2. PIPE BREAK RESTRAINTS ARE IDENTIFIED AS 2XXX\*PRRXXX
3. STRESS RESULTS ARE GIVEN IN TABLE 3.6A-15 AND 3.6A-16

REFERENCES:  
EP-17 SERIES  
EV-11B, N, P

FIGURE 3.6A-21

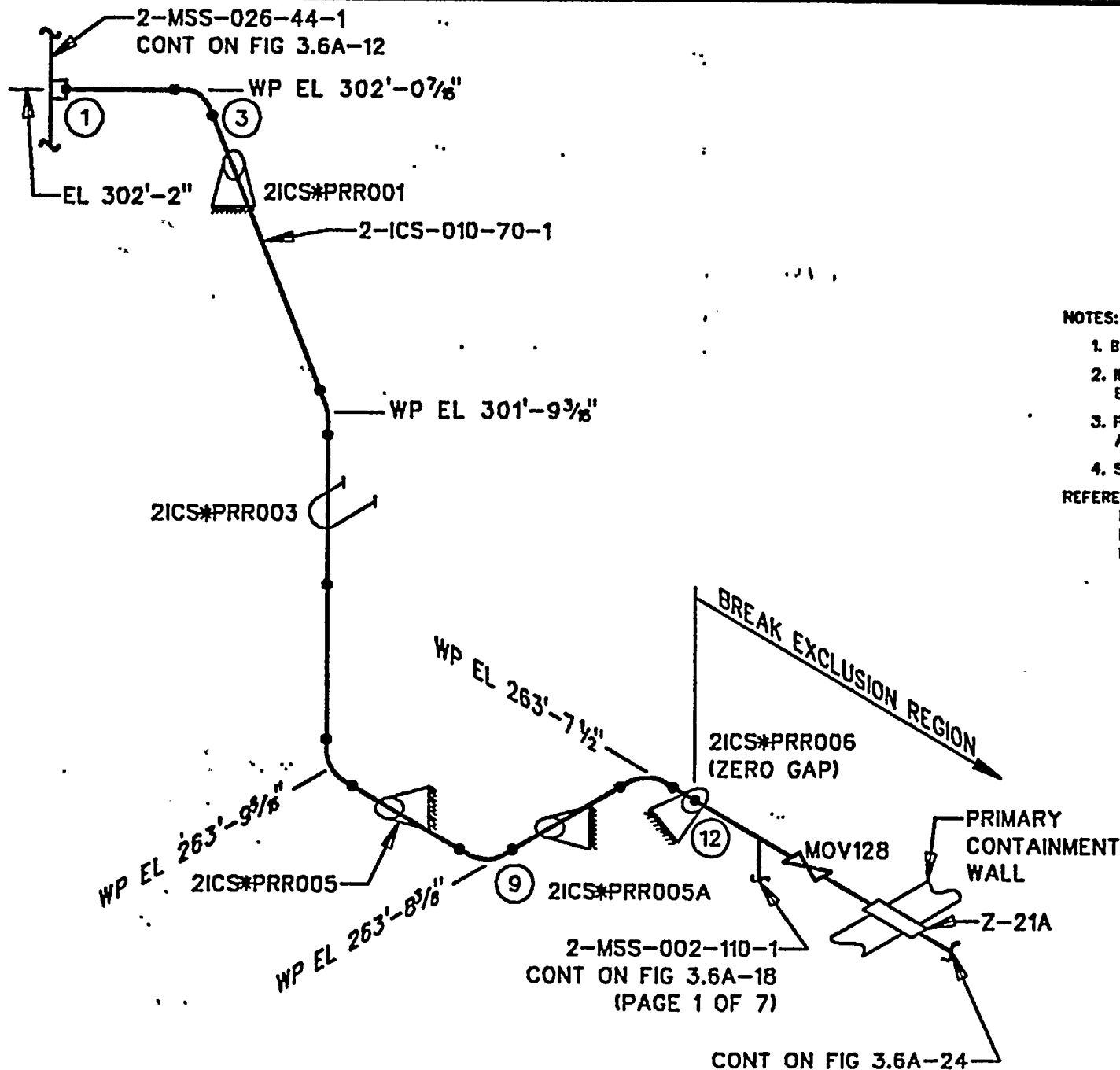
HIGH ENERGY PIPE BREAKS  
FEEDWATER - NORTH & SOUTH LOOPS  
OUTSIDE CONTAINMENT

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

MODEL NO. FSAR36AB REVISED 1-3-88

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#### NOTES:

1. BREAK LOCATIONS ARE IDENTIFIED BY (NO.)
2. INTEGRAL ATTACHMENTS ARE IDENTIFIED BY [NO.]
3. PIPE BREAK RESTRAINTS ARE IDENTIFIED AS 2XXX\*PRRXXX
4. STRESS RESULTS ARE GIVEN IN TABLE 3.6A-17

#### REFERENCES:

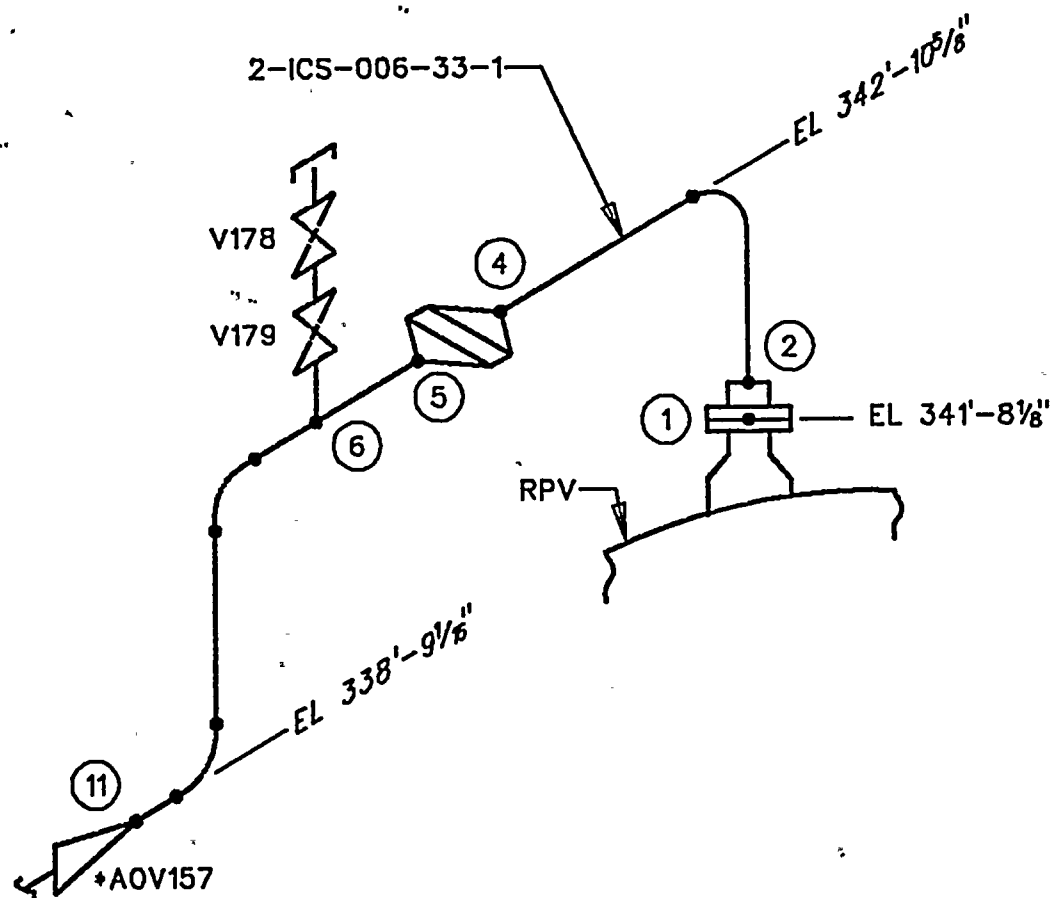
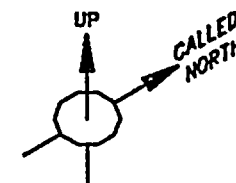
EP-76 SERIES  
EV-69C, D  
BZ-760Y

FIGURE 3.6A-22

HIGH ENERGY PIPE BREAKS  
REACTOR CORE ISOLATION COOLING  
INSIDE CONTAINMENT

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





NOTES:

1. BREAK LOCATIONS ARE IDENTIFIED BY (NO)
2. STRESS RESULTS ARE GIVEN IN TABLE 3.6A-17

REFERENCES:

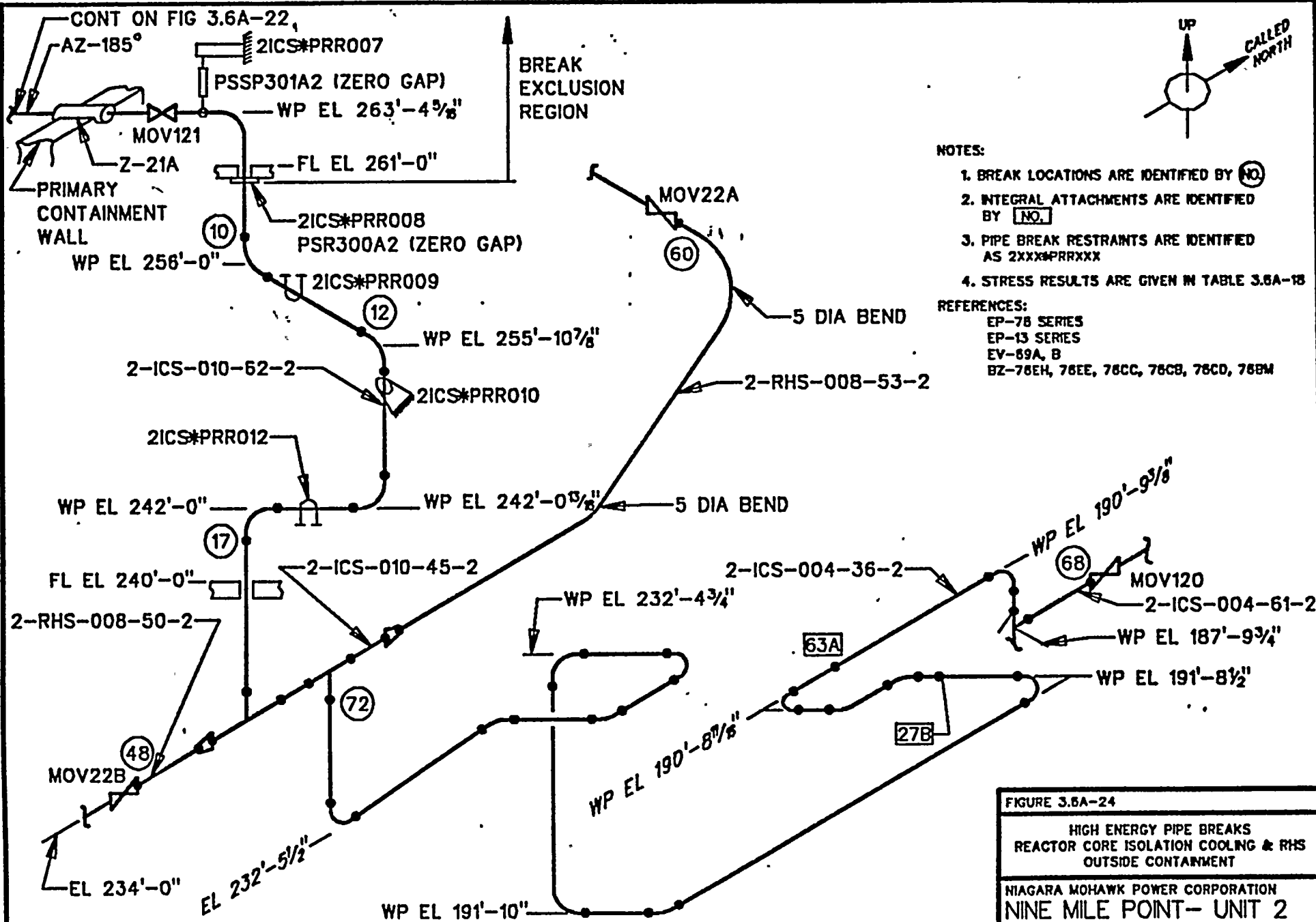
EP-76 SERIES

FIGURE 3.6A-23

HIGH ENERGY PIPE BREAKS  
REACTOR CORE ISOLATION COOLING-  
HEAD SPRAY, INSIDE CONTAINMENT

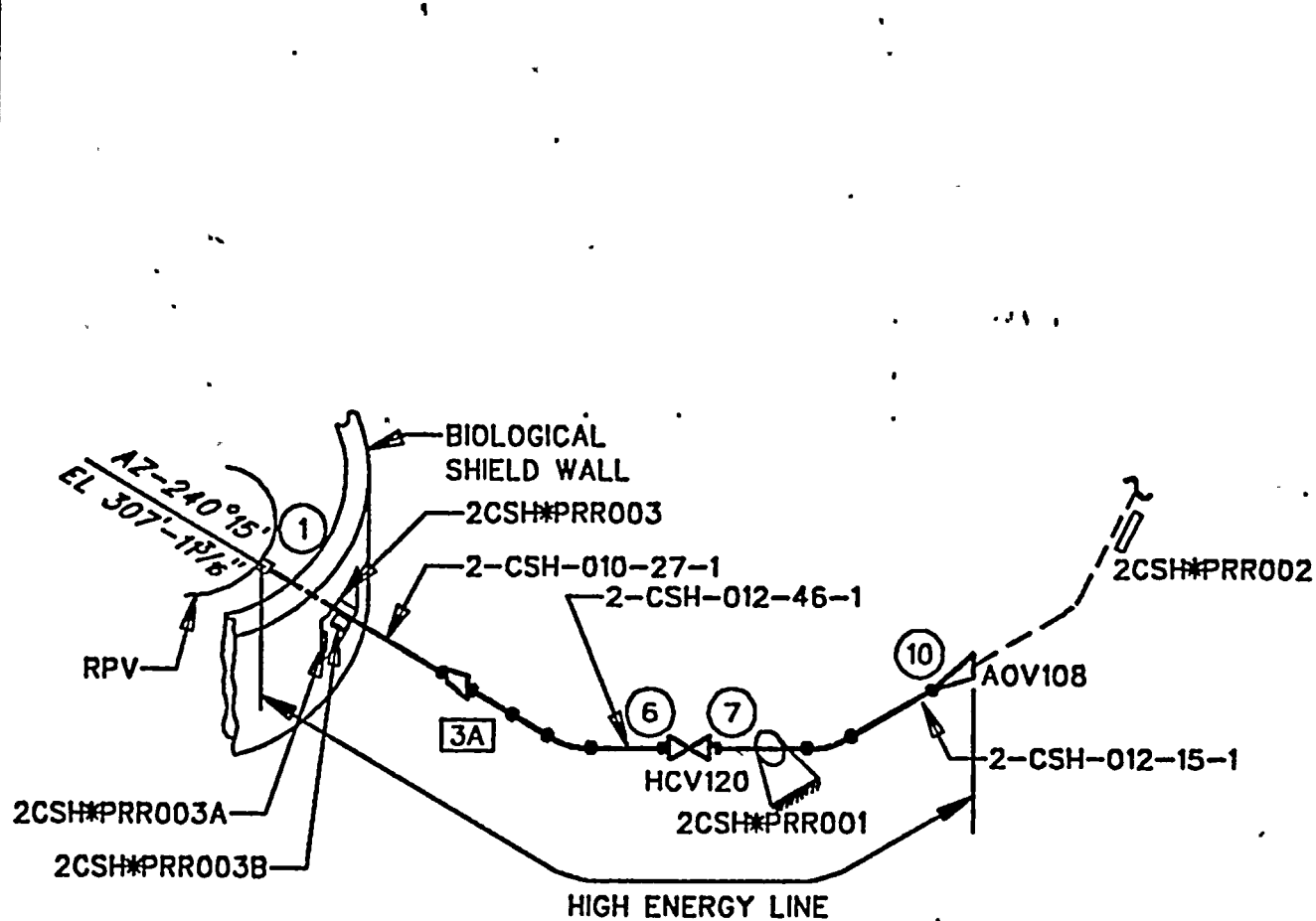
NIAGARA MOHAWK POWER CORPORATION  
NINE MILE POINT- UNIT 2  
FINAL SAFETY ANALYSIS REPORT











NOTES:

1. BREAK LOCATIONS ARE IDENTIFIED BY (NO.)
2. INTEGRAL ATTACHMENTS ARE IDENTIFIED BY [NO.]
3. PIPE BREAK RESTRAINTS ARE IDENTIFIED AS 2XXX\*PRRXXX
4. STRESS RESULTS ARE GIVEN IN TABLE 3.6A-19

REFERENCES:

EP-78 SERIES  
EV-88A  
BZ-78CN

FIGURE 3.6A-25

HIGH ENERGY PIPE BREAKS  
HIGH PRESSURE CORE SPRAY  
INSIDE CONTAINMENT

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



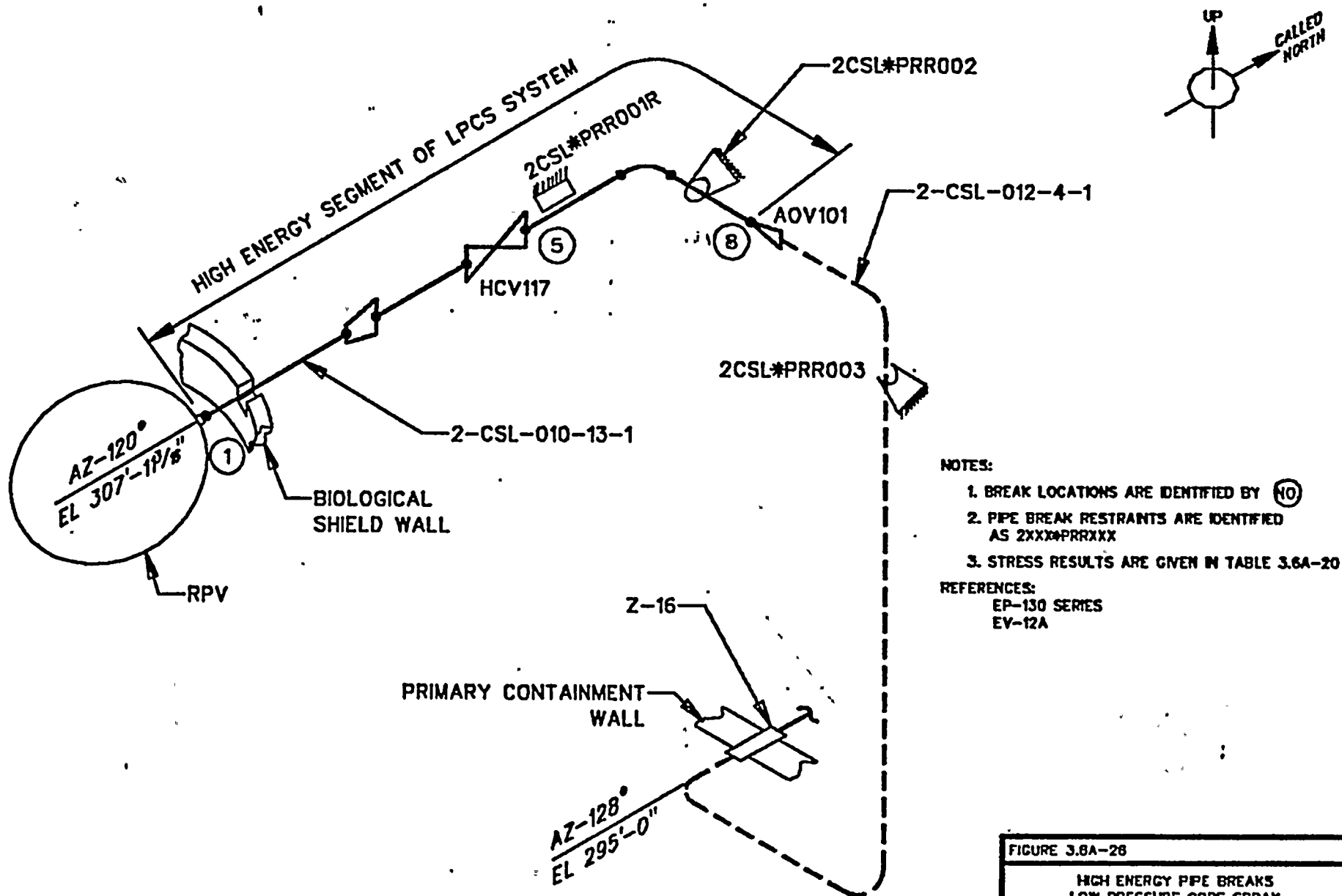
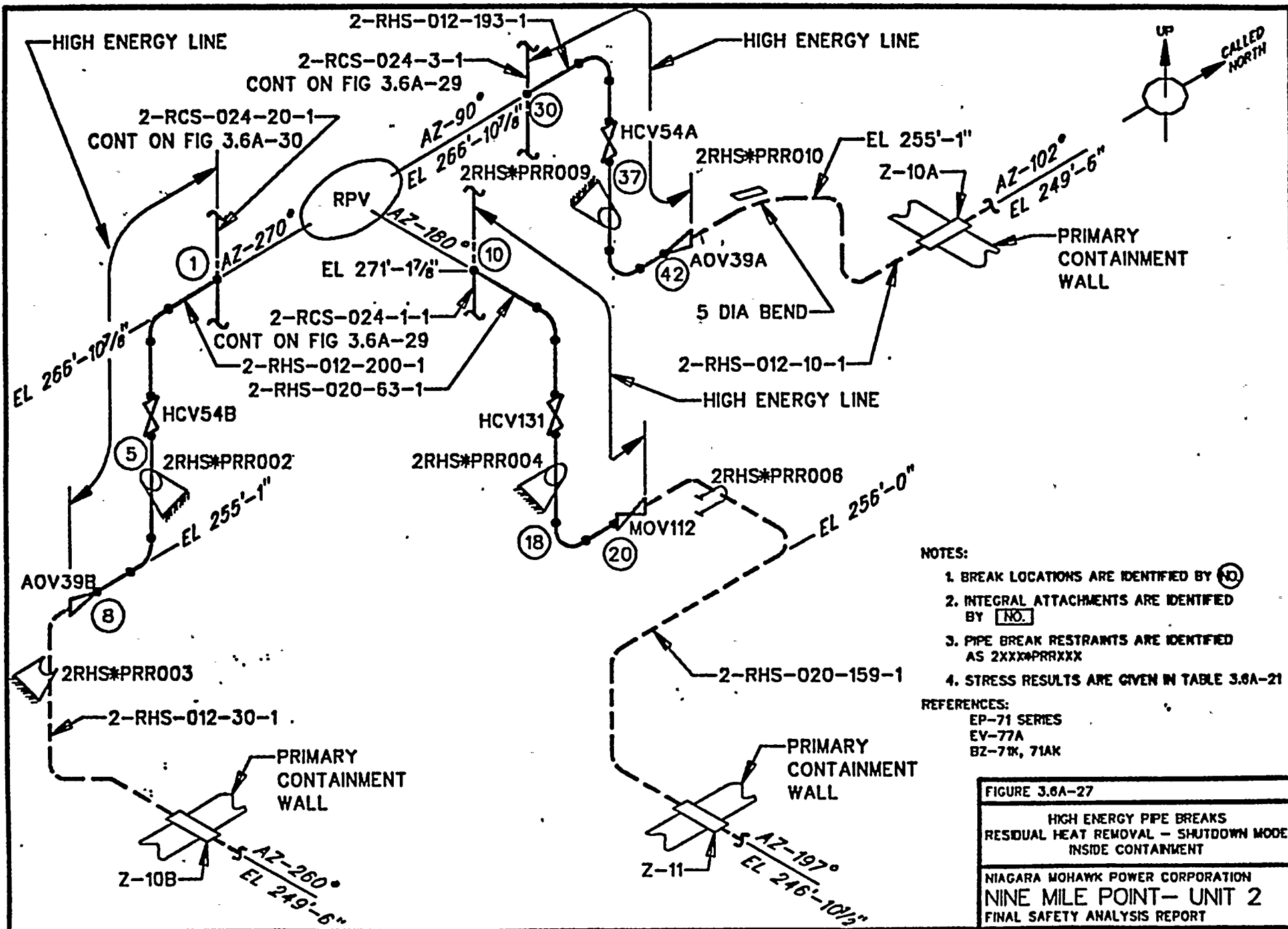


FIGURE 3.6A-28

HIGH ENERGY PIPE BREAKS  
LOW PRESSURE CORE SPRAY  
INSIDE CONTAINMENT

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





**NOTES:**

1. BREAK LOCATIONS ARE IDENTIFIED BY (NO.)
2. INTEGRAL ATTACHMENTS ARE IDENTIFIED BY [NO.]
3. PIPE BREAK RESTRAINTS ARE IDENTIFIED AS 2XXX\*PRRXXX
4. STRESS RESULTS ARE GIVEN IN TABLE 3.6A-21

**REFERENCES:**

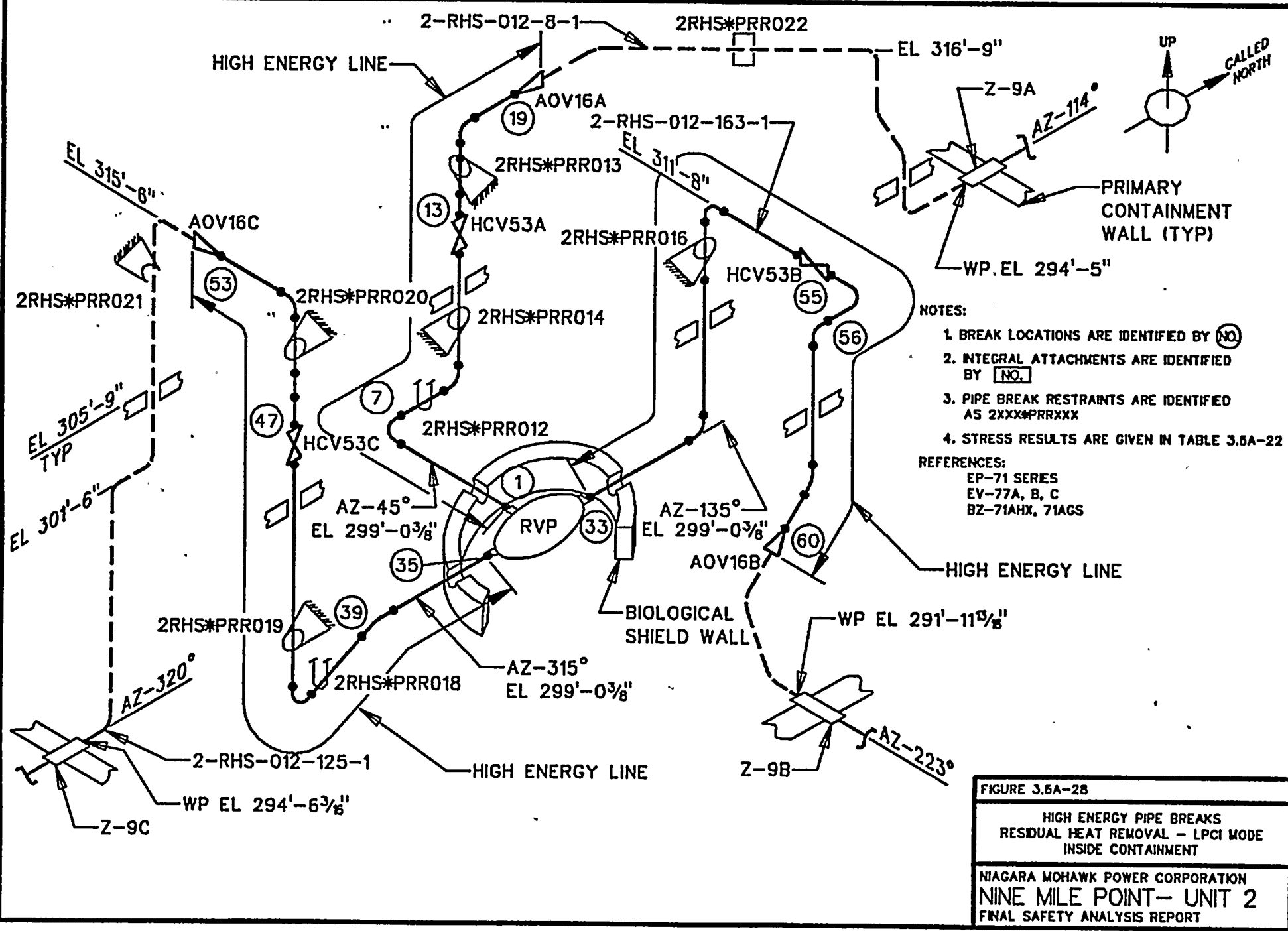
EP-71 SERIES  
EV-77A  
BZ-71K, 71AK

**FIGURE 3.6A-27**

HIGH ENERGY PIPE BREAKS  
RESIDUAL HEAT REMOVAL - SHUTDOWN MODE  
INSIDE CONTAINMENT

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









**THIS FIGURE IS INTENTIONALLY BLANK**

**FIGURE 36A-29**

**RECIRCULATION SYSTEM**

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



THIS FIGURE IS INTENTIONALLY BLANK

FIGURE 36A-30

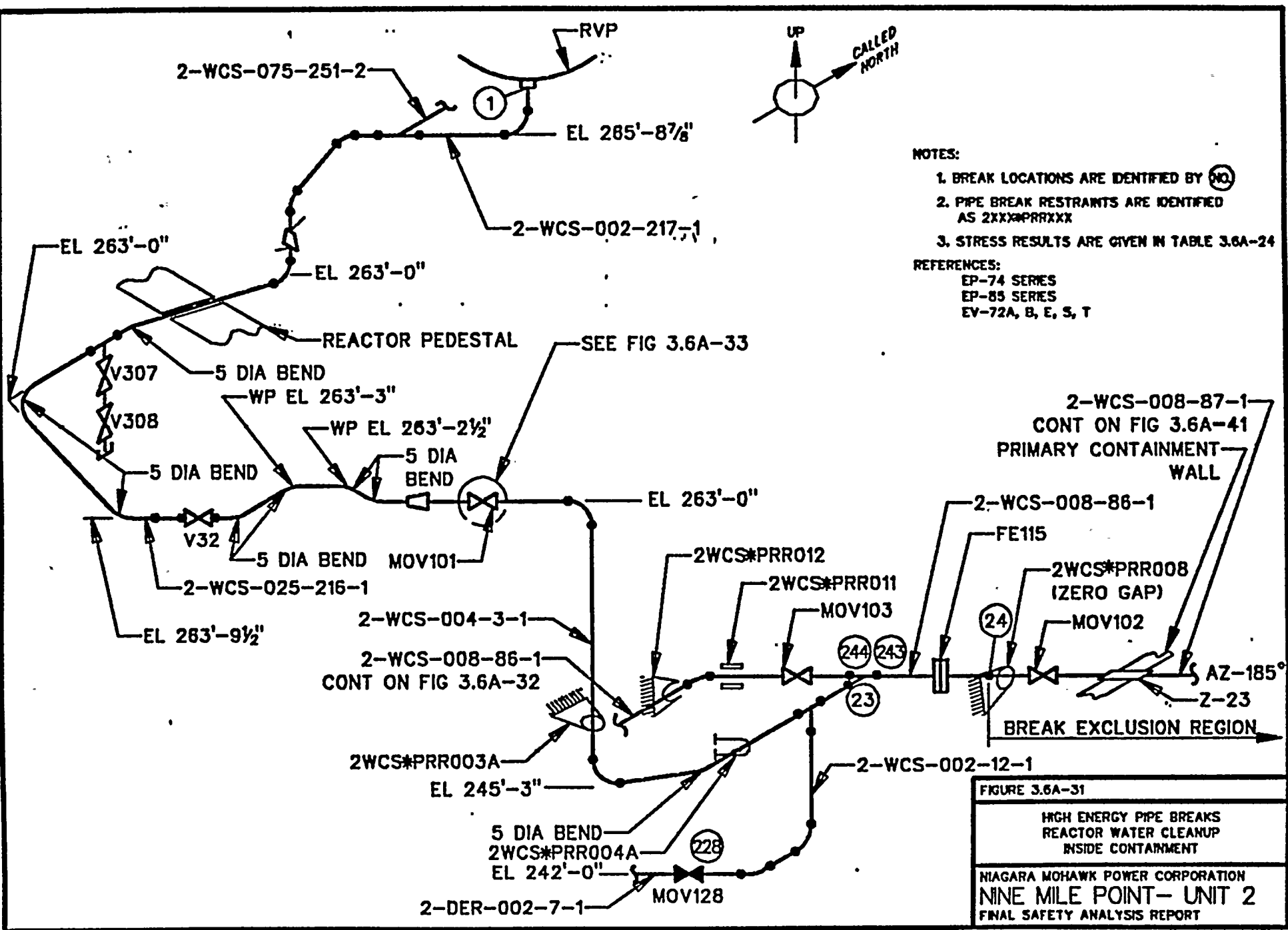
RECIRCULATION SYSTEM

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

AMENDMENT 12

JUNE 1984





NOTES:

1. BREAK LOCATIONS ARE IDENTIFIED BY (NO)
2. PIPE BREAK RESTRAINTS ARE IDENTIFIED AS 2XXX\*PRRXXX
3. STRESS RESULTS ARE GIVEN IN TABLE 3.6A-24

REFERENCES:

EP-74 SERIES  
 EP-85 SERIES  
 EV-72A, B, E, S, T

MODEL NO. FSAR30AC REVISED 2-6-80

THIS DRAWING CREATED ELECTRONICALLY

FIGURE 3.6A-31

HIGH ENERGY PIPE BREAKS  
 REACTOR WATER CLEANUP  
 INSIDE CONTAINMENT

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



NOTES:

1. BREAK LOCATIONS ARE IDENTIFIED BY (NO.)
2. PIPE BREAK RESTRAINTS ARE IDENTIFIED AS 2XXX\*PRRXXX
3. STRESS RESULTS ARE GIVEN IN TABLE 3.6A-24

REFERENCES:

EP-74 SERIES  
EV-72A, C, D, H, T  
BZ-74EZ

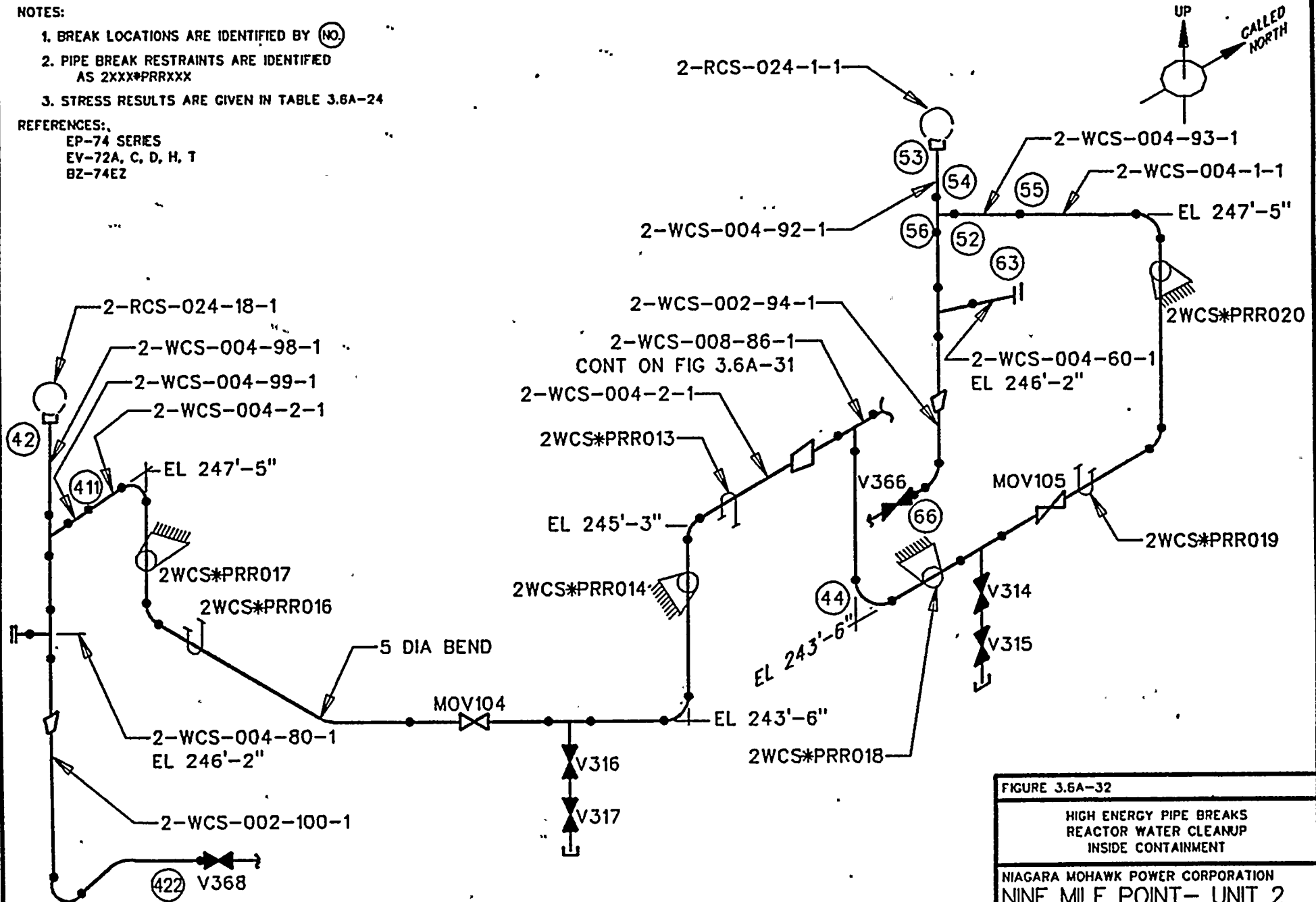


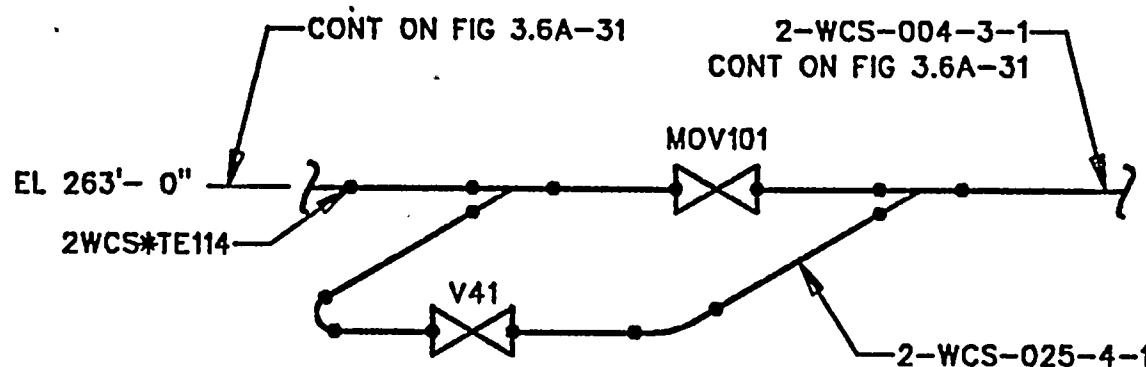
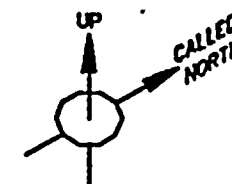
FIGURE 3.6A-32

HIGH ENERGY PIPE BREAKS  
REACTOR WATER CLEANUP  
INSIDE CONTAINMENT

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







NOTES:

1. BREAK LOCATIONS ARE IDENTIFIED BY (10)
2. STRESS RESULTS ARE GIVEN IN TABLE 3.6A-24

REFERENCES:  
EP-74 SERIES

FIGURE 3.6A-33

HIGH ENERGY PIPE BREAKS  
REACTOR WATER CLEANUP  
INSIDE CONTAINMENT

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



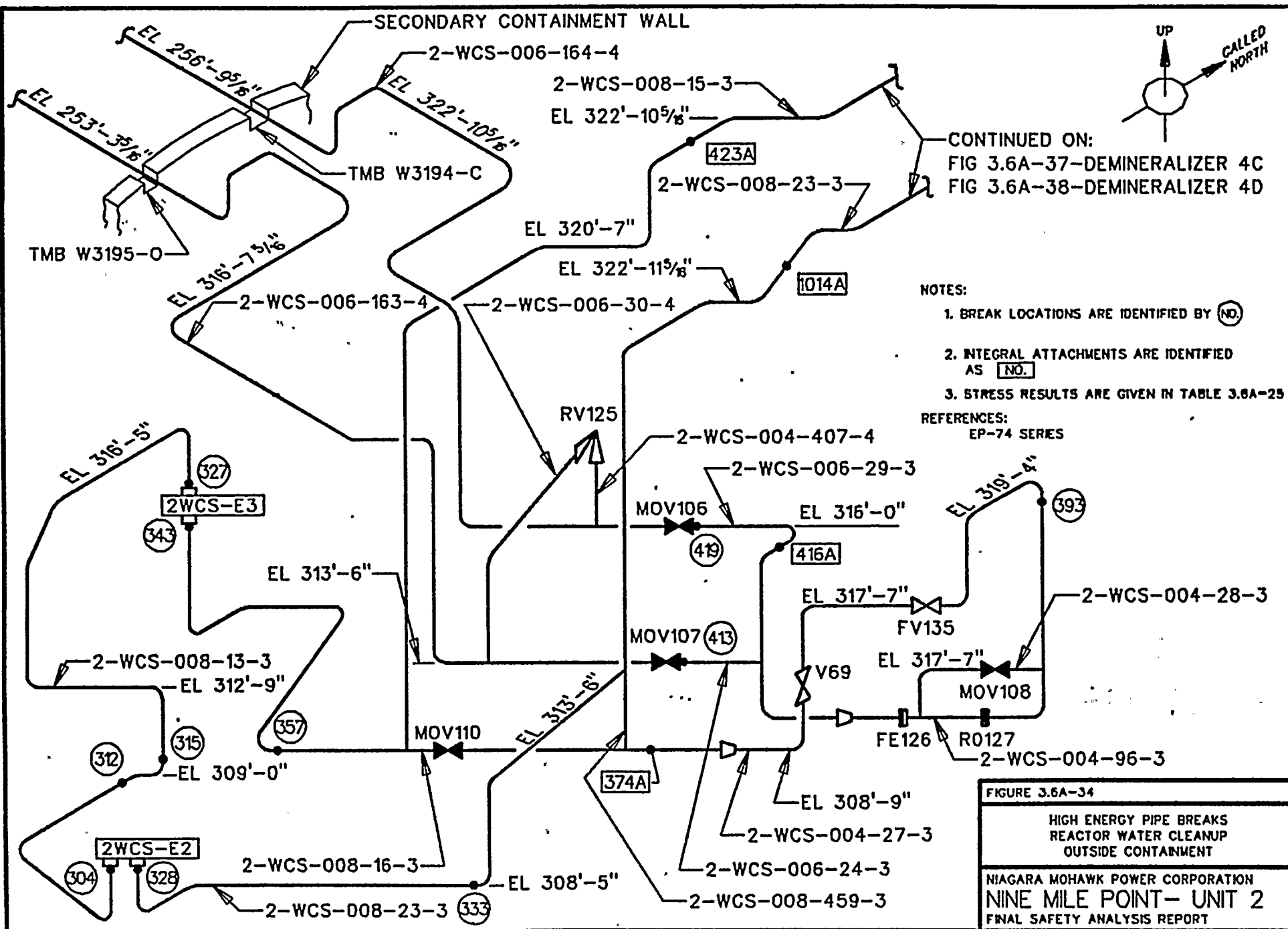


FIGURE 3.6A-34

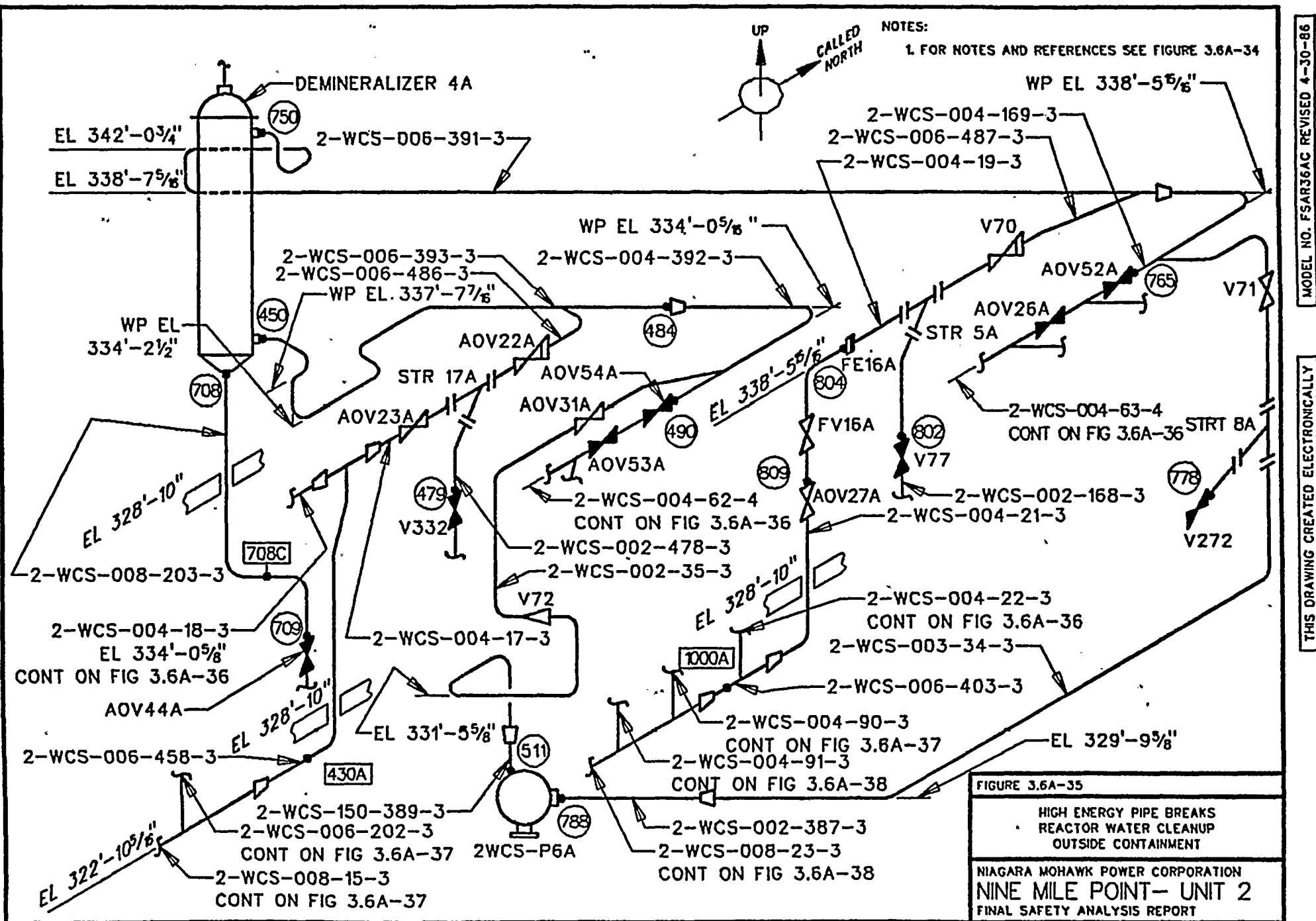
HIGH ENERGY PIPE BREAKS  
REACTOR WATER CLEANUP  
OUTSIDE CONTAINMENT

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

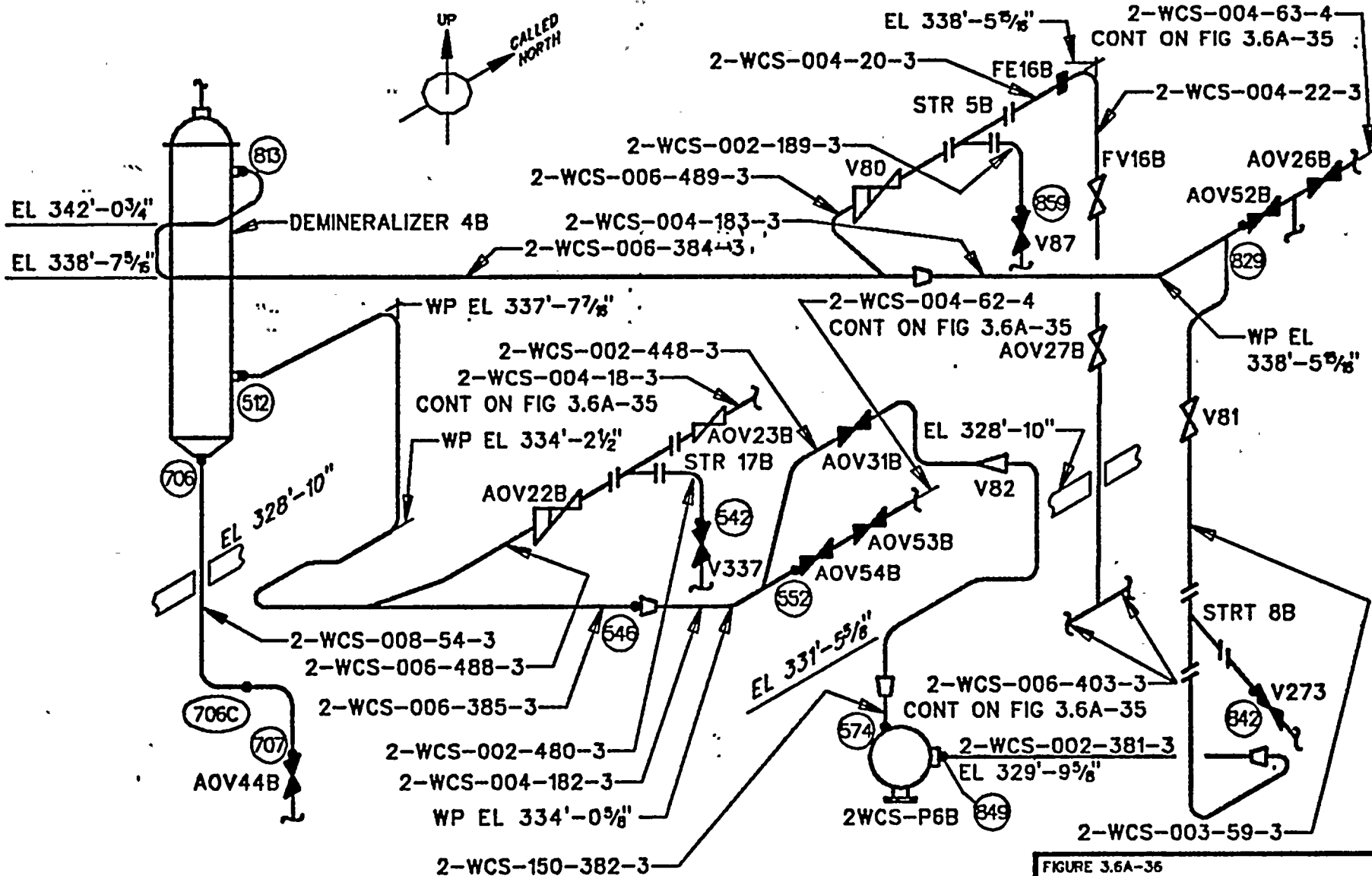
MODEL NO. FSAR36AC REVISED 4-25-86

THIS DRAWING CREATED ELECTRONICALLY









NOTES:

1. BREAK LOCATIONS ARE IDENTIFIED BY (NO.)  
OR (NO.)

2. STRESS RESULTS ARE GIVEN IN TABLE 3.6A-25

REFERENCES:

EP-74 SERIES

FIGURE 3.6A-36

HIGH ENERGY PIPE BREAKS  
REACTOR WATER CLEANUP  
OUTSIDE CONTAINMENT

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

MODEL NO. FSARJ6AC REVISED 4-28-86

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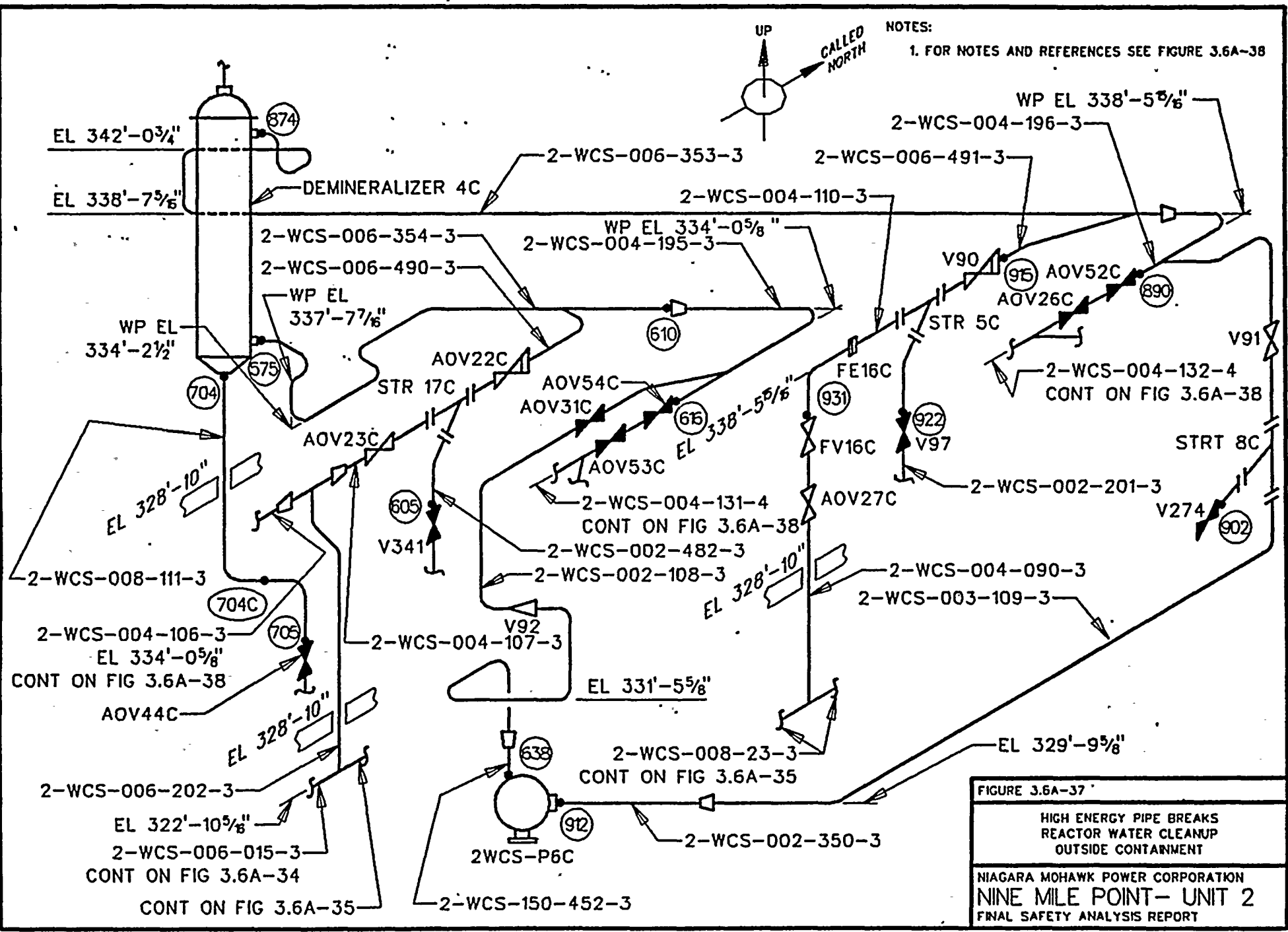
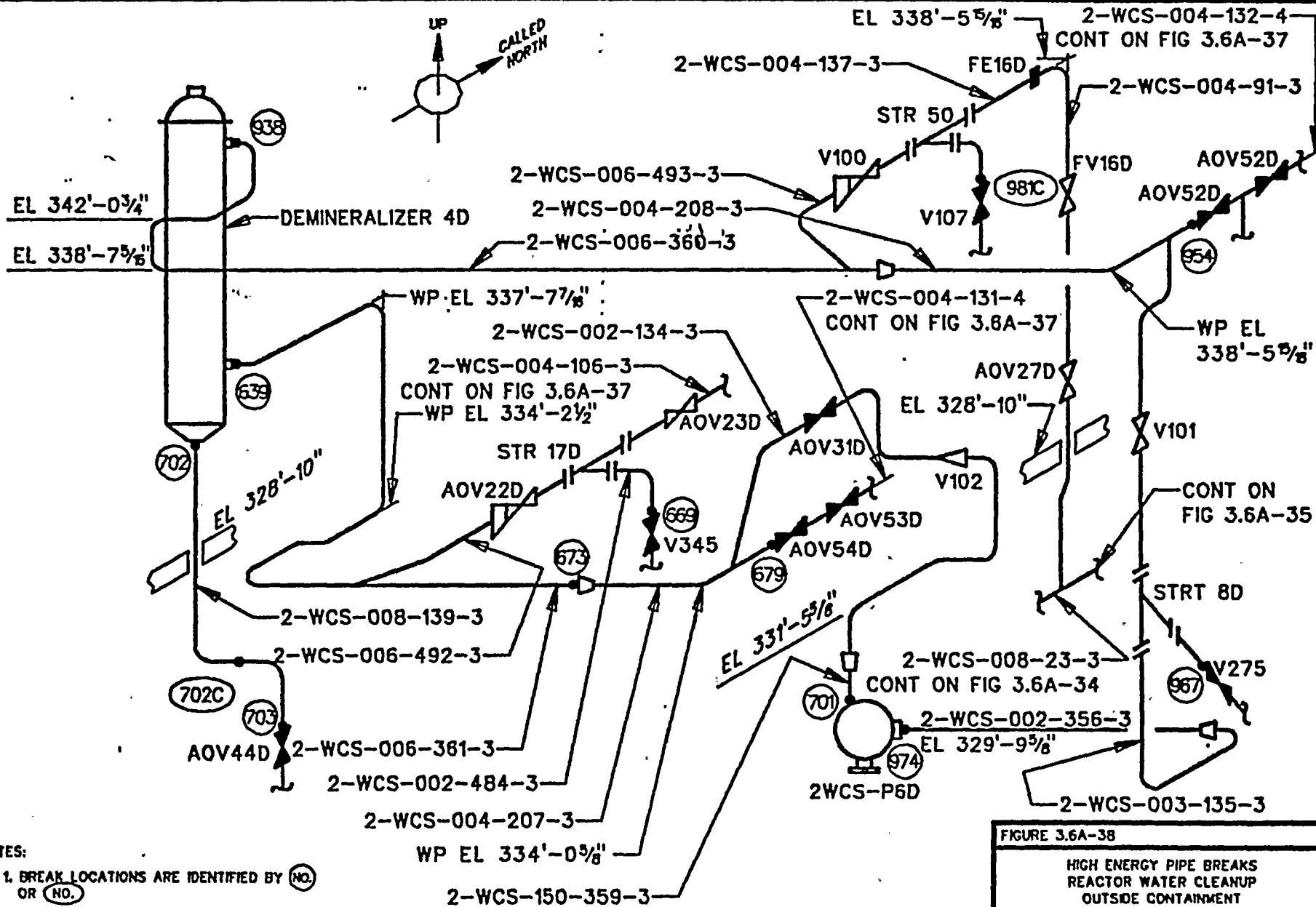


FIGURE 3.6A-37

HIGH ENERGY PIPE BREAKS  
REACTOR WATER CLEANUP  
OUTSIDE CONTAINMENT

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





NOTES:

1. BREAK LOCATIONS ARE IDENTIFIED BY (NO.) OR (NO.)

2. STRESS RESULTS ARE GIVEN IN TABLE 3.6A-25

REFERENCES:

EP-74 SERIES

FIGURE 3.6A-38

HIGH ENERGY PIPE BREAKS  
REACTOR WATER CLEANUP  
OUTSIDE CONTAINMENT

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

MODEL NO. FSAR36AC REVISED 4-28-86

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NOTES:

1. BREAK LOCATIONS ARE IDENTIFIED BY (NO.)

2. INTEGRAL ATTACHMENTS ARE IDENTIFIED AS [NO.]

3. PIPE BREAK RESTRAINTS ARE IDENTIFIED AS 2XXX\*PRRXXX

4. STRESS RESULTS ARE GIVEN IN TABLE 3.6A-25

REFERENCES:

EP-74 SERIES  
EV-72

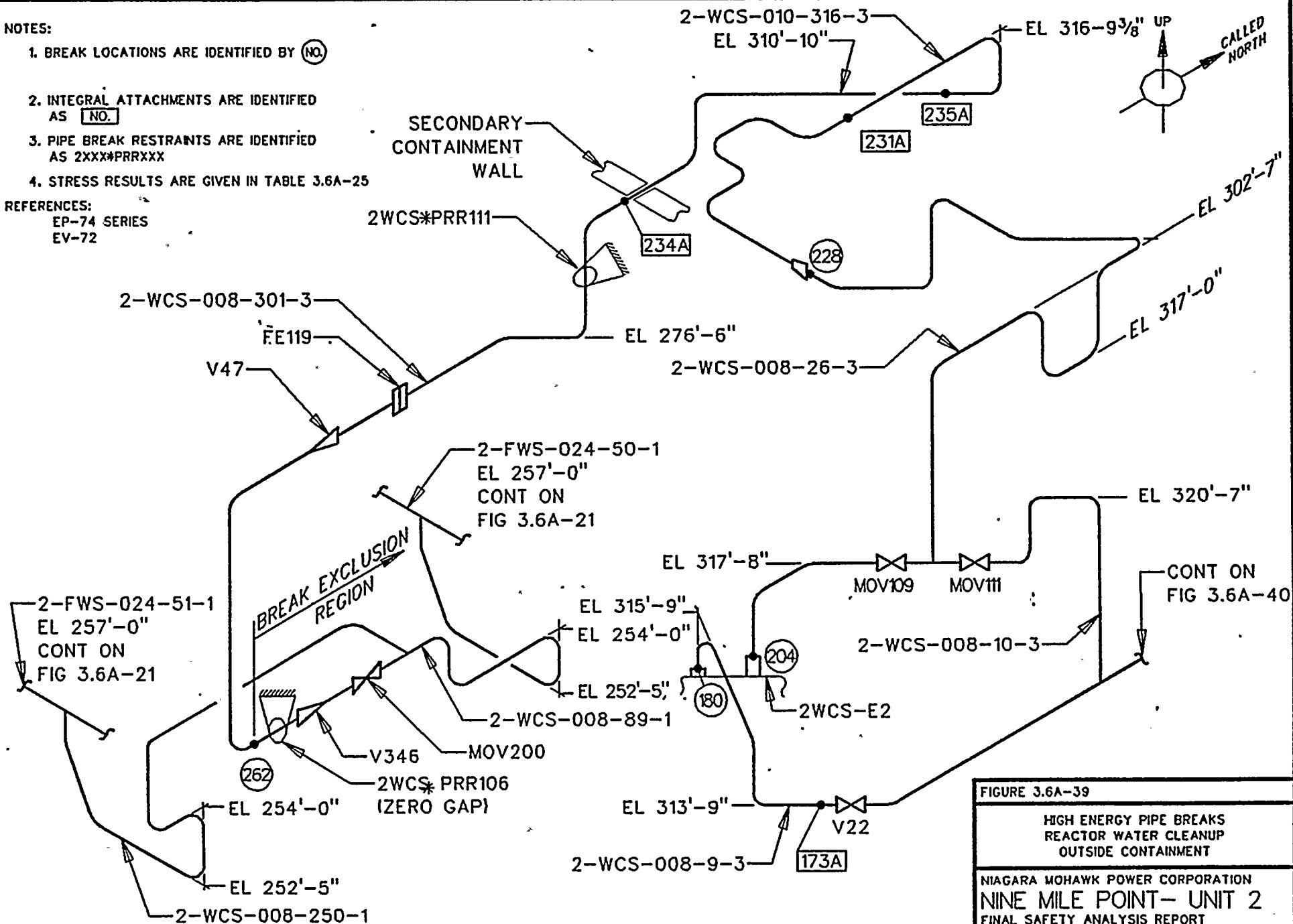
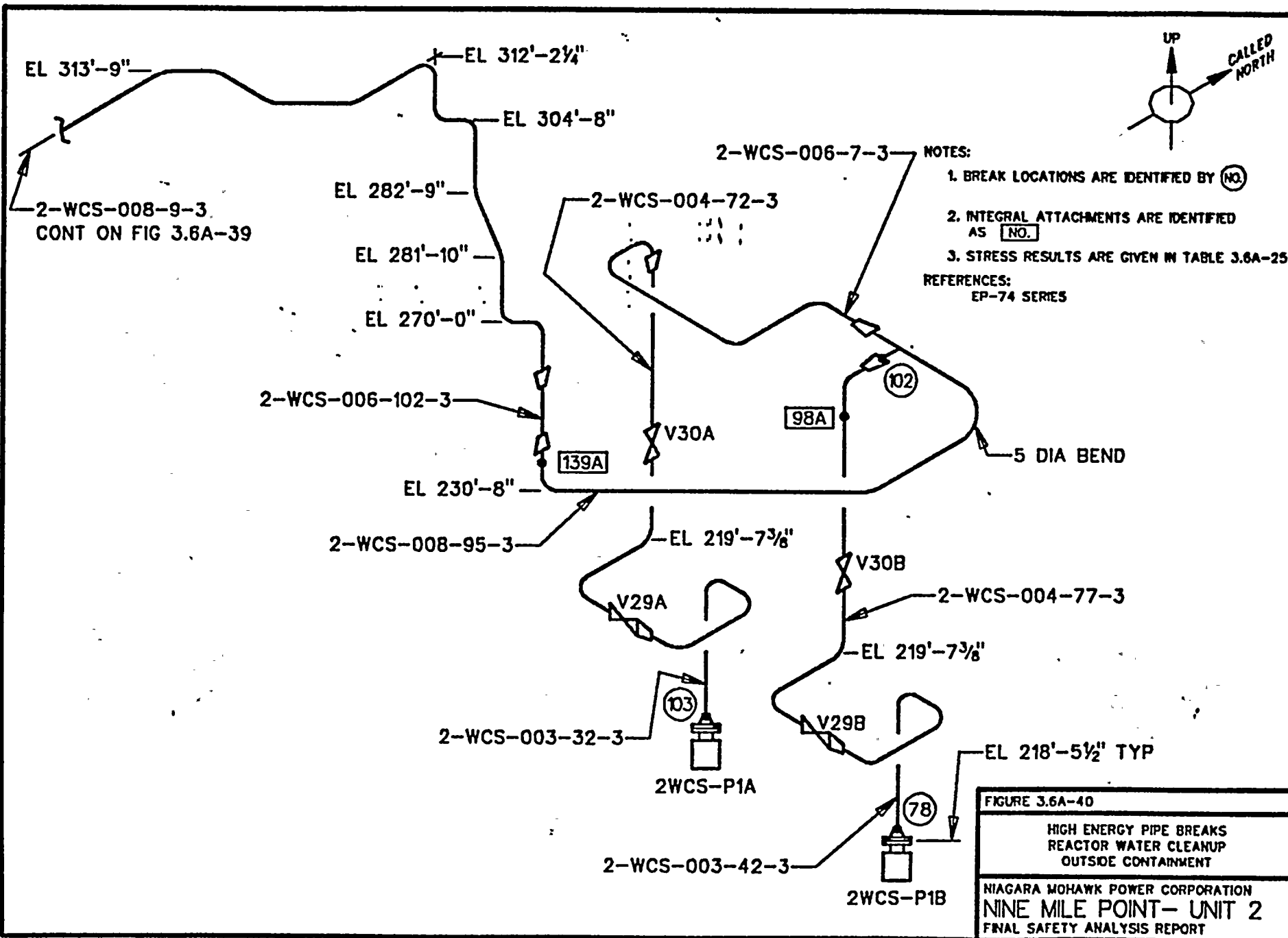


FIGURE 3.6A-39

HIGH ENERGY PIPE BREAKS  
REACTOR WATER CLEANUP  
OUTSIDE CONTAINMENT

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





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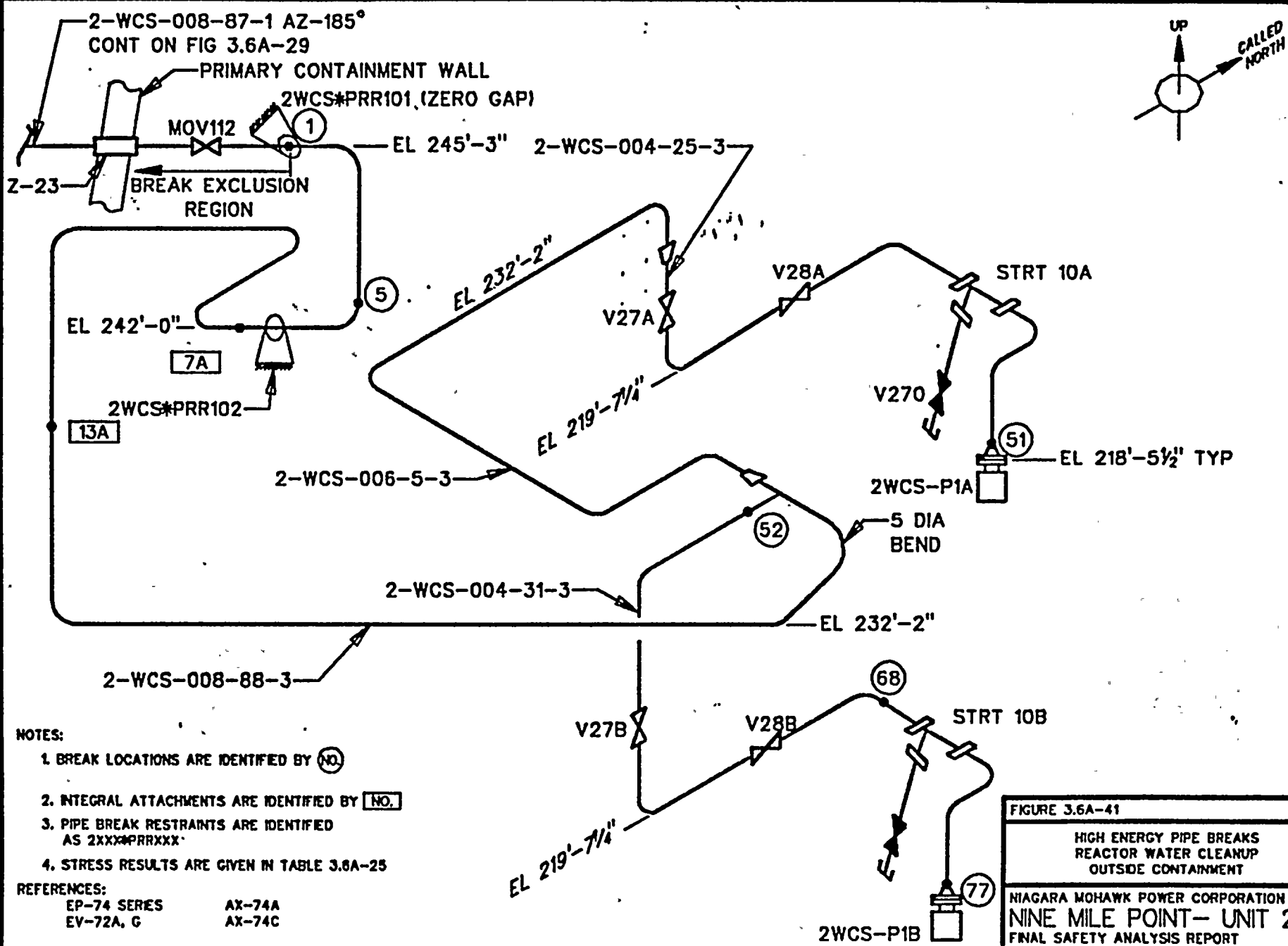
FIGURE 3.6A-40

HIGH ENERGY PIPE BREAKS  
REACTOR WATER CLEANUP  
OUTSIDE CONTAINMENT

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



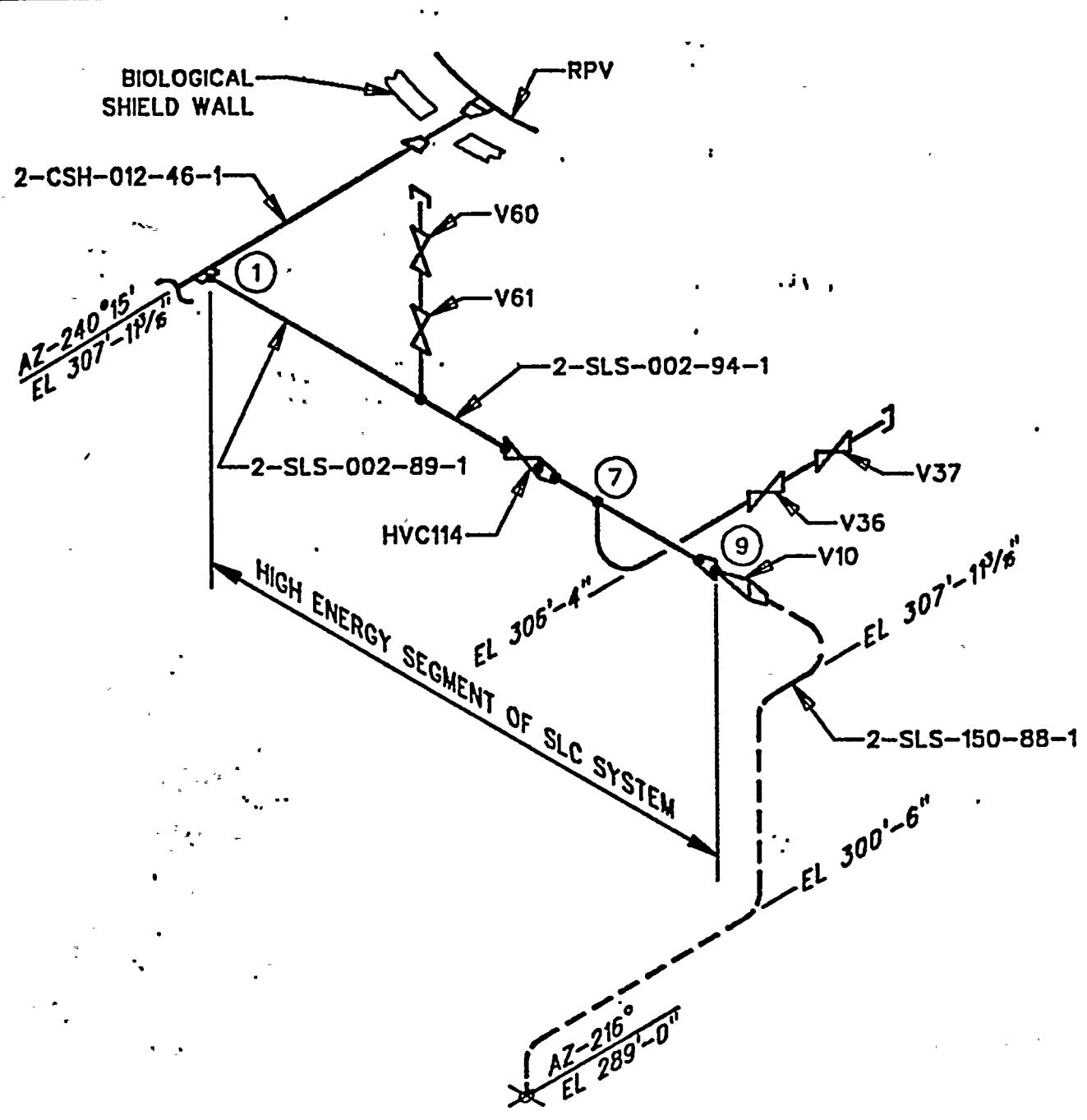




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THIS DRAWING CREATED ELECTRONICALLY





NOTES:

- 1. BREAK LOCATIONS ARE IDENTIFIED BY (NO.)
- 2. STRESS RESULTS ARE GIVEN IN TABLE 3.6A-28

REFERENCES:

EP-75 SERIES

FIGURE 3.6A-42
HIGH ENERGY PIPE BREAKS STANDBY LIQUID CONTROL INSIDE CONTAINMENT
NIAGARA MOHAWK POWER CORPORATION NINE MILE POINT- UNIT 2 FINAL SAFETY ANALYSIS REPORT



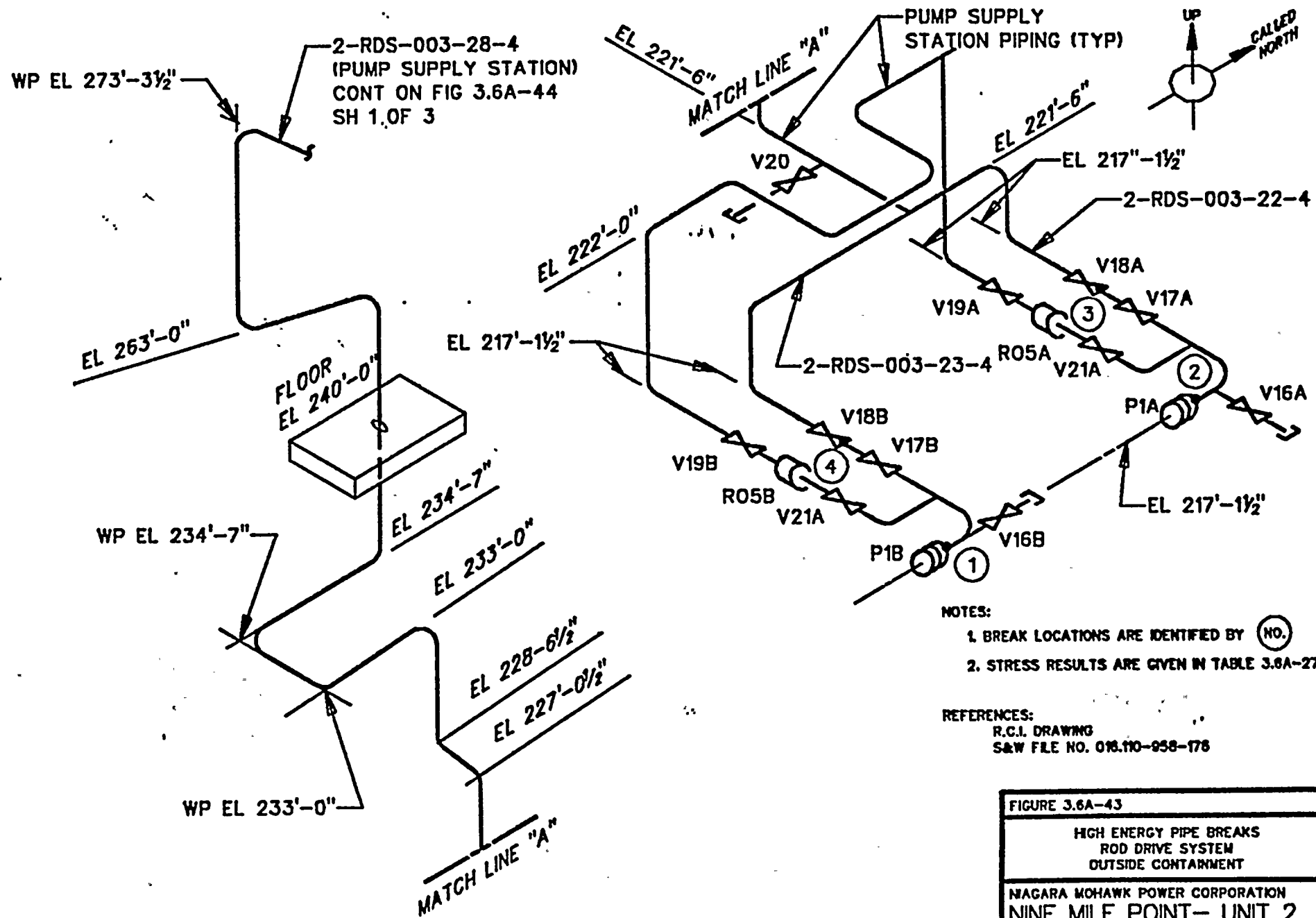
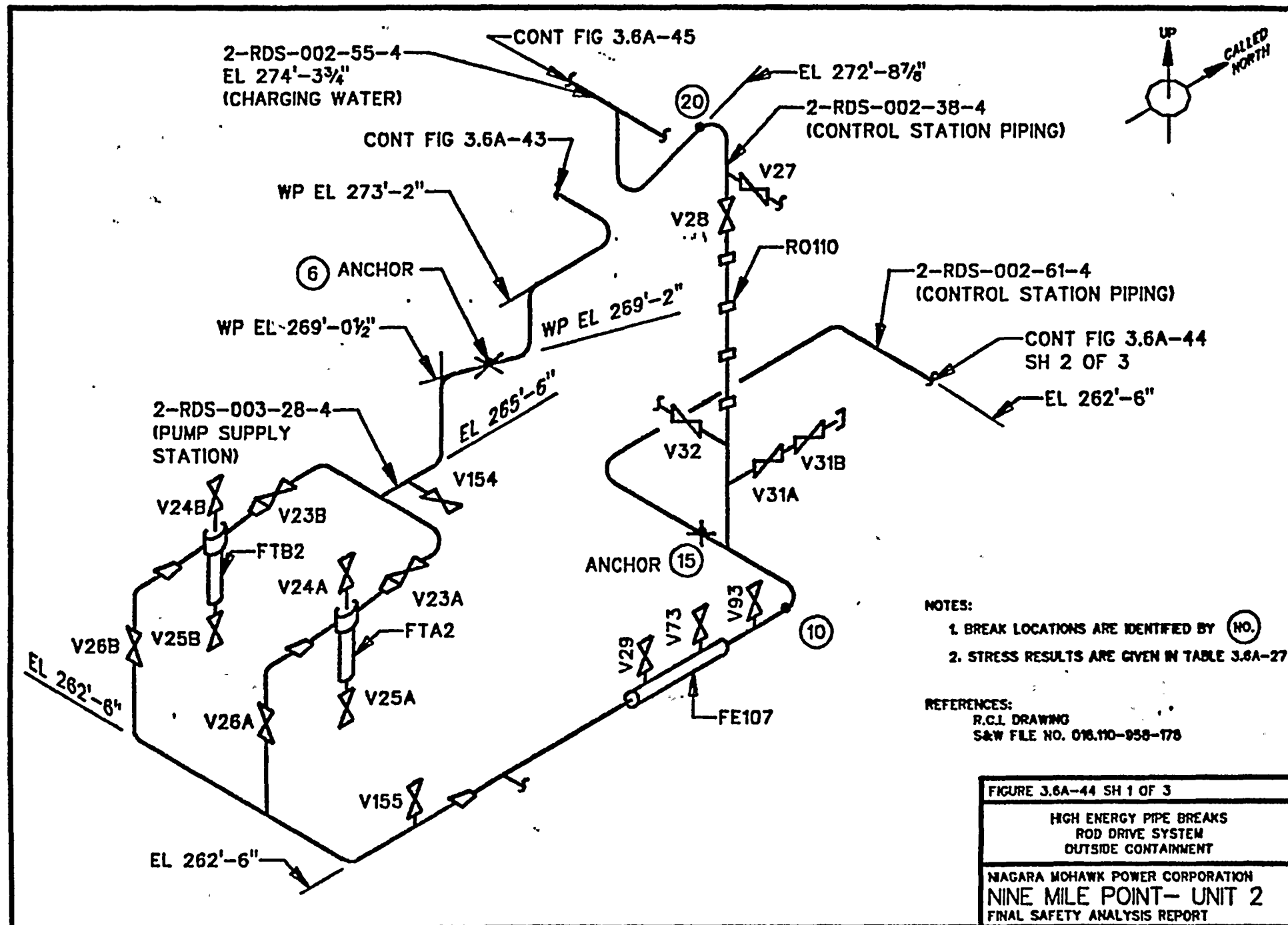


FIGURE 3.6A-43

HIGH ENERGY PIPE BREAKS  
ROD DRIVE SYSTEM  
OUTSIDE CONTAINMENT

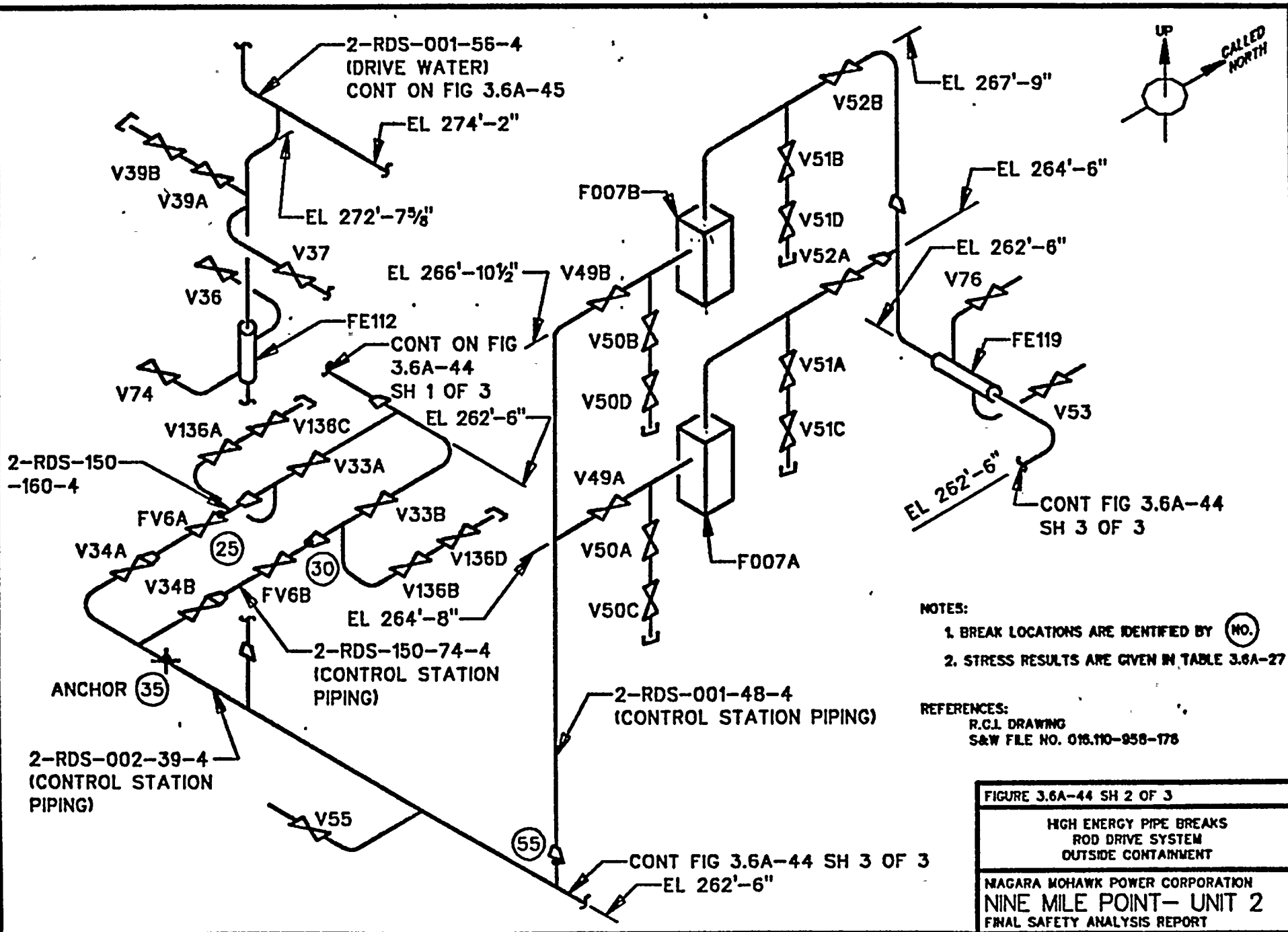
NIAGARA MOHAWK POWER CORPORATION  
NINE MILE POINT- UNIT 2  
FINAL SAFETY ANALYSIS REPORT



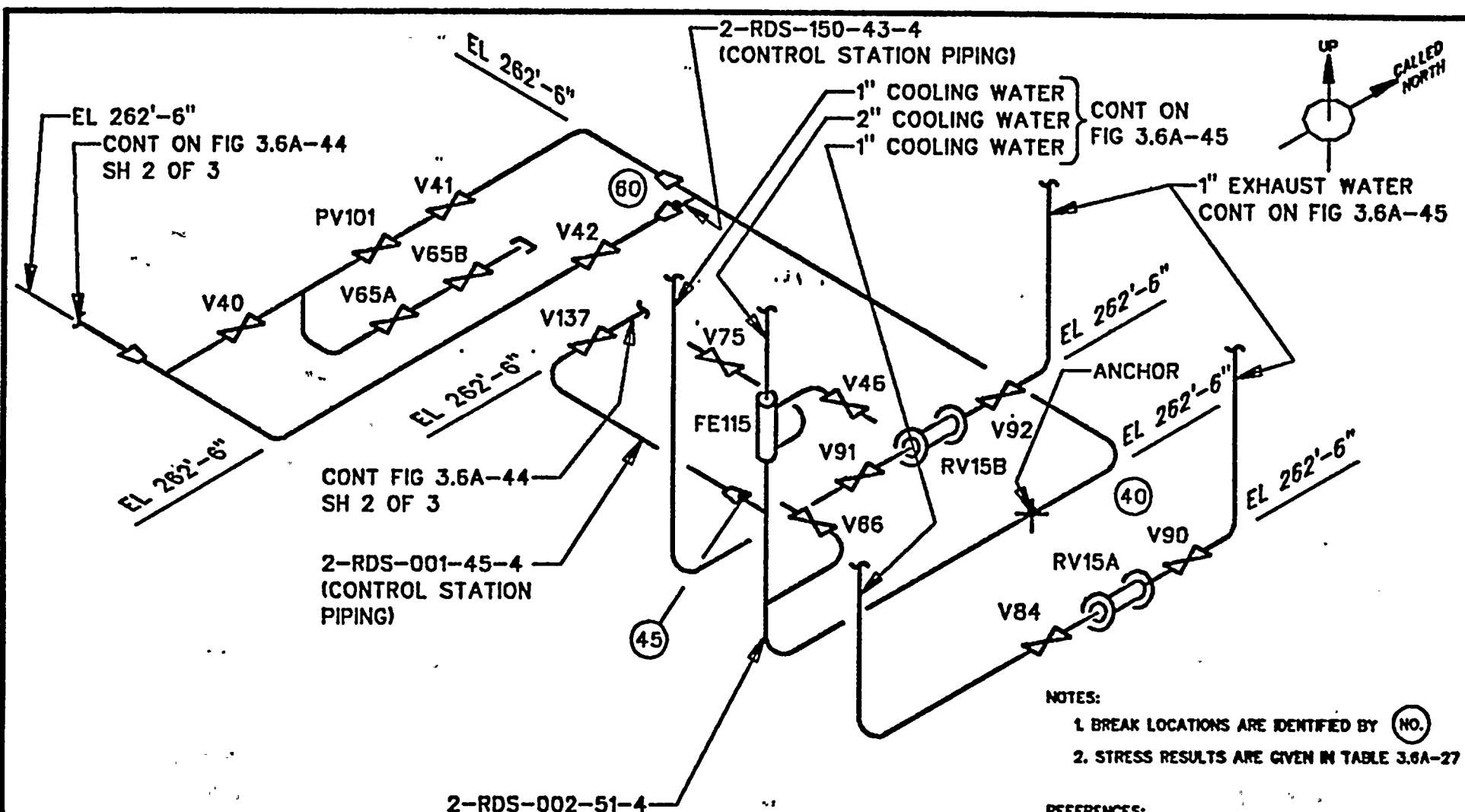




7







NOTES:

1. BREAK LOCATIONS ARE IDENTIFIED BY (NO.)
2. STRESS RESULTS ARE GIVEN IN TABLE 3.6A-27

REFERENCES:

R.C.J. DRAWING  
S&W FILE NO. 016.110-958-176

FIGURE 3.6A-44 SH 3 OF 3

HIGH ENERGY PIPE BREAKS  
ROD DRIVE SYSTEM  
OUTSIDE CONTAINMENT

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



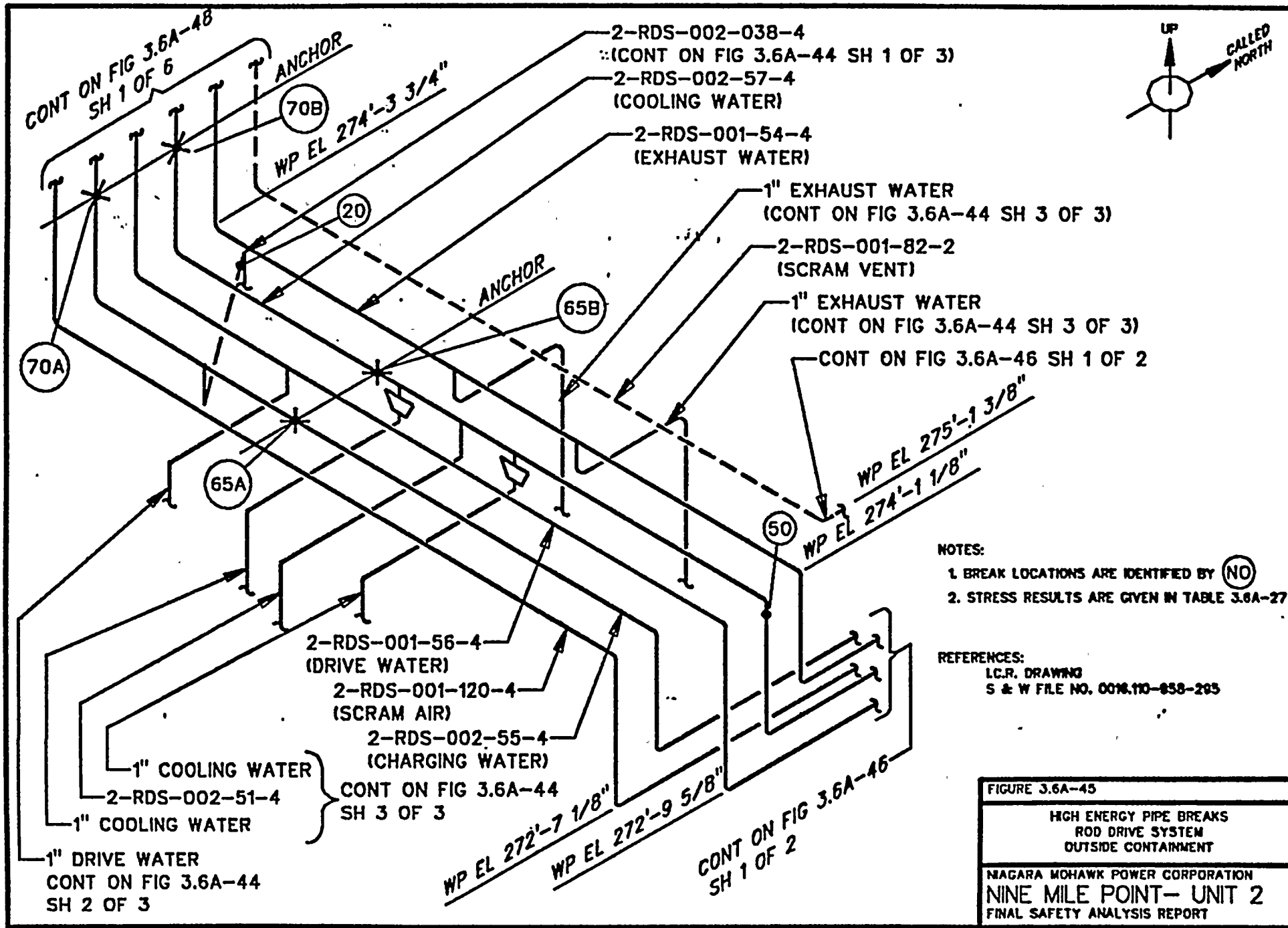
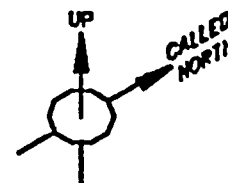


FIGURE 3.6A-45

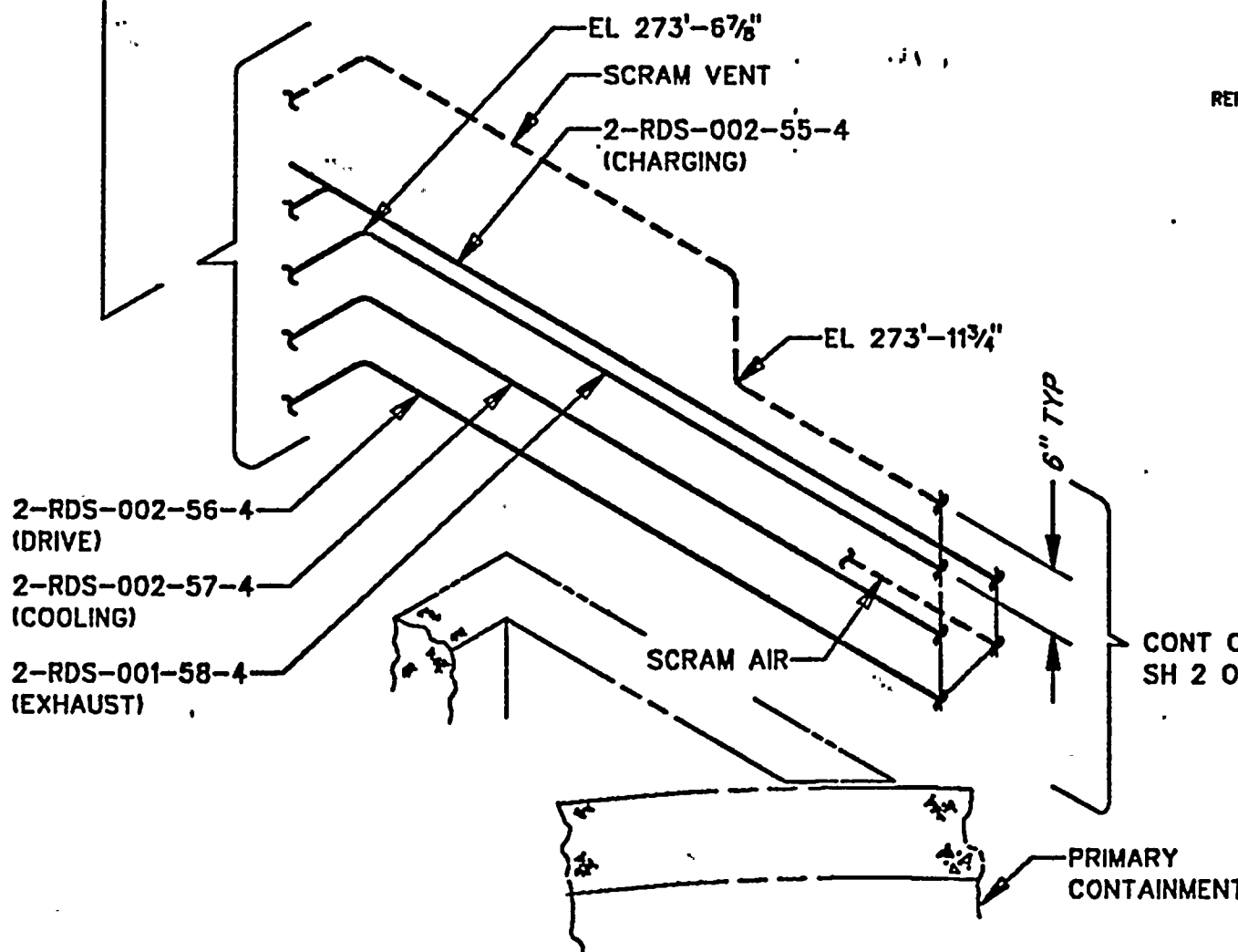
HIGH ENERGY PIPE BREAKS  
ROD DRIVE SYSTEM  
OUTSIDE CONTAINMENT

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





CONT ON FIG 3.6A-45



NOTES:

1. BREAK LOCATIONS ARE IDENTIFIED BY (NO)
2. STRESS RESULTS ARE GIVEN IN TABLE 3.6A-27

REFERENCES:

R.C.I. DRAWING  
S & W FILE NO 0016.110-958-218

CONT ON FIG 3.6A-46  
SH 2 OF 2

FIGURE 3.6A-46 SH 1 OF 2

HIGH ENERGY PIPE BREAKS  
ROD DRIVE SYSTEM  
OUTSIDE CONTAINMENT

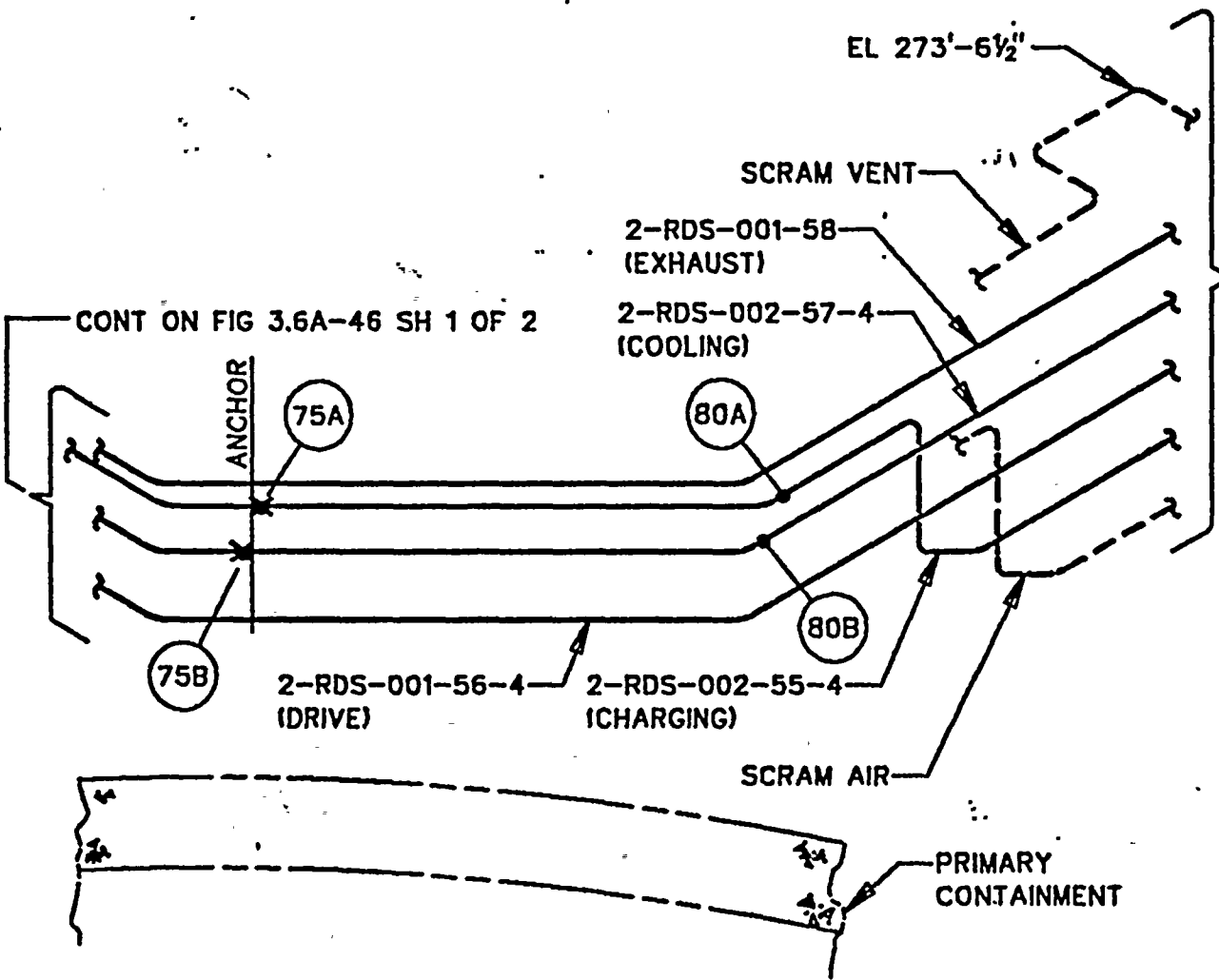
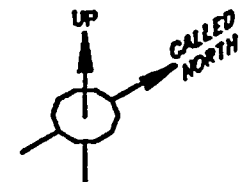
NIAGARA MOHAWK POWER CORPORATION  
NINE MILE POINT- UNIT 2  
FINAL SAFETY ANALYSIS REPORT





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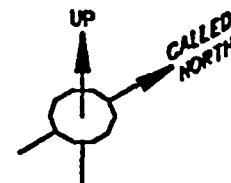
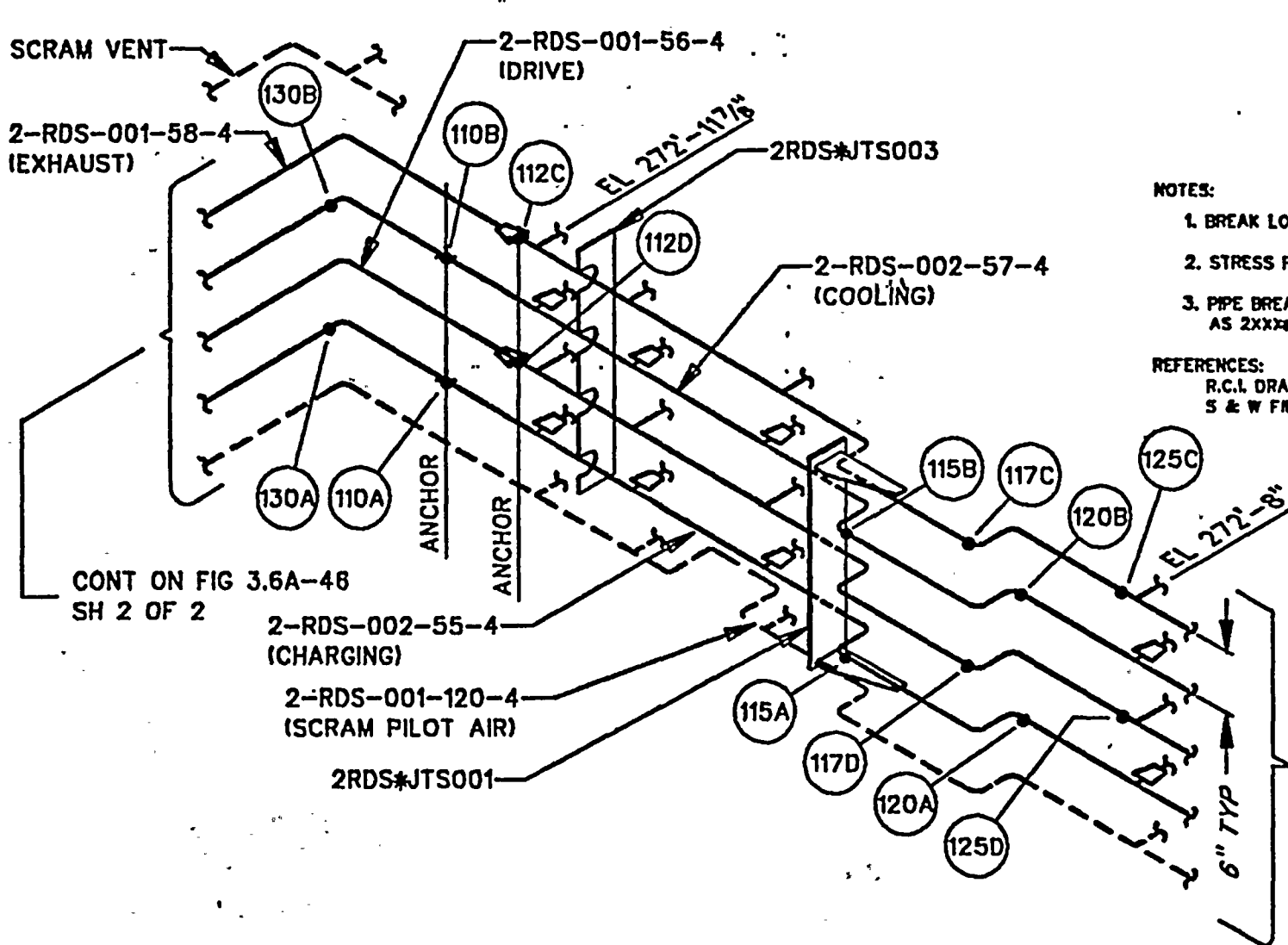
CONT ON FIG 3.6A-47 SH 1 OF 2

CONT ON FIG 3.6A-46 SH 1 OF 2

- NOTES:
- 1. BREAK LOCATIONS ARE IDENTIFIED BY (NO)
  - 2. STRESS RESULTS ARE GIVEN IN TABLE 3.8A-27
- REFERENCES:
- R.C.I. DRAWING
  - S & W FILE NO 0016.110-858-224

FIGURE 3.8A-48 SH 2 OF 2
HIGH ENERGY PIPE BREAKS ROD DRIVE SYSTEM OUTSIDE CONTAINMENT
NIAGARA MOHAWK POWER CORPORATION NINE MILE POINT- UNIT 2 FINAL SAFETY ANALYSIS REPORT





NOTES:

1. BREAK LOCATIONS ARE IDENTIFIED BY (NO)
2. STRESS RESULTS ARE GIVEN IN TABLE 3.6A-27
3. PIPE BREAK SHIELDS ARE IDENTIFIED AS 2XXX\*JTSXXX

REFERENCES:

R.C.I. DRAWING  
S & W FILE NO 0016.110-956-218

FIGURE 3.6A-47 SH 1 OF 2

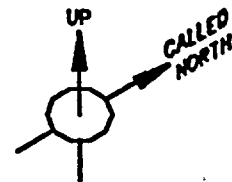
HIGH ENERGY PIPE BREAKS  
ROD DRIVE SYSTEM  
OUTSIDE CONTAINMENT

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

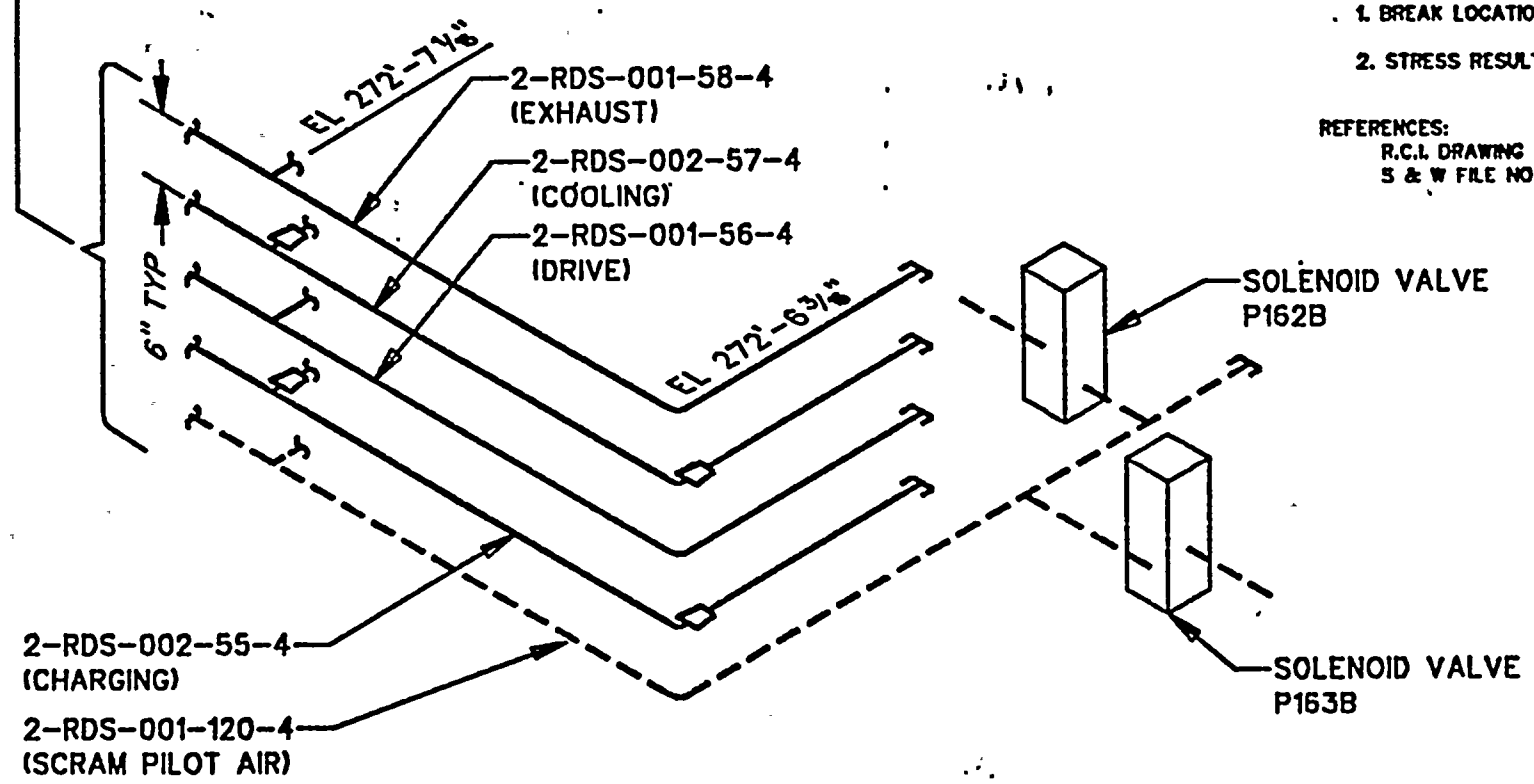
MODEL NO. FSAR36AE REVISED 3-02-86

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CONT ON FIG 3.6A-47 SH 1 OF 2



NOTES:

- 1. BREAK LOCATIONS ARE IDENTIFIED BY (NO)
- 2. STRESS RESULTS ARE GIVEN IN TABLE 3.6A-27

REFERENCES:

R.C.I. DRAWING  
S & W FILE NO 0015.110-955-215

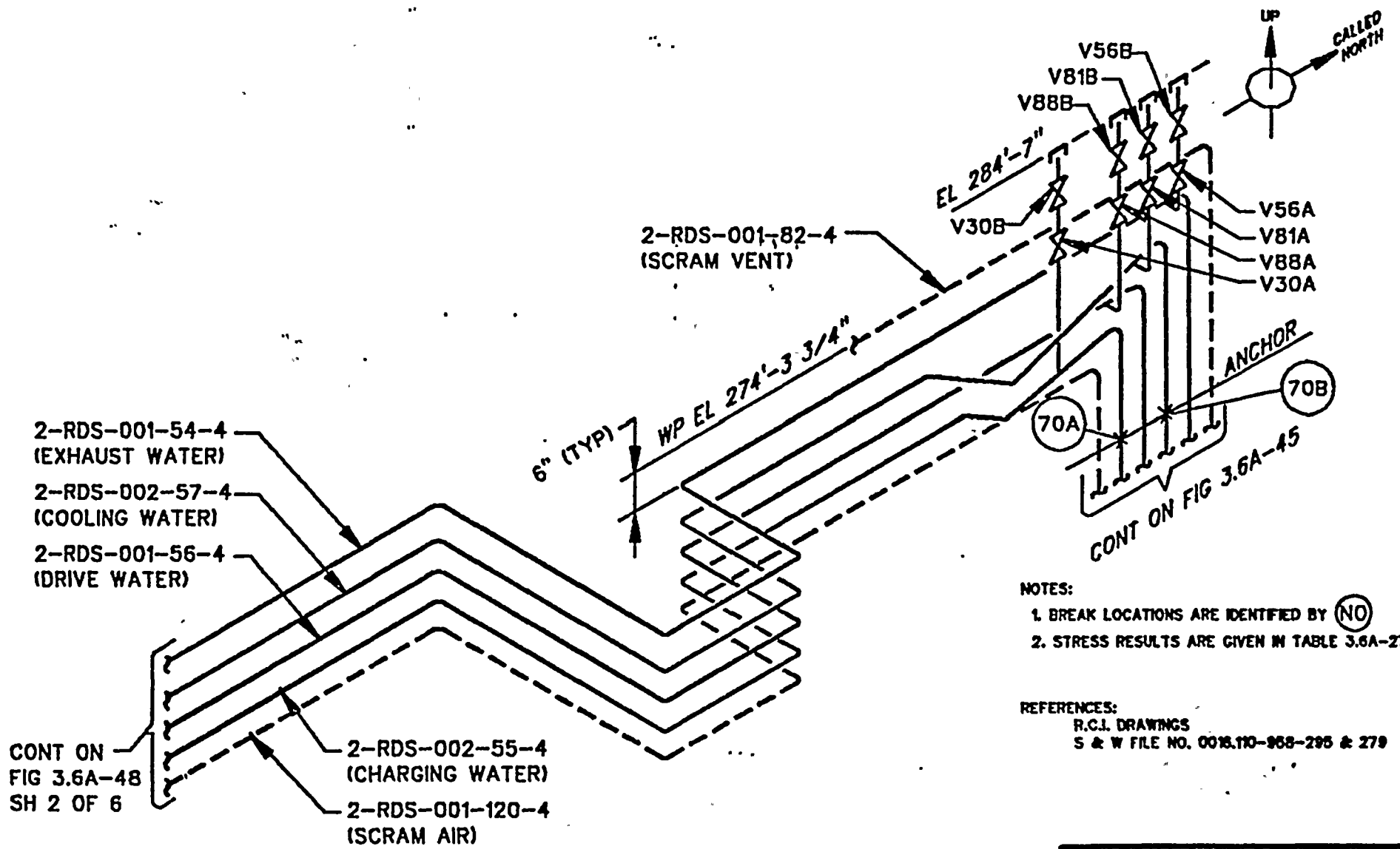
90° SIDE HEADER

FIGURE 3.6A-47 SH 2 OF 2
HIGH ENERGY PIPE BREAKS ROD DRIVE SYSTEM OUTSIDE CONTAINMENT
NIAGARA MOHAWK POWER CORPORATION NINE MILE POINT- UNIT 2 FINAL SAFETY ANALYSIS REPORT

MODEL NO. FSAR38AE REVISED 5-02-86

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- NOTES:
1. BREAK LOCATIONS ARE IDENTIFIED BY (NO)
  2. STRESS RESULTS ARE GIVEN IN TABLE 3.6A-27

REFERENCES:  
 R.C.I. DRAWINGS  
 S & W FILE NO. 0018.110-968-295 & 279

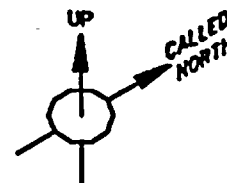
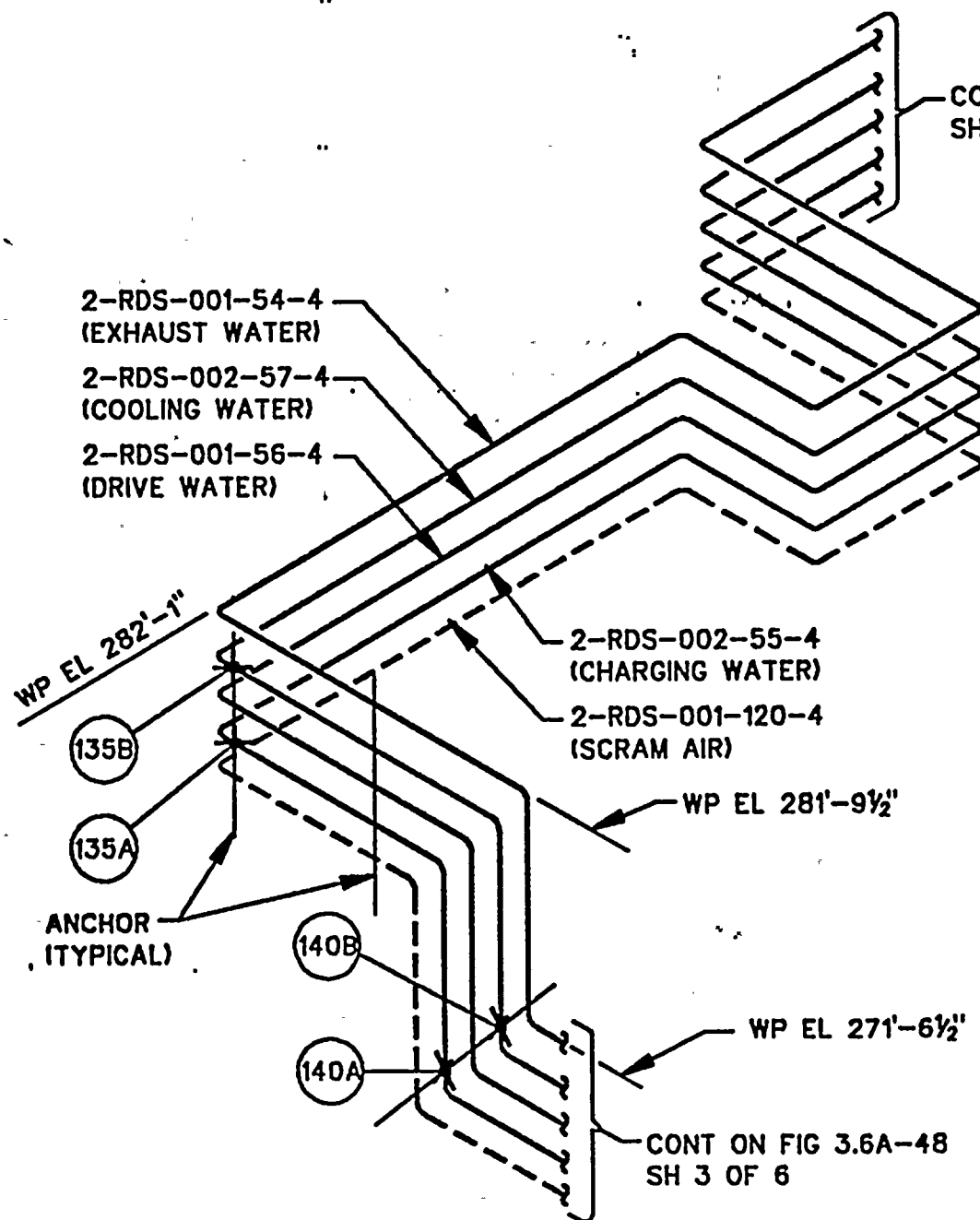
FIGURE 3.6A-48 SH 1 OF 6
HIGH ENERGY PIPE BREAKS ROD DRIVE SYSTEM OUTSIDE CONTAINMENT
NIAGARA MOHAWK POWER CORPORATION NINE MILE POINT- UNIT 2 FINAL SAFETY ANALYSIS REPORT

MODEL NO. FSAR36AE REVISED 5-02-86

THIS DRAWING CREATED ELECTRONICALLY







NOTES:

1. BREAK LOCATIONS ARE IDENTIFIED BY (NO)
2. STRESS RESULTS ARE GIVEN IN TABLE 3.6A-27

REFERENCES:

R.C.I. DRAWING  
S & W FILE NO. 0010.110-050-270

FIGURE 3.6A-48 SH 2 OF 6

HIGH ENERGY PIPE BREAKS  
ROD DRIVE SYSTEM  
OUTSIDE CONTAINMENT

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



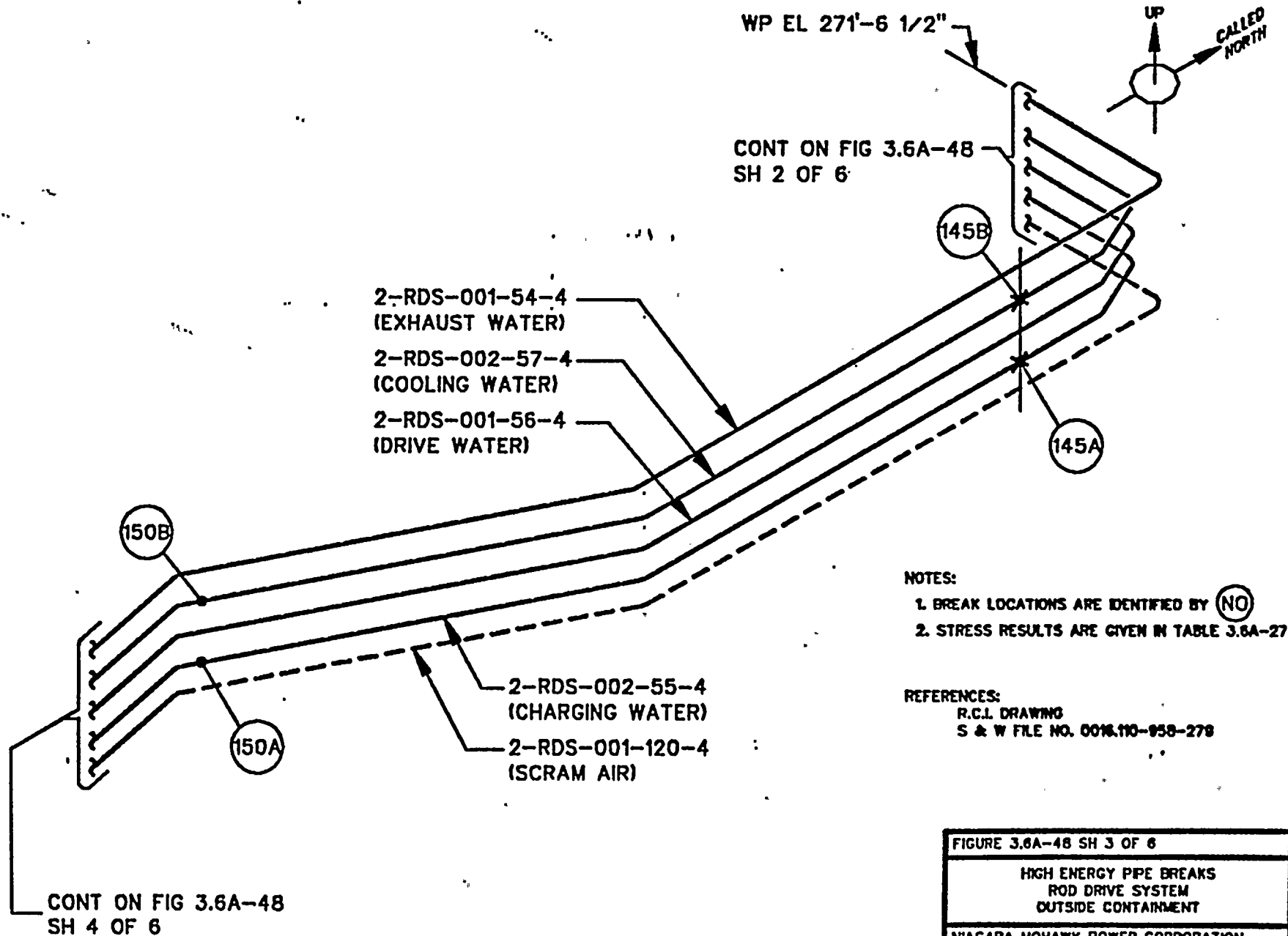
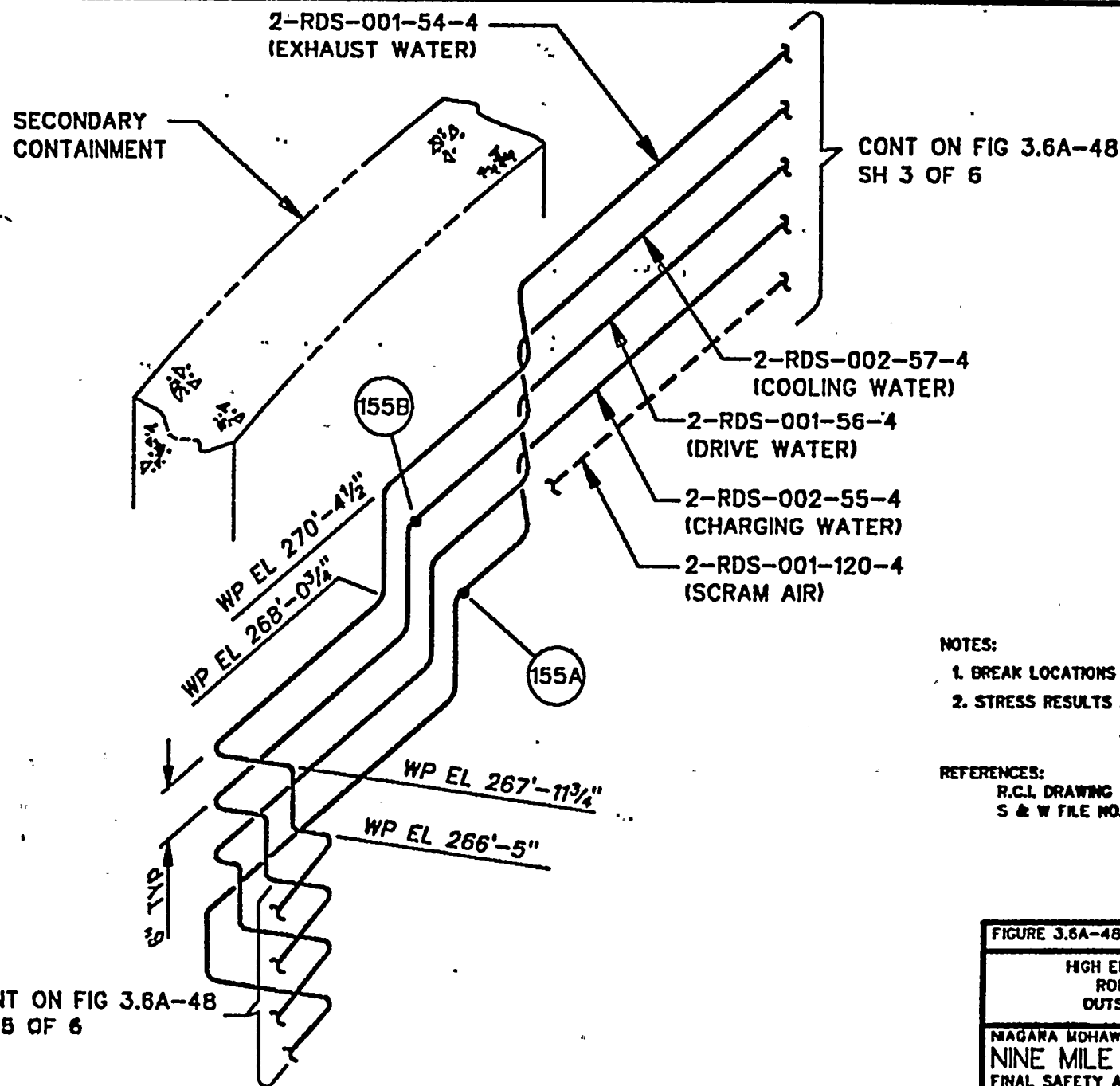


FIGURE 3.6A-48 SH 3 OF 6

HIGH ENERGY PIPE BREAKS  
ROD DRIVE SYSTEM  
OUTSIDE CONTAINMENT

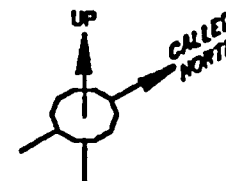
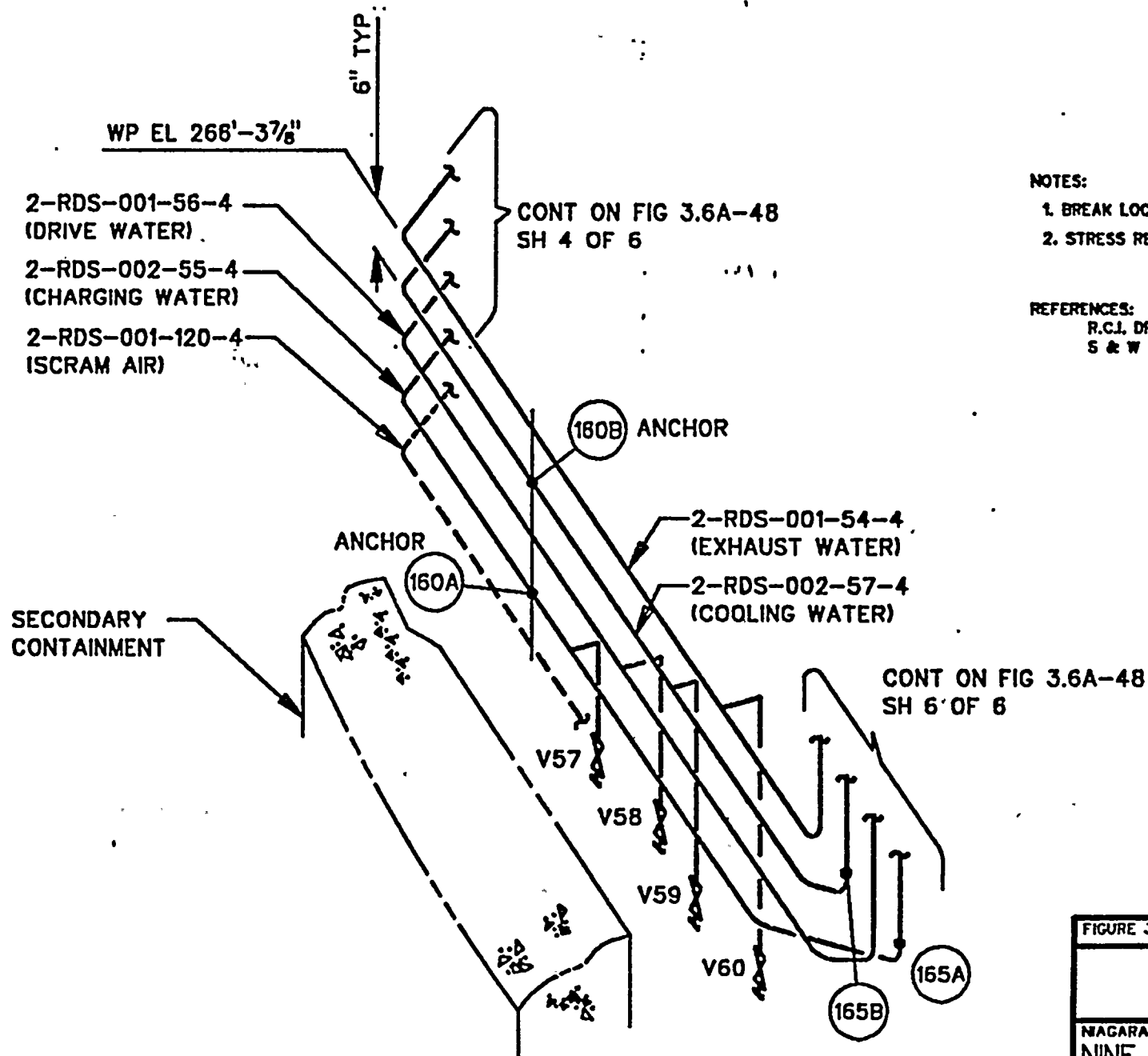
NIAGARA MOHAWK POWER CORPORATION  
NINE MILE POINT- UNIT 2  
FINAL SAFETY ANALYSIS REPORT





CONT ON FIG 3.6A-48  
SH 5 OF 6





**NOTES:**

1. BREAK LOCATIONS ARE IDENTIFIED BY (NO)
2. STRESS RESULTS ARE GIVEN IN TABLE 3.6A-27

**REFERENCES:**

R.C.I. DRAWING  
S & W FILE NO. 0018.110-958-223

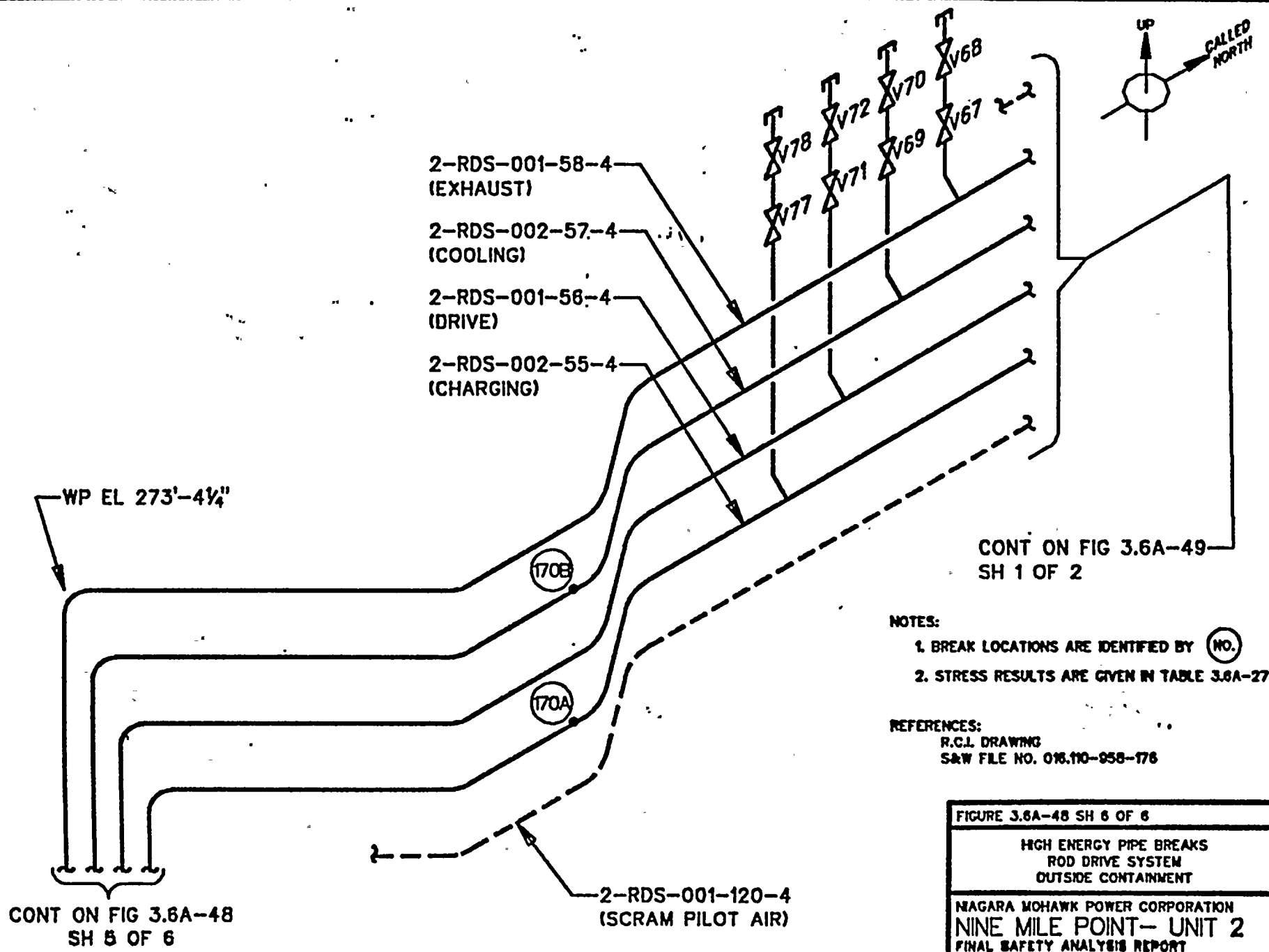
FIGURE 3.6A-48 SH 5 OF 6

HIGH ENERGY PIPE BREAKS  
ROD DRIVE SYSTEM  
OUTSIDE CONTAINMENT

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









SCRAM VENT

2-RDS-001-58-4  
(EXHAUST)

85B

90C ANCHOR

EL 272-117 1/2

90D ANCHOR

2-RDS-002-57-4  
(COOLING)

ANCHOR

85A

CONT ON FIG 3.6A-48  
SH 6 OF 6

2-RDS-001-56-4  
(DRIVE)

2-RDS-002-55-4  
(CHARGING)

2-RDS-001-120-4  
(SCRAM PILOT AIR)

95A

97D

100A

105D

95B

97C

100B

105C

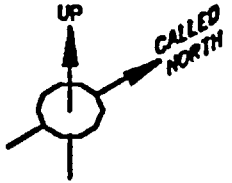
EL 272-91 1/2

REFERENCES:

R.C.I. DRAWING  
S & W FILE NO 0016.110-958-218

NOTES:

1. BREAK LOCATIONS ARE IDENTIFIED BY (NO)
2. STRESS RESULTS ARE GIVEN IN TABLE 3.6A-27
3. PIPE BREAK SHIELDS ARE IDENTIFIED AS 2XXXJTSXXX



270° SIDE HEADER

2RDS\*JTS002

CONT ON FIG 3.6A-49  
SH 2 OF 2

6" TYP

FIGURE 3.6A-49 SH 1 OF 2

HIGH ENERGY PIPE BREAKS  
ROD DRIVE SYSTEM  
OUTSIDE CONTAINMENT

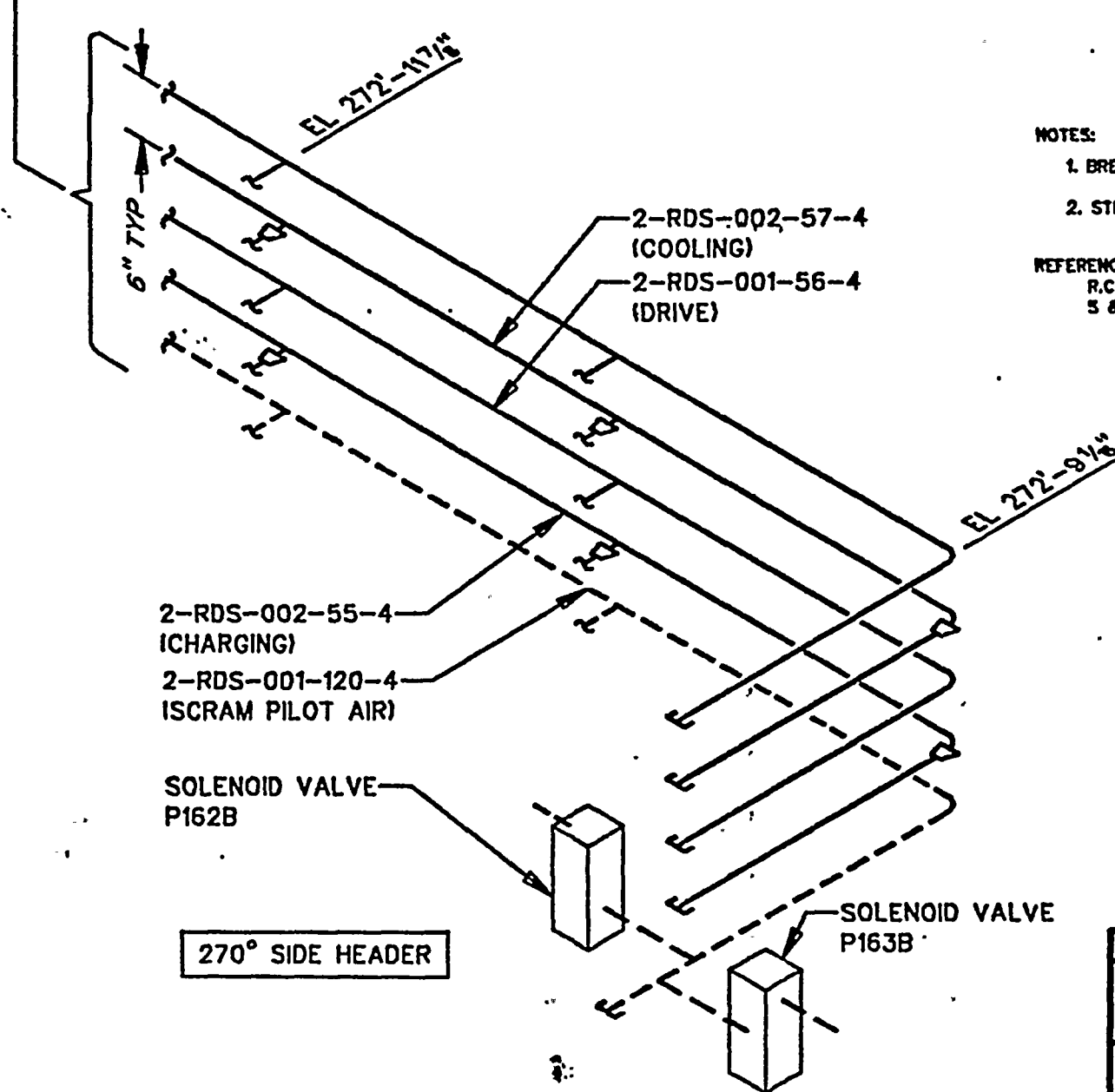
NIAGARA MOHAWK POWER CORPORATION  
NINE MILE POINT- UNIT 2  
FINAL SAFETY ANALYSIS REPORT

MODEL NO. FSAR36AF REVISED 5-02-88

THIS DRAWING CREATED ELECTRONICALLY



CONT ON FIG 3.6A-49 SH 1 OF 2



NOTES:

1. BREAK LOCATIONS ARE IDENTIFIED BY (NO)
2. STRESS RESULTS ARE GIVEN IN TABLE 3.6A-27

REFERENCES:

R.C.I. DRAWING  
S & W FILE NO 0016.110-958-218

FIGURE 3.6A-49 SH 2 OF 2

HIGH ENERGY PIPE BREAKS  
ROD DRIVE SYSTEM  
OUTSIDE CONTAINMENT

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

