Attachment A

Metropolitan Edison Co.
August 17, 1977
11 Pages

INSERVICE INSPECTION OF TMI-1
CLASS 1 COMPONENT PRESSURE BOUNDARY

I. Scope and Objectives

This attachment describes the inservice inspection program for Class 1 (reactor coolant system) pressure boundary components of TMI-1. The objective of the inservice inspection program is to provide assurance of the continuing integrity of the reactor coolant system while at the same time minimizing radiation exposure to personnel and plant downtime in the performance of the inspections.

II. Identification of Class 1 Boundary

The Class 1 boundary was established in accordance with 10CFR50, paragraph 50.2(v) and footnote 2 to paragraph 50.55a(g)(1). The Class 1 boundary is shown in the attached drawings, Drawing Nos. C-300-004 & 5-GN1, C300-015 to 017-GN1, and C-300-019 & 020-GN1.

III. Applicable Code Edition and Addenda

In accordance with 10CFR50, paragraph 50.55a(b), the applicable Code Edition and Addenda are the 1974 Edition with Addenda through Summer 1975.

IV. Period of Applicability

In accordance with 10CFR50, paragraph 50.55a(g)(4)(ii), this program is applicable from January 1978 to May 1981. However, the program is

written in terms of the Code required ten-year inspection interval, which started September 1974.

V. Bases for Inspection

The inspection program detailed in Table A-1 below follows the Code, except that inspections are focused on those areas which engineering analysis indicates are subject to relatively more critical conditions of stress, fatigue, radiation, and/or thermal cycles. Inspections are also required of those areas which had recordable indications during the pre-service baseline examination. It is considered that inspection of areas subjected to relatively more critical conditions or which have pre-existing indications will provide good assurance of identification of any potential problems before significant flaws develop in the Class 1 component pressure boundaries.

VI. Inspection Program

Inservice inspections will be carried out in accordance with Section XI, 1974 Edition with Addenda through Summer 1975, except that the specific inspections to be performed will be in accordance with Table A-1 rather than Tables IWB-2500 and IWB-2600 in the Code.

Any repairs found to be necessary as a result of inservice inspections will be performed in accordance with Section XI, 1974 Edition with Addenda through Summer 1975.

1491 246

TABLE A-1

CLASS 1 INSERVICE INSPECTIONS

ITEM NO. PER TABLE IWB-2600	EXAMINATION CATEGORY PER TABLE IWB-2500	AREAS TO BE EXAMINED	INSPECTION METHOD	INSPECTION SCHEDULE AND EXTENT	REMARKS
Reactor Vessel					
B1.1	B-A	Longitudinal and circumferential welds and major weld repairs in the core beltline region. These welds include the two circumferential welds and four longitudinal welds in the beltline region.	Volumetric	At or near the end of the 10-year inspection interval, 10% of each longitudinal and 5% of each circumferential weld will be inspected. When the neutron fluence exceeds 10^{19} nvt (E_n of 1.0 Mev or greater), the length of each weld which is inspected will be increased to 50%. At least 50% of areas with major repairs shall be inspected by the end of the second 10-year inspection interval.	These inspections will include a region in the center circumferential weld which had a UT reflector.
B1.2	B-B	Longitudinal and circumferential welds in the shell and heads (other than those covered in Items B1.1 and B1.3.	See Remarks	See Remarks	The welds in this category are the circumferential weld just above the support skirt junction with the vessel, the lower head to vessel weld which is only accessible from the bottom of the vessel, and the circumferential nozzle belt weld. The stresses and fatigue usages in these welds are lower than in the other reactor vessel shell welds to be inspected per Items B1.1 and B1.4. Therefore, no inspections are planned.
B1.3	B-C	Vessel to flange and head to flange circumferential welds.	Volumetric	1/3 about every 3-1/3 years.	
B1.4	B-D	Primary nozzle to vessel welds and nozzle inside radiused sections.	Volumetric	100% of one outlet nozzle will be inspected each five years, and 100% of the higher stressed core flood nozzle will be inspected near the end of the 10-year inspection interval.	The outlet nozzles are selected for inspection since they see higher stresses and fatigue usage than the inlet nozzles. The higher stressed core flood nozzle is selected because it has a somewhat different configuration than the outlet nozzles.
B1.5	B-E	Pressure retaining partial penetration welds in the vessel.	Visual	The area around 25% of the control rod drive penetration nozzle welds will be inspected for leakage during the pressure test conducted near the end of the 10-year inspection interval.	
B1.6	B-F	Primary nozzle to safe-end welds (dissimilar metal welds).	Volumetric	100% of the dissimilar metal weld at the nozzle leading to core flooding tank 1A will be inspected. This inspection will be done near the end of the 10-year inspection interval.	The pipe stresses at this nozzle are about three times those at the nozzle leading to tank 1B. The core flooding nozzles are the only nozzles on the reactor vessel with dissimilar metal welds. Surface inspection will not be performed because of the high radiation levels at this weld.
B1.7	B-G-1	Closure studs, in-place.	See Item B1.8	See Item B1.8.	
B1.8	B-G-1	Closure studs and nuts 2 inches and over in diameter.	Volumetric and surface	Cumulative 100% with 33-1/3% being examined about every 3-1/3 years.	The studs and nuts are normally removed during refueling and are thus accessible for surface inspection.

TABLE A-1

CLASS 1 INSERVICE INSPECTIONS

ITEM NO. PER TABLE IWB-2600	EXAMINATION CATEGORY PER TABLE IWB-2500	AREAS TO BE EXAMINED	INSPECTION METHOD	INSPECTION SCHEDULE AND EXTENT	REMARKS
B1.9	B-G-1	Ligaments between threaded stud holes.	Volumetric	Cumulative 100% with 33-1/3% being examined about every 3-1/3 years.	
B1.10	B-G-1	Closure washers, bushings.	Visual	Cumulative 100% with 33-1/3% being examined about every 3-1/3 years.	
B1.11	B-G-2	Pressure retaining bolting below 2 inches in diameter.	Visual	Cumulative 100% with 33-1/3% being examined about every 3-1/3 years.	Will be done in place unless joints are disassembled for other reasons.
B1.12	B-H	Integrally welded vessel supports	See Remarks	See Remarks	Inspection is not required since the skirt to vessel junction is an integrally forged piece.
B1.13	B-I-1	Closure head cladding	See Remarks	See Remarks	Experience has shown cladding inspections to not be warranted, and they have been deleted.
B1.14	B-I-1	Vessel cladding.	See Remarks	See Remarks	Experience has shown cladding inspections to not be warranted, and they have been deleted.
B1.15	B-N-1	Vessel interior.	Visual	Normally accessible areas will be visually inspected at the first refueling and every third refueling thereafter.	
B1.16	B-N-2	See Remarks	See Remarks	See Remarks	This inspection applies only to BWRs.
B1.17	B-N-3	Removable core support structures.	Visual	This inspection will be performed once each 10-year inspection interval.	
B1.18	B-O	Control rod drive housings	Volumetric	There are three control rod drive housings with welds with UT reflectors. These three housings will be inspected during the 10 year interval with one being inspected each 3-1/3 years.	
B1.19	B-P	Exempted components.	Visual	These components will be inspected for leakage during the pressure test conducted near the end of the 10-year inspection interval.	
Pressurizer					
B2.1	B-B	Longitudinal and circumferential welds.	Volumetric	One foot of the circumferential and one foot of the longitudinal weld at each corner of the heater bundle course will be inspected. One corner will be inspected within 3-1/3 years, a second within 6-2/3 years, and all four by the end of ten years.	The intersections of the longitudinal and circumferential welds at the four corners of the heater bundle course see higher stresses and fatigue usages than the other longitudinal and circumferential shell welds in the pressurizer.

TABLE A-1

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ITEM NO. PER TABLE IWB-2600	EXAMINATION CATEGORY PER TABLE IWB-2500	AREAS TO BE EXAMINED	INSPECTION METHOD	INSPECTION SCHEDULE AND EXTENT	REMARKS
B2.2	B-D	Nozzle-to-vessel welds and nozzle-to-vessel radiused section.	Volumetric	The surge nozzle weld will be inspected in the first five years and the spray nozzle in the second five years of the 10-year inspection interval. In addition, the three relief and safety nozzles each have UT reflectors, and the areas with reflectors will be inspected during the 10-year inspection interval with one nozzle being inspected each 3-1/3 years.	The surge and spray nozzles are subjected to higher stresses than the relief and safety valve nozzles, and are therefore selected for inspection.
B2.3	B-E	Heater penetrations.	Visual	These connections will be inspected during the pressure test conducted near the end of the 10-year inspection interval.	
B2.4	B-F	Nozzle-to-safe-end welds (dissimilar metal).	See Remarks	See Remarks	These dissimilar metal welds are covered in Item B4
B2.5, B2.6 and B2.7	B-G-1	Pressure retaining bolting 2 inches and greater in diameter.	Visual, volumetric and surface	The bolting for the manway and the three heater bundles will be inspected during the 10-year inspection interval with one or two of these sets of bolting being checked about every 3-1/3 years.	In-place visual and volumetric inspections will be performed unless the bolting is removed for other reasons, in which case surface inspection will also be performed.
B2.8	B-H	Integrally welded vessel supports.	Volumetric	The eight supports will be inspected each 10-year inspection interval, with about 1/3 of them being inspected each 3-1/3 years.	
B2.9	B-I-2	Vessel cladding.	See Remarks	See Remarks	Experience has shown cladding inspections to not be warranted, and they have been deleted.
B2.10	B-J	Exempted components.	Visual	These components will be inspected for leakage during the pressure test conducted near the end of the 10-year inspection interval.	
B2.11	B-G-2	Pressure retaining bolting less than 2 inches in diameter.	Visual	This bolting will be visually inspected at least once during the 10-year interval. The inspections will be done in place unless breaking the connection is required for other reasons. 1/3 of these inspections will be done about every 3-1/3 years.	
Steam Generators (S. G.) and Let-Down Coolers (L. C.)					
B3.1	B-B	Longitudinal or circumferential welds in primary side shell	Volumetric	S. G. -- The only welds in this category are the tubesheet-to-head welds. Five percent of the upper head-to-tubesheet welds on one steam generator will be inspected near the end of the inspection interval. In addition, all of the four tubesheet to head welds have some UT reflectors, and these reflectors will all be inspected during the 10-year inspection interval	The upper head-to-tubesheet welds are subjected to relatively more severe stress conditions than the lower head-to-tubesheet welds, though both welds see very low stresses and 0.0 fatigue usage.

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CLASS 1 INSERVICE INSPECTIONS

ITEM NO. PER TABLE IWB-2600	EXAMINATION CATEGORY PER TABLE IWB-2500	AREAS TO BE EXAMINED	INSPECTION METHOD	INSPECTION SCHEDULE AND EXTENT	REMARKS
B3.1 (continued)				L. C. -- A portion of the longitudinal seam welds on each primary manifold is accessible at the manifold-to-pipe joint. The accessible portion will be inspected near the end of the inspection interval on the inlet manifold of the cooler which is used the most.	The inlet manifold is subjected to much more severe temperature transients than the outlet manifold.
B3.2	B-D	Primary nozzle-to-head welds and nozzle inside radiused section.	Visual	S. G. -- No volumetric inspections are planned. Visual inspection of the inside radiused section will be performed once during the 10-year inspection interval if the primary heads are opened for other reasons. L. C. -- There are no L. C. welds in this category.	The reactor coolant piping surge nozzle and reactor vessel outlet nozzle welds are subjected to significantly more severe stress and fatigue usage conditions than S. G. nozzle welds. Since the surge and reactor vessel outlet nozzle welds will be inspected, inspection of the S. G. nozzle welds is not warranted.
B3.3	B-F	Primary nozzle-to-safe-end welds (dissimilar metal).	See Remarks	See Remarks	S. G. and L. C. -- There are no welds in this category.
B3.4, B3.5 and B3.6	B-G-1	Pressure retaining bolting 2 inches and over in diameter.	Visual, volumetric and surface	S. G. -- The bolting for the four manways will be inspected during the 10-year interval, with one or two manways being inspected each 3-1/3 years. L. C. -- There is no bolting in this category.	In-place visual and volumetric inspections will be performed unless the bolting is removed for other reasons, in which case surface inspection will also be performed.
B3.7	B-H	Integrally welded vessel supports.	Volumetric	S. G. -- Ten percent of the length of this weld on each steam generator will be inspected during the 10-year inspection interval with 3-1/3% of each weld being inspected about every 3-1/3 years. L. C. -- There are no supports in this category.	These inspections will include the regions in one of these welds which had UT reflectors.
B3.8	B-I-2	Vessel cladding.	See Remarks	S. G. -- See Remarks L. C. -- There is no cladding in the L. C.	Experience has shown cladding inspections to not be warranted, and they have been deleted.
B3.9	B-P	Exempted components.	Visual	These components will be inspected for leakage during the pressure test conducted near the end of the 10-year inspection interval.	
B3.10	B-G-2	Pressure retaining bolting less than 2 inches in diameter.	Visual	S. G. -- This bolting will be visually inspected at least once during the 10-year inspection interval. The inspections will be done in place unless breaking the connection is required for other reasons. 1/3 of these checks will be done about every 3-1/3 years. L. C. -- There is no bolting in this category.	

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Piping					
B4.1	B-F	Safe-end welds (dissimilar metal).	Volumetric and surface	28" pipe -- The four bimetallic welds at the RC pump outlets will be inspected in the 10-year inspection interval; one by 3-1/3 years, two by 6-2/3 years, and four by ten years. 14" pipe -- See Item B1.6. 12" and 10" pipe -- The bimetallic welds at the surge line connection to the reactor coolant pipe and to the pressurizer will be inspected. One of these will be inspected each five years. 4" and under pipe -- The bimetallic weld at the high pressure injection nozzle used for normal make-up will be inspected once each 3-1/3 years, and the bimetallic weld at the nozzle connected to valve MU-V86A will be inspected once during the 10-year inspection interval.	The bimetallic welds at the RC pump outlets see significantly higher stresses and fatigue usage than at the RC pump inlets. There are three welds in this group: One decay heat outlet and one surge line dissimilar metal weld to the reactor coolant (RC) piping, and one surge line dissimilar metal weld to the pressurizer. Of these welds, the welds at the surge line connection to the pressurizer and the RC pipe see significantly higher stresses and fatigue usage and thus are selected for inspection. The welds in this group include four high pressure injection, one letdown, and three drain line dissimilar metal welds to the RC piping, and three relief and one spray dissimilar metal welds to the pressurizer. Of these welds, the high pressure injection nozzle used for normal make-up sees relatively higher thermal transients and is selected for inspection. The dissimilar metal weld in the nozzle connected to MU-V86A is subjected to the highest piping stresses and is also selected for inspection.
B4.2, B4.3 and B4.4	B-G-1	Pressure retaining bolting 2 inches and over in diameter.	See Remarks	See Remarks	There are no bolted joints in Class 1 piping with bolting 2 inches or over in diameter.
B4.5	B-J-1	Circumferential and longitudinal pipe welds.	Volumetric	The most severely stressed welds (exclusive of dissimilar metal welds which are covered in Item B4.1) in each size range in each system will be inspected. The following welds will be inspected during the 10-year inspection interval: Reactor Coolant System a. In the 36" I.D. reactor coolant pipe, the welds between the 180° elbow at the top of the steam generator and the vertical run up from the reactor vessel will be inspected together with one foot of each intersecting longitudinal weld. In addition, the reactor vessel outlet nozzle-to-pipe welds will be inspected, since access to these welds is provided when the nozzles are inspected per Item B1.4.	

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ITEM NO. PER TABLE IWB-2600	EXAMINATION CATEGORY PER TABLE IWB-2500	AREAS TO BE EXAMINED	INSPECTION METHOD	INSPECTION SCHEDULE AND EXTENT	REMARKS
B4.5 (continued)				b. In the 28" I.D. reactor coolant pipe, the welds at the upstream ends of the elbows at the discharges of each reactor coolant pump will be inspected together with one foot of each intersecting longitudinal weld. c. In the surge line, the weld at the far end of the elbow welded to the RC pipe will be inspected. d. In the safety valve lines (6" diameter), the weld at the end of the second 90° elbow from the pressurizer safety nozzle to valve RC-RV1A will be inspected e. In the spray lines (2-1/2" diameter), the first weld in the 2-1/2" pipe after the reducer will be inspected. Core Flooding System The pipe-to-reactor nozzle weld in the line from tank A will be inspected. Decay Heat System a. Inlet lines (10" diameter) -- The first weld inside the reactor building in the line with DH-V4B will be inspected. b. Outlet line (12" diameter) -- The downstream weld on the elbow just before the secondary shield wall will be inspected. Make-Up and Purification System a. High pressure injection (2-1/2" diameter) -- (1) Line with valve MU-V16A -- The weld on the reactor building wall side of the first elbow inside the reactor building will be inspected. (2) Line with valve MU-V16B -- The weld on reactor building wall side of the first elbow inside the reactor building will be inspected. (3) Line with valve MU-V16C -- The weld on the downstream side of valve MU-V86B will be inspected (4) Line with valve MU-V16D -- The weld on the downstream side of valve MU-V86A will be inspected.	

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ITEM NO. PER TABLE IWB-26..	EXAMINATION CATEGORY PER TABLE IWB-2500	AREAS TO BE EXAMINED	INSPECTION METHOD	INSPECTION SCHEDULE AND EXTENT	REMARKS
B4.5 (continued)				b. Letdown line (2-1/2" diameter) -- The upstream pipe-to-tee weld upstream of valves MU-V1A and MU-V1B will be inspected. c. Four welds with UT reflectors will also be inspected. The pipe weld inspections will be distributed approximately uniformly over the 10-year inspection interval.	
B4.6	B-J	Branch pipe connections (nozzle-to-pipe welds) over 6 inches in nominal diameter.	Volumetric	The surge line to RC pipe connection will be inspected each 10-year interval.	The only branch connections over 6 inches nominal pipe size are the decay heat-to-RC pipe connection, and the pressurizer surge line-to-RC piping connection. The surge line nozzle weld has a significantly higher usage factor, and is therefore selected for inspection.
B4.7	B-J	Branch pipe connections (nozzle-to-pipe welds) 6 inches or less in nominal diameter.	Surface	The high pressure injection nozzle used for normal make-up will be inspected once each 3-1/3 years.	The nozzles in this category are the four HP injection nozzles, one spray line nozzle, three drain nozzles, and one letdown nozzle. Of these the HP injection nozzle used for normal make-up is subjected to the most severe conditions. Also, experience has shown that nozzles where cold water is injected into a hot system are subject to cracking.
B4.8	B-J	Socket welds.	Surface	25% of the socket welds 2 inches and under and larger than 1 inch will be inspected each inspection interval, except the socket welds in the auxiliary spray line between the spray line and RC-V4. The weld on the pressurizer side of the valve RC-V4 in the auxiliary spray line will be inspected once during the inspection interval.	A detailed stress analysis of most of this piping was not performed and, therefore, standard code inspection requirements will be met. However, a stress analysis was performed for part of the auxiliary spray line, and the selected weld is the highest stressed weld in that line. The 1-1/2" reactor coolant pump seal water piping is exempted from this inspection since the RC pump seal would limit leakage through this piping to less than [redacted] of 1" piping.
B4.9	B-K-1	Supports integrally welded to the pressure boundary.	Volumetric	One support will be inspected each 10-year inspection interval.	There are two integrally welded supports, one on a decay heat line and one on a core flooding line.
B4.10	B-K-2	Piping support components.	Visual	All of the support components will be inspected during the 10-year inspection interval. The inspections will be distributed approximately uniformly over the inspection interval.	
B4.11	B-P	Exempted components.	Visual	These components will be inspected for leakage during the pressure test conducted near the end of the 10-year inspection interval.	
B4.12	B-G-2	Pressure retaining bolting less than 2 inches in diameter.	See Remarks	See Remarks	These joints are covered in the pressurizer and valve sections of this specification.

TABLE A-1

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ITEM NO. PER TABLE IWB-2600	EXAMINATION CATEGORY PER TABLE IWB-2500	AREAS TO BE EXAMINED	INSPECTION METHOD	INSPECTION SCHEDULE AND EXTENT	REMARKS
Reactor Coolant Pumps					
B5.1, B5.2 and B5.3	B-G-1	Pressure retaining bolting 2 inches and over in diameter.	Visual, volumetric and surface	The bolting for the four RC pumps will be inspected during the 10-year inspection interval, with one or two pumps being inspected each 3-1/3 years.	In-place visual and volumetric inspections will be performed unless the bolting is removed for other reasons, in which case surface inspection will also be performed.
B5.4	B-K-1	Integrally welded supports.	Visual and surface	One pump will be inspected each 10-year interval.	Lug welds on the pump casings cannot meaningfully be R. T. or U. T. inspected because of their geometry and since the casings are cast austenitic stainless steel. Therefore L.P will be used.
B5.5	B-K-2	Support components.	Visual	All the support components will be visually inspected during the 10-year inspection interval.	
B5.6	B-L-1	Pump casing seam welds.	See Remarks	See Remarks	There are no casing seam welds on Class 1 pumps.
B5.7	B-L-2	Internal inspection of pump casings.	Visual	This inspection will be done to the extent practicable for one pump casing near the end of the 10-year inspection interval if a pump is removed for other reasons.	
B5.8	B-P	Exempted components.	Visual	These components will be inspected for leakage during the pressure test conducted near the end of the 10-year inspection interval.	
B5.9	B-G-2	Pressure retaining bolting less than 2 inches in diameter.	Visual	This bolting will be visually inspected at least once during the 10-year interval. The inspections will be done in place unless breaking the connection is required for other reasons. 1/3 of these inspections will be done about every 3-1/3 years.	
Valve Pressure Boundary					
B6.1, B6.2 and B6.3	B-G-1	Pressure retaining bolting 2 inches and over in diameter.	See Remarks	See Remarks	None of the valves within the Class 1 boundary use bolting 2 inches or larger in diameter.
B6.4	B-K-1	Integrally welded supports.	See Remarks	See Remarks	Integrally welded supports are not used for valves within the Class 1 boundary.

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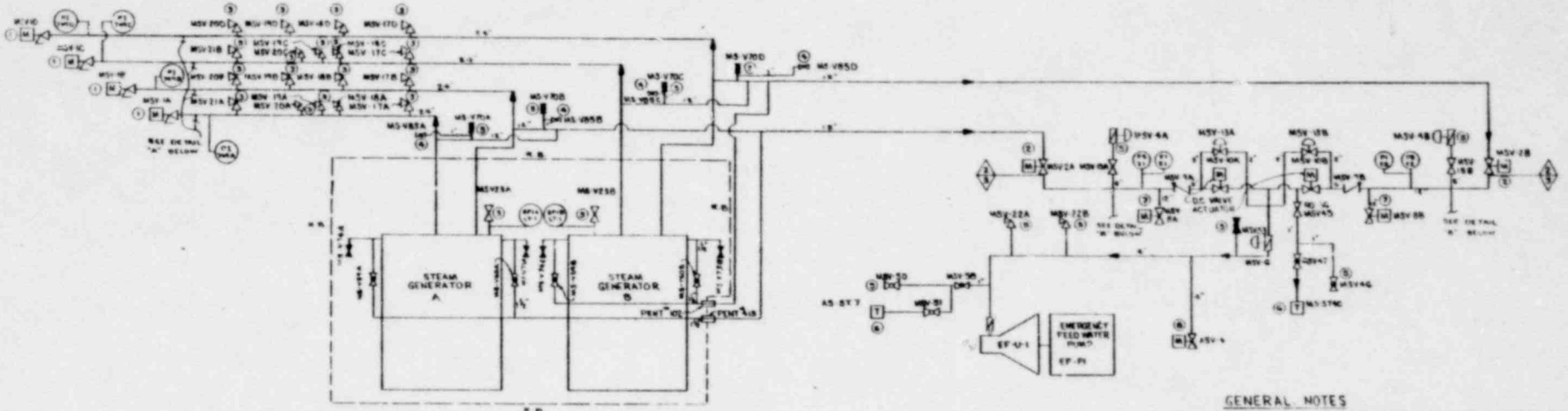
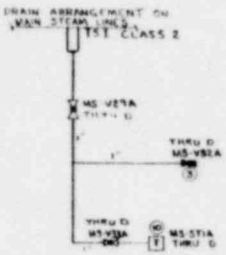
ITEM NO. PER TABLE IWB-26	EXAMINATION CATEGORY PER TABLE IWB-2500	AREAS TO BE EXAMINED	INSPECTION METHOD	INSPECTION SCHEDULE AND EXTENT	REMARKS
B6.5	B-K-2	Support components.	Visual	All of the support components will be visually inspected during the 10-year inspection interval. These inspections will be distributed approximately uniformly over the inspection interval.	
B6.6	B-M-1	Valve body seam welds.	See Remarks	See Remarks	None of the valves within the IS boundary have body seam welds.
B6.7	B-M-2	Internal inspection of valves over 4 inches in nominal size. This applies to:	Visual	Visual inspections will be performed on one valve of each design once during the 10-year inspection interval if the valves are disassembled for other reasons.	
		Valve Tag No.	Size and Type	Manufacturer Catalog No.	
		DH-V1	Gate-12 inches	Walworth 5262	
		DH-V2	Gate-12 inches	Walworth 5262	
		DH-V4A and B	Gate-10 inches	Walworth 5262	
		DH-V22A and B	Check-10 inches	Chapman 2573	
		CF-V4A and B	Check-14 inches	Rockwell 1570	
		CF-V5A and B	Check-14 inches	Rockwell 1570	
B6.8	B-P	Exempted components.	Visual	These components will be inspected for leakage during the pressure test conducted near the end of the 10-year inspection interval.	
B6.9	B-G-2	Pressure retaining bolting less than 2 inches in diameter.	Visual	The bolting will be visually inspected at least once during the 10-year inspection interval. Inspections will be done in place unless breaking the connection is required for other reasons. 1/3 of the bolts will be inspected about every 3-1/3 years.	



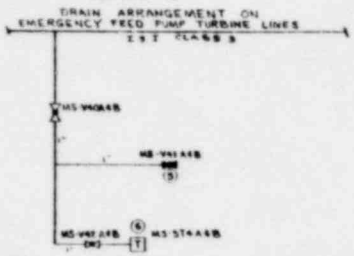
DETAIL "A"

DRAIN ARRANGEMENT ON MAIN STEAM LINES

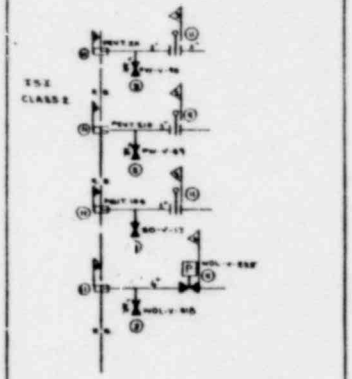


DETAIL "B"

DRAIN ARRANGEMENT ON EMERGENCY FEED PUMP TURBINE LINES



SUMP PUMP AND DRAINAGE SYSTEM PENETRATIONS



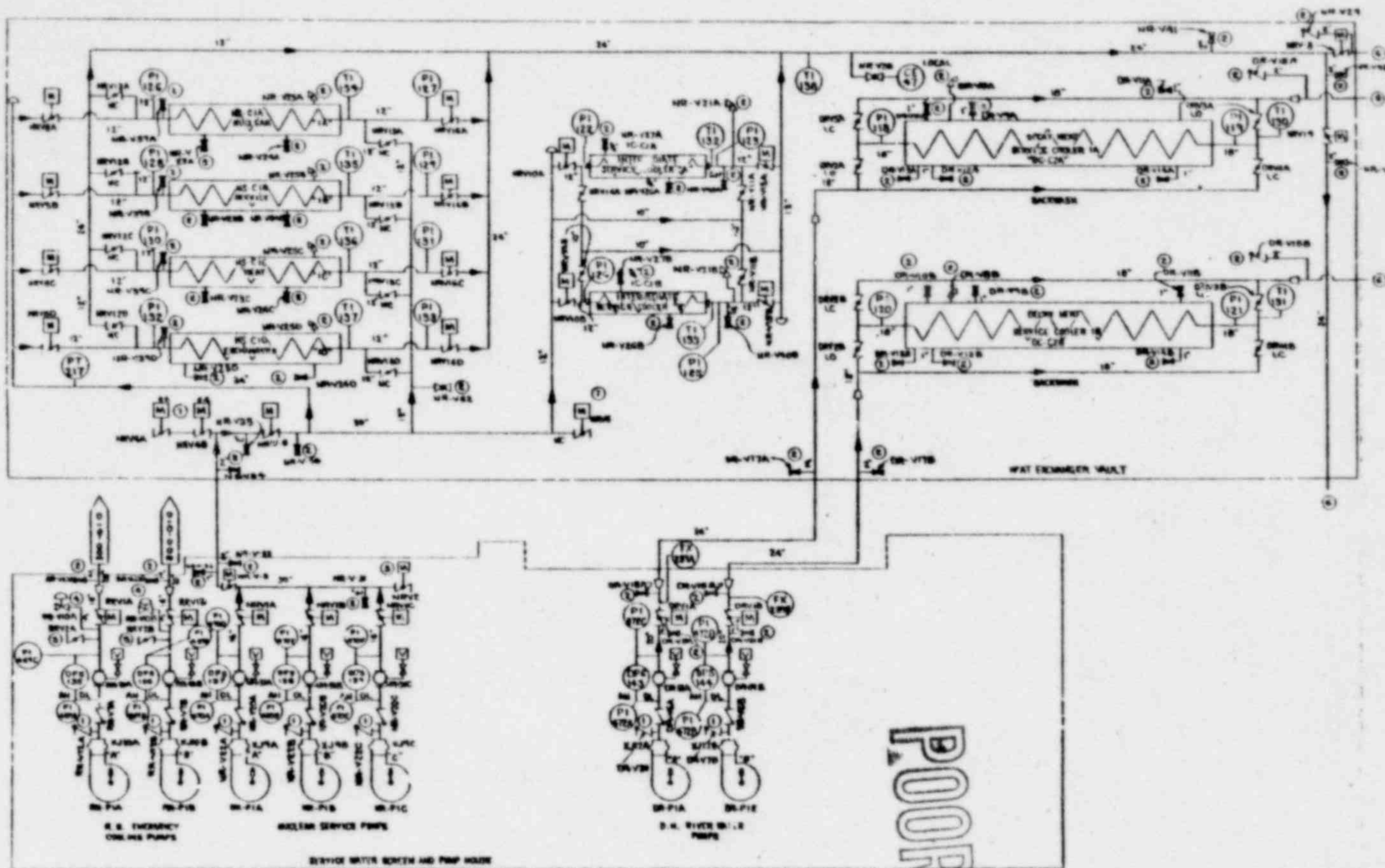
GENERAL NOTES

1. THIS DRAWING REFLECTS ISI CLASSIFICATIONS FOR SYSTEMS SHOWN ON GAI FLOW DIAGRAMS 302-011, 302-011, 302-121 AND 302-119.

SPECIFIC NOTES

1. CLASS II SYSTEM BOUNDARY IS STOPPED AT MS-V-1 A/D PER TO REG. GUIDE 1.26 - STEP (D) BECAUSE MSV-1A/D IS NOT NORMALLY CLOSED OR CAPABLE OF AUTOMATIC CLOSURE AN EXCEPTION MUST BE TAKEN TO THIS STEP. IT IS POSSIBLE TO OPERATE THESE VALVES FROM CONTROL ROOM.)
2. CLASS II SYSTEM BOUNDARY IS STOPPED AT MS-V-2 A/B PER REG. GUIDE 1.26 - STEP (D) (VALVES CAPABLE OF REMOTE CLOSURE)
3. CLASS 1 I SYSTEM BOUNDARY PER REG. GUIDE DISCUSSION VENT, DRAIN & RELIEF VALVES - NORMALLY CLOSED
4. CLASS II SYSTEM BOUNDARY PER REG. GUIDE 1.26 - STEP (D) (EXCEPTION MUST BE TAKEN TO REG. GUIDE OTHERWISE THE ENTIRE STM. HEAD POST SUPPORT SYSTEM AND FEEDWATER SYSTEMS MUST BE INCLUDED.
5. CLASS III SYSTEM BOUNDARY PER REG. GUIDE 1.26 DISCUSSION VENTS, DRAIN & RELIEF VALVES ARE NORMALLY CLOSED.
6. CLASS III SYSTEM BOUNDARY PER REG. GUIDE 1.26 - STEP 2A (EXCEPTION STEAM TRAP EQUIVALENT TO NORMALLY CLOSED VALVE.)
7. CLASS III SYSTEM BOUNDARY PER REG. GUIDE 1.26 - STEP 2A MSV-1 A/B ARE NORMALLY CLOSED.
8. CLASS III SYSTEM BOUNDARY PER REG. GUIDE 1.26 - STEP 2A AS-V-4 IS NORMALLY CLOSED.
9. CLASS III SYSTEM BOUNDARY PER REG. GUIDE 1.26 - STEP 2A (EXCEPTION ONCE THE STEAM IS THRU THE TURBINE THE PURPOSE OF THIS PART OF THE SYSTEM IS ACCOMPLISHED.)
10. CLASS II SYSTEM BOUNDARY PER REG. GUIDE 1.26 STEP 2A (EXCEPTION - STEAM TRAP EQUIVALENT TO NORMALLY CLOSED VALVE.)
11. CLASS II SYSTEM BOUNDARY PER REG. GUIDE 1.26 STEP (D) - WDL-V-535 IS NORMALLY CLOSED AND FLANGED JOINTS ARE NORMALLY BLAIL FLANGED.

			MAIN STEAM SYSTEM AND DRAINAGE	
			ISI PIPING DIAGRAM	
			METROPOLITAN EDISON COMPANY READING PA.	



GENERAL NOTES

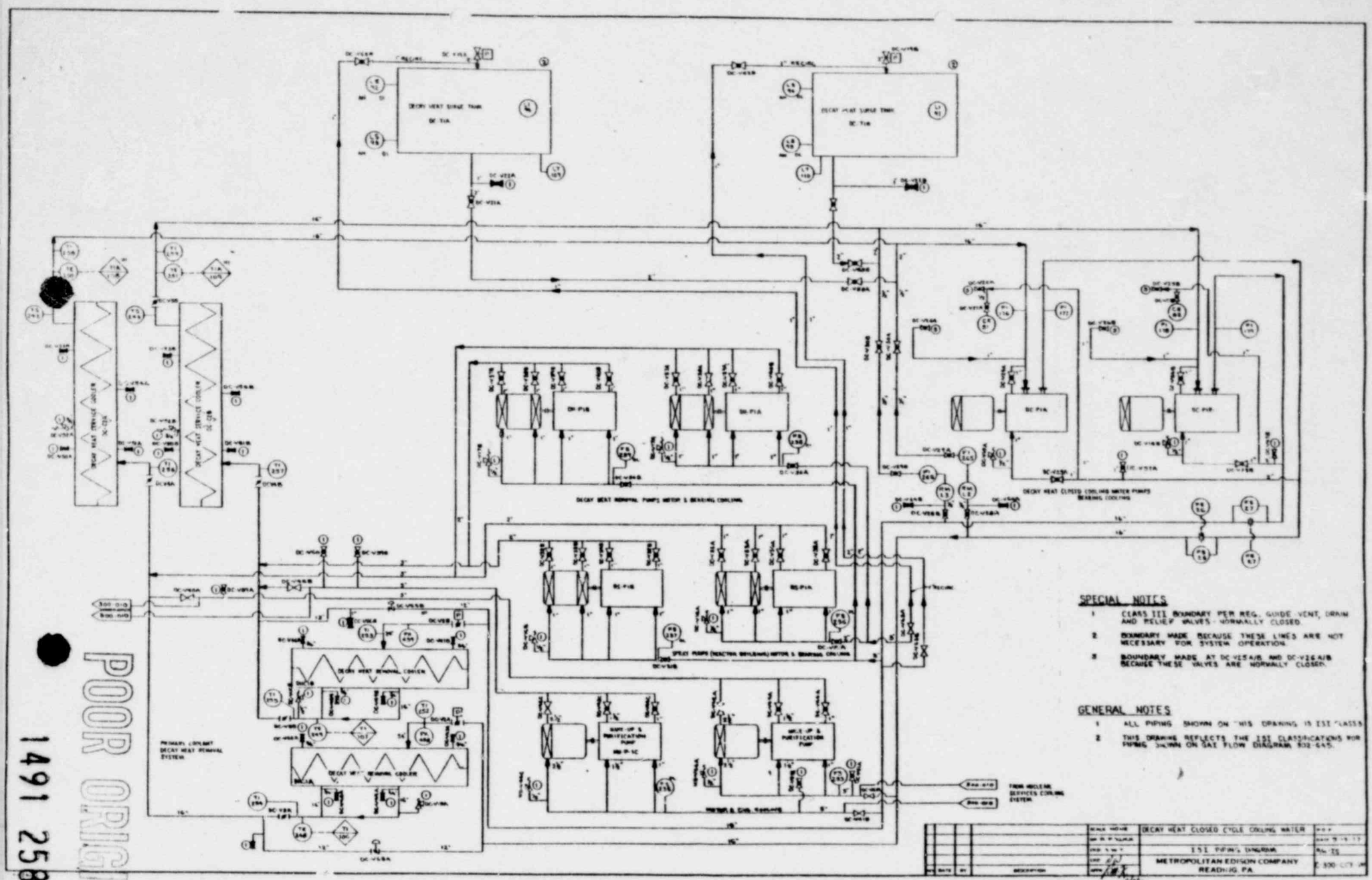
1. THIS DRAWING REFLECTS ISI CLASSIFICATIONS FOR THE SYSTEM SHOWN ON GAI FLOW DIAGRAM 302-202.
2. ALL PIPING SHOWN ON THIS DRAWING IS ISI CLASS 3.

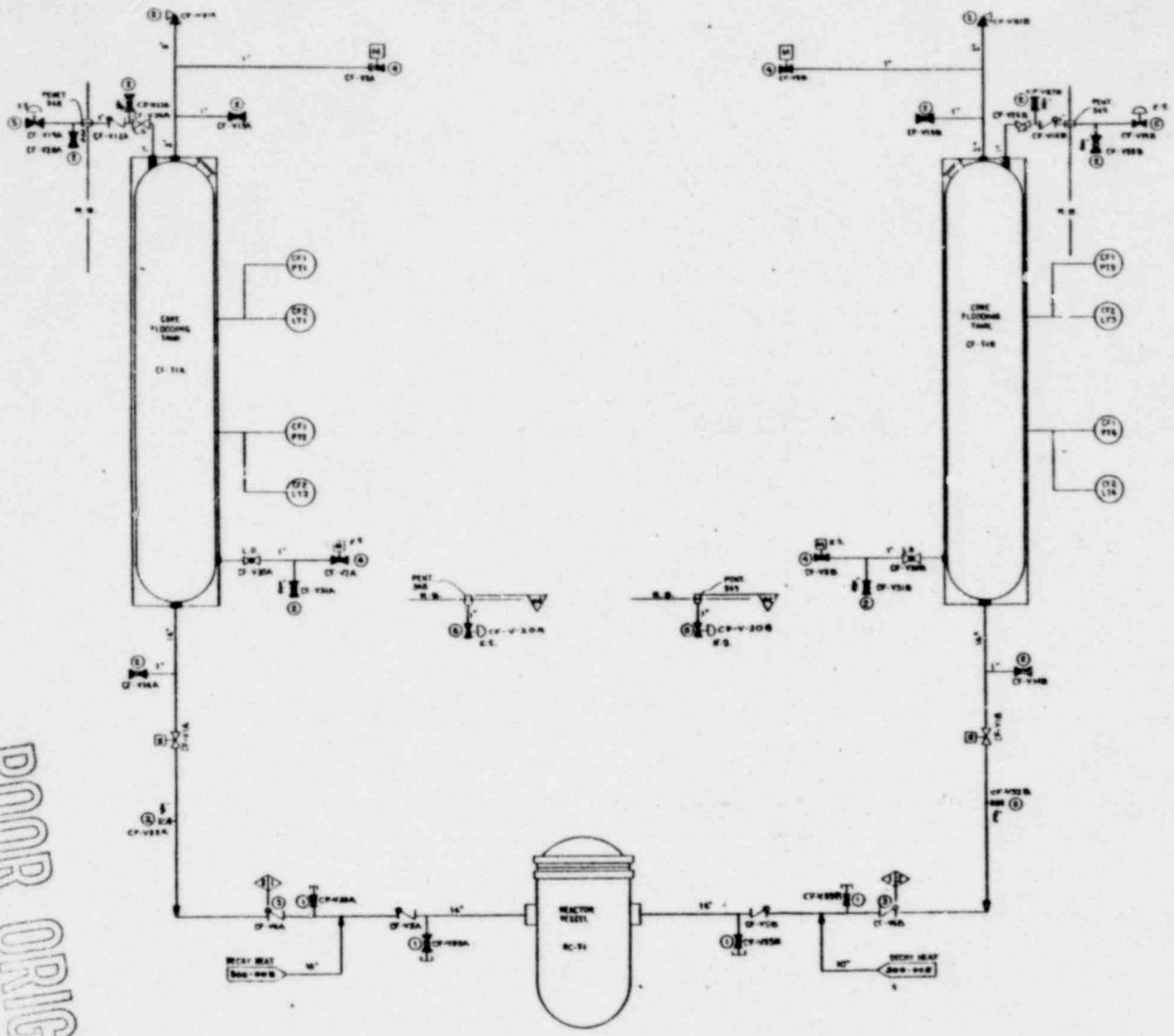
SPECIFIC NOTES

1. CLASS III SYSTEM BOUNDARY PER REG. GUIDE 1.26 - STEP 2A OR 2B - VACUUM BREAKER-DR-V-7A/B, NR-V-22A/C, NR-V-12 A/B
2. CLASS III SYSTEM BOUNDARY VALVES PER REG. GUIDE 1.26 STEP 2A OR 2B - RELIEF, DRAIN OR VENT VALVES - NORMALLY CLOSED.
3. CLASS III SYSTEM BOUNDARY PER REG. GUIDE 1.26 - STEP 2A OR 2B - NORMALLY CLOSED - MOTOR OPERATED NR-V-2
4. CLASS III SYSTEM BOUNDARY PER REG. GUIDE 1.26 - STEP 2A OR 2B - DR-V-10A/B - NORMALLY CLOSED.
5. CLASS III SYSTEM BOUNDARY PER REG. GUIDE 1.26 - STEP 2A OR 2B - RR-V-2A/B NORMALLY CLOSED.
6. CLASS III SYSTEM BOUNDARY PER REG. GUIDE 1.26 - STEP 2A OR 2B (PIPE OUTSIDE OF HEAT EXCHANGER VAULT)(EXCEPTION) PIPING OUTSIDE THE VAULT NEED NOT BE CLASSIFIED BECAUSE IF THERE IS A BREAK OUTSIDE THE VAULT THE BREAK WILL DRAIN OUTSIDE, STILL ALLOWING THE COOLERS (INSIDE) TO OPERATE.
7. CLASS III SYSTEM BOUNDARY PER REG. GUIDE 1.26 - STEP 2A OR 2B - NR-V-4A AND NR-V-C ARE NORMALLY CLOSED.

				SCALE NONE	RIVER WATER SYSTEM	
				DR R.T. KLICK		DATE 4-7-77
				CHK A.W.T.	ISI PIPING DIAGRAM	
					METROPOLITAN EDISON COMPANY READING, PA.	C 300 009(R)
NO.	DATE	BY	DESCRIPTION			

POOR ORIGINAL





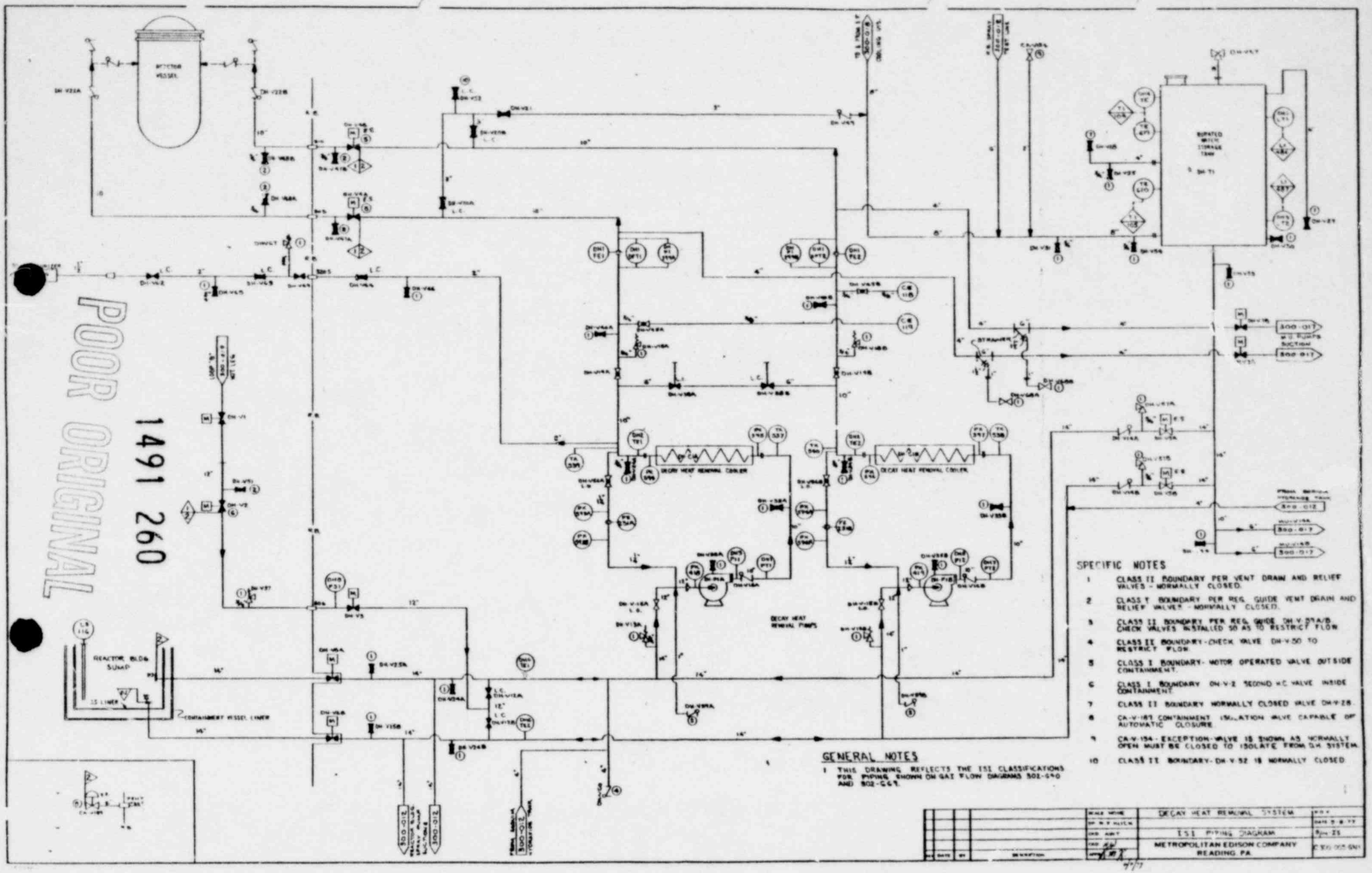
GENERAL NOTES

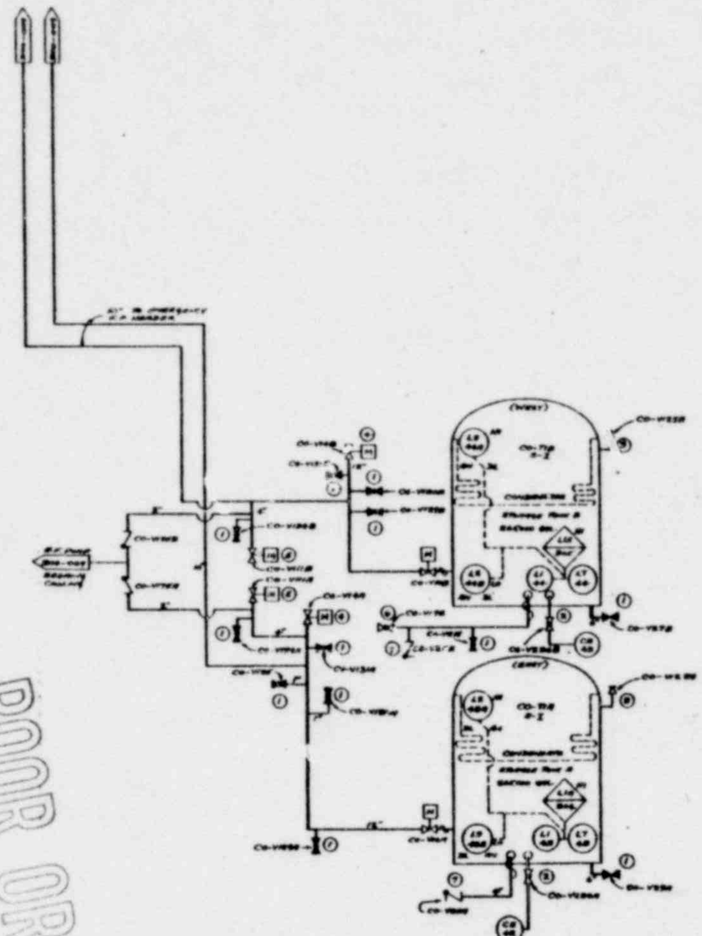
1. THIS DRAWING REFLECTS ISI CLASSIFICATIONS FOR THE SYSTEM SHOWN ON GAI FLOW DIAGRAM 302 711.

SPECIFIC NOTES

1. CLASS I BOUNDARY VALVES - VENTS, DRAINS, RELIEF VALVES NORMALLY CLOSED.
2. CLASS II BOUNDARY VALVES - VENTS, DRAINS, RELIEF VALVES NORMALLY CLOSED.
3. CLASS I BOUNDARY VALVE CHECK VALVE CAPABLE OF CHECKING FLOW FROM THE REACTOR VESSEL THESE VALVES ARE THE SECOND OF TWO IN THEIR RESPECTIVE LINES.
4. CLASS II BOUNDARY VALVE CF V-2 A/B - VALVES CAPABLE OF OPERATING ONE SIGNAL (ALSO VALVES CF-V-54A/B)
5. CLASS II BOUNDARY VALVE - CONTAINMENT ISOLATION VALVES CF-V-20A/B AND CF-V-19A/B.

		CORE FLOODING SYSTEM	
		ISI PIPING DIAGRAM	
		METROPOLITAN EDISON COMPANY READING, PA	





GENERAL NOTES

1. [illegible]
2. [illegible]

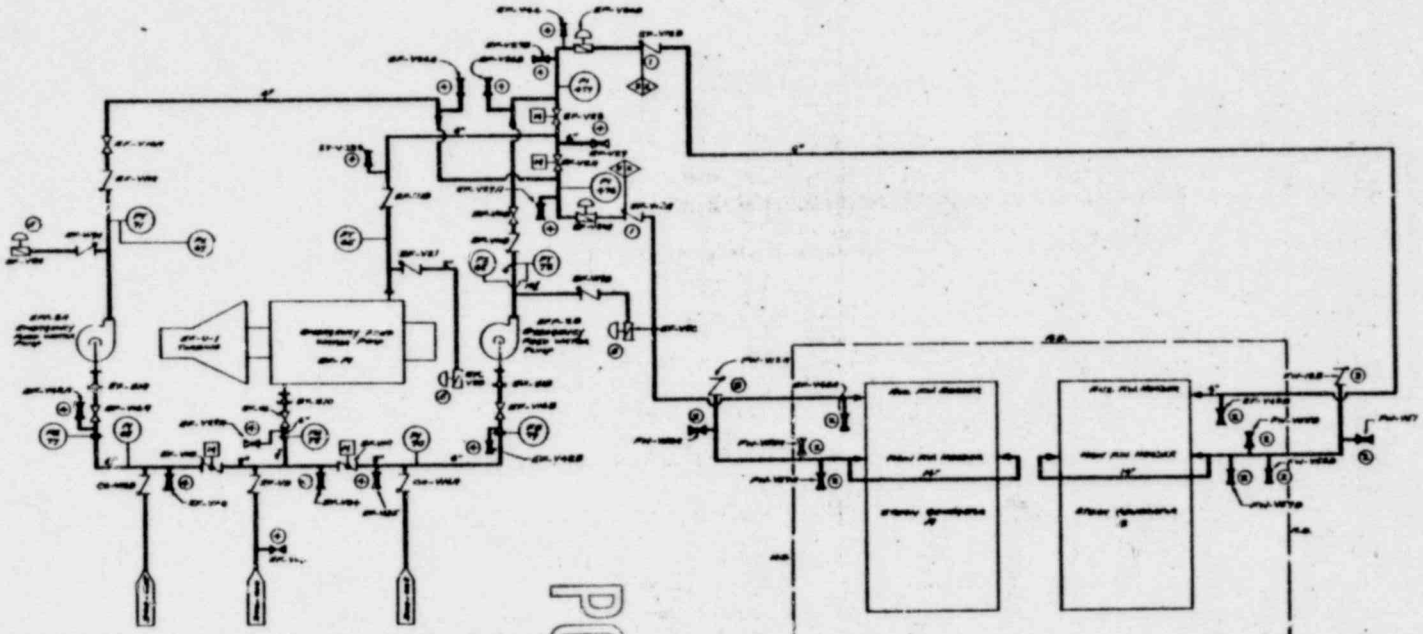
SPECIFIC NOTES:

1. [illegible]
2. [illegible]
3. [illegible]
4. [illegible]
5. [illegible]
6. [illegible]
7. [illegible]

	Condensate System	
	ISI Piping Diagram	
	METROPOLITAN EDISON COMPANY READING, PA	

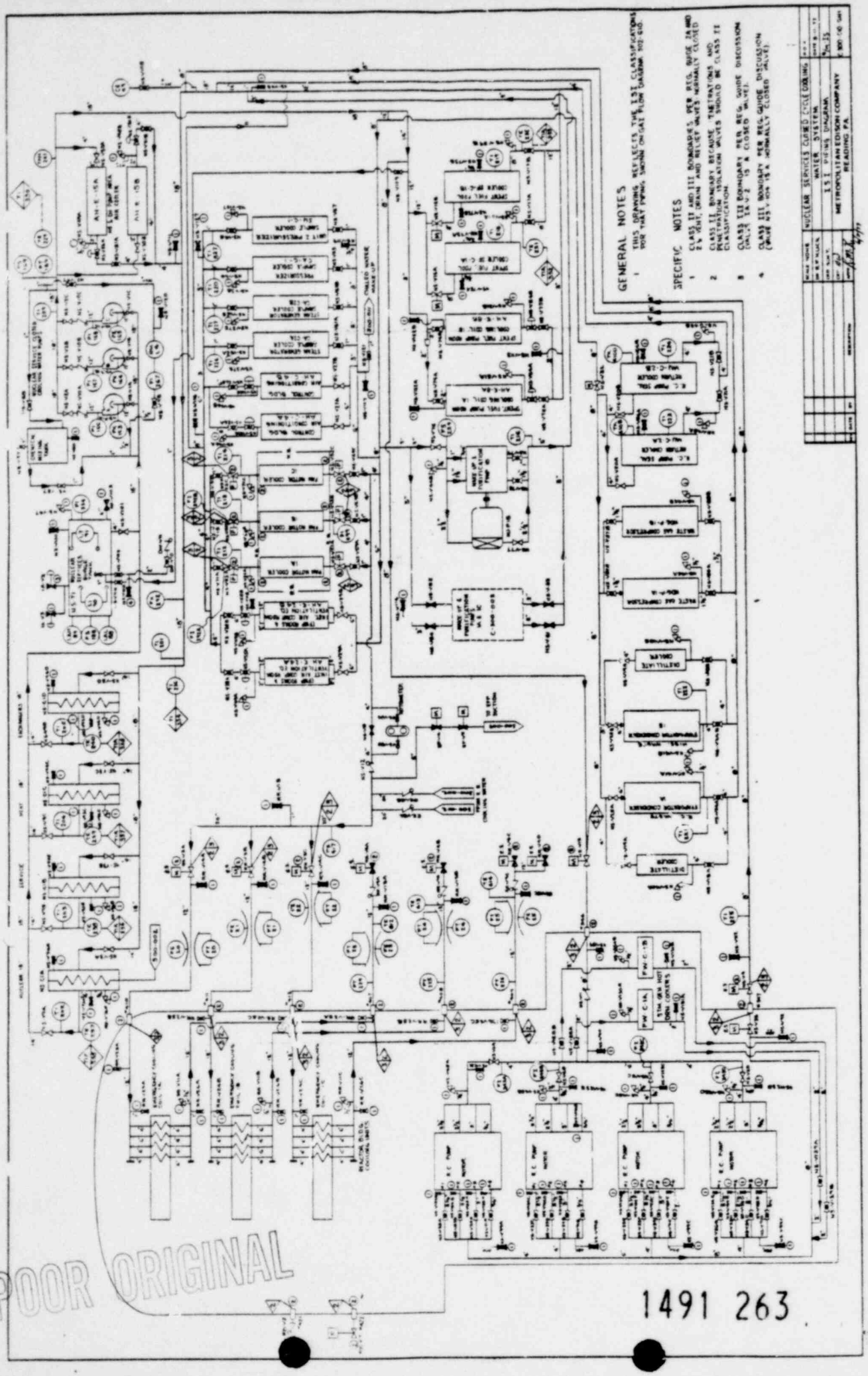
POOR ORIGINAL

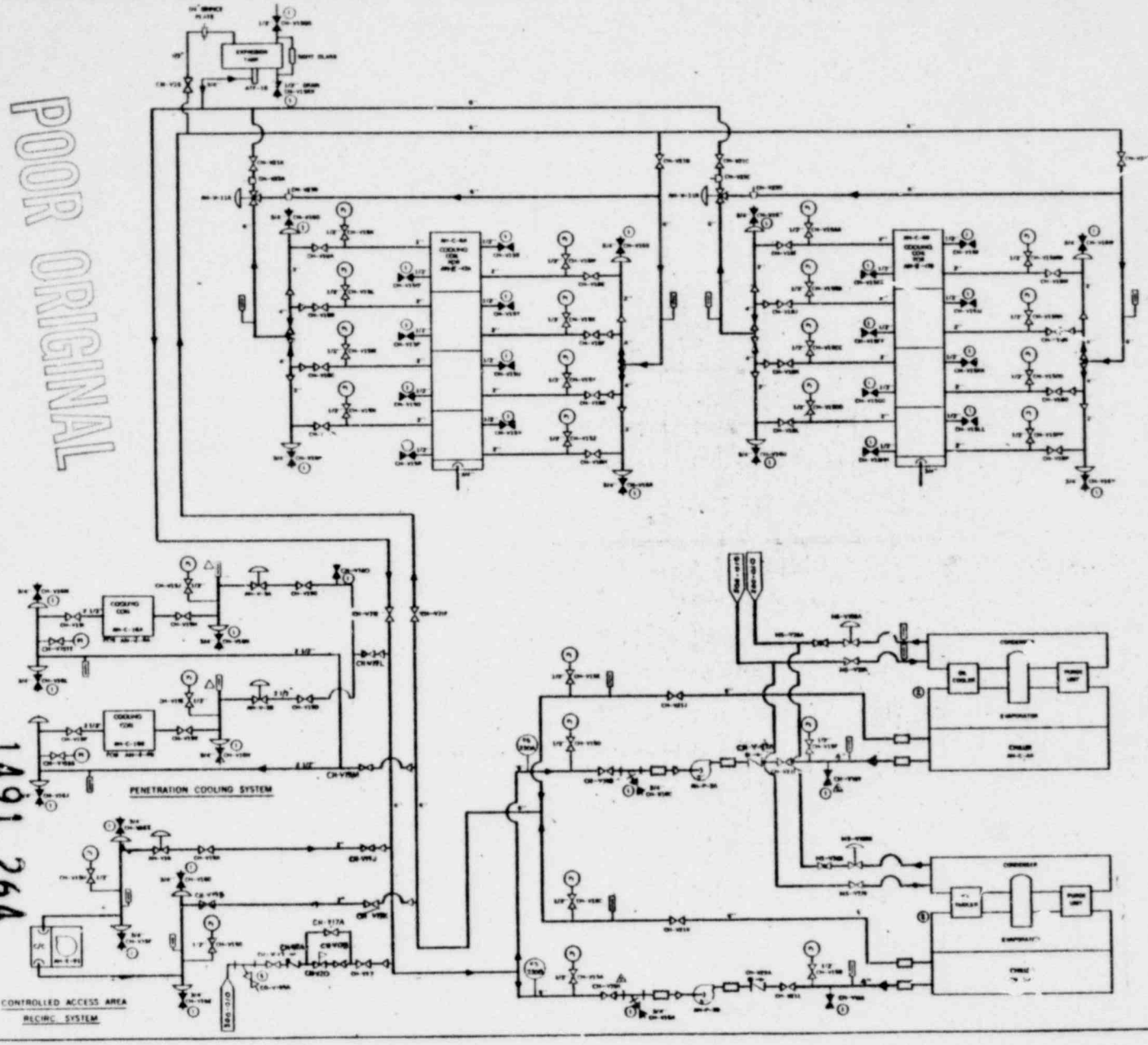
1491 261



1491 262

POOR ORIGINAL





GENERAL NOTES

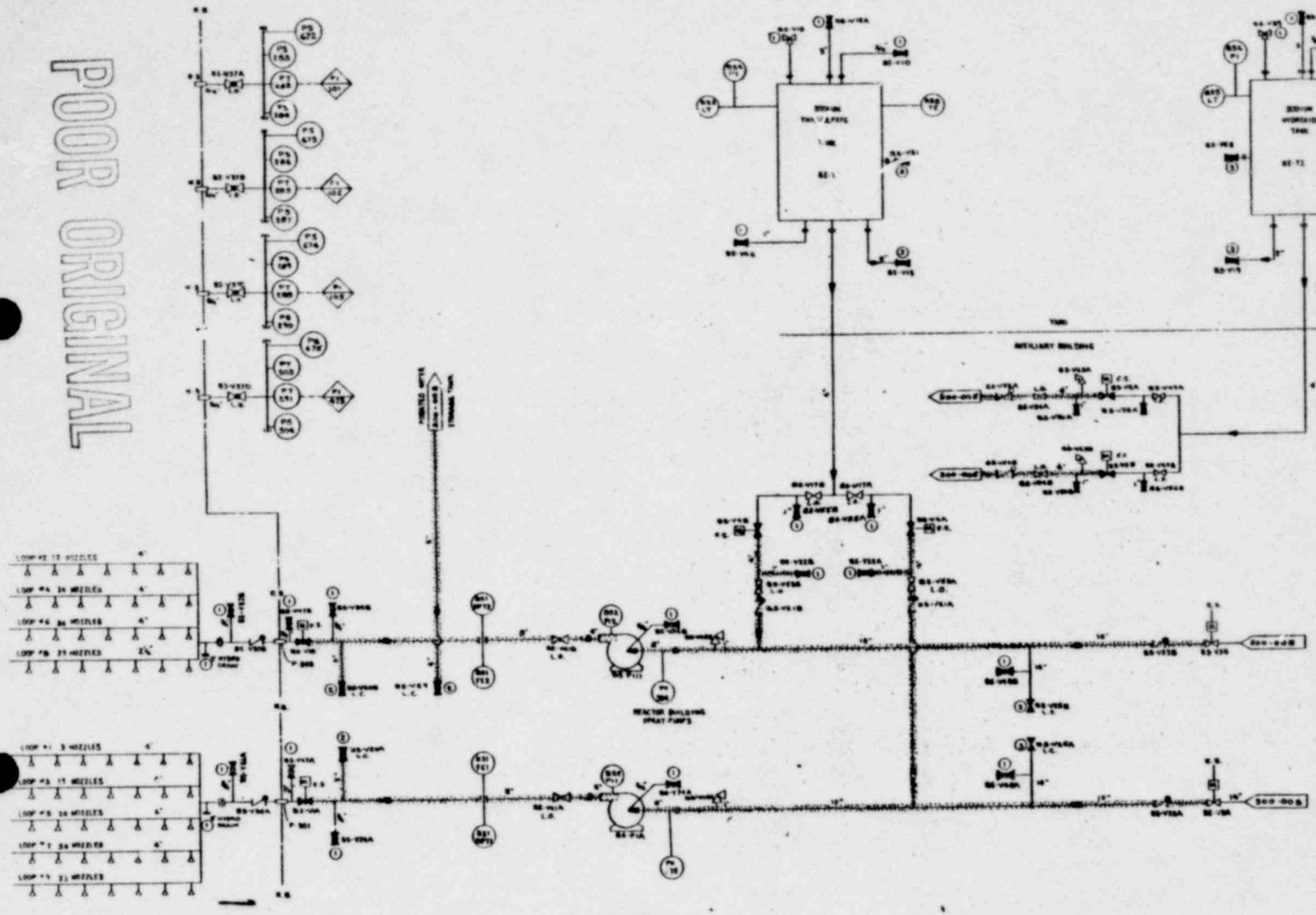
1. THIS DRAWING REFLECTS THE ISI CLASSIFICATIONS FOR THE SYSTEM SHOWN ON GAI FLOW DIAGRAM, 302 #47.
2. ALL PIPING SHOWN ON THIS DRAWING IS ISI CLASS 3.

SPECIFIC NOTES

1. CLASS III SYSTEM BOUNDARIES PER REG GUIDE. VENTS, DRAINS AND RELIEF VALVES NORMALLY CLOSED.
2. VENTING CONNECTION ON THE EVAPORATOR NEED NOT BE CLASSIFIED BECAUSE IT WILL NOT AFFECT THE OPERATION OF THE CHILLER.

NO.	DATE	BY	DESCRIPTION

	CONTROL BUILDING CHILLED WATER
	ISI PIPING DIAGRAM
	METROPOLITAN EDISON COMPANY READING, PA.



GENERAL NOTES

1. THIS DRAWING REFLECTS THE ISI CLASSIFICATIONS FOR THE SYSTEM SHOWN ON GAI FLOW DIAGRAM 302-718.
2. ALL PIPING SHOWN ON THIS DRAWING IS ISI CLASS 2.

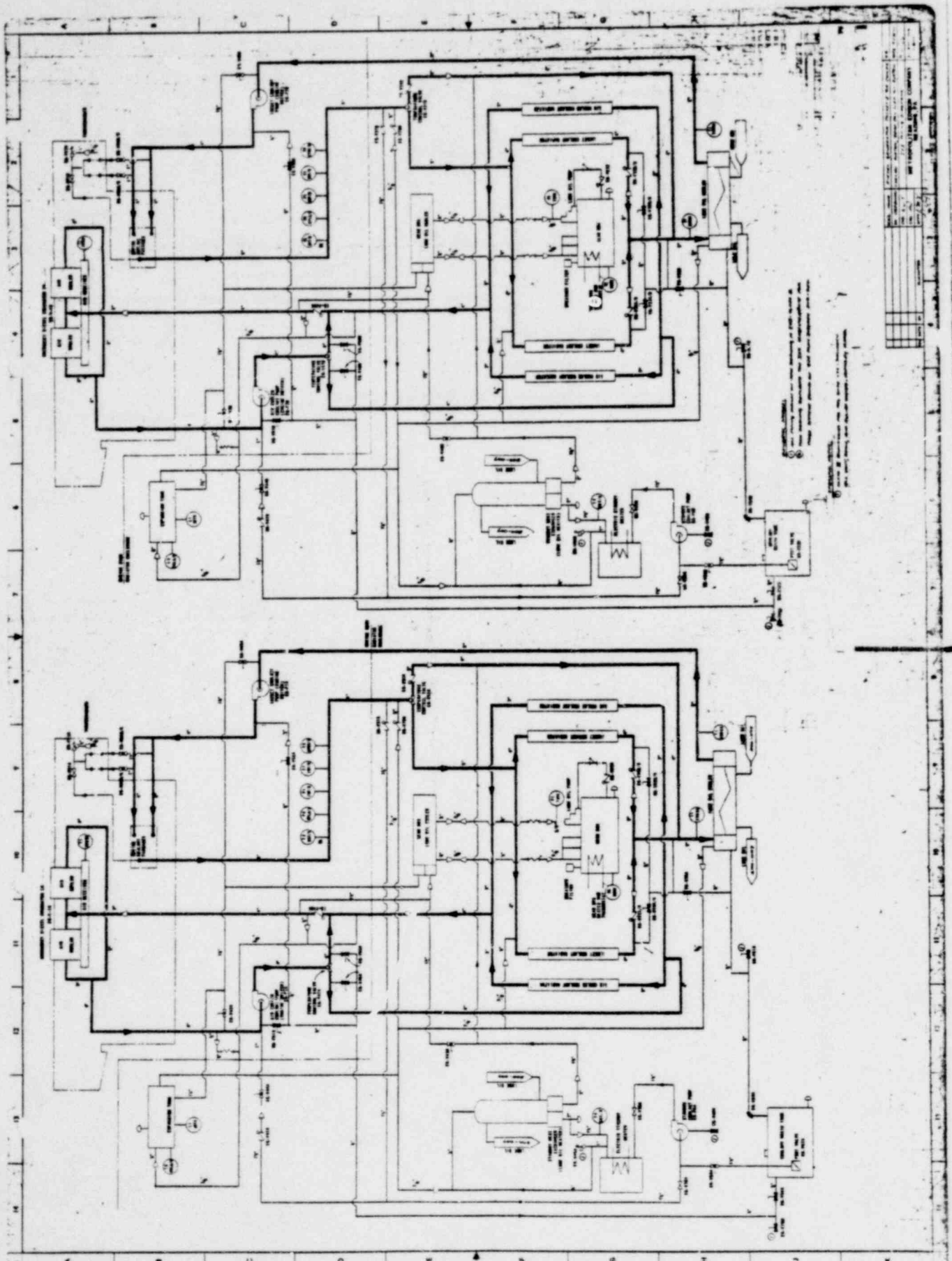
SPECIFIC NOTES

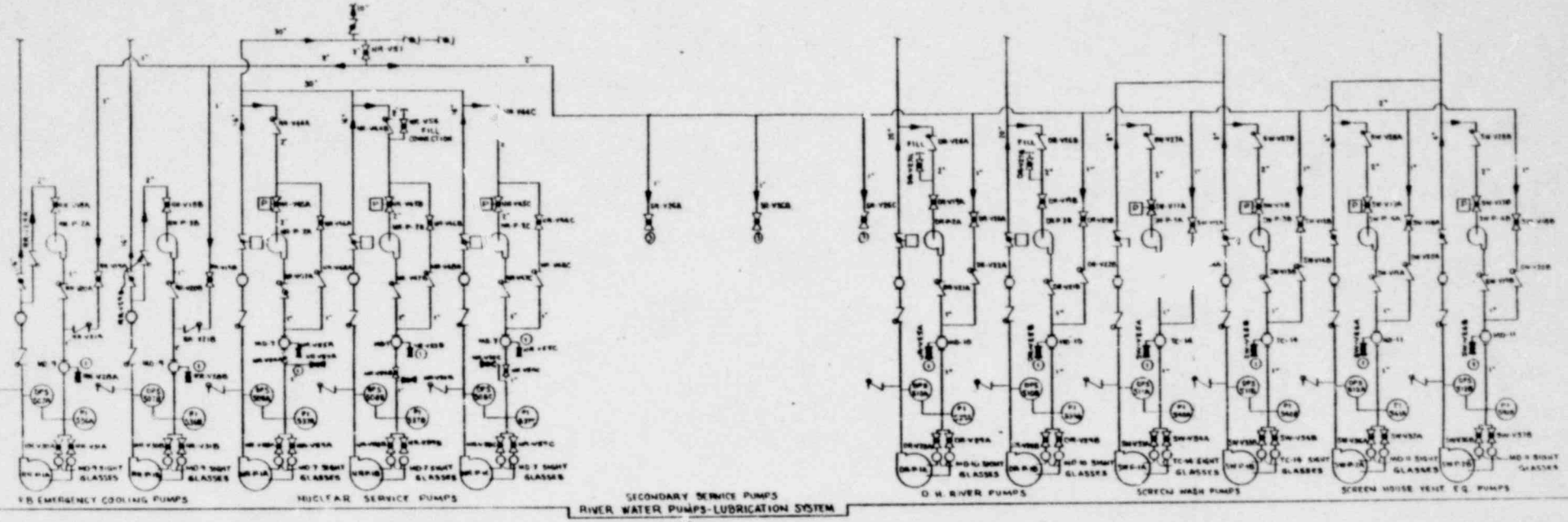
1. CLASS II BOUNDARY VALVES - VENTS DRAINS AND RELIEF VALVES.
2. CLASS II BOUNDARY VALVES - BS-V-59, BS-V-60A AND BS-V-60B, ARE NORMALLY CLOSED VALVES.
3. CLASS II BOUNDARY VALVES, BS-V-22A/B, ARE NORMALLY CLOSED VALVES. SO ARE BS-V-15, BS-V-51, BS-V-62 AND BS-V-14.

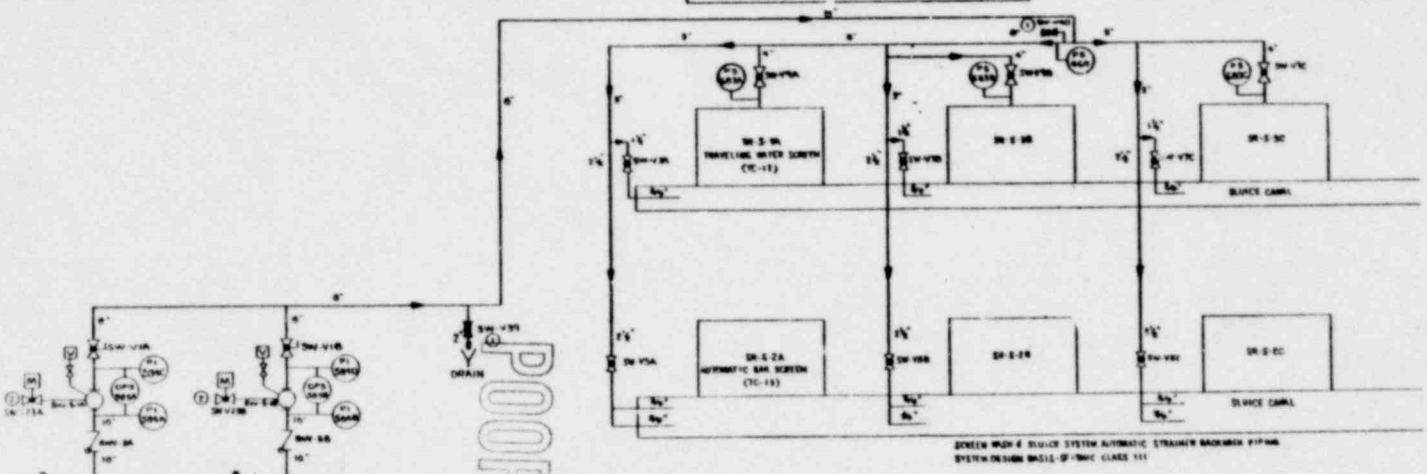
		REACTOR BUILDING SPRAY SYSTEM	
		ISI PIPING DIAGRAMS	
		METROPOLITAN EDISON COMPANY READING, PA	

9/70

1491 265







GENERAL NOTES

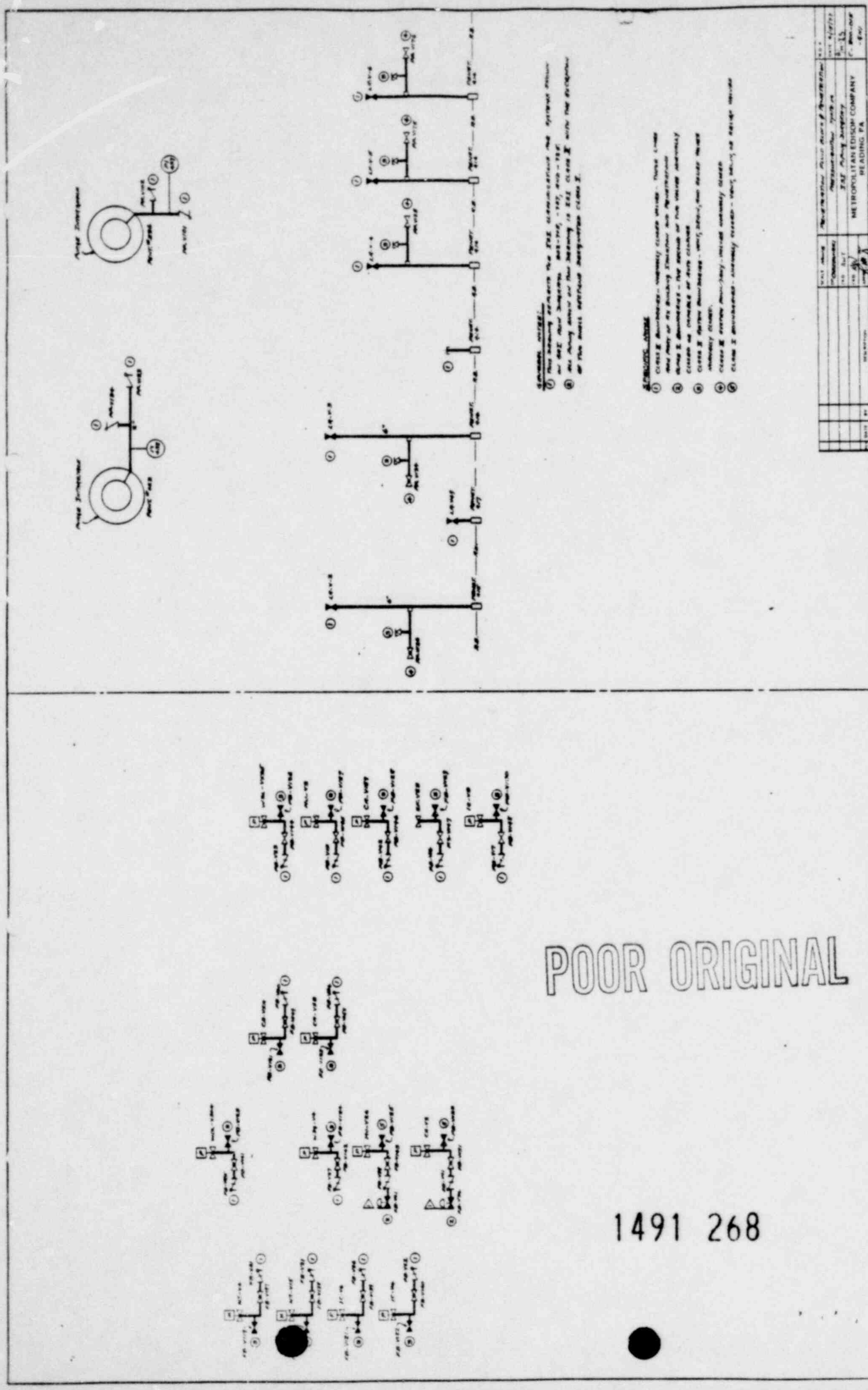
1. ALL PIPING SHOWN ON THIS DRAWING IS ISI CLASS 3.
2. THIS DRAWING REFLECTS THE ISI CLASSIFICATIONS FOR ALL PIPING SHOWN ON GAI FLOW DIAGRAM NO. E09

SPECIFIC NOTES

1. CLASS III SYSTEM BOUNDARY PER REG GUIDE 1.26 FOR 2A OR 2B FILL CONNECTIONS AND VENT VALVES NORMALLY CLOSED.
2. VALVES SW-V23A AND SW-V23B ARE NORMALLY CLOSED. THIS IS AN ACCEPTABLE CLASS III BOUNDARY.
3. VALVES SW-V-158/B/C ARE NORMALLY OPEN EXCEPTION THESE VALVES MUST BE NORMALLY CLOSED.

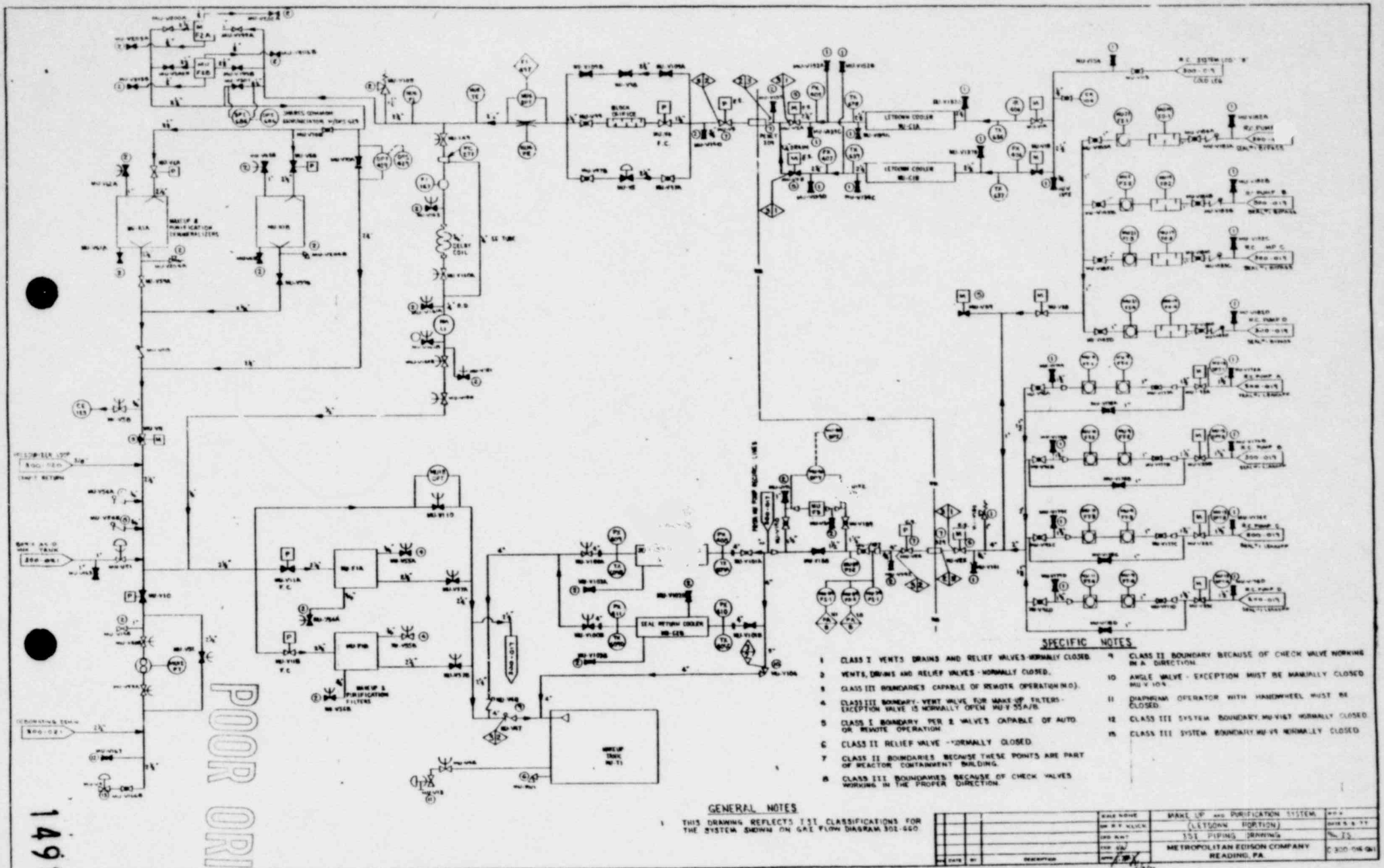
		SCREEN WASH AND SLUICE SYSTEM	
		RIVER WATER PUMPS LUBRICATION SYSTEM	
		ISI PIPING DIAGRAM	
		METROPOLITAN EDISON COMPANY READING, PA	2300-ON-GA1

1491 26.



POOR ORIGINAL

1491 268



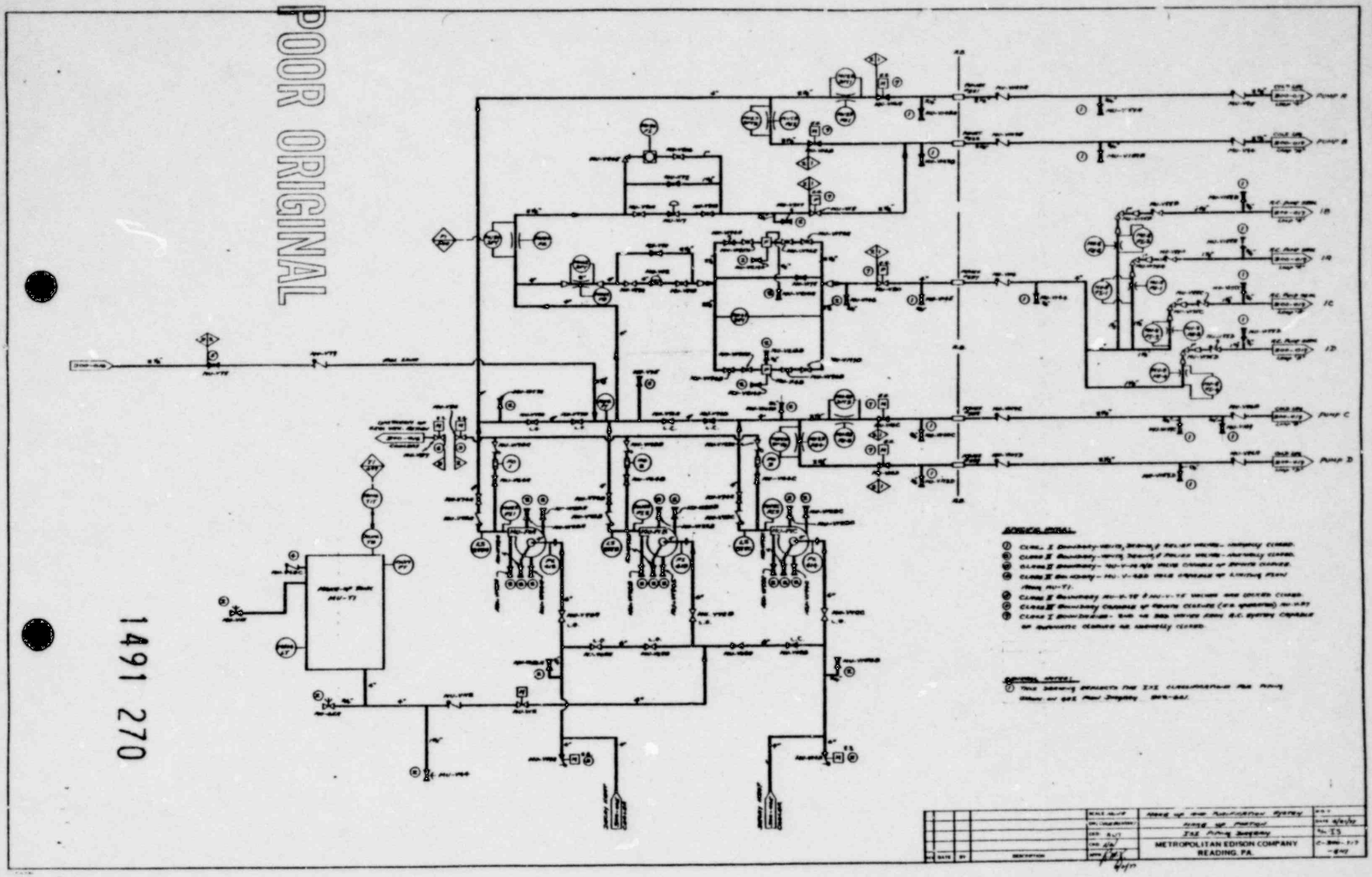
SPECIFIC NOTES

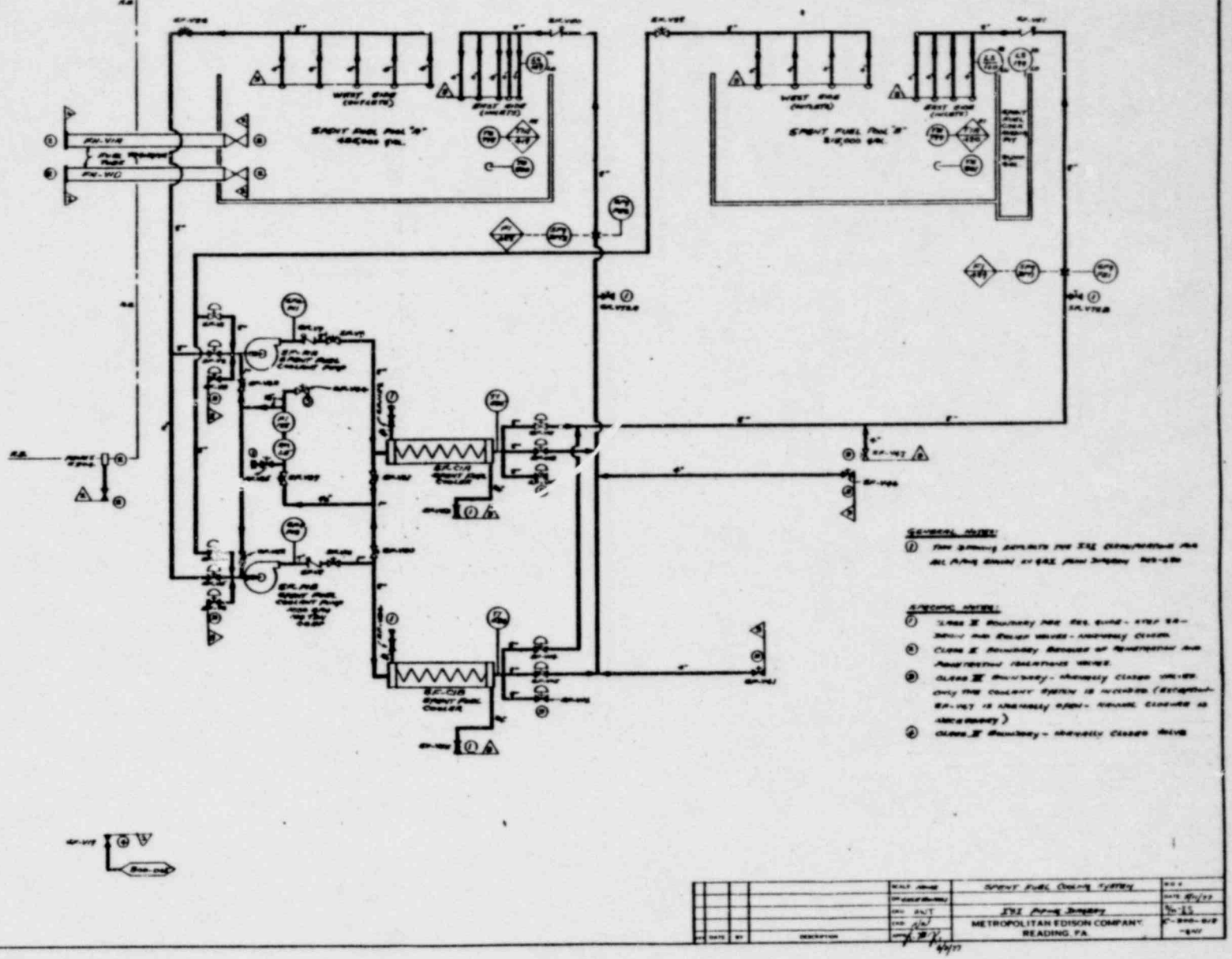
1. CLASS I VENTS DRAINS AND RELIEF VALVES NORMALLY CLOSED.
2. VENTS, DRAINS AND RELIEF VALVES - NORMALLY CLOSED.
3. CLASS III BOUNDARIES CAPABLE OF REMOTE OPERATION (N.O.).
4. CLASS III BOUNDARY - VENT VALVE FOR MAKE UP FILTERS - EXCEPTION VALVE IS NORMALLY OPEN MU-V 55A/B.
5. CLASS I BOUNDARY PER 2 VALVES CAPABLE OF AUTO OR REMOTE OPERATION.
6. CLASS II RELIEF VALVE - NORMALLY CLOSED.
7. CLASS II BOUNDARIES BECAUSE THESE POINTS ARE PART OF REACTOR CONTAINMENT BUILDING.
8. CLASS III BOUNDARIES BECAUSE OF CHECK VALVES WORKING IN THE PROPER DIRECTION.
9. CLASS II BOUNDARY BECAUSE OF CHECK VALVE WORKING IN A DIRECTION.
10. ANGLE VALVE - EXCEPTION MUST BE MANUALLY CLOSED MU-V 104.
11. DIAPHRAM OPERATOR WITH HANDWHEEL MUST BE CLOSED.
12. CLASS III SYSTEM BOUNDARY MU-V167 NORMALLY CLOSED.
13. CLASS III SYSTEM BOUNDARY MU-V9 NORMALLY CLOSED.

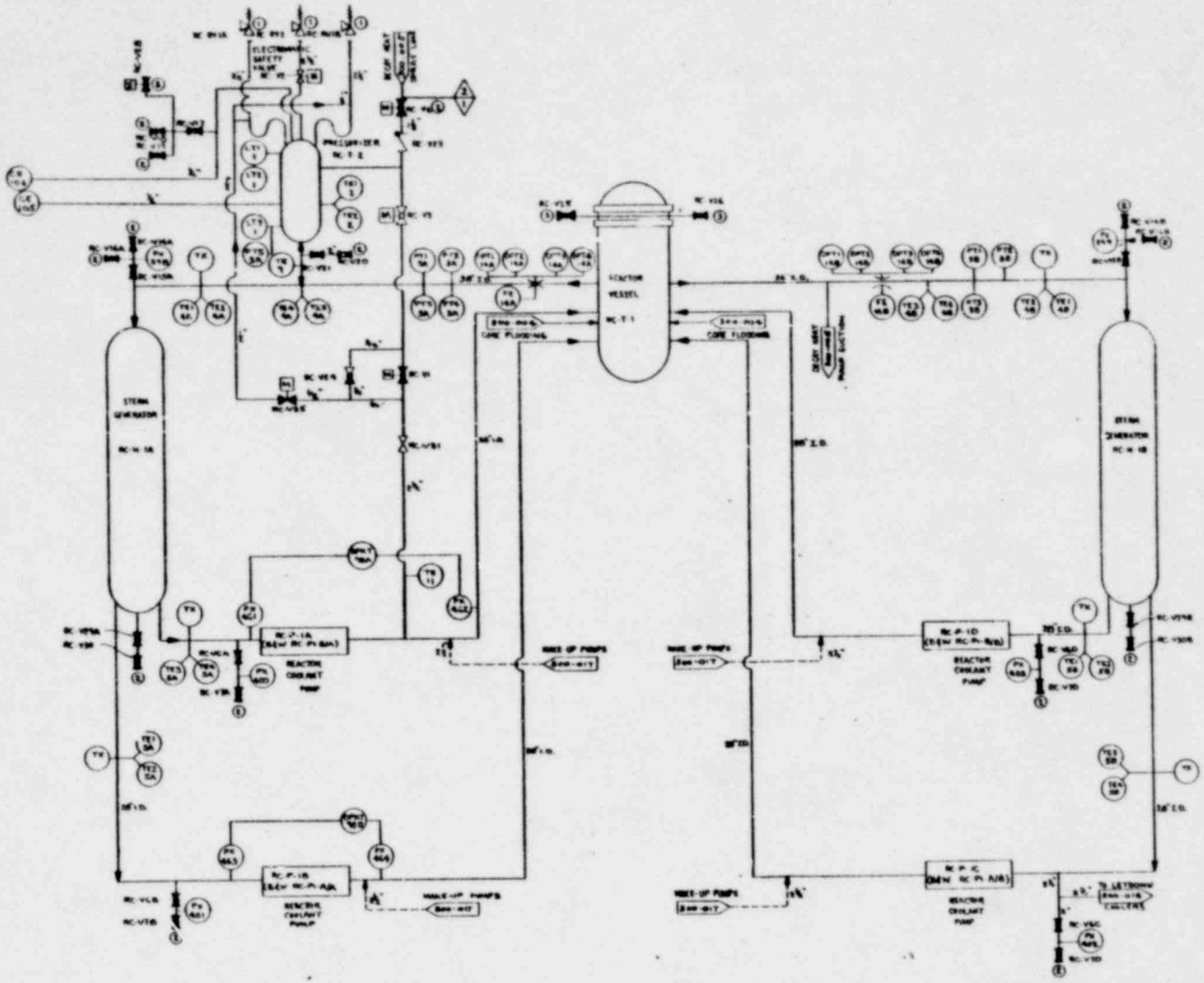
GENERAL NOTES

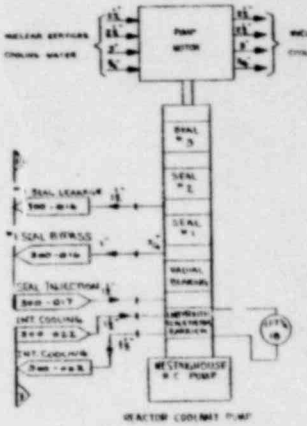
1. THIS DRAWING REFLECTS I.S.I. CLASSIFICATIONS FOR THE SYSTEM SHOWN ON GAI FLOW DIAGRAM 302-660.

			MAKE UP AND PURIFICATION SYSTEM (LETDOWN PORTION)	
			I.S.I. PIPING DRAWING	
			METROPOLITAN EDISON COMPANY READING, PA.	









REACTOR COOLANT PUMP

GENERAL NOTES

1. THIS DRAWING REFLECTS THE ISI CLASSIFICATIONS FOR PIPING SHOWN ON GAI FLOW DIAGRAM 312-650

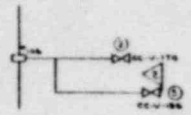
SPECIFIC NOTES:

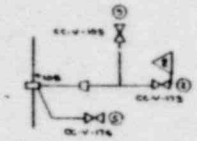
1. CLASS I SYSTEM BECAUSE PART OF REACTOR COOLANT PRESSURE BOUNDARY. BOUNDARY BECAUSE REACTOR COOLANT SYSTEM SAFETY AND RELIEF VALVES NORMALLY CLOSED.
2. CLASS I SYSTEM BOUNDARY BECAUSE PART OF REACTOR COOLANT PRESSURE BOUNDARY BOUNDARY BECAUSE SECOND OF TWO VALVES NORMALLY CLOSED DURING NORMAL REACTOR OPERATION IN SYSTEM PIPING WHICH DOES NOT PENETRATE PRIMARY REACTOR CONTAINMENT
3. CLASS I NORMALLY CLOSED DRAIN AND TEST VALVES RC V-25 AND RC V-26

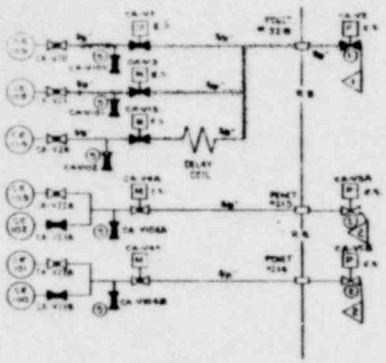
	REACTOR COOLANT SYSTEM	
	ISI PIPING DIAGRAM	
	METROPOLITAN EDISON COMPANY READING PA	

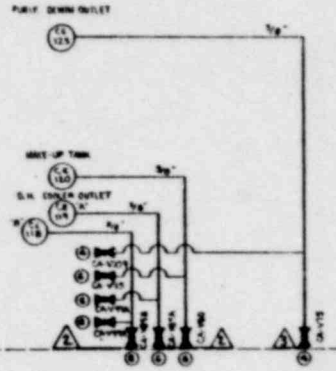
POOR ORIGINAL

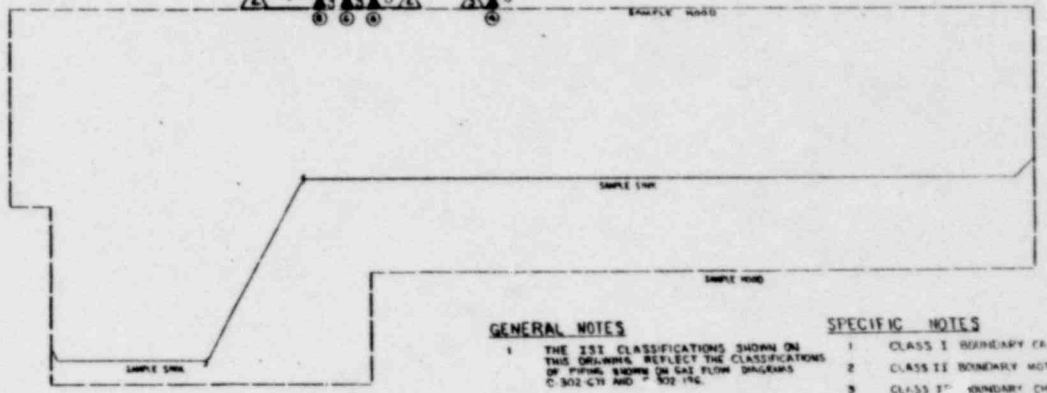
1491 272











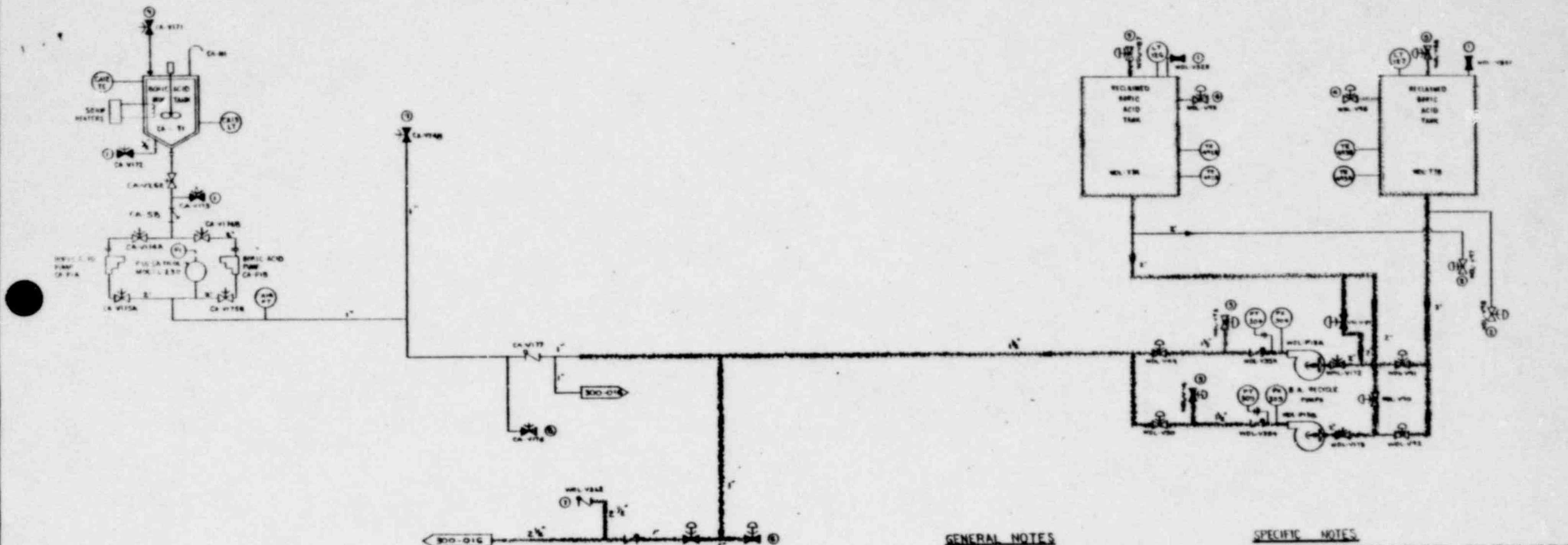
GENERAL NOTES

1. THE ISI CLASSIFICATIONS SHOWN ON THIS DRAWING REFLECT THE CLASSIFICATIONS OF PIPING SHOWN ON GAI FLOW DIAGRAMS C-302-674 AND C-302-676.

SPECIFIC NOTES

1. CLASS 1 BOUNDARY CA-V-2 2ND MOTOR OPERATED VALVE
2. CLASS II BOUNDARY MOTOR OPERATED VALVE CA-V-5A/B.
3. CLASS 3" BOUNDARY CHECK VALVE CA-V-29 INSTALL TO RESTRICT FLOW FROM MAKE UP SYSTEM.
4. CLASS III BOUNDARY NORMALLY CLOSED VALVES - CA-V-75 AND CA-V-107.
5. DRAINS, VENT AND RELIEF VALVES - NORMALLY CLOSED.
6. CLASS II BOUNDARIES NORMALLY CLOSED VALVES - CA-V-80, CA-V-85A/B, CA-V-93 AND CA-V-94A/B.

			CHEMICAL SAMPLING & OTSG CHEMICAL CLEANING SYSTEMS ISI PIPING DIAGRAMS	
			METROPOLITAN EDISON COMPANY READING, PA.	C-300-020-3N1



GENERAL NOTES

1. ALL PIPING SHOWN ON THIS DRAWING IS ISI CLASS 3.
2. THIS DRAWING REFLECTS THE ISI CLASSIFICATIONS FOR ALL PIPING SHOWN ON G&I FLOW DIAGRAMS 302-C70, 302-690 AND 302-692.

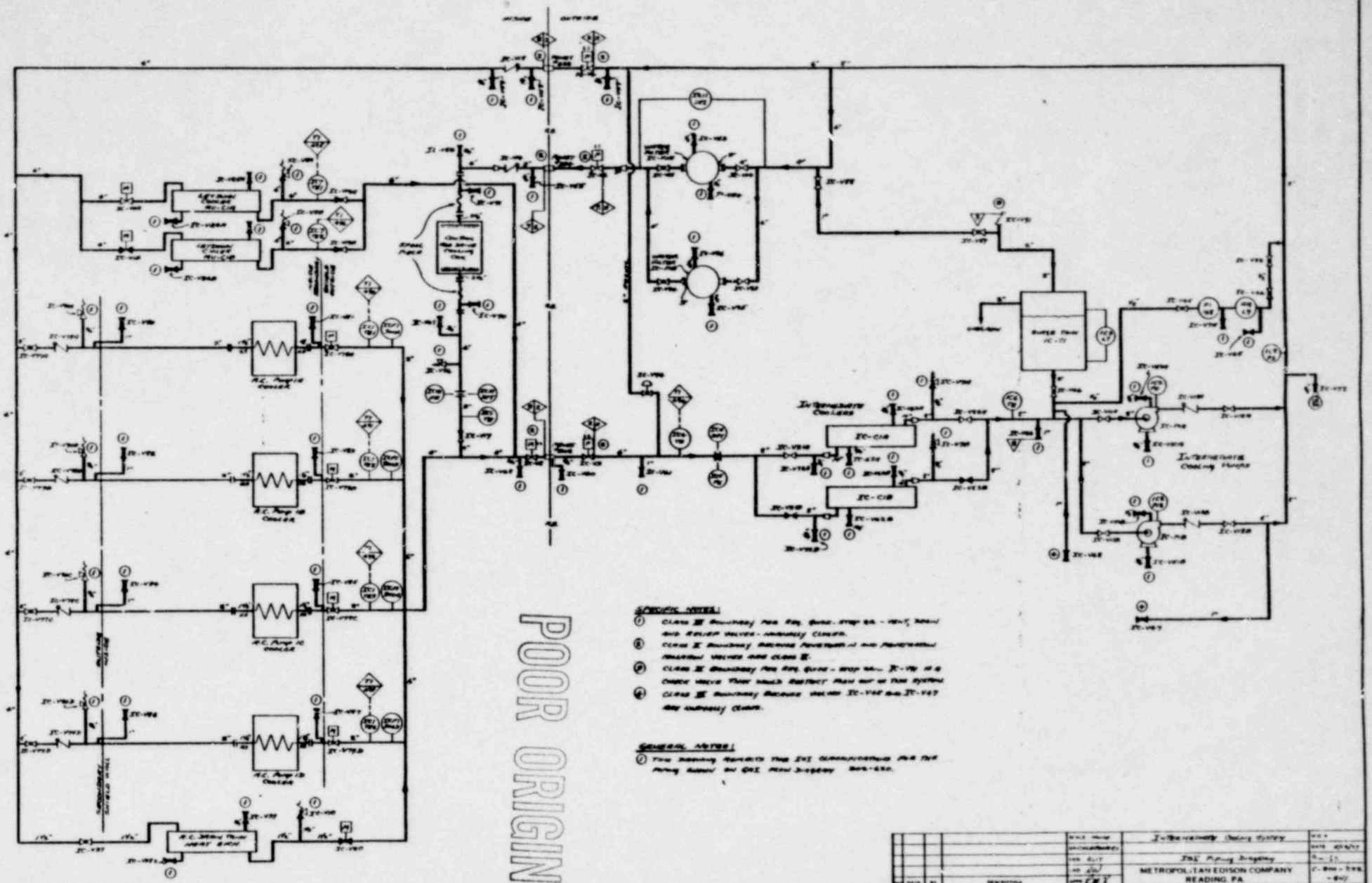
SPECIFIC NOTES

1. CLASS III SYSTEM BOUNDARY VENT, DRAIN AND RELIEF VALVES NORMALLY CLOSED.
2. CLASS III SYSTEM BOUNDARY WDL-V-97 AND WDL-V-98 ARE NORMALLY CLOSED.
3. CLASS III SYSTEM BOUNDARY WDL-V-93 AND WDL-V-73 ARE NORMALLY CLOSED.
4. CLASS III SYSTEM BOUNDARY WDL-V-75 AND WDL-V-76 ARE NORMALLY CLOSED.
5. CLASS III SYSTEM BOUNDARY WDL-V-87 AND WDL-V-88 THESE VALVES WOULD BE CLOSED WHEN THE MIXTURES PUMPED FROM THE RECLAIMED BORIC ACID TANK TO THE MAKE-UP SYSTEM.
6. CLASS III SYSTEM BOUNDARY WDL-V-62 IS NORMALLY CLOSED FOR THE FUNCTION OF PUMPING FROM THE RECLAIMED BORIC ACID TANK TO THE MAKE UP SYSTEM.
7. CLASS III SYSTEM BOUNDARY WDL-V-362 WILL RESTRICT FLOW OF MIXTURE BEING PUMPED FROM THE RECLAIMED BORIC ACID TANK TO THE MAKE-UP SYSTEM.
8. CLASS III SYSTEM BOUNDARY CA-V-176 IS NORMALLY CLOSED.
9. CLASS III SYSTEM BOUNDARIES CA-V-248 AND CA-V-171 ARE NORMALLY CLOSED WHEN BORIC ACID IS PUMPED FROM THE BORIC ACID MIX TANK TO THE MAKE-UP SYSTEM.

POOR ORIGINAL

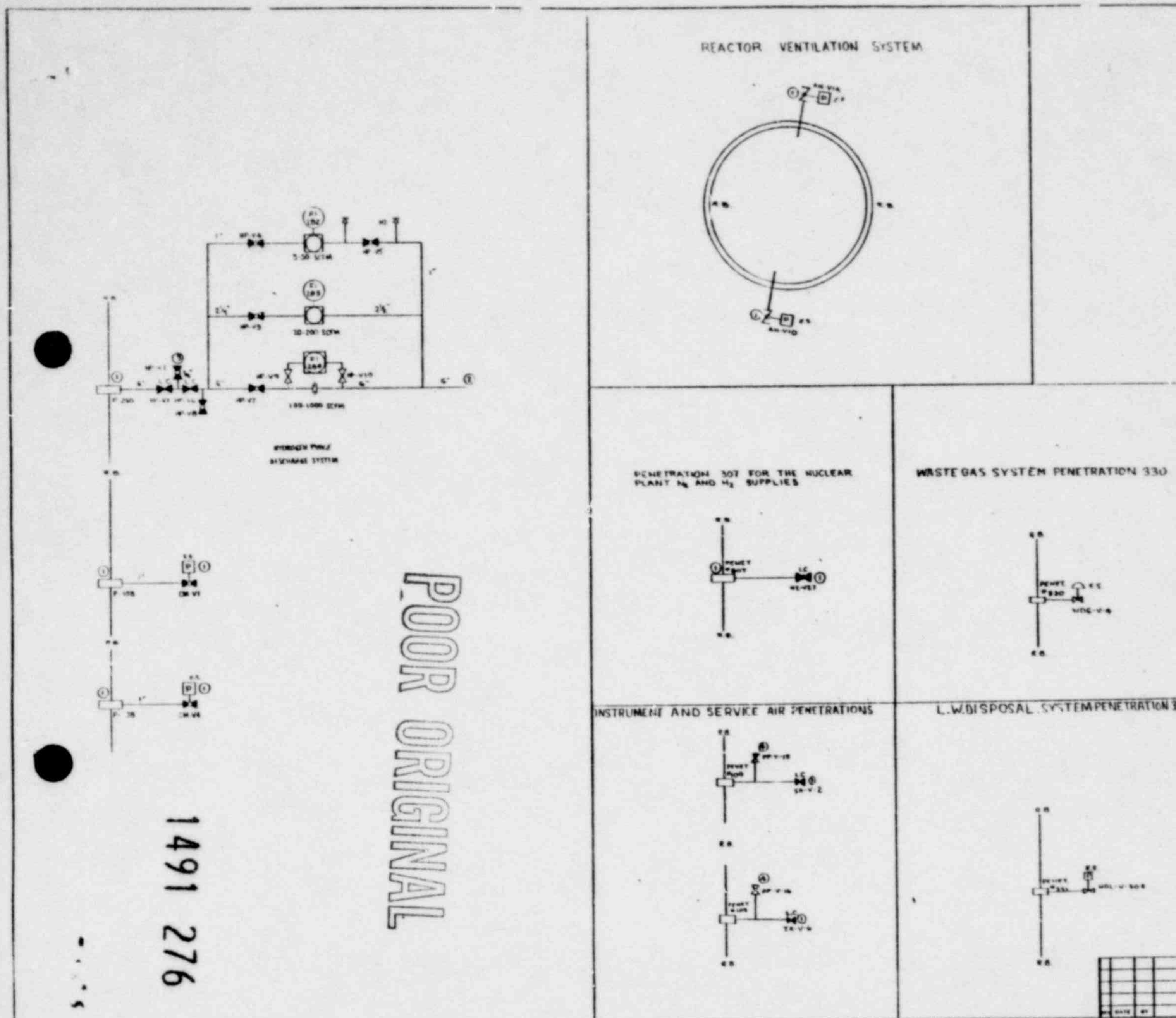
1491 274

CHEMICAL ADDITION AND LIQUID WASTE DISPOSAL SYSTEMS
ISI PIPING DIAGRAM
METROPOLITAN EDISON COMPANY
READING, PA.
C 300-021GNI



POOR ORIGINAL

1491 376



GENERAL NOTES

1. THIS DRAWING REFLECTS THE ISI CLASSIFICATIONS FOR THOSE SYSTEMS SHOWN ON GAI FLOW DIAGRAMS 302 720, 302 721, 302 [illegible], 302 [illegible], 302-[illegible] AND 302 [illegible]
2. ALL PIPING SHOWN ON THIS DRAWING IS ISI CLASS II

SPECIFIC NOTES

1. CLASS II BOUNDARY VALVES - CONTAINMENT ISOLATION VALVES - EITHER NORMALLY CLOSED OR CAPABLE OF E.S. CLOSURE.
2. EXHAUST PIPE NO CLASSIFICATION REQUIRED.
3. CLASS II BOUNDARY VALVE - HP-V-7 - NORMALLY CLOSED TEST VALVE.
4. CLASS II BOUNDARY - EXCEPTION - HP-V-15 AND HP-V-16 ARE N.O. AND MUST BE MANUALLY CLOSED.

SCALE NONE	HYDROGEN PURGE SYSTEM [illegible]		
DR. H. T. KLICK	[illegible]	DATE 5-[illegible]-77	
CKD. A. W. T.	ISI PIPING DIAGRAM		
CKD.	METROPOLITAN EDISON COMPANY READING, PA	C 300-023 GAI	
APPD. [signature] 6/[illegible]/77			

NO.	DATE	BY	DESCRIPTION