PSEG Public Service Electric and Gas Company

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Robert L. Mittl General Manager
Nuclear Assurance and Regulation

June 11, 1985

Director of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
7920 Norfolk Avenue
Bethesda, MD 20814

Attention: Mr. Walter Butler, Chief
Licensing Branch 2
Division of Licensing

Gentlemen:

ELIMINATION OF ARBITRARY INTERMEDIATE PIPE BREAKS
HOPE CREEK GENERATING STATION
DOCKET NO. 50-354

Public Service Electric and Gas Company requests approval for the Hope Creek Generating Station to eliminate the postulation of intermediate pipe breaks as specified by SRP 3.6.2 Sections II.1 and II.2 unless such locations exceed the stress and usage factor threshold levels provided in BTP MEB 3-1 or are located in the proximity of welded pipe attachments.

In support of this request, the following information, requested in a telecon by D. Wagner, is provided:

1. Provide a short discussion of the technical justification for elimination of arbitrary intermediate breaks.

RESPONSE

The technical justification for elimination of arbitrary intermediate breaks is as follows:

a. Deletion of whip restraints will improve access for operation, inservice inspection, and maintenance.

b. Occupational radiation exposure during inspection, maintenance, and repair will be reduced over the life of the plant.

c. The additional accessibility to the piping systems may improve the efficiency of inservice inspections.

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d. Postulating arbitrary intermediate breaks provides only additional conservatism with no physical basis.

e. Deletion of arbitrary intermediate break locations will not impact the environmental qualification of safety related equipment and components since the harsh environment conditions have already been defined and will not be revised.

f. Although the currently installed drywell pipe whip restraints will remain, substantial cost savings will occur since notching of insulation around shimpacs is not required, resulting in reduced heat loss to the containment and ease of insulation installation, and removal.

g. The option exists to remove unnecessary existing pipe whip restraints if maintenance/inspection operations could be simplified by enhanced accessibility.

2. Provide a table or summary which includes the following information:

   a) identification of all affected piping systems.

   b) pipe diameter and material of each system in (a).

   c) estimated number of breaks eliminated in each system in (a).

   d) estimated number of rupture restraints and jet deflectors eliminated in each system in (a).

RESPONSE

A summary table of the affected systems is provided as follows:

Pipe System	Pipe Material	Nom. Pipe Dia.	Arb. Interm. Breaks Elimin.[c]	Pipe Whip Restraints Eliminated[a]	Jet Deflectors Eliminated
Inside Containment					
RHR Supply	CS/SS(304L)	20"	2[b]	0	0
RHR Return	CS/SS(304L)	12"	4[b]	0	0
Core Spray	CS	12"	4	0	0
LPCI	CS	12"	7	0	0
HPCI	CS	10"	2	0	0
RCIC	CS	4"	1	0	0

Pipe System	Pipe Material	Nom. Pipe Dia.	Arb. Interm. Breaks Elimin.[c]	Pipe Whip Restraints Eliminated[a]	Jet Deflectors Eliminated
Ouside Containment					
Main Steam	CS	28"	2	0	0
Feedwater	CS	24"	2	0	0
HPCI	CS	12"/8"	5	7	0
RCIC	CS	6"	5	4	0
RWCU	CS	4"	2	0	0
RWCU	CS	6"/4"/3"	11	1	0
MSIV Drains	CS	3"/2"	7	0	0
Starting Air	SS(304L)	3"/2"	16	0	0

NOTES:

a. The quantities listed are those restraints which have not yet been installed. Those restraints which have been installed will remain, however several restraint shimpacs may not be required.

b. The postulated intermediate breaks are located in the stainless steel portion of the RHR piping connections to the recirculation system piping.

c. Welded piping attachments are not located in the proximity of any eliminated arbitrary intermediate breaks and no such welded attachments are expected to be added in the future.

3. Provide a detailed discussion to justify why the systems identified in 2(a) are not susceptible to the following:

   (a) IGSCC.

   (b) Water/Steam hammer effects.

RESPONSE

The above systems are not susceptible to intergranular stress corrosion cracking (IGSCC) or steam/water hammer effects due to the following:

a. Industry experience has shown per NUREG-1061 that IGSCC can occur when the following conditions exist simultaneously: high tensile stresses, piping material susceptible to cracking, and a corrosive environment.

Although any stainless or carbon steel piping will exhibit some degree of residual stresses and be exposed to tensile stresses, the potential of IGSCC is minimized by choosing piping material with low susceptibility to stress corrosion and by ensuring that a corrosive environment does not exist. The likelihood of IGSCC in stainless steel increases with carbon content. Therefore, only a low carbon content stainless steel has been used (304L) in the portion of the RHR system connecting to the recirculation system. The remainder of the affected system piping is ferritic carbon steel which has been found not to be susceptible to IGSCC.

The existence of a corrosive environment is minimized by specifying stringent criteria for internal and external cleaning and by following the EPRI BWR water chemistry guidelines during power ascension and normal operation.

b. Systems such as main steam, HPCI, and RCIC steam lines which experience transients as a result of fast valve closure have been designed to accommodate such effects. In general, steam/water hammer effects are not expected to occur due to system piping designs which prevent such occurrence, e.g., steam lines with adequate slope and drainage and water lines with fill system feed.

4. Provide a commitment that all systems in 2(a) will be included in the preoperational piping testing program.

RESPONSE

All piping systems in which arbitrary intermediate breaks are to be eliminated are within the scope of the piping startup testing program. Each system will be tested to verify that steady state vibratory levels are within acceptable limits for operating conditions anticipated during service.

5. Provide a commitment that all safety related equipment in the vicinity of the eliminated breaks has been environmentally qualified to withstand the effects of a non-mechanistic break.

RESPONSE

Elimination of arbitrary intermediate breaks will not affect the environmental qualification of safety related equipment in the vicinity of the arbitrary intermediate break locations. The break locations for defining the worst case harsh environment conditions for all safety related equipment have been evaluated, which include the arbitrary intermediate break locations, and the results documented in the FSAR. These worst case conditions will not be revised based upon elimination of the arbitrary intermediate break locations.

In addition to the above information, attached for your review are proposed FSAR changes to Sections 1.11 and 3.6 eliminating the postulation of arbitrary pipe break locations. These changes will be incorporated upon approval of the above request.

Should you have any questions in this regard, please contact us.

Very truly yours,

RJ [signature]

C D. H. Wagner
USNRC Licensing Project Manager

A. R. Blough
USNRC Senior Resident Inspector

SRP Section	Specific SRP Acceptance Criteria	Summary Description of Differences	FSAR Section(s) Where Discussed
3.5.3 (Rev 1)	Appendix A, Sect. II.1, Reinforced Concrete Members		3.8.4.8
	Permissible ductility ratios shall be in accordance with Regulatory Guide 1.142.	For flexural beams and slabs subjected to impactive loads, the permissible ductility ratios exceed those given in Regulatory Guide 1.142.	
	Appendix A, Sect.II.2, Structural Steel Members		3.8.4.8
	Permissible ductility ratios are listed.	For flexural beams subjected to impactive loads (other than tornado missiles) the permissible ductility ratio exceeds that given in Appendix A of SRP 3.5.3. For axial tension members subject to impulsive loads, a permissible ductility ratio of 3 is used.	
3.6.2 (Rev 1)	II.1 and II.2		3.6.2.7
	Postulated pipe rupture locations in containment and outside should meet MEB 3-1.	a) HCGS design for NSSS piping meets the provisions of Rev 0 (November 1973) of this SRP section, and not the current SRP (Rev 1, July 1981). b) Add insert E	
	II.3		
	This section refers to III.2.a(2), which states that the initial condition prior to postulated pipe rupture should be the greater of the contained energy at hot standby or at 102% power.	A pipe break initial condition of 100% power at normal plant conditions is used.	

Insert E

b. Intermediate breaks on Class 1, 2, and 3 piping are not postulated unless such locations exceed stress and usage factor threshold levels per MEB 3-1 or are located in the proximity of welded pipe attachments.

3.6.2.1.1.2 Recirculation System Piping

See Section 3.6.2.6 for a discussion of recirculation system piping.

3.6.2.1.1.3 Class 1 Piping (Other Than Recirculation System Piping and Piping in Containment Penetration Areas)

Breaks in high energy Class 1 piping (ASME B&PV Code, Section III) are postulated to occur at the following locations:

a. At terminal ends of piping runs or branch runs

b. At intermediate locations between terminal ends, as determined by one of the two following criteria:

1. The maximum range of stress intensity as calculated by ASME B&PV Code equation (10) and either equation (12) or (13) exceeds 2.4 S_m.

2. The cumulative usage factor exceeds 0.1.

Add INSERT Δ →

When the above stress and fatigue criteria result in less than two intermediate break locations, a minimum of two separated locations are chosen based on highest stress, as calculated by equation (10) of Paragraph NB-3653. The two locations are separated by a change in direction of the pipe break jet thrust vector. Where the piping consists of a straight run without fittings, valves, or welded attachments, a minimum of one location is chosen on the basis of highest stress.

Intermediate pipe break locations are initially based upon committed design piping stress calculations in accordance with the above criteria. As a result of piping reanalysis, the highest stress locations may be shifted. An initially determined pipe break location will not be changed as a consequence however unless one of the following conditions exist:

Insert D

When the above stress and usage factor criteria are not exceeded, the minimum of two intermediate breaks based on highest stress, as calculated by Equation 10 of paragraph NB-3653, are not postulated unless the break location is in the proximity of a welded attachment.

1. Reanalysis shows that the maximum stress range or the cumulative usage factor at another location not only exceeds that for the initial pipe break location but also exceeds the above pipe break criteria. In addition, the break at the new location results in more serious consequences to safety-related systems than the initial break.

2. Significant changes are made in the routing, size, or wall thickness of the pipe after the initial pipe break determination.

3.6.2.1.1.4 Class 2 and 3 Piping (Other Than Recirculation System Piping and Piping in Containment Penetration Areas)

Breaks in high energy Class 2 and 3 piping (ASME B&PV Code, Section III) are postulated to occur at the following locations:

a. At terminal ends of piping runs or branch runs

b. At intermediate locations between terminal ends, as determined by one of the two following criteria:

1. At each location of potential high stress, such as pipe fittings with elbows, tees, reducers, etc; valves; and welded attachments

2. At each location where the maximum stress range, as calculated by the sum of equations (9) and (10) of Paragraph NC-3652, considering normal and upset plant conditions, exceeds $0.8(1.2\ S_h + S_A)$.

Add INSERT C →

When the above stress criteria result in less than two intermediate break locations, a minimum of two separated locations are chosen based on highest stress, as calculated by the sum of equations (9) and (10) of Paragraph NC-3652. The two locations are chosen with a difference in stress of at least 10% or, if stresses differ by less than 10%, the two locations are separated by a change in direction of the pipe break jet thrust vector. Where the piping consists of a straight run without fittings, valves, or welded

Incert C

When the above stress criteria are not exceeded, the minimum of two intermediate breaks based on highest stress, as calculated by the sum of Equations 9 and 10 of paragraph NC-3652, are not postulated unless the break location is in the proximity of a welded attachment.

attachments, and all stress ranges are less than $0.8(1/2\ S_h+S_A)$, a minimum of one location is chosen on the basis of highest stress.

Intermediate pipe break locations are initially based upon committed design piping stress calculations in accordance with the above criteria. As a result of piping reanalysis, the highest stress locations may be shifted. An initially determined pipe break location will not be changed as a consequence, however, unless one of the following conditions exist:

1. Reanalysis shows that the maximum stress range or the cumulative usage factor at another location not only exceeds that for the initial pipe break location but also exceeds the above pipe break criteria. In addition, the break at the new location results in more serious consequences to safety-related systems than the initial break.

2. Significant changes are made in the routing, size, or wall thickness of the pipe after the initial pipe break determination.

3.6.2.1.1.5 Nonnuclear Class Piping

Breaks in high energy nonnuclear class piping are postulated to occur at the following locations:

a. At terminal ends of piping runs or branch runs

b. At each intermediate location of potential high stress, such as pipe fittings with elbows, tees, reducers, etc; valves; and welded attachments.

Alternatively, the break locations for nonnuclear class piping can be selected according to the same criteria used for Class 2 and 3 piping, provided that all necessary analyses are made.

the beam is based on a 20% ultimate elongation of the diagonal plate.

3.6.2.6.4 Material to be Submitted for the Operating License Review

3.6.2.6.4.1 Implementation of Criteria for Pipe Break Location and Orientation

The criteria for selection of postulated pipe breaks in the recirculation piping system are provided in Section 3.6.2.6.1. The postulated breaks and types, recirculation pipe breaks selected in accordance with these criteria are shown on Figure 3.6-12. Conformation with the criteria is demonstrated in Table 3.6-6.

3.6.2.6.4.2 Implementation of Special Protection Criteria

The location of pipe whip restraints provided for the recirculation piping systems are also shown in Figure 3.6-12. Using the analysis methods of Section 3.6.2.6.2.2, this system of restraints was found to prevent unrestrained pipe whip at the break locations, postulated in Section 3.6.2.6.1.

3.6.2.7 Standard Review Plan Rule Review

3.6.2.7.1 Acceptance Criterion II.1 and II.2

Acceptance criterion II.1 of standard review plan (SRP) Section 3.6.2 provides that postulated pipe rupture locations in containment should meet BTP MEB 3-1, which imposes new limits of 2.4 S_m for Class 1 pipe, in equations (10) and (12) of Paragraph NB-3653 of the ASME B&PV Code, Section III, for which pipe breaks must be postulated. Acceptance criterion II.2 provides that postulated pipe rupture locations outside containment should meet BTP MEB 3-1.

The HCGS NSSS design meets the intent of MEB 3-1, Revision 1, with the following clarifications:

a. GE meets the requirements of criterion B.1.d, B.3.a (2-5), and B.3.b, as described in Sections 3.6.2.6.1.5 and 3.6.2.6.2.1.1.

b. GE has taken the following positions on the remaining items of BTP MEB 3-1, Revision 1, criteria within GE scope:

1. Criterion B.1.c(1) - GE uses criteria from SRP Section 3.6.2, Revision 0, which requires no break postulation if equation (10) is less than 3 S_m and the cumulative usage factor is less than 0.1. Section 3.6.2.6.1.4 discusses this criterion in detail.

Add INSERT A

3.6.2.7.2 Acceptance Criterion II.3

Acceptance criterion II.3 of SRP Section 3.6.2 provides criteria for initial conditions used in the dynamic analysis of postulated pipe break of the pressurized non-NSSS piping during operation at power. The initial condition to be used is the greater of the contained energy at hot standby or at 102% power.

On HCGS, the dynamic analysis of postulated pipe break is based on the initial condition of 100% power in the pressurized pipe. It is recognized that, for short periods of time, the pressure and enthalpy in some systems may be higher for some modes than for 100% power operation. From a safe and realistic protection point of view, 100% power represents the high energy condition of most likely occurrence, due to the relatively short time period of operation at the higher energy modes.

3.6.3 DEFINITIONS

Certain terms used in Sections 3.6.1 and 3.6.2 have specific meanings, as described below:

a. Essential systems and components - Systems and components required to shut down the reactor, maintain it in a safe shutdown mode, and mitigate the consequences of a postulated piping failure, without offsite power.

Insert A

The HCGS non-NSSS design meets the intent of MEB 3-1, Revision 1, with the following clarifications:

a. For Class 1 piping, when the stress and usage factor criteria in Section 3.6.2.1.1.3.b are not exceeded, the minimum of two intermediate breaks based on highest stress, as calculated by Equation 10 of paragraph NB-365 , are not postulated unless the break location is in the proximity of a welded attachment.

b. For Class 2 and 3 piping, when the stress criteria of Section 3.6.2.1.1.4.b are not exceeded, the minimum of two intermediate breaks based on highest stress, as calculated by the sum of Equations 9 and 10 of paragraph NC-3652, are not postulated unless the break location is in the proximity of a welded attachment.

In addition to limiting the stress and usage factor values for Class 1 piping and limiting the stress values for Class 2 and 3 piping, the following criteria are all required to be met when considering deletion of arbitrary intermediate breaks:

a. The piping systems are not susceptible to IGSCC nor to unanticipated waterhammer/ thermal transient events.

b. The piping system is included in the piping startup testing program for steady state vibrations.

c. Safety related equipment in the vicinity of the deleted intermediate break remains environmentally qualified to the non-dynamic effects of the pipe break with the greatest consequences on the equipment.

d. The deleted intermediate break is not in the vicinity of a welded attachment.

TABLE 3.6-3

PRELIMINARY MAIN STEAM SYSTEM PIPING STRESS LEVELS AND PIPE BREAK DATA (PORTION OUTSIDE PRIMARY CONTAINMENT)

Node Point[1]	Node Type[2]	Total Stress EQ.9+EQ.10 ksi	Pipe Break Stress Limit 0.8(1.2Sh+Sa) ksi	Break Type[3]	Basis for Break Selection
45	EL	14.78	37.8	C	TE
215	EL	14.57	37.8	C	TE
385	EL	13.47	37.8	C	TE
565	EL	14.20	37.8	C	TE
75	EL	23.83	37.8	C	MBL
245	EL	25.62	37.8	C	MBL
~~415~~	~~EL~~	~~29.61~~	~~37.8~~	~~C~~	~~MBL~~
~~595~~	~~EL~~	~~29.13~~	~~37.8~~	~~C~~	~~MBL~~

(1) Locations of the nodes are shown in Figure 3.6-3

(2) Symbols used to denote the node type are as follows
EL - Elbow

(3) Break types are indicated as follows
C - Circumferential

(4) Symbols used to denote the basis for break selection are as follows:
TE - Terminal end
MBL - Intermediate break locations selected to satisfy the requirements for a minimum number of break locations where such locations are in the proximity of welded attachments.

TABLE 3.6-9 Page 1 of 2

PRELIMINARY FEEDWATER SYSTEM PIPING STRESS LEVELS AND PIPE BREAK DATA (PORTION OUTSIDE PRIMARY CONTAINMENT)

Node Point[1]	Node Type[2]	Total Stress (ksi)	Pipe Break Stress Limit 0.8(1.2 S~~m~~h+Sa) (ksi)	Break Type[3]	Basis for Break Selection[4]
		Line from F.W. ISO: Valves			
~~50~~	~~EL~~	~~8.31~~	~~32.40~~	~~C~~	~~TE~~
70	EL	3.31	32.40	C	~~MBL~~ TE
~~655~~	~~EL~~	~~8.73~~	~~32.40~~	~~C~~	~~TE~~
630	EL	9.84	32.40	C	~~MBL~~ TE
		Line from HPCI pump disch.			
A05	BW	21.45	32.40	C	TE
A10	BW	21.02	32.40	C	TE
		Line from RCIC pump disch.			
60	BW	17.04	32.40	C	TE
~~954~~	~~EL~~	~~18.51~~	~~32.40~~	~~C~~	~~MBL~~
958	BW	28.74	32.40	C	TE
		Line from RWCU			
40	BW	16.33	32.40	C	TE
665	BW	12.07	32.40	C	TE
~~868~~	~~TEE~~	~~19.53~~	~~32.40~~	~~C~~	~~MBL~~
~~873~~	~~BW~~	~~20.54~~	~~32.40~~	~~C~~	~~MBL~~

TABLE 3.6-9 (Con't) Page 2 of 2

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(1) Locations of the nodes are shown in Figure 3.6-14

(2) Symbols used to denote the node type are as follows:
- EL - Elbow
- TEE - Tee
- BW - Butt weld

(3) Break types are indicated as follows:
- C - Circumferential

(4) Symbols used to denote the basis for break selection are as follows:
- TE - Terminal end
- ~~MBL - Intermediate break locations selected to satisfy the requirements for a minimum number of break locations.~~
- SFL - Stress and fatigue limits established in Section 3.6.2.1.1.3 are not met.

PRELIMINARY RWCU SYSTEM PIPING STRESS LEVELS AND PIPE BREAK DATA
(PORTION OUTSIDE PRIMARY CONTAINMENT)

Node Point(1)	Node Type(2)	Total Stress EQ.9+EQ.10 (ksi)	Pipe Break Stress Limit 0.8(1.2 Sh+Sa) (ksi)	Break Type(3)	Basis for Break Selection(4)
E	Anch.	39.42	32.4	C	TE
D	Anch.	38.21	32.4	C	TE
~~10~~	~~EL~~	~~16.96~~	~~32.4~~	~~C~~	~~MBL~~
45	TEE	39.78	32.4	C & L	SFL
250	FL	7.32	32.4	C	TE
355	FL	8.90	32.4	C	TE
~~315~~	~~EL~~	~~9.68~~	~~32.4~~	~~C~~	~~MBL~~
~~290~~	~~EL~~	~~3.32~~	~~32.4~~	~~C~~	~~MBL~~
255	FL	16.91	32.4	C	TE
375	FL	25.52	32.4	C	TE
~~450~~	~~TEE~~	~~10.24~~	~~32.4~~	~~C~~	~~MBL~~
~~115~~	~~TEE~~	~~8.09~~	~~32.4~~	~~C~~	~~MBL~~
~~95~~	~~TEE~~	~~12.87~~	~~32.4~~	~~C~~	~~MBL~~
~~80~~	~~TEE~~	~~18.27~~	~~32.4~~	~~C~~	~~MBL~~
B	Anch.	13.07	32.4	C	TE
~~530~~	~~EL~~	~~10.91~~	~~32.4~~	~~C~~	~~MBL~~
5	BW	14.04	32.4	C	TE
640	BW	14.89	32.4	C	TE
~~20~~	~~EL~~	~~11.42~~	~~32.4~~	~~C~~	~~MBL~~
~~40~~	~~EL~~	~~13.78~~	~~32.4~~	~~C~~	~~MBL~~
50	EL	14.73	32.4	C	TE

TABLE 3.6-11 (cont) Page 2 of 2

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(1) Locations of the nodes are shown in Figure 3.6-16

(2) Symbols used to denote the node type are as follows:
FL - Flange
EL - Elbow
TEE - Tee
BW - Butt weld
RED - Reducer
Anch. - Anchor

(3) Break types are indicated as follows:
C - Circumferential
L - Longitudinal

(4) Symbols used to denote the basis for break selection are as follows:
TE - Terminal end
~~MBL - Intermediate break locations selected to satisfy the requirements for a minimum number of break locations.~~
SFL - Stress and fatigue limits established in Section 3.6.2.1.1.3 are not met.

TABLE 3.6-12

PRELIMINARY HPCI SYSTEM PIPING STRESS LEVELS AND PIPE BREAK DATA
(PORTION INSIDE PRIMARY CONTAINMENT)

Node Point[1]	Node Type[2]	Stress By EQ. 10 (ksi)	Cumulative Usage Factor	Pipe Break Stress Limit 2.4 Sm (ksi)	Break Type[3]	Basis for Break Selection[4]
402	TTJ	~~31.6~~ 31.3	0.0026	42.48	C	TE
~~404~~	~~EL~~	~~36.42~~	~~0.0006~~	~~42.48~~	~~C~~	~~MBL~~
~~418~~	~~EL~~	~~41.172~~	~~0.001~~	~~42.48~~	~~C~~	~~MBL~~
420	EL	~~19.27~~ 33.2	~~0.0002~~ 0.0015	42.48	C	TE

(1) Locations of the nodes are shown in Figure 3.6-18

(2) Symbols used to denote the node type are as follows:
TTJ - Tapered transition joint
EL - Elbow
~~TEE - Tee~~
~~BW - Butt weld~~
~~RED - Reducer~~

(3) Break types are indicated as follows:
C - Circumferential

(4) Symbols used to denote the basis for break selection are as follows:
TE - Terminal end
~~MBL - Intermediate break locations selected to satisfy the requirements for a minimum number of break locations.~~
SFL - Stress and fatigue limits established in Section 3.6.2.1.1.3 are not met.

TABLE 3.6-13

PRELIMINARY HPCI SYSTEM PIPING STRESS LEVELS AND PIPE BREAK DATA
(PORTION OUTSIDE PRIMARY CONTAINMENT)

Node Point(1)	Node Type(2)	Total Stress (ksi)	Pipe Break Stress Limit 0.8(1.2 Sh+Sa) (ksi)	Break Type(3)	Basis for Break Selection(4)
Pump Discharge					
(see Feedwater and Core Spray)					
Turbine Steam Supply					
79	BW	12.79	32.40	C	TE
89	TEE	16.60	32.40	C	MBL
110	EL	16.37	32.40	C	MBL
120	EL	10.58	32.40	C	TE
C	ANCH	20.72	32.40	C	TE
171	EL	26.79	32.40	C	MBL
182	BW	8.84	32.40	C	TE
110	BW	10.16	32.40	C	TE
55	EL	7.98	32.40	C	MBL
20	EL	7.54	32.40	C	MBL

(1) Locations of the nodes are shown in Figure 3.6-19

(2) Symbols used to denote the node type are as follows:
EL - Elbow
TEE - Tee
BW - Butt weld
RED - Reducer
ANCH - Anchor

(3) Break types are indicated as follows:
C - Circumferential

(4) Symbols used to denote the basis for break selection are as follows:
TE - Terminal end
MBL - Intermediate break locations selected to satisfy the requirements for a minimum number of break locations.

TABLE 3.6-14

PRELIMINARY RCIC SYSTEM PIPING STRESS LEVELS AND PIPE BREAK DATA
(PORTION INSIDE PRIMARY CONTAINMENT)

Node Point[1]	Node Type[2]	Stress By EQ. 10 (ksi)	Cumulative Usage Factor	Pipe Break Stress Limit 2.4 Sm (ksi)	Break Type[3]	Basis for Break Selection[4]
405 ~~401~~	TTJ	26.81 ~~31.6~~	0.0015 ~~0.004~~	42.14 ~~42.09~~	C	TE
420	DMW	43.05	0.0107	33.72	C	MBL
~~410~~	~~EL~~	~~27.3~~	~~0.0002~~	~~42.09~~	~~C~~	~~MBL~~
~~601~~	~~BW~~	~~53.3~~	~~0.018~~	~~33.65~~	~~C~~	~~SFL~~
455	~~EL~~ BW	~~35.2~~ 17.75	~~0.0006~~ 0.0003	~~42.09~~ 42.14	C	TE

(1) Locations of the nodes are shown in Figure 3.6-22

(2) Symbols used to denote the node type are as follows:
TTJ - Tapered transition joint
~~EL - Elbow~~
~~TEE - Tee~~
BW - Butt weld
~~RED - Reducer~~
DMW - Dissimilar metal weld

(3) Break types are indicated as follows:
C - Circumferential

(4) Symbols used to denote the basis for break selection are as follows:
TE - Terminal end
MBL - Intermediate break locations selected to satisfy the requirements for a minimum number of break locations, where such locations are in the proximity of welded attachments.
SFL - Stress and fatigue limits established in Section 3.6.2.1.1.3 are not met.

TABLE 3.6-15

PRELIMINARY RCIC SYSTEM PIPING STRESS LEVELS AND PIPE BREAK DATA
(PORTION OUTSIDE PRIMARY CONTAINMENT)

Node Point(1)	Node Type(2)	Total Stress EQ.9+EQ.10 (ksi)	Pipe Break Stress Limit 0.8(1.2 Sh+Sa) (ksi)	Type Break(3)	Basis for Break Selection(4)
A	EL	43.34	32.4	C	~~SFL~~ TE
~~45~~	~~BE~~	~~15.48~~	~~32.4~~	~~C~~	~~MBL~~
~~20~~	~~EL~~	~~20.79~~	~~32.4~~	~~C~~	~~MBL~~
85	BW	9.96	32.4	C	TE
~~6~~	~~EL~~	~~8.37~~	~~32.4~~	~~C~~	~~MBL~~
~~30~~	~~TEE~~	~~5.45~~	~~32.4~~	~~C~~	~~MBL~~
44	BW	7.60	32.4	C	TE

(1) Locations of the nodes are shown in Figure 3.6-23

(2) Symbols used to denote the node type are as follows:
EL - Elbow
BW - Butt weld
~~BE - Bend~~

(3) Break types are indicated as follows:
C - Circumferential

(4) Symbols used to denote the basis for break selection are as follows:
TE - Terminal end
~~MBL - Intermediate break locations selected to satisfy the requirements for a minimum number of break locations~~.
~~SFL - Stress and fatigue limits established in Section 3.6.2.1.1.3 are not met~~.

TABLE 3.6-17

PRELIMINARY MAIN STEAM DRAIN PIPING STRESS LEVELS AND PIPE BREAK DATA (PORTION OUTSIDE PRIMARY CONTAINMENT)

Node Point (1)	Node Type (2)	Total Stress (ksi)	Pipe Break Stress Limit 0.8(1.2Sh+Sa) (ksi)	Break Type (3)	Basis for Break Selection (4)
60	TE	12.26	32.40	C	TE
~~120~~	~~EL~~	~~13.25~~	~~32.40~~	~~C~~	~~MBL~~
~~145~~	~~TEE~~	~~12.09~~	~~32.40~~	~~C~~	~~MBL~~
5	BW	27.33	32.40	C	TE
~~925~~	~~TEE~~	~~25.15~~	~~32.40~~	~~C~~	~~MBL~~
~~770~~	~~TEE~~	~~25.32~~	~~32.40~~	~~C~~	~~MBL~~
815	BW	21.31	32.40	C	TE
~~652~~	~~TE~~	~~20.82~~	~~32.40~~	~~C~~	~~MBL~~
660	BW	23.20	32.40	C	TE
~~175~~	~~EL~~	~~14.94~~	~~32.40~~	~~C~~	~~MBL~~
225	BW	17.15	32.40	C	TE
~~376~~	~~TE~~	~~16.17~~	~~32.40~~	~~C~~	~~MBL~~
160	EL	11.81	32.40	C	TE
740	TEE	6.07	32.40	C	TE
585	TEE	8.56	32.40	C	TE
425	TEE	8.05	32.40	C	TE

Add INSERT B

(1) Locations of the nodes are shown in Figure 3.6-27.

(2) Symbols used to denote the node type are as follows:
EL - Elbow
TEE - Tee
BW - Butt weld

(3) Break types are indicated as follows:
C - Circumferential

(4) Symbols used to denote the basis for break selection are as follows:
TE - Terminal end
~~MBL - Intermediate break locations selected to satisfy the requirements for a minimum number of break locations.~~

Insert B

Node Point (1)	Node Type (2)	Total Stress (ksi)	Pipe Break Stress Limit 0.8(1.2Sh+SA) (ksi)	Break Type (3)	Basis For Break Selection (4)
765	BW	20.7	32.40	C	TE
680	BW	22.0	32.40	C	TE
610	BW	23.9	32.40	C	TE
540	BW	21.3	32.40	C	TE
275	BW	5.3	32.40	C	TE
345	BW	9.5	32.40	C	TE
75	BW	12.14	32.40	C	TE
180	BW	17.54	32.40	C	TE
305	BW	12.37	32.40	C	TE
380	BW	13.79	32.40	C	TE
495	BW	4.30	32.40	C	TE

TABLE 3.6-20

PRELIMINARY RHR SHUTDOWN COOLING SUCTION PIPING STRESS LEVELS AND PIPE BREAK DATA

Node Point[1]	Node Type[2]	Stress By EQ. 10 (ksi)	Cumulative Usage Factor	Pipe Break Stress Limit 2.4 Sm (ksi)	Break Type[3]	Basis for Break Selection[4]
500	~~BW~~ TTJ	~~39.77~~ 46.8	~~0.001~~ 0.0051	~~34.032~~ 34.05	C	TE
~~510B~~	~~EL~~	~~85.27~~	~~0.655~~	~~34.032~~	~~C&L~~	~~SFL~~
~~510E~~	~~EL~~	~~85.27~~	~~0.655~~	~~34.032~~	~~C&L~~	~~SFL~~
~~520M~~	~~BE~~	~~61.39~~	~~0.133~~	~~34.032~~	~~C&L~~	~~SFL~~
~~530B~~	~~EL~~	~~72.08~~	~~0.365~~	~~34.032~~	~~C&L~~	~~SFL~~
~~530E~~	~~EL~~	~~72.08~~	~~0.365~~	~~34.032~~	~~C&L~~	~~SFL~~
~~533~~	~~TTJ~~	~~66.03~~	~~0.566~~	~~34.032~~	~~C&L~~	~~SFL~~
630	TTJ	~~47.87~~ 34.5	~~0.0124~~ 0.0188	~~42.86~~ 42.375	C	TE

(1) Locations of the nodes are shown in Figure 3.6-30

(2) Symbols used to denote the node type are as follows:
TTJ - Tapered transition joint
~~EL - Elbow~~
~~TEE - Tee~~
~~BW - Butt weld~~
~~RED - Reducer~~
~~BE - Bend~~

(3) Break types are indicated as follows:
C - Circumferential
~~L - Longitudinal~~

(4) Symbols used to denote the basis for break selection are as follows:
TE - Terminal end
~~MBL - Intermediate break locations selected to satisfy the requirements for a minimum number of break locations.~~
~~SFL - Stress and fatigue limits established in Section 3.6.2.1.1.3 are not met.~~

TABLE 3.6-21

PRELIMINARY RHR SHUTDOWN COOLING RETURN PIPING STRESS LEVELS AND PIPE BREAK DATA

Node Point[1]	Node Type[2]	Stress By EQ. 10 (ksi)	Cumulative Usage Factor	Pipe Break Stress Limit 2.4 Sm (ksi)	Break Type[3]	Basis for Break Selection[4]
LOOP A 12"-CCA-116(SS) 12"-DLA-069(CSS)						
500	~~BW~~ TTJ	~~62.116~~ 41.3	~~0.4767~~ 0.0196	~~34.032~~ 34.05	C	TE
~~510B~~	~~EL~~	~~59.398~~	~~0.3764~~	~~34.032~~	~~C&L~~	~~SFL~~
~~510E~~	~~EL~~	~~57.672~~	~~0.3206~~	~~34.032~~	~~C&L~~	~~SFL~~
~~520B~~	~~EL~~	~~57.814~~	~~0.3198~~	~~34.032~~	~~C&L~~	~~SFL~~
~~520E~~	~~EL~~	~~57.881~~	~~0.3211~~	~~34.032~~	~~C&L~~	~~SFL~~
~~530~~	~~TTJ~~	~~51.987~~	~~0.1688~~	~~34.032~~	~~C&L~~	~~SFL~~
610	TTJ	~~38.61~~ 30.1	~~0.0133~~ 0.0137	~~42.864~~ 42.375	C	TE
LOOP B 12"-CCA-115(SS) 12"-DLA-021(CSS)						
700	~~BW~~ TTJ	~~61.6~~ 46.6	~~0.499~~ 0.0210	~~34.032~~ 34.05	C	TE
~~710B~~	~~EL~~	~~50.09~~	~~0.441~~	~~34.032~~	~~C&L~~	~~SFL~~
~~710E~~	~~EL~~	~~58.56~~	~~0.376~~	~~34.032~~	~~C&L~~	~~SFL~~
~~720B~~	~~EL~~	~~59.23~~	~~0.378~~	~~34.032~~	~~C&L~~	~~SFL~~
~~720E~~	~~EL~~	~~58.9~~	~~0.355~~	~~34.032~~	~~C&L~~	~~SFL~~
~~725~~	~~STR~~	~~57.53~~	~~0.102~~	~~34.032~~	~~C&L~~	~~SFL~~
~~735~~	~~TTJ~~	~~50.91~~	~~0.161~~	~~34.032~~	~~C&L~~	~~SFL~~
830	TTJ	~~37.53~~ 38.9	~~0.0136~~ 0.0140	~~42.86~~ 42.375	C	TE

(1) Locations of the nodes are shown in Figure 3.6-31

(2) Symbols used to denote the node type are as follows:
TTJ - Tapered transition joint
~~EL - Elbow~~
~~TEE - Tee~~
~~BW - Butt weld~~
~~RED - Reducer~~

(3) Break types are indicated as follows:
C - Circumferential
~~L - Longitudinal~~

(4) Symbols used to denote the basis for break selection are as follows:
TE - Terminal end
~~MBL - Intermediate break locations selected to satisfy the requirements for a minimum number of break~~

~~locations.~~

SFL - Stress and fatigue limits established in Section 3.6.2.1.1.3 are not met.

TABLE 3.6-22

PRELIMINARY LPCI INJECTION PIPING STRESS LEVELS AND PIPE BREAK DATA

Node Point[1]	Node Type[2]	Stress By EQ. 10 (ksi)	Cumulative Usage Factor	Pipe Break Stress Limit 2.4 Sm (ksi)	Break Type[3]	Basis for Break Selection[4]
Line 12"-DLA-014						
80	TTJ	~~110.9~~ 65.29	~~0.3047~~ 0.0389	~~42.864~~ 42.48	C	TE
~~75~~	~~EL~~	~~89.5~~	~~0.0494~~	~~42.864~~	~~C~~	~~SFL~~
~~60~~	~~EL~~	~~57.2~~	~~0.0035~~	~~42.864~~	~~C~~	~~SFL~~
25	TTJ	~~36.821~~ 27.59	~~0.0142~~ 0.0010	~~42.864~~ 42.48	C	TE
Line 12"-DLA-015						
180	TTJ	~~110.37~~ 63.06	~~0.2903~~ 0.0303	~~42.864~~ 42.48	C	TE
~~175~~	~~EL~~	~~82.83~~	~~0.0306~~	~~42.864~~	~~C~~	~~SFL~~
~~140~~	~~EL~~	~~39.03~~	~~0.0008~~	~~42.864~~	~~C~~	~~SFL~~
125	TTJ	~~36.205~~ 28.27	~~0.0029~~ 0.0008	~~42.864~~ 42.48	C	TE
Line 12"-DLA-055						
495	TTJ	~~109.30~~ 62.73	~~0.2878~~ 0.0292	~~42.864~~ 42.48	C	TE
~~490~~	~~EL~~	~~86.05~~	~~0.0408~~	~~42.864~~	~~C~~	~~SFL~~
~~460~~	~~EL~~	~~49.312~~	~~0.0012~~	~~42.864~~	~~C~~	~~SFL~~
425	TTJ	~~39.64~~ 25.93	~~0.0045~~ 0.0006	~~42.864~~ 42.48	C	TE
Line 12"-DLA-056						
395	TTJ	~~108.99~~ 58.86	~~0.2614~~ 0.0233	~~42.864~~ 42.48	C	TE
~~390~~	~~EL~~	~~85.06~~	~~0.0840~~	~~42.864~~	~~C~~	~~SFL~~
335	EL	~~47.83~~ 39.30	~~0.0010~~ 0.0008	~~42.864~~ 42.48	C	MBL ~~SFL~~
325	TTJ	~~38.70~~ 28.25	~~0.0037~~ 0.0007	~~42.864~~ 42.48	C	TE

---

(1) Locations of the nodes are shown in Figure 3.6-32

(2) Symbols used to denote the node type are as follows:
TTJ - Tapered transition joint
EL - Elbow
~~TEE - Tee~~
~~BW - Butt weld~~
~~RED - Reducer~~

(3) Break types are indicated as follows:
C - Circumferential

TABLE 3.6-22 (cont)

(a) Symbols used to denote the basis for break selection are as follows:

TE - Terminal end

MBL - Intermediate break locations selected to satisfy the requirements for a minimum number of break locations, where such locations are in the proximity of welded attachments.

SFL - Stress and fatigue limits established in Section 3.6.2.1.1.3 are not met.

TABLE 3.6-23

PRELIMINARY CORE SPRAY INJECTION PIPING STRESS LEVELS AND PIPE BREAK DATA

Node Point[1]	Node Type[2]	Stress By EQ. 10 (ksi)	Cumulative Usage Factor	Pipe Break Stress Limit 2.4 Sm (ksi)	Break Type[3]	Basis for Break Selection[4]
Line 12"-DLA-001		47.07	0.013	42.48		
150	RED	~~83.03~~	~~0.069~~	~~42.86~~	C	TE
~~145~~	~~EL~~	~~69.92~~	~~0.055~~	~~42.86~~	~~C~~	~~MBL~~
~~105~~	~~TTJ~~	~~37.63~~	~~0.0016~~	~~42.86~~	~~C~~	~~MBL~~
35	TTJ	~~25.39~~	~~0.0004~~	~~42.86~~	C	TE
		24.23	0.0003	42.48		
Line 12" - DLA-023						
		48.32	0.016	42.48		
140	RED	~~Later~~	~~Later~~	~~42.86~~	C	TE
~~135~~	~~EL~~	~~(3/85)~~	~~(3/85)~~	~~42.86~~	~~C~~	~~MBL~~
~~85~~	~~TTJ~~	~~(3/85)~~	~~(3/85)~~	~~42.86~~	~~C~~	~~MBL~~
35	TTJ	~~(3/85)~~	~~(3/85)~~	~~42.86~~	C	TE
		26.49	0.0004	42.48		

(1) Locations of the nodes are shown in Figure 3.6-33

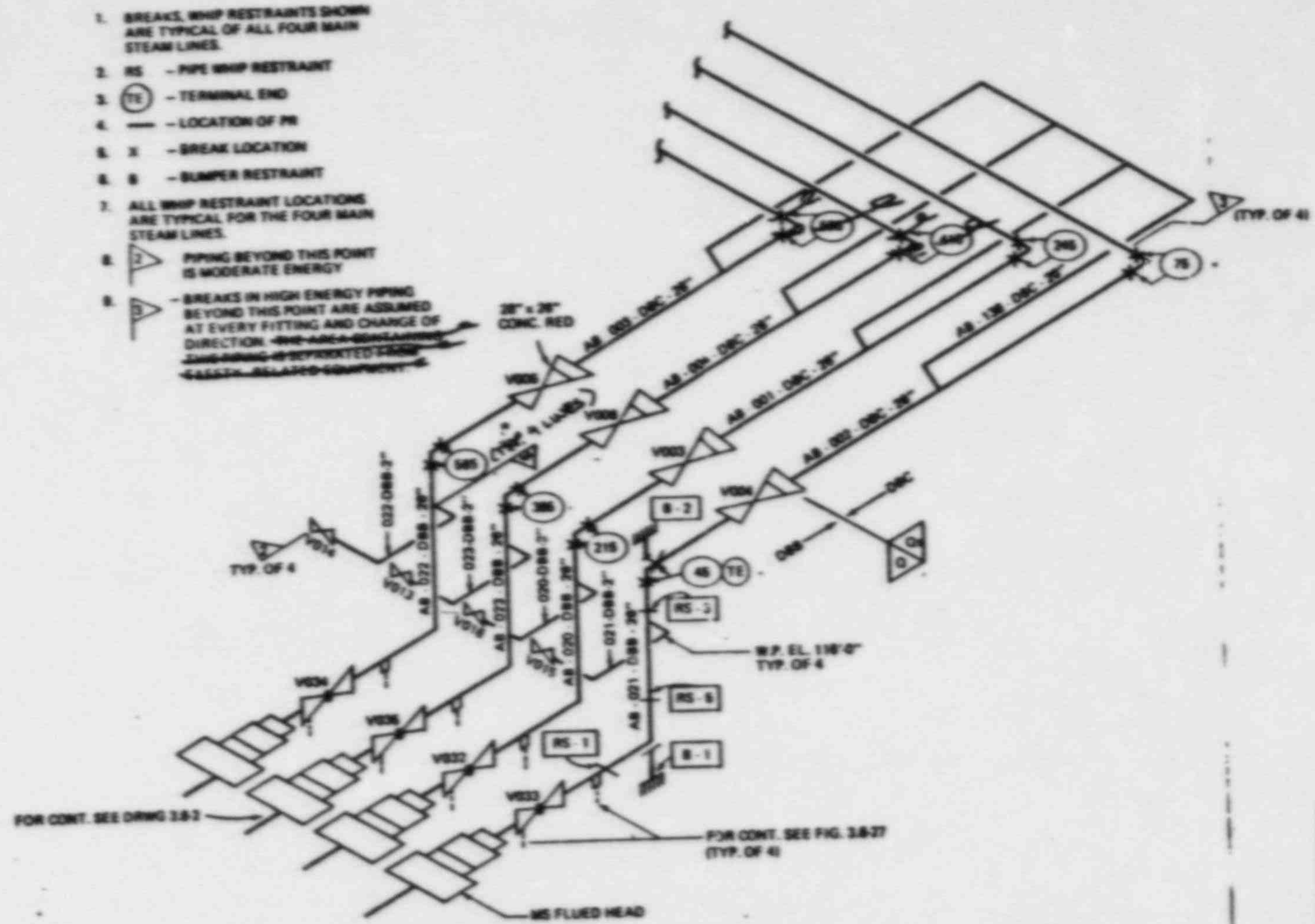
(2) Symbols used to denote the node type are as follows:
TTJ - Tapered transition joint
~~EL - Elbow~~
RED - Reducer

(3) Break types are indicated as follows:
C - Circumferential

(4) Symbols used to denote the basis for break selection are as follows:
TE - Terminal end
~~MBL - Intermediate break locations selected to satisfy the requirements for a minimum number of break locations.~~

NOTES:

1. BREAKS, WHIP RESTRAINTS SHOWN ARE TYPICAL OF ALL FOUR MAIN STEAM LINES.
2. RS — PIPE WHIP RESTRAINT
3. (TE) — TERMINAL END
4. —— — LOCATION OF PR
5. X — BREAK LOCATION
6. B — BUMPER RESTRAINT
7. ALL WHIP RESTRAINT LOCATIONS ARE TYPICAL FOR THE FOUR MAIN STEAM LINES.
8. (2) PIPING BEYOND THIS POINT IS MODERATE ENERGY
9. (3) — BREAKS IN HIGH ENERGY PIPING BEYOND THIS POINT ARE ASSUMED AT EVERY FITTING AND CHANGE OF DIRECTION. ~~THE AREA CONTAINING THIS PIPING IS SEPARATED FROM SAFETY-RELATED COMPONENTS.~~

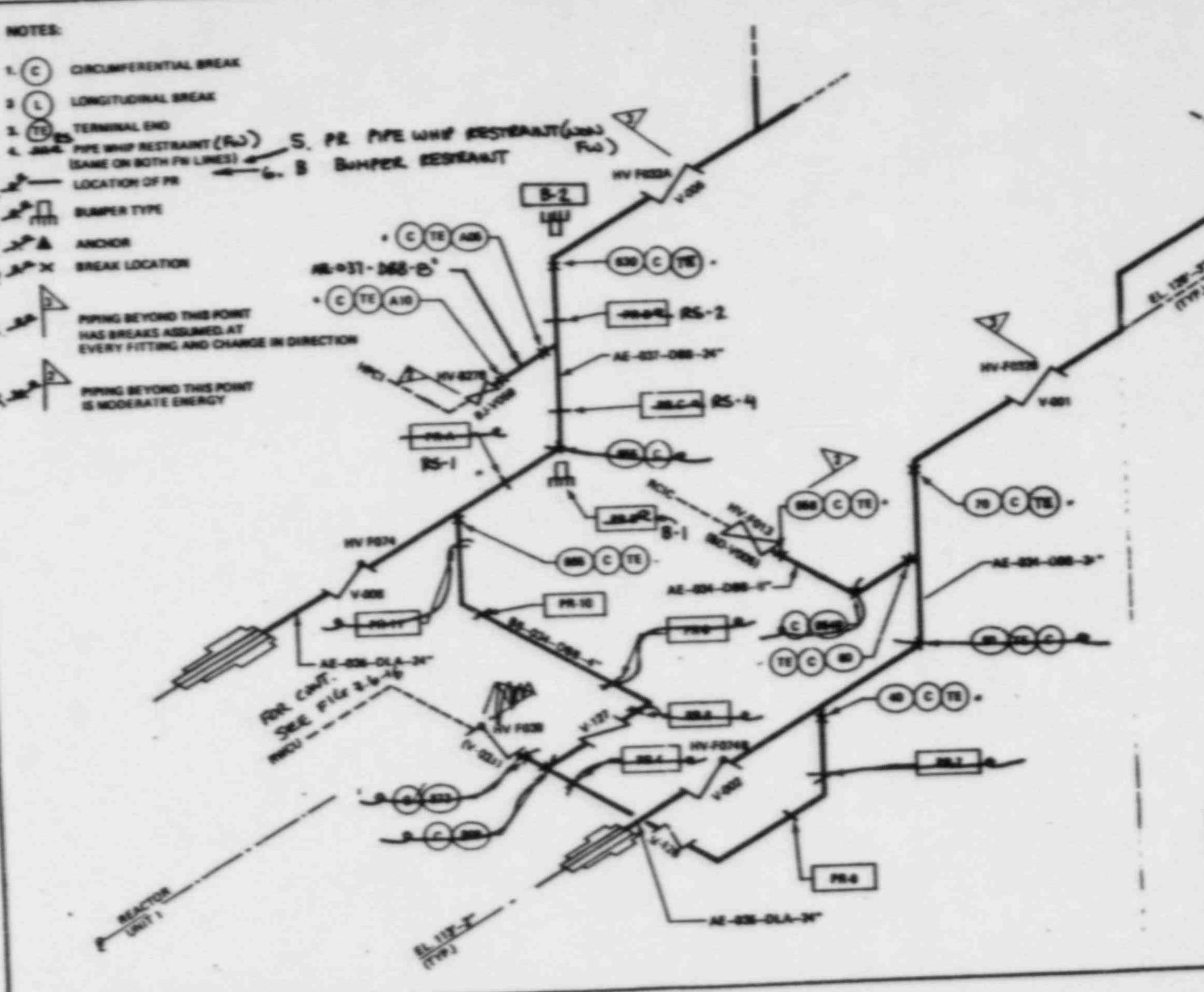


HOPE CREEK GENERATING STATION

FINAL SAFETY ANALYSIS REPORT

MAIN STEAM PIPING ISOMETRIC (PORTION OUTSIDE PRIMARY CONTAINMENT)

FIGURE 3.6-3 AMENDMENT 6, 06/84

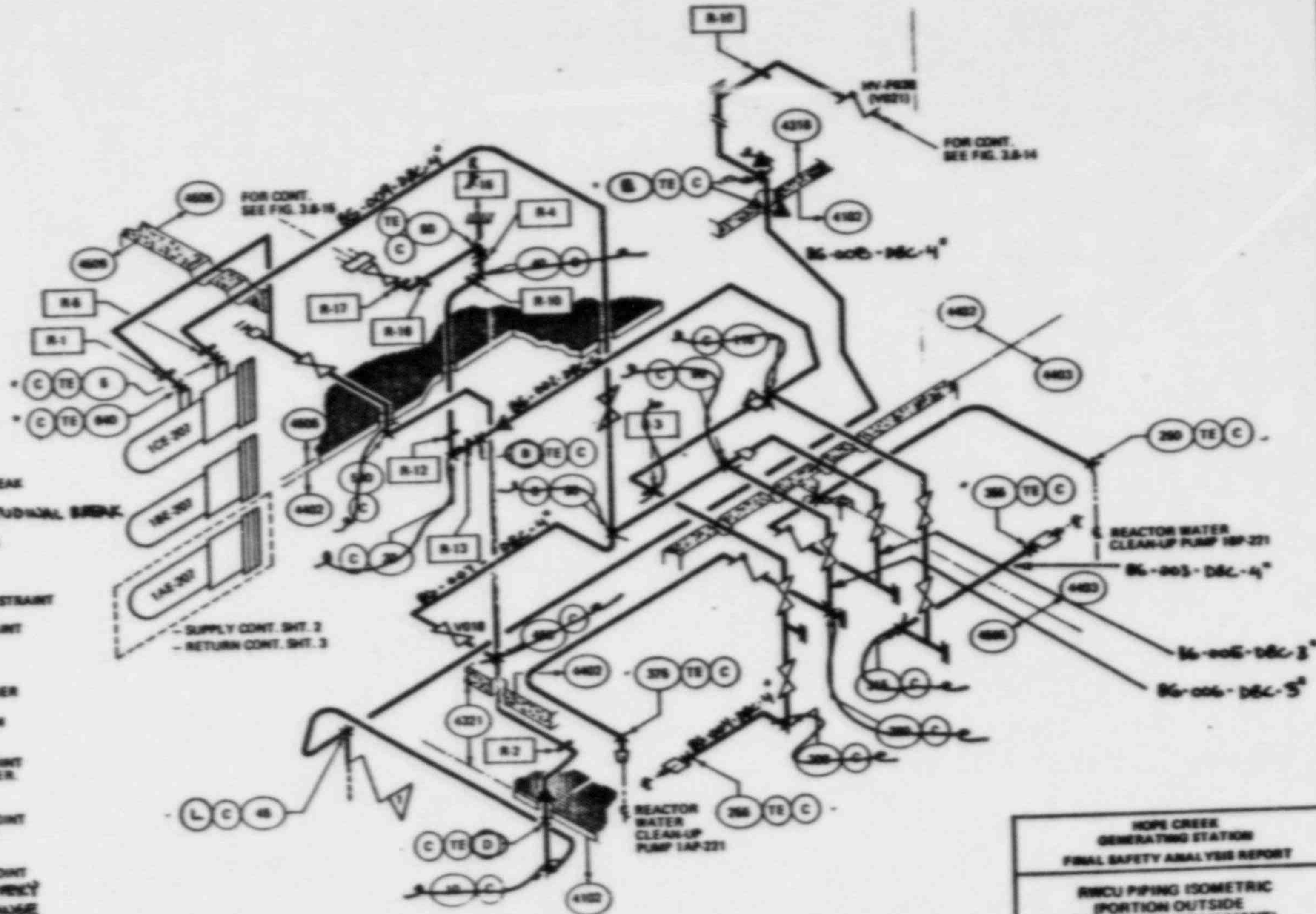


HOPE CREEK GENERATING STATION

FINAL SAFETY ANALYSIS REPORT

FEEDWATER PIPING ISOMETRIC (PORTION OUTSIDE PRIMARY CONTAINMENT)

FIGURE 3.6-14 AMENDMENT 6, 08/84



NOTES:

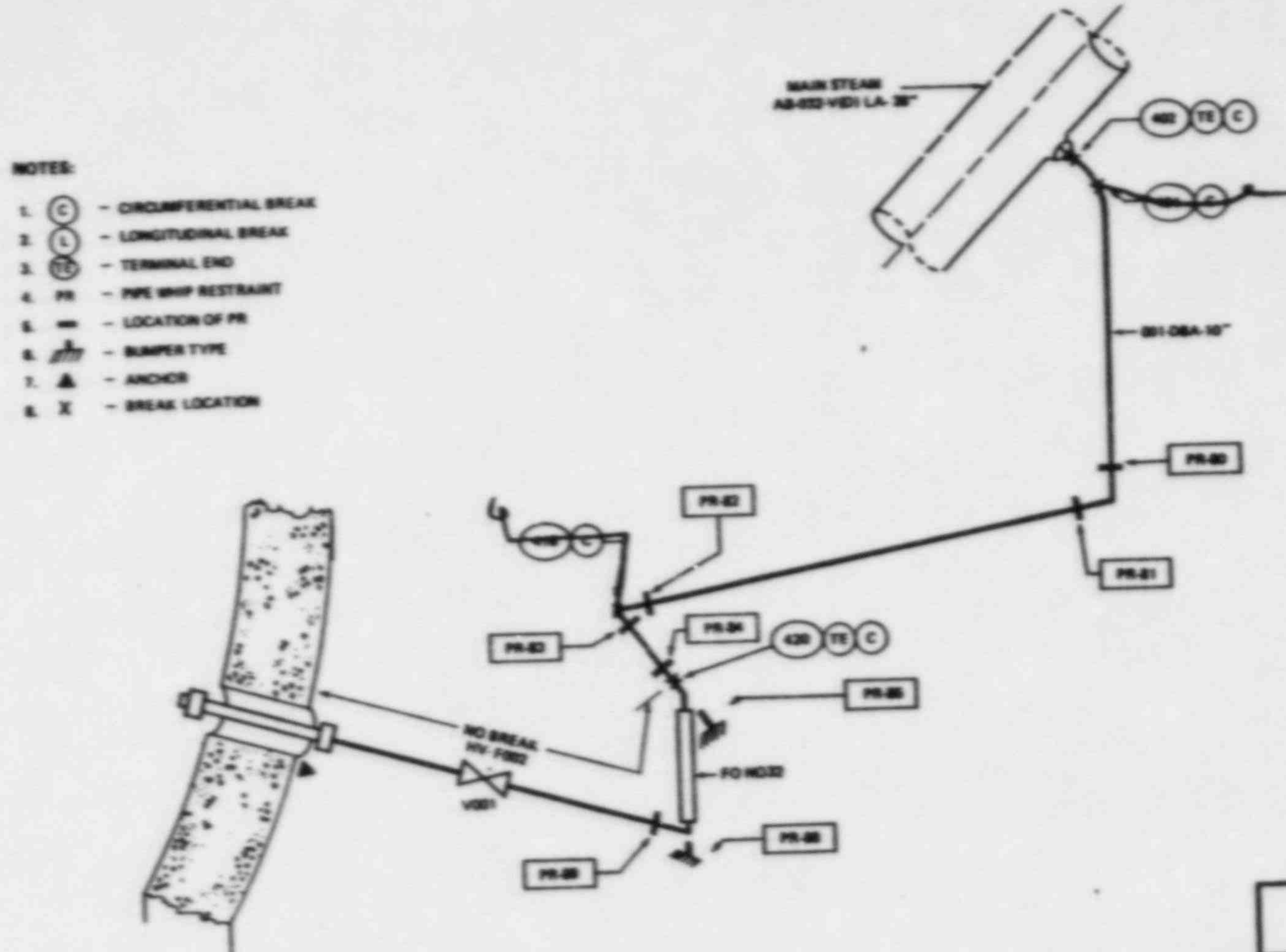
1. (C) – CIRCUMFERENTIAL BREAK
2. (L) – ~~DELETED~~ – LONGITUDINAL BREAK
3. (TE) – TERMINAL END BREAK
4. R – PIPE WHIP RESTRAINT
5. — – LOCATION OF WHIP RESTRAINT
6. – BUMPER TYPE RESTRAINT
7. ▲ – ANCHOR
8. (XXXX) – DENOTES ROOM NUMBER
9. X – PIPE BREAK LOCATION
10. (1) PIPING BEYOND THIS POINT IS 1" NOMINAL DIAMETER.
11. (2) PIPING BEYOND THIS POINT IS MODERATE ENERGY
12. (3) PIPING BEYOND THIS POINT HAS BREAKS AT EVERY FITTING AND CHANGE OF DIRECTION

HOPE CREEK GENERATING STATION
FINAL SAFETY ANALYSIS REPORT

RWCU PIPING ISOMETRIC (PORTION OUTSIDE PRIMARY CONTAINMENT)

FIGURE 3.6-18
SHEET 1 OF 3

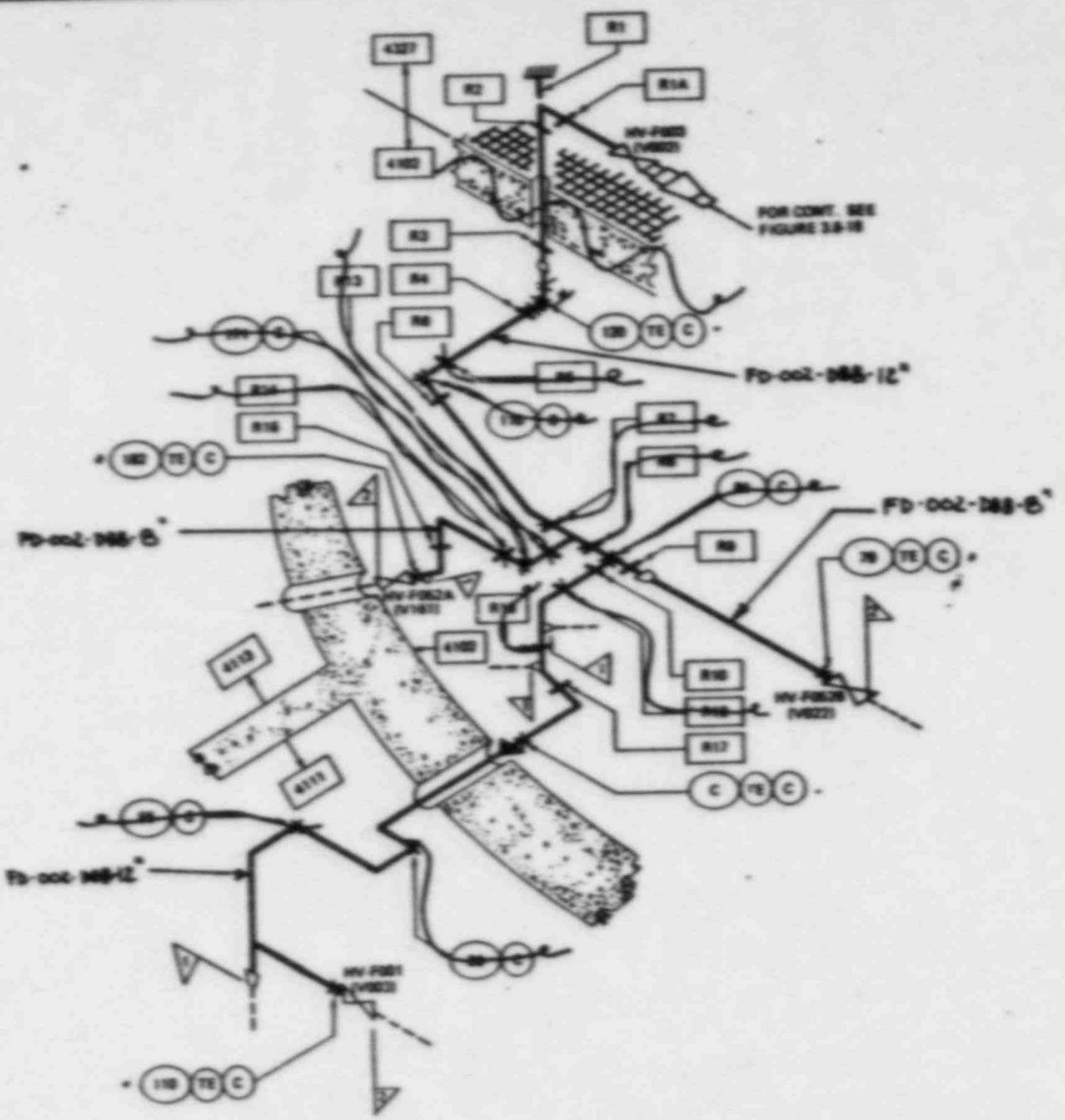
AMENDMENT 6, [illegible]



HOPE CREEK
GENERATING STATION
FINAL SAFETY ANALYSIS REPORT

HPCI STEAM SUPPLY PIPING
ISOMETRIC (PORTION INSIDE
PRIMARY CONTAINMENT)

FIGURE 3.6-16 AMENDMENT 5, 08/84



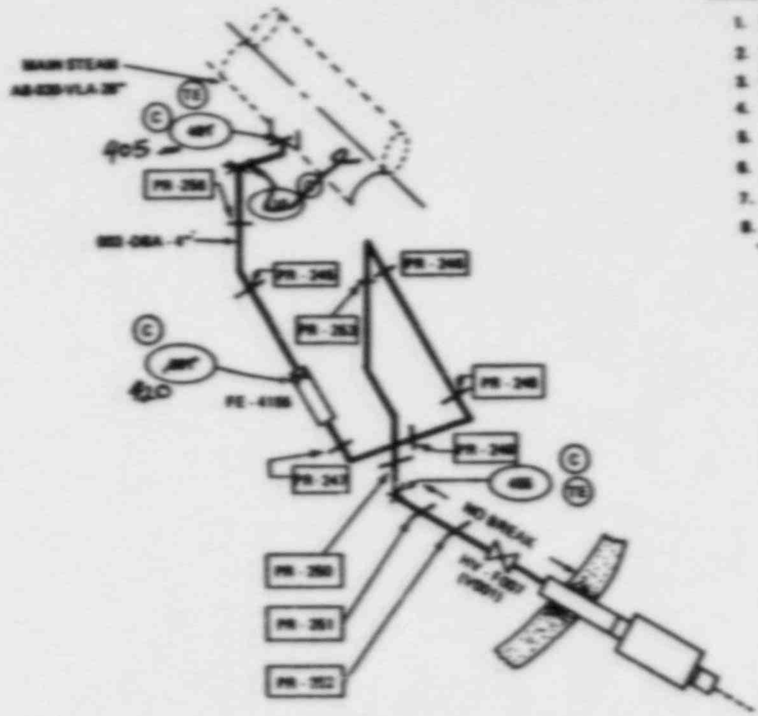
NOTES:

1. (TE) TERMINAL END
2. X BREAK LOCATION
3. [XXXX] ROOM NUMBER
4. PIPING BEYOND THIS POINT IS 1" NOMINAL PIPE SIZE
5. PIPING BEYOND THIS POINT IS MODERATE ENERGY
6. ▲ ANCHOR
7. (C) CIRCUMFERENTIAL BREAK
8. X PIPE WHIP RESTRAINT
9. BUMPE 1 TYPE RESTRAINT
10. PIPE WHIP LOCATIONS

HOPE CREEK GENERATING STATION
FINAL SAFETY ANALYSIS REPORT

HPCI STEAM SUPPLY PIPING ISOMETRIC (PORTION OUTSIDE PRIMARY CONTAINMENT)

FIGURE 3.6-19



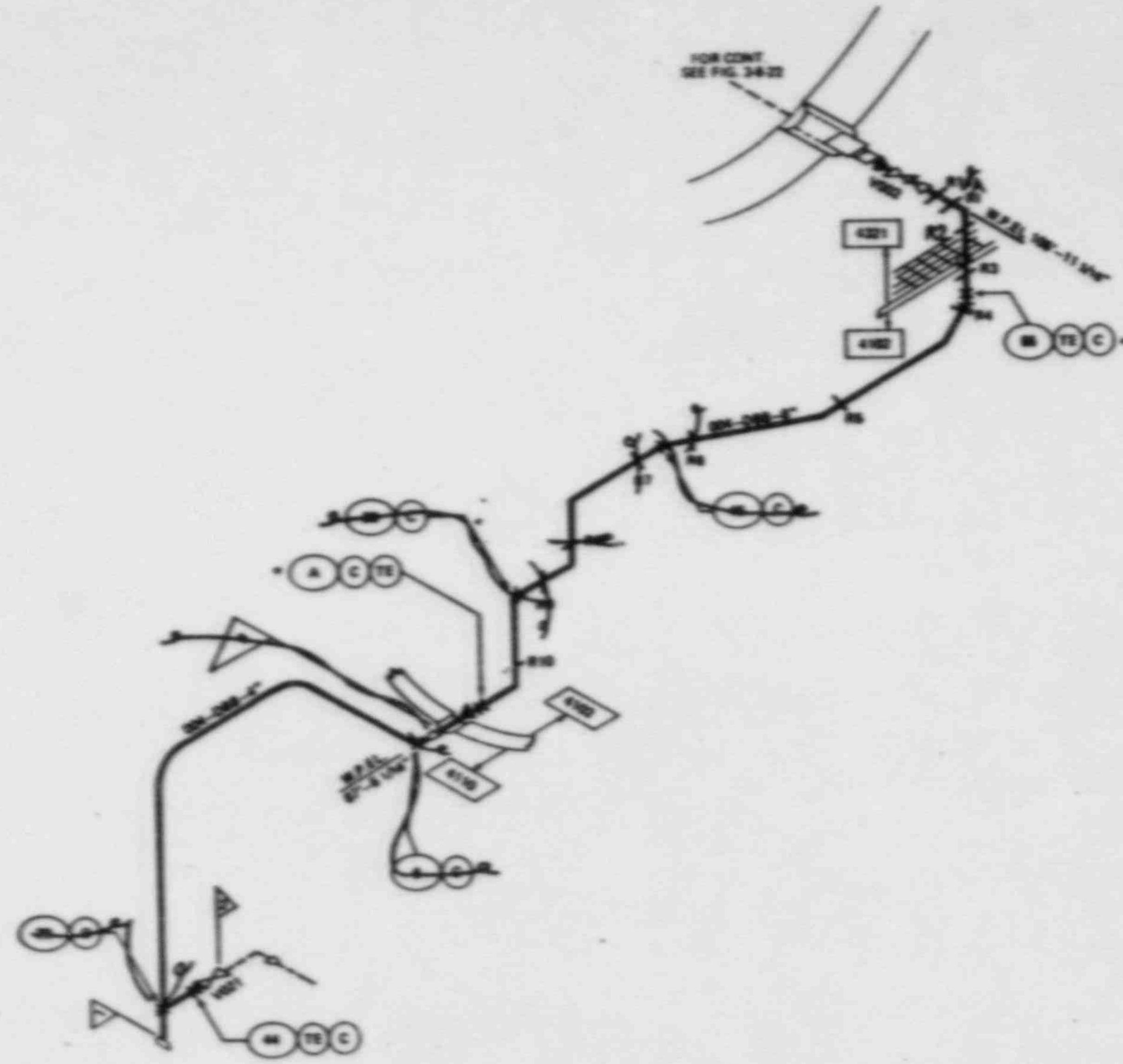
NOTES:

1. © CIRCUMFERENTIAL BREAK
2. Ⓛ LONGITUDINAL BREAK
3. (TE) TERMINAL END
4. PR PIPE WHIP RESTRAINT
5. – LOCATION OF PR
6. BUMPER TYPE
7. ▲ ANCHOR
8. X BREAK LOCATION

HOPE CREEK
GENERATING STATION
FINAL SAFETY ANALYSIS REPORT

RCIC STEAM SUPPLY PIPING
ISOMETRIC (PORTION INSIDE
PRIMARY CONTAINMENT)

FIGURE 3.6-22 AMENDMENT 6



NOTES:

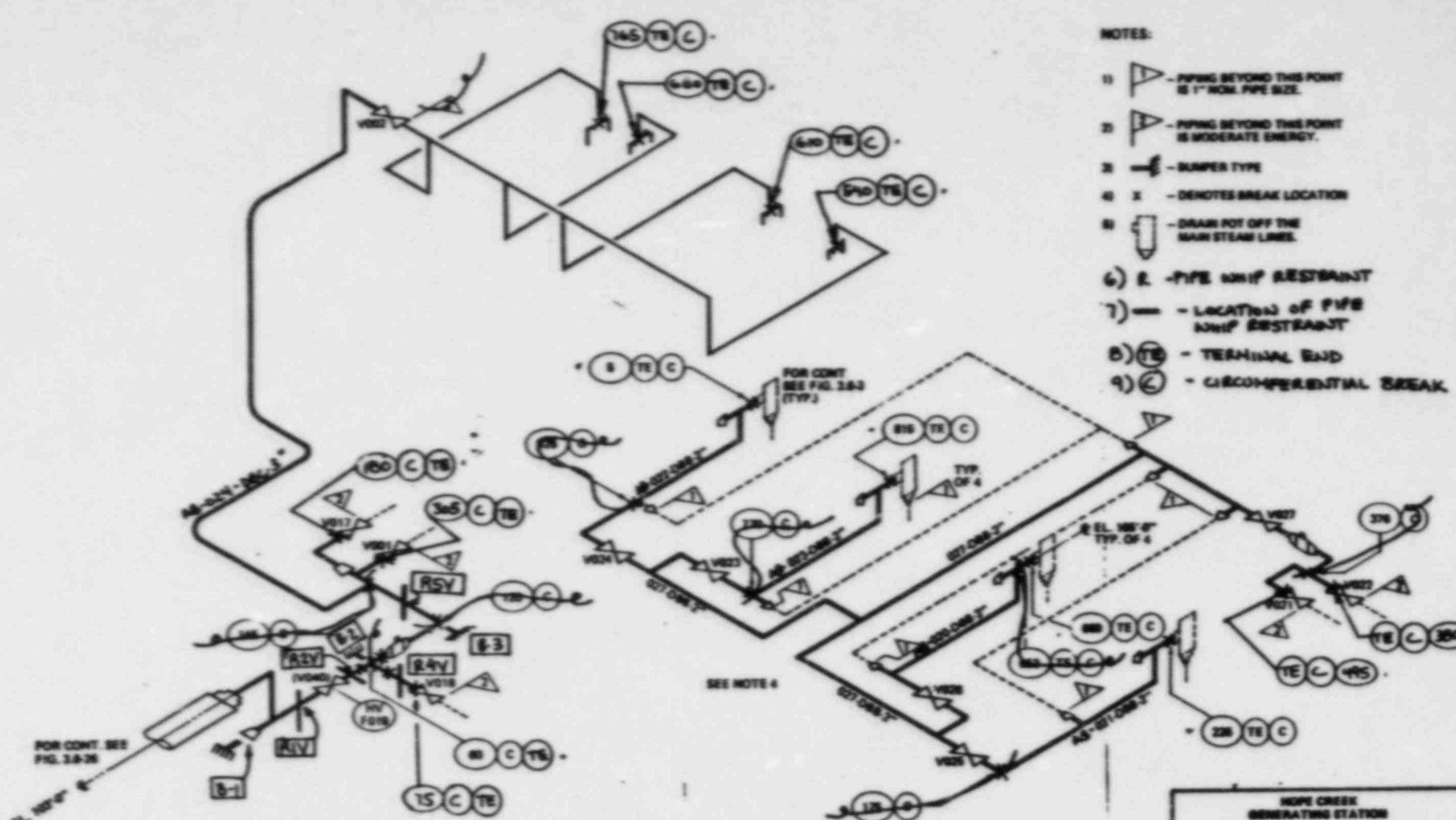
1. —R— PIPE WHIP RESTRAINT
2. (C) CIRCUMFERENTIAL BREAK
3. (TE) TERMINAL END
4. — LOCATION OF RESTRAINT
5. x BREAK LOCATION
6. ▲ ANCHOR
7. PIPING BEYOND THE POINT IS 1" NORMAL PIPE
8. PIPING BEYOND THE POINT MODERATE ENERGY
9. ~~PIPING BEYOND THIS POINT [illegible]~~ DELETED
10. XXXX DENOTES ROOM NUMBER

HOPE CREEK GENERATING STATION

FINAL SAFETY ANALYSIS REPORT

RCIC STEAM SUPPLY PIPING ISOMETRIC (PORTION OUTSIDE PRIMARY CONTAINMENT)

FIGURE 3.6-23 AMENDMENT [illegible]



NOTES:

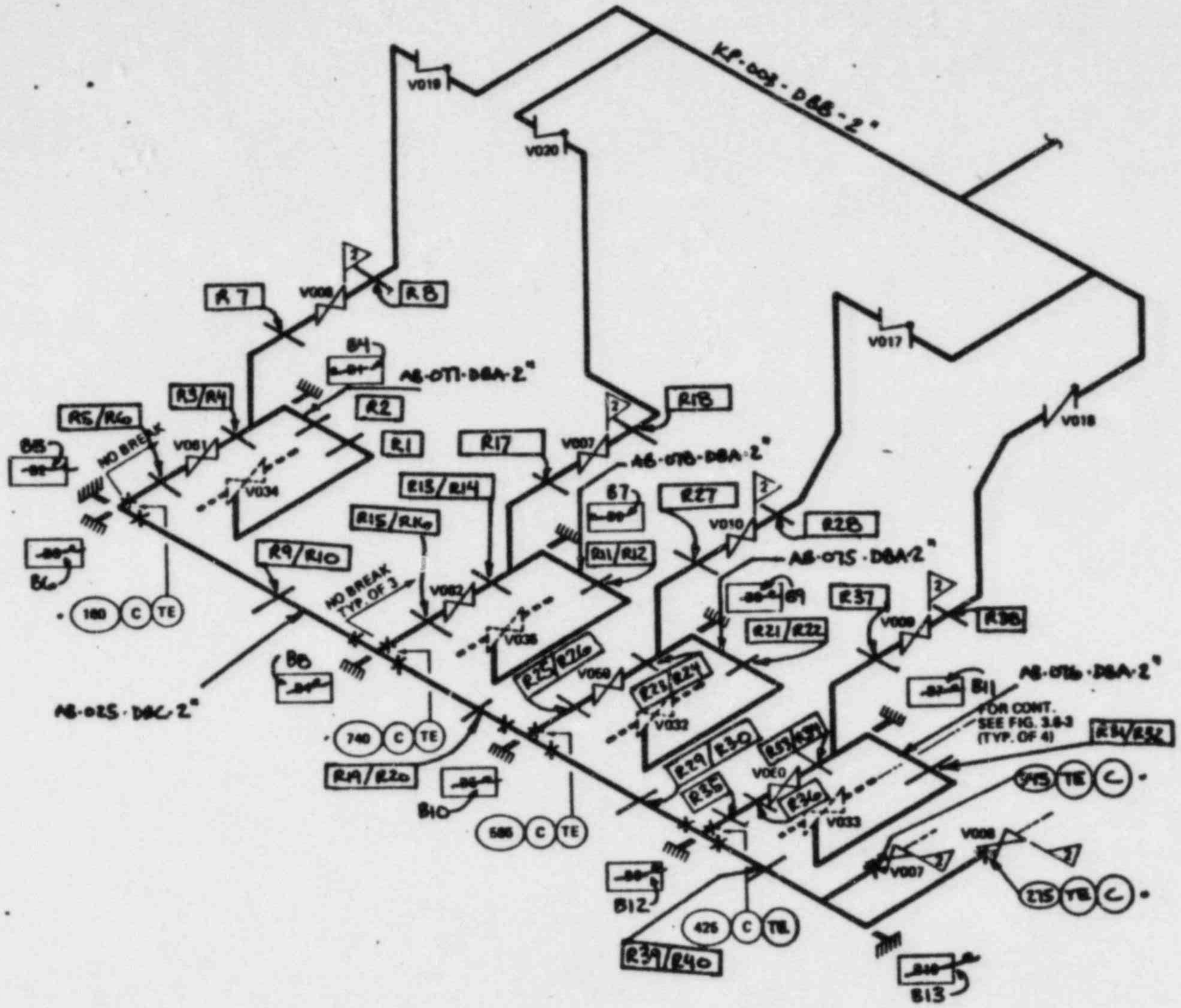
1) — PIPING BEYOND THIS POINT IS 1" NOM. PIPE SIZE.
2) — PIPING BEYOND THIS POINT IS MODERATE ENERGY.
3) — BUMPER TYPE
4) X — DENOTES BREAK LOCATION
5) — DRAIN POT OFF THE MAIN STEAM LINES.
6) R - PIPE WHIP RESTRAINT
7) — - LOCATION OF PIPE WHIP RESTRAINT
8) (TE) - TERMINAL END
9) (C) - CIRCUMFERENTIAL BREAK

HOPE CREEK GENERATING STATION
FINAL SAFETY ANALYSIS REPORT

MAIN STEAM DRAIN PIPING ISOMETRIC (PORTION OUTSIDE PRIMARY CONTAINMENT)

FIGURE 3.6-27
SHEET 1 OF 2

AMENDMENT 6, 05/84



NOTES:

1. B – BUMPER RESTRAINT
2. R – PIPE WHIP RESTRAINT
3. (TE) – TERMINAL END
4. ▬ – LOCATION OF PIPE WHIP RESTRAINT
5. X – BREAK LOCATION
6. ▷ – PIPING BEYOND THIS POINT IS MODERATE ENERGY.
7. (C) – CIRCUMFERENTIAL BREAK

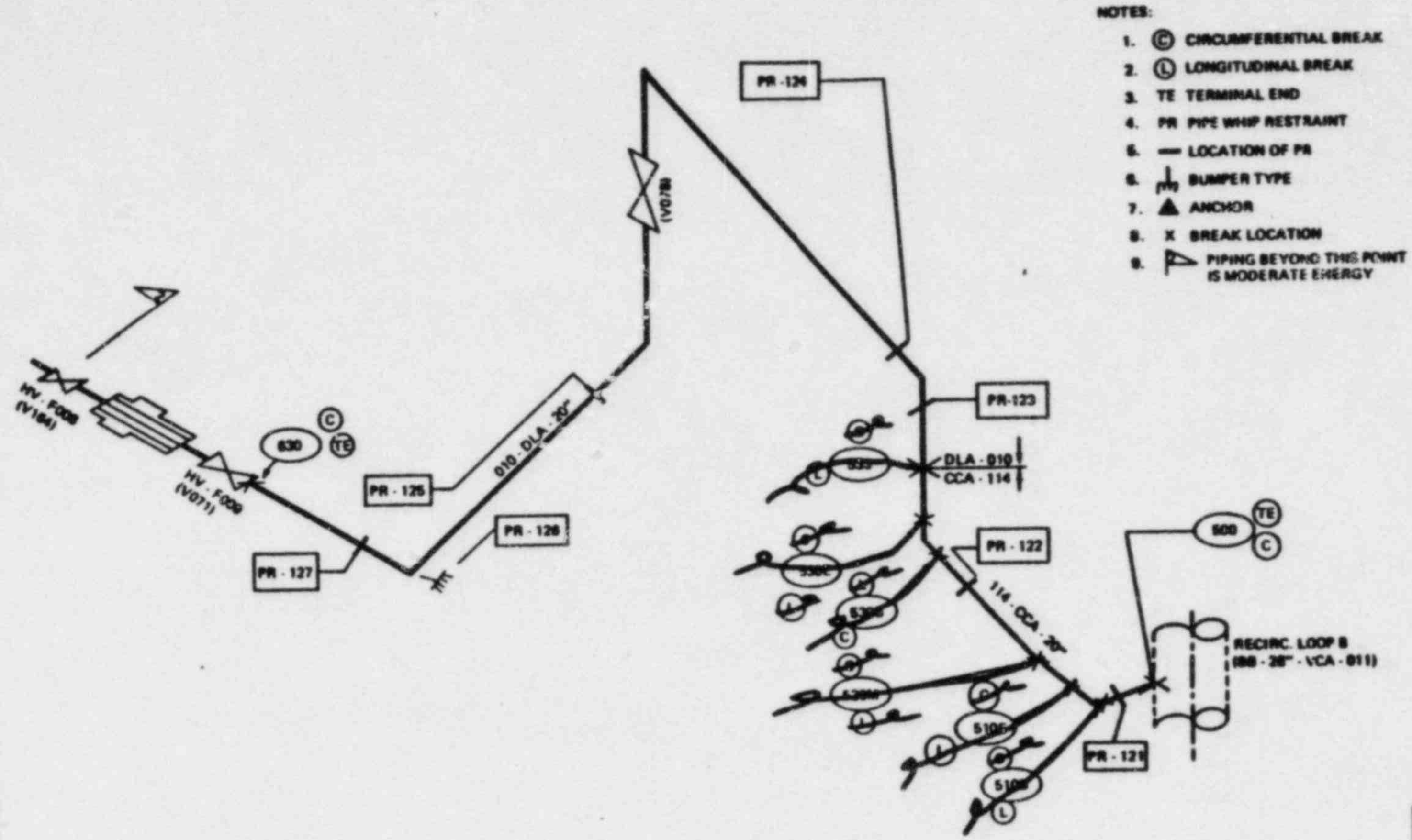
HOPE CREEK GENERATING STATION

FINAL SAFETY ANALYSIS REPORT

MAIN STEAM DRAIN PIPING ISOMETRIC (PORTION OUTSIDE PRIMARY CONTAINMENT)

FIGURE 3.6-37
SHEET 2 OF 2

AMENDMENT 6, 06/84



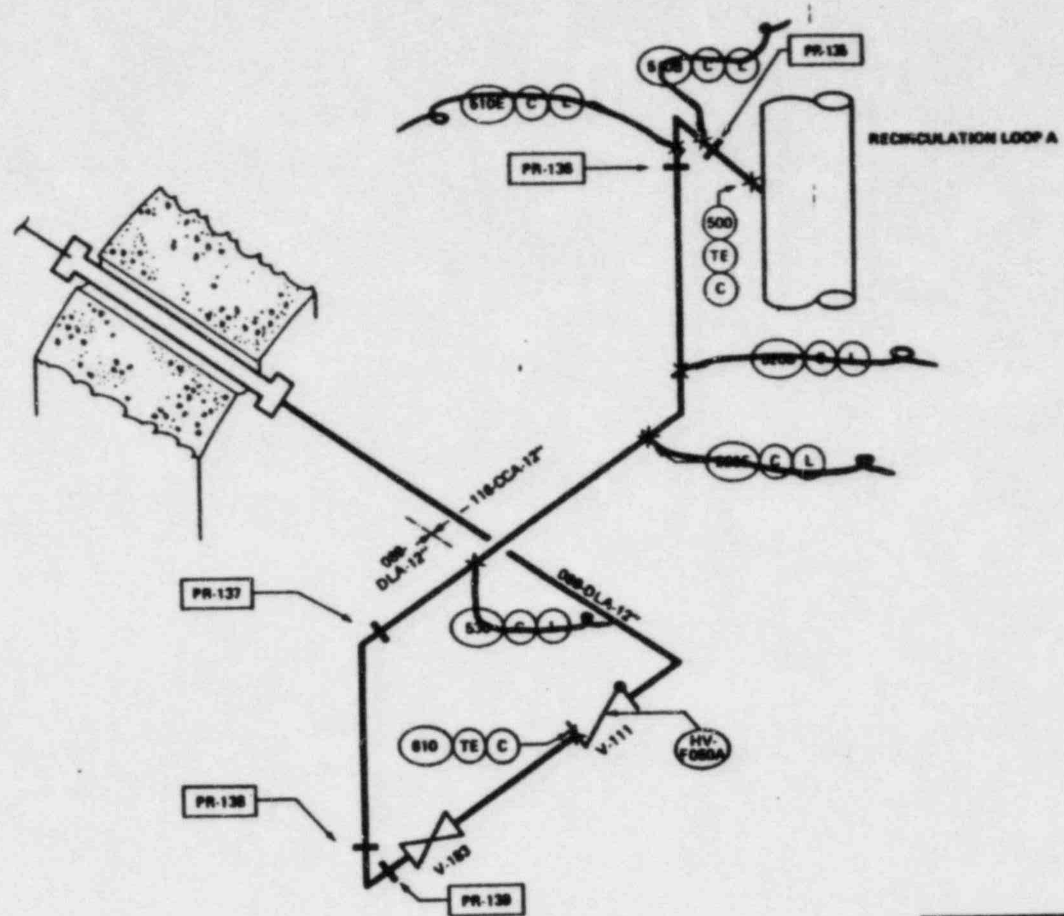
HOPE CREEK
GENERATING STATION
FINAL SAFETY ANALYSIS REPORT

RHR SHUTDOWN COOLING
SUCTION PIPING ISOMETRIC

FIGURE 3.6-39 AMENDMENT 6, 06/84

NOTES:

1. (C) – CIRCUMFERENTIAL BREAK
2. (L) – LONGITUDINAL BREAK
3. TE – TERMINAL END
4. PR – PIPE WHIP RESTRAINT
5. ▬ – LOCATION OF PR
6. X – BREAK LOCATION

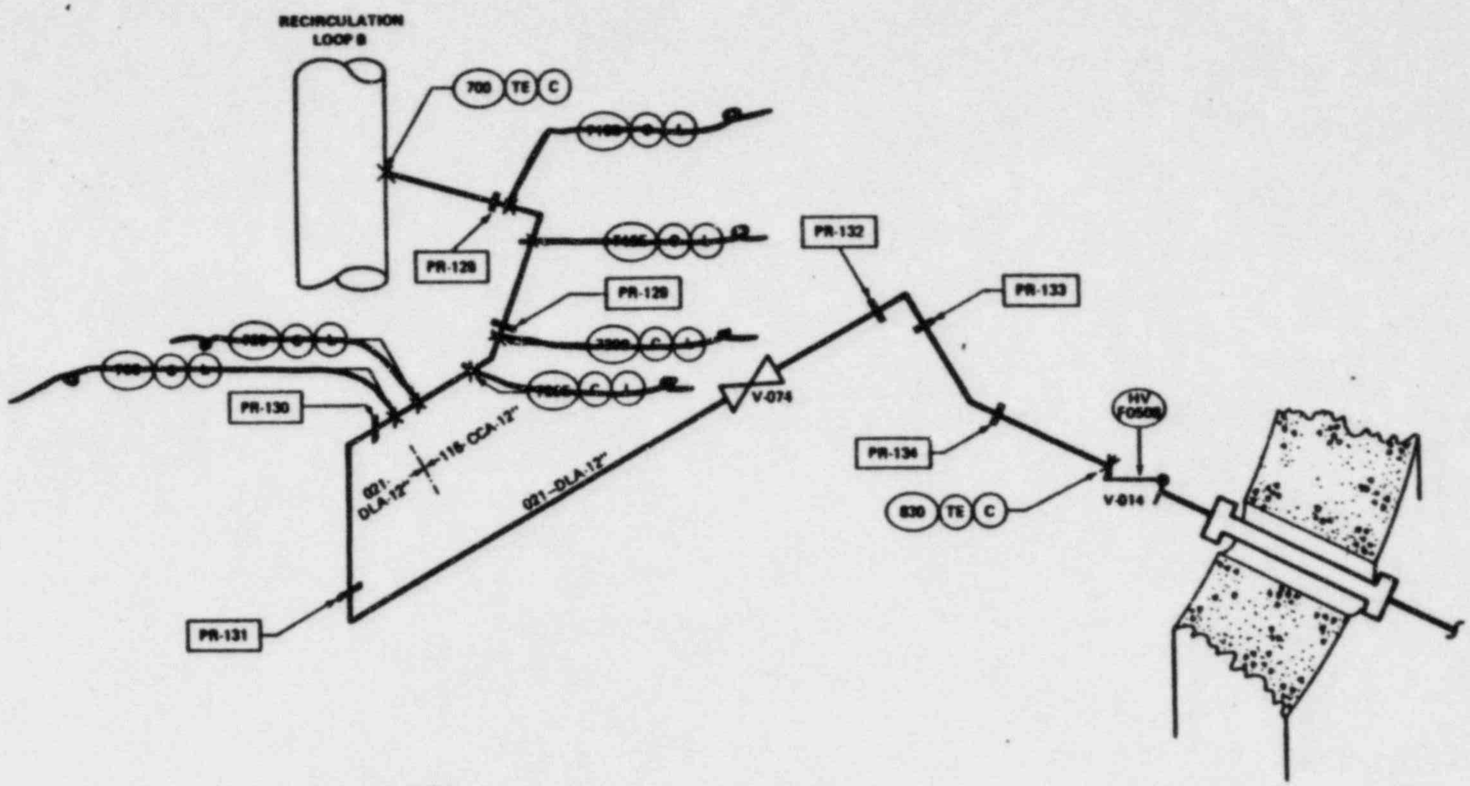


HOPE CREEK
GENERATING STATION
FINAL SAFETY ANALYSIS REPORT

RHR SHUTDOWN COOLING
RETURN PIPING ISOMETRIC
LOOP A

FIGURE 3.6-31
SHEET 1 OF 2

AMENDMENT 6, 05/84



NOTES:

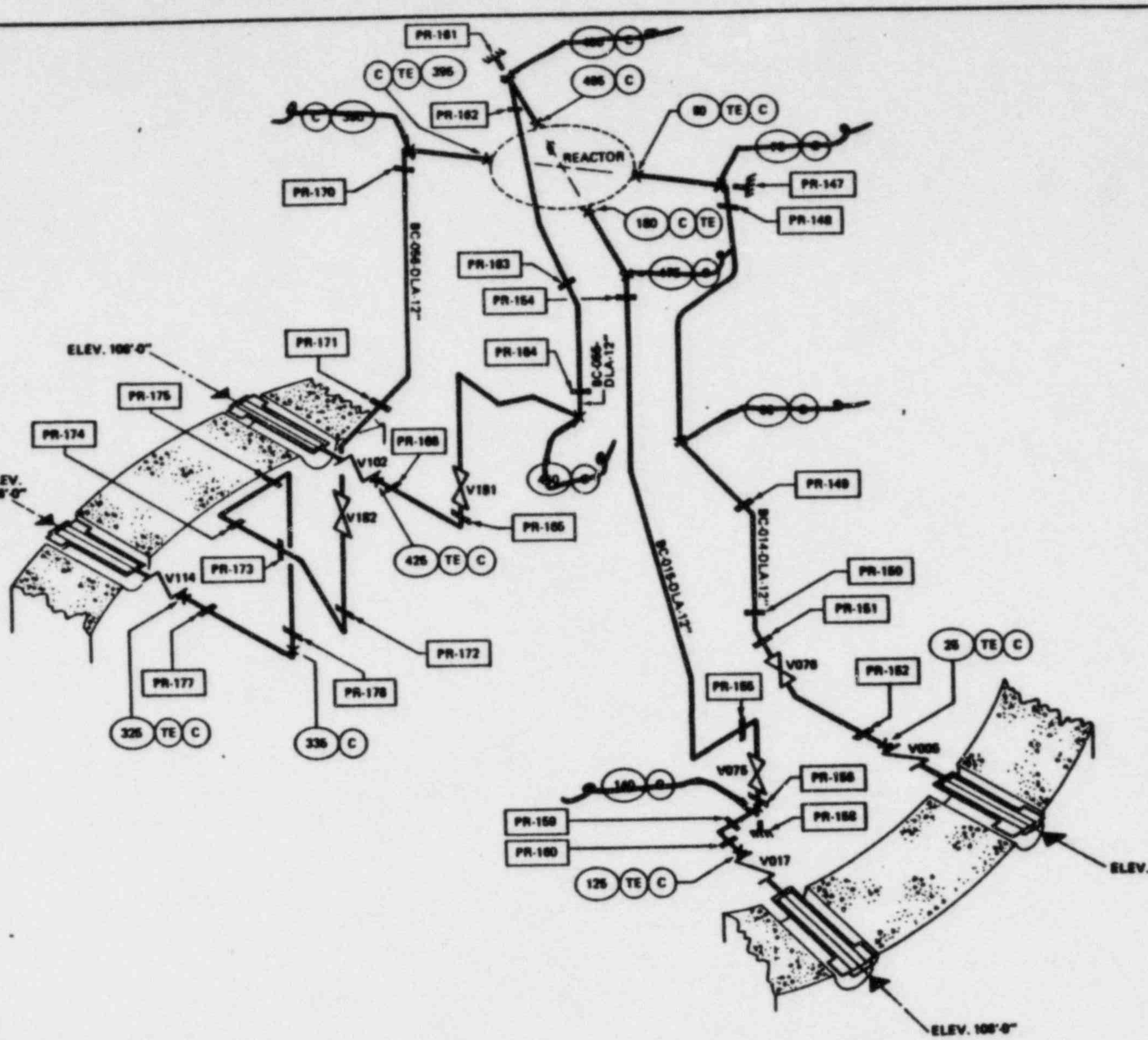
1. (C) – CIRCUMFERENTIAL BREAK
2. (L) – LONGITUDINAL BREAK
3. TE – TERMINAL END
4. PR – PIPE WHIP RESTRAINT
5. ▬ – LOCATION OF P…
6. X – BREAK LOCATION

HOPE CREEK
GENERATING STATION
FINAL SAFETY ANALYSIS REPORT

RHR SHUTDOWN COOLING
RETURN PIPING ISOMETRIC
LOOP B

FIGURE 3.6-31
SHEET 2 OF 2

AMENDMENT 6, 08/84



NOTES:

1. (C) – CIRCUMFERENTIAL BREAK
2. (L) – LONGITUDINAL BREAK
3. TE – TERMINAL END
4. PR – PIPE WHIP RESTRAINT
5. ▬ – LOCATION OF PR
6. ┤ – BUMPER TYPE
7. ▲ – ANCHOR
8. X – BREAK LOCATION

HOPE CREEK
GENERATING STATION
FINAL SAFETY ANALYSIS REPORT

LPCI INJECTION PIPING ISOMETRIC

FIGURE 3.6-32

AMENDMENT 6, 06/84

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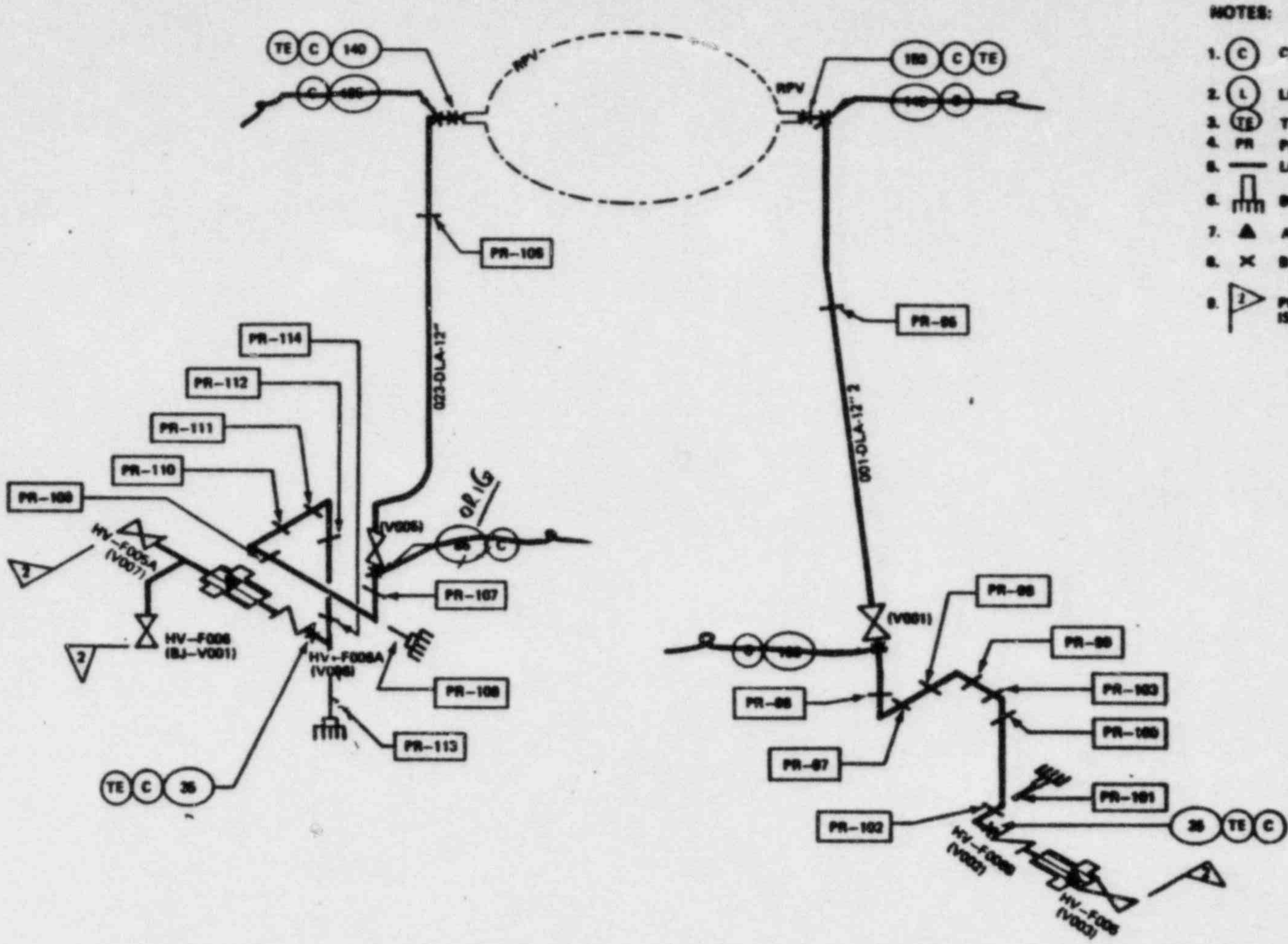

NOTES:

1. (C) CIRCUMFERENTIAL BREAK
2. (L) LONGITUDINAL BREAK
3. (TE) TERMINAL END
4. PR PIPE WHIP RESTRAINT
5. — LOCATION OF PR
6. BUMPER TYPE
7. ▲ ANCHOR
8. × BREAK LOCATION
9. PIPING BEYOND THIS POINT IS MODERATE ENERGY.

HOPE CREEK
GENERATING STATION
FINAL SAFETY ANALYSIS REPORT

CORE SPRAY INJECTION
PIPING ISOMETRIC
INSIDE CONTAINMENT

FIGURE 3.6-23 AMENDMENT 6, 06/84