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SUBJECT: Forwards environ qualification justification for interim operation of Class IE equipment per NUREG-0588.Tech Specs meet qualifications contained in Generic Ltr 82-09.

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May 7, 1982

Mr. A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUSQUEHANNA STEAM ELECTRIC STATION
ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT
JUSTIFICATION FOR INTERIM OPERATION
ER 100450 FILE 843 Docket Nos. 50-387
PLA-1084 50-388

Dear Mr. Schwencer:

Attached is the Environmental Qualification Justification for Interim Operation for the Susquehanna Steam Electric Station. This report demonstrates that interim operation of Unit 1 of the Susquehanna Steam Electric Station is justified until completion of the environmental qualification program.

The justification for interim operation was provided to auditors during the audit of the Susquehanna Environmental Qualification Program conducted this past week. Should you have any questions or need further clarification concerning this subject, please contact Mr. G. S. Wetzel (215-770-6534).

Very truly yours,

NW Curtis

N. W. Curtis
Vice President-Engineering & Construction-Nuclear

WWW/mks

Attachment

cc: R. Perch

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ENVIRONMENTAL QUALIFICATION

JUSTIFICATION FOR INTERIM OPERATION

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 AND 2   JOB 8856
DOCKET NO. 50-387

PREPARED BY:

BECHTEL POWER CORPORATION AND
TORREY PINES TECHNOLOGY

FOR

PENNSYLVANIA POWER AND LIGHT COMPANY
APRIL, 1982

PF27/8-1

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

I. INTRODUCTION

A. Intent

The intent of this report is to demonstrate that interim operation of Unit 1 of the Susquehanna Steam Electric Station (SSES) is justified pending completion of the environmental qualification program. The purpose of the study is to show that one path of achieving and maintaining a cold shutdown condition is available using only Class 1E equipment which is environmentally qualified or for which an acceptable justification for interim operation has been identified. Each Class 1E component which is not yet qualified is evaluated to determine whether an appropriate justification for interim operation can be ascertained for that component, regardless of whether it is required for the single path to cold shutdown.

B. Groundrules

A single path to cold shutdown must be determined for each design basis event identified in the SSES FSAR Appendix 15A which can produce a harsh environment. Random single failures of environmentally qualified equipment are not assumed. The only failures of Class 1E equipment considered are those which may result from the initiating event.

The single cold shutdown (CSD) path includes the minimum systems and equipment essential to emergency reactor shutdown, containment isolation, reactor core cooling, containment and reactor heat removal, and prevention of significant release of radioactive material to the environment.

All components located in a potentially harsh environment and required to function in the CSD path must either be environmentally qualified or "justified". A Class 1E component is environmentally qualified if it meets the required category of NUREG-0588. (Environmentally qualified Class 1E equipment is not evaluated further in this study). A component is considered "justified" if it has been analyzed in detail to ensure that the plant can be safely operated pending completion of the component's environmental qualification. The criteria for interim justification have been derived from the proposed rule 10 CFR 50.49(j) (47 F.R. 2876 through 2879). These justification criteria are detailed in part III of this report.

Class 1E equipment in a mild environment is considered generically justified due to the SQRT program, accessibility following an accident, and lack of significant or unusual stress on the equipment following the DBE. In addition, plant technical specification testing and maintenance and surveillance demonstrates qualification, as called for in NRC Generic Letter No. 82-09, dated April 20, 1982.

C. Methodology

The study proceeded in the following manner:

First, each of the design basis events (DBE's) identified in FSAR Appendix 15A were reviewed to determine which events produce a harsh environment. Next, those safety actions necessary to achieve cold shutdown from each DBE were established and the primary and auxiliary systems required to perform those safety functions were identified. This enabled identification of potential paths to cold shutdown. From there, a preferred CSD path was selected for further review, and the specific components within the preferred path which will be subjected to a harsh environment as a result of the postulated DBEs were identified.

Those Class 1E components in a harsh environment which will not be environmentally qualified (per NUREG-0588) by fuel load were analyzed in detail with respect to their safety functions. All not yet qualified components, both those in the preferred CSD path as well as those not essential to achieve success of the path, were evaluated to determine whether interim operation is justified. This evaluation is presented in part III. Qualified components are not evaluated further. Where a given component is not required for the preferred cold shutdown path, this fact is considered to be a justification for interim operation; however, the impact of failure of such a component upon the ability to achieve and maintain cold shutdown was considered.

Once all the Class 1E components were evaluated, a comparison was made to the list of required components on the preferred CSD path. The path is considered successful if it is demonstrated that all required components are either qualified or justified and that failure of unqualified, unjustified components not in the preferred CSD path will not affect the plant's ability to achieve and maintain a safe cold shutdown condition.

D. Organization of Report

Part II presents the selection process for determining the preferred CSD path as discussed above in Section I.C. Part III is devoted to the component justification for interim operation, including a discussion of criteria employed in the evaluations. In Part IV, Conclusion, the preferred CSD path is reviewed to determine whether all required components in the path are qualified or justified. If this goal is attained, then it can be concluded that the SSES Unit 1 can be operated safely pending completion of the environment qualification program.

II. COLD SHUTDOWN (CSD) PATH SELECTION

A system/plant analysis was accomplished to establish that (at time of fuel load) a CSD path is available with the use of only components which have been justified for interim operation with regard to the harsh environment. This analysis (a) reviewed the Design Basis Events (DBE's) to identify those producing harsh environments, (b) established required safety actions and systems providing these actions, (c) identified the auxiliary systems which support these systems, (d) reviewed potential CSD paths and selected a "preferred" CSD path, (e) documented the systems which provide this path, and (f) identified explicitly the required electrical/mechanical components in each system. Electrical and control components are included implicitly by being associated/supportive of the listed components. If an electrical or control component was not fully qualified, its system function was reviewed and analyzed to determine whether an adequate basis for interim justification exists (see Section III). The failure of a safety-related component to appear on the System Environmental Data Sheets (either explicitly or implicitly) provides one of the justifications used in this study i.e. it is not needed for the preferred CSD path nor will it adversely affect the preferred CSD path.

A. Harsh Environment DBE's

The DBE's which are identified in FSAR Section 15, Appendix 15A were reviewed with respect to their effect on the environment to determine which ones produce a harsh environment. The results of this review are displayed in Figure II.A-1. Five DBE's (Events #40, 42, 43, 44 and 45) were identified as producing a harsh environment. One of these events (the Control Rod Drop Accident) produces a harsh environment which is the result of radioactive reactor water that is maintained within the reactor coolant pressure boundary and associated cooling systems pressure boundary.

B. Safety Actions Required for Response to DBE's

For each DBE the plant must respond in such a manner so as to assure that specific Safety Actions occur. Table II.B-1 summarizes the Safety Actions as identified by FSAR Appendix 15A.

C. CSD Path Options

It can be seen by reviewing the FSAR figures in Appendix 15 that the only Safety Action (Table II.B-1) which has a wide selection of alternate paths is Initial Core Cooling. The other Safety Actions are generally accomplished by redundant sets of the same components and do not provide much relief in this harsh environment study.

Appendix A is a set of Protective Logic Diagrams (from FSAR Appendix 15A) for Initial Core Cooling and Extended Core Cooling, which demonstrates the options available. The great variety of systems, sequences and timing is evident. The effect of removing a system can qualitatively be evaluated as was done by the "X"ing out of HPCI, RCIC and CS systems.

D. CSD Path Selection

1. Minimum Core Cooling Response

From Appendix A for Extended Core Cooling, it is seen that RHR/ADS is required, while for Initial Core Cooling ADS/RHR/CS is shown as adequate. Based upon the premise that no failure beyond the DBE and its consequences occurs, it was decided to exclude the CS from the minimum CSD path. Historically, BWRs have been designed such that the RHR system could provide the minimum cooling water required post DBE for both short and long term cooling. This was confirmed in the GE presentation made by C. H. Stoll to PP&L's Blue Ribbon, TMI committee. The RHR system as provided for Susquehanna was reported by GE to provide a 140% required cooling water flow rate with four RHR pumps running (i.e., no Core Spray).

The proposed path, Figure II.D-1, was then compared to the SSES FSAR. A search of the SSES FSAR did not find any contradiction with the suggested path. The relevant sections are discussed below:

- Section 6.3.1.1.2 identifies the ECCS available after a single failure, but not the minimum required.
- Section 6.3.3.7.4 states that failure of the LPCI is more severe than failure of the CS.
- Table 6.3-5 identifies the ECCS available after a single failure, but not the minimum required.
- Figure 7.3-1 identifies the acceptable and unacceptable number of RHR pump with one or two CS trains, but does not address 4 RHR pumps alone or if CS is not available.
- Section 15, Appendix 15A describes the need for LPCI/CS but does not quantify this need.

Based upon the above, the described Shutdown Path is adequate.

2. Support System Identification

Combining the preceeding data, Table II.D-1 was developed which provides a listing of responses to a specific event. For each response, the responding systems are identified and the support or auxiliary systems are shown. This provides a system level identification of the minimum CSD path. Table II.D-2 provides further identification of the Auxiliary Systems and their prime function(s) with respect to the systems which they support.

3. Required CSD Components

The System Environmental Data Sheets, Appendix B, were developed to provide a detailed identification of each system with respect to the major components required for the minimum shutdown path under a harsh environment. It also identifies the events for which the system is required, the Safety Actions the system is providing/ supporting, and provides a best estimate of the time required for the components to operate. The electrical and control components necessary to support listed equipment are not listed specifically but rather are implicitly included with their associated mechanical/ electrical components. For example, MCC, switchgear, panels, time delay relays, cable, transformers, etc., have not been specifically identified.

FIGURE II.A-1

SUSQUEHANNA STEAM ELECTRIC STATION

DESIGN BASES EVENT

ENVIRONMENTAL EFFECTS

The DBEs discussed in the FSAR Appendix 15A, were evaluated with respect to their effect upon the environment. Five of these DBEs (Events 40, 42, 43, 44 and 45) were identified as producing a harsh environment.

SUSQUEHANNA STEAM ELECTRIC STATION
DESIGN BASES EVENT
(CHAPTER 15A)
HARSH ENVIRONMENTAL EFFECTS

EVENT TITLE	HARSH ENV. PRODUCED		COMMENTS
	YES	NO	
40. Control Rod Drop Accident	X		Per FSAR 15.4.9, RCPB not breached but high activity in water
41. Fuel Handling Accident		X	Not a qualification problem
42. Loss of Coolant Accident Resulting from Spectrum of Postulated Piping Breaks Within RPCB Inside Primary Containment	X		
43. Steam System Piping Break Outside Primary Containment	X		
44. Instrument Line Break Inside Secondary Containment	X		
[illegible]. Feedwater Line Break Outside Primary Containment	X		
46. Gaseous Radwaste System Leak or Failure		X	No safety related items in area
47. Ambient Charcoal Off-Gas Treatment System Failure		X	No safety related items in area
48. Liquid Radwaste System Leak or Failure		X	No safety related items in area
49. Liquid Radwaste System Storage Tank Failure		X	No safety related items in area
50. Spent Fuel Cask Drop		X	
51. Reactor Shutdown from Anticipated Transient - Without SCRAM (ATWS)			Not a design bases
52. Reactor Shutdown - from Outside Main Control Room		X	
53. Reactor Shutdown - Without Control Rods		X	

TABLE II.B-1

SUSQUEHANNA STEAM ELECTRIC STATION

SAFETY ACTIONS

Table II.B-1 summarizes the Safety Actions required to respond to the Harsh Environment Design Bases events identified in Figure II.A-1. For more detail as to the systems which normally provide these Safety Actions refer to the figures in FSAR Appendix 15A.

SUSQUEHANNA
DESIGN BASES EVENTS
SAFETY ACTIONS
(FSAR Chapter 15A)

EVENT 40	Event 42	Event 43, 44,45
Scram	Scram	Scram
Reactor Vessel Isolation		Reactor Vessel Isolation
Establish Containment	Establish Primary Cont. Establish Secondary Cont.	
Initial Core Cooling	Initial Core Cooling	Initial Core Cooling
Extended Core Cooling	Extended Core Cooling	Extended Core Cooling
Pressure Relief	Pressure Relief	Pressure Relief
Control Room Env. Control	Control Room Env. Control	Control Room Env. Control
Limit Reactivity Insertion Rate	Stop Rod Ejection	Restrict loss of Reactor Coolant
	Suppression Pool Cooling	

FIGURE II.D-1

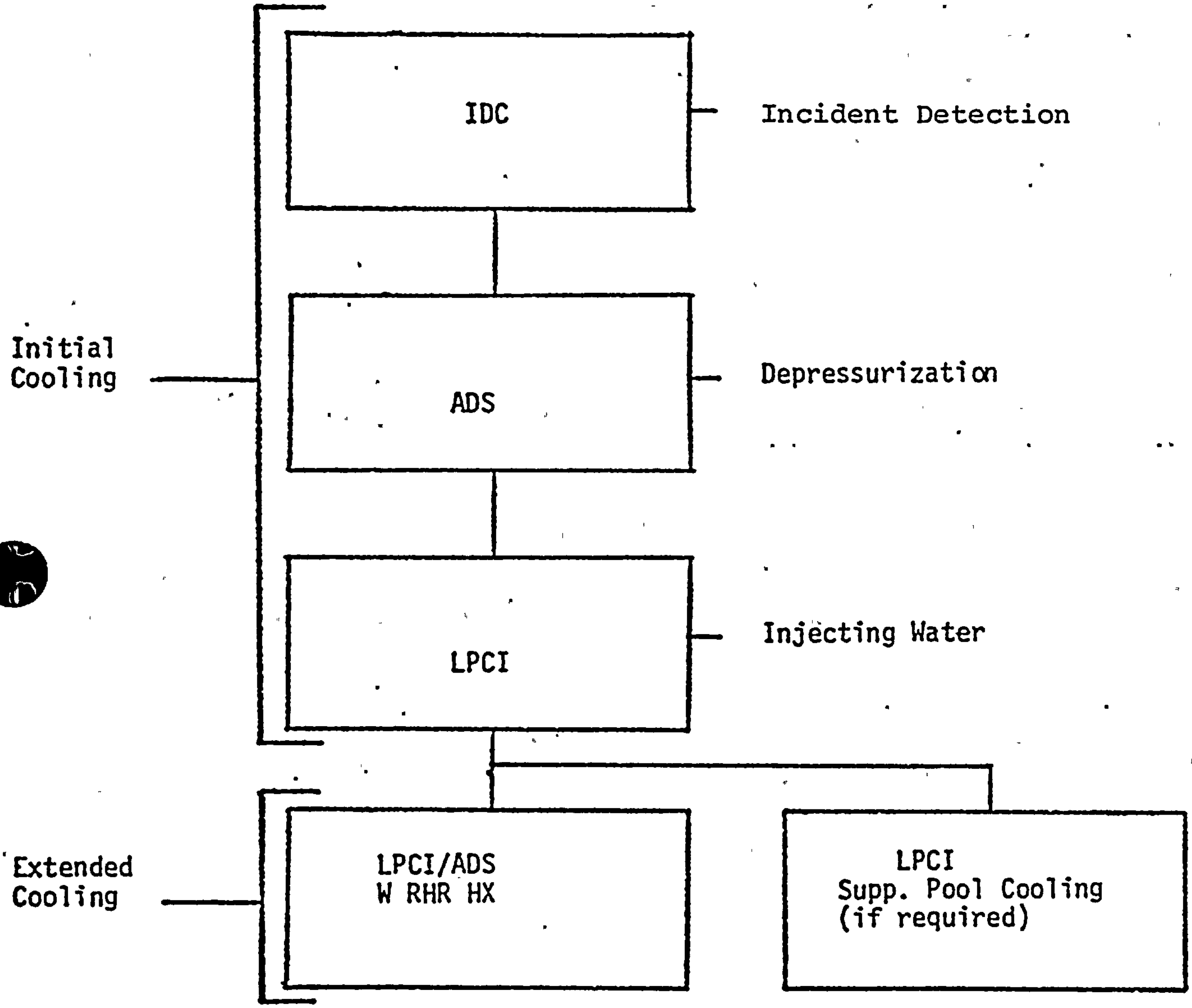
SUSQUEHANNA STEAM ELECTRIC STATION

DESIGN BASES EVENT

MINIMUM CORE COOLING REPONSE

This fiqure provides a core coolinq cold shutdown path based upon the premise that no failure beyond the DBE occurs and upon minimizing the quantity of components needed. The LPCI/ADS mode with RHR HX will exceed the cooling requirements for the core in the extended cooling period. At that time, the suppression pool could be cooled at the operator's option. Note that for Event 40, it is possible to use ADS/RHR in lieu of the HPCI/RCIC response shown in Appendix A and FSAR Appendix 15A.

SUSQUEHANNA SES
DESIGN BASES EVENT
MINIMUM CORE COOLING RESPONSE



Assume: no single failure

TABLE II.D-1

SUSQUEHANNA STEAM ELECTRIC STATION

SUPPORT SYSTEM IDENTIFICATION

This table provides a listing of responses to a specific DBE. For each response, the responding systems are identified and the support or auxiliary systems are shown. This provides a system level identification of the minimum CSD path.

Acronyms used in this table are as follows:

IDC	Incident Detection Circuitry
CRD	Control Rod Drive
RPS	Reactor Protection System
PCRVICS	Primary Containment and Reactor Vessel Isolation Control System
RBICS	Reactor Building Isolation Control System
MSIV	Main Steam Isolation Valve
RHR	Residual Heat Removal
LPCI	Low Pressure Coolant Injection Mode of RHR
HX	Heat Exchanger
ADS	Automatic Depressurization System

TABLE II.D-1

SUPPORT SYSTEM IDENTIFICATION

EVENT	RESPONSE	RESPONDING SYSTEM	AUXILIARY SYSTEM	SUB-AUXILIARY SYSTEM	SUB-SUB AUXILIARY SYSTEM
42 Pipe Break Inside Containment					
Large Break	Scram	CRD RPS			
	Establish Primary Containment	PCRVICS	DC Power	Aux. AC or Batteries	
			Aux. AC Power	Standby AC Power	DC Power Diesel Oil Transfer Emergency Service Water Diesel Generator Bldg. Vent Diesel Generator Combustion Air ESSW Pumphouse Vent
		MS Isolation Valve	DC Power		
			Instrument Gas Accumulator		
			Aux. AC Power	Standby AC Power	See Above
		Containment Atmos. Cont.	Hydrogen Recombiners	Aux. AC Power	See Above (Standby AC)
		Drywell HVAC (H_2 Mix.)	Aux. AC Power	Standby AC Power	See Above

SUPPORT SYSTEM IDENTIFICATION

EVENT	RESPONSE	RESPONDING SYSTEM	AUXILIARY SYSTEM	SUB-AUXILIARY SYSTEM	SUB-SUB AUXILIARY SYSTEM
42 Large Break Inside Containment (Cont'd)	Establish Secondary Containment	PCRVICS	See Above		
		RBICS			
		MSIV-Leakage Control	MS branch line isolation		
		Standby Gas Treatment	DC Power		
			Control Structure HVAC		
			Aux. AC Power	Standby AC Power	See Above
	Environmental Control of Control Room	Control Room HVAC	Aux. AC Power	Standby AC Power	See Above
			Control Structure Chilled Water	Emergency Service Water	
	Initial Core Cooling	Incident Detection Circuitry	DC Power	Aux. AC Power or Batteries	
		LPCI	Auxiliary AC Power	Standby AC Power	DC Power Diesel Oil Transfer Emergency Service Water Diesel Generator Bldg. Vent Diesel Generator Combustion Air ESSW Pumphouse Vent

SUPPORT SYSTEM IDENTIFICATION

EVENT	RESPONSE	RESPONDING SYSTEM	AUXILIARY SYSTEM	SUB-AUXILIARY SYSTEM	SUB-SUB AUXILIARY SYSTEM
42 Large Break Inside Containment (Cont'd)	Initial Core Cooling (Cont'd)		DC Power		
			Emergency Service Water		
			Equipment Area Cooling		
	Extended Core Cooling (including Suppression Pool Cooling)	RHR - LPCI via RHR HX	DC Power		
			Auxiliary AC Power	Standby AC Power	See Above
			Emergency Service Water		
			RHR Service Water		
			Equipment Area Cooling		
		*ADS	DC Power		
			Instrument Gas Accumulator		
		*Suppression Pool Temp.	Aux. AC Power	Standby AC Power	See Above

*Not required for large Recirculation Line Break.

SUPPORT SYSTEM IDENTIFICATION

	EVENT	RESPONSE	RESPONDING SYSTEM	AUXILIARY SYSTEM	SUB-AUXILIARY SYSTEM	SUB-SUB AUXILIARY SYSTEM
42	Large Break Inside Containment (Cont'd)	Detect Rad Leakage	Plant Process Rad Monitoring	Aux. AC Power	See Above	
	Intermediate/ Small Break Inside Containment	Same as above except ADS required for initial cooling				
40	Control Rod Drop	Scram	Neutron Monitoring	DC Power	Auxiliary AC Power or Batteries	
			CRD			
			RPS			
		Reactor Vessel Isolation and Establish Containment	Main Steam Line Radiation Monitoring			

SUPPORT SYSTEM IDENTIFICATION

EVENT	RESPONSE	RESPONDING SYSTEM	AUXILIARY SYSTEM	SUB-AUXILIARY SYSTEM	SUB-SUB AUXILIARY SYSTEM
40 Control Rod Drop (Cont'd)	Reactor Vessel Isolation and Establish Containment	PCRVICS	Aux. AC Power	Standby AC Power	DC Power Diesel Oil Transfer Emergency Service Water Diesel Generator Bldg. Vent Diesel Generator Combustion Air ESSW Pumphouse Vent
			DC Power	Aux. AC or Batteries	
		Main Steam Isolation Valve	DC Power		
			Instrument Gas Accumulator		
			Aux. AC Power	Standby AC Power	See Above
	Environmental Control of Control Room	Control Room HVAC	Auxiliary AC Power	Standby AC Power	See Above
			Emergency Service Water		

SUPPORT SYSTEM IDENTIFICATION

EVENT	RESPONSE	RESPONDING SYSTEM	AUXILIARY SYSTEM	SUB-AUXILIARY SYSTEM	SUB-SUB AUXILIARY SYSTEM
40 Control Rod Drop (Cont'd)			Control Structure Chilled water		
	Initial Core Cooling	Incident Detection Circuitry	DC Power	Auxiliary AC Power or Batteries	
		ADS	DC Power		
			Instrument Gas Accumulator		
		LPCI	DC Power		
			Aux. AC Power	Standby AC Power	See Above
			Emergency Service Water		
			Equipment Area Cooling		
	Extended Core Cooling (including Suppression Pool Cooling)	RHR - LPCI via RHR HX	DC Power		
			Aux. AC Power	Standby AC Power	See Above
			Emergency Service Water		
			RHR Service Water		
			Equipment Area Cooling		

SUPPORT SYSTEM IDENTIFICATION

EVENT	RESPONSE	RESPONDING SYSTEM	AUXILIARY SYSTEM	SUB-AUXILIARY SYSTEM	SUB-SUB AUXILIARY SYSTEM
40 Control Rod Drop (Cont'd)	Extended Core Cooling (Cont'd)	Suppression Pool Temp.	Aux. AC Power		
		ADS	DC Power		
			Instrument Gas Accumulator		
	Detect Rad Leakage	Plant Process Rad Monitoring			
44, 45					
Pipe Break Outside Containment					
RHR Shutdown Cooling Break	Scram	CRD			
		RPS			
	Establish RV Isolation	PCRVICS	DC Power	Aux. AC Power or Batteries	

SUPPORT SYSTEM IDENTIFICATION

EVENT	RESPONSE	RESPONDING SYSTEM	AUXILIARY SYSTEM	SUB-AUXILIARY SYSTEM	SUB-SUB AUXILIARY SYSTEM
43, 44, 45 (Cont'd)					
Pipe Break Outside Containment (Cont'd)			Auxiliary AC Power	Standby AC Power	DC Power Diesel Oil Transfer Emergency Service Water Diesel Generator Bldg. Vent Diesel Generator Combustion Air ESSW Pumphouse Vent
		Main Steam Isolation Valves	DC Power	Aux. AC Power or Batteries	
			Instrument Gas Accumulator		
			Auxiliary AC Power	Standby AC Power	See Above
	Environmental Control of Control Room	Control Room HVAC	Aux. AC Power	Standby AC Power	See Above
			Control Structure Chilled Water	Emergency Service Water	
	Initial Core Cooling	IDC	DC Power		

SUPPORT SYSTEM IDENTIFICATION

EVENT	RESPONSE	RESPONDING SYSTEM	AUXILIARY SYSTEM	SUB-AUXILIARY SYSTEM	SUB-SUB AUXILIARY SYSTEM
43, 44, 45					
RHR Shutdown Cooling Break Outside Containment (Cont'd)	Initial Core Cooling (Cont'd)	LPCI	Aux. AC Power	Standby AC Power	See Above
			DC Power		
			Emergency Service Water		
			Equipment Area Cooling		
	Extended Core Cooling (including Suppression Pool Cooling)	RHR - LPCI via RHR HX	DC Power		
			Aux. AC Power	Standby AC Power	See Above
			Emergency Service Water		
			RHR Service Water		
			Equipment Area Cooling	Emergency Service Water	
		ADS	DC Power		
			Instrument Gas Accumulator		
		Supp. Pool Temp.	Aux. AC Power		

SUPPORT SYSTEM IDENTIFICATION

EVENT	RESPONSE	RESPONDING SYSTEM	AUXILIARY SYSTEM	SUB-AUXILIARY SYSTEM	SUB-SUB AUXILIARY SYSTEM
43, 44, 45					
Break (other than RHR Shut-down Cooling) Outside Containment	Scram	See Above			
	Establish RV Isolation	See Above			
	Environmental Control of Control Room	See Above			
	Initial Core Cooling	IDC	DC Power		
		ADS	DC Power		
			Instrument Gas Accumulator		
		LPCI	Aux. AC Power	Standby AC Power	DC Power Diesel Oil Transfer Emergency Service Water Diesel Generator Bldg. Vent Diesel Generator Combustion Air ESSW Pumphouse Vent
			DC Power		

SUPPORT SYSTEM IDENTIFICATION

EVENT	RESPONSE	RESPONDING SYSTEM	AUXILIARY SYSTEM	SUB-AUXILIARY SYSTEM	SUB-SUB AUXILIARY SYSTEM
43, 44, 45					
Break (other than RHR Shut-down Cooling) Outside Containment (Cont'd)	Initial Core Cooling (Cont'd)		Emergency Service Water		
			Equipment Area Cooling		
	Extended Core Cooling (including Suppression Pool Cooling)	RHR - LPCI via RHR Hx	DC Power		
			Aux. AC Power	Standby AC Power	See Above
			Emergency Service Water		
			RHR Service Water		
			Equipment Area Cooling		
		ADS	DC Power		
			Instrument Gas Accumulator		
		Suppression Pool Temp.	Aux. AC Power		
		LPCI	See Above		
	Break Detection	Plant Leak Detection	Aux. AC Power	Standby AC Power	See Above

SUPPORT SYSTEM IDENTIFICATION

EVENT	RESPONSE	RESPONDING SYSTEM	AUXILIARY SYSTEM	SUB-AUXILIARY SYSTEM	SUB-SUB AUXILIARY SYSTEM
43, 44, 45					
Break (other than RHR Shut-down Cooling) Outside Containment (Cont'd)	Extended Core Cooling (Cont'd)		Emergency Service Water		
			RHR Service Water		
			Equipment Area Cooling		
		ADS	DC Power		
			Instrument Gas Accumulator		
		Suppression Pool Temp.	Aux. AC Power		
		LPCI	See Above		
	Break Detection	Plant Leak Detection	Aux. AC Power	Standby AC Power	See Above

TABLE II.D-2

SUSQUEHANNA STEAM ELECTRIC STATION

AUXILIARY SAFETY SYSTEMS

This table identifies the auxiliary systems directly required by the safety-related systems. In addition, the primary support functions of the auxiliary systems are provided. This table includes all safety systems, not merely those on the preferred Cold Shutdown path.

Table II.D-2

AUXILIARY SAFETY SYSTEMS

SYSTEM	AUXILIARY SYSTEM	COMMENTS
RCIC	DC Power System	Control Circuit Valve Power Lube Oil Pump
	Equipment Area Cooling System	Cool Area of RCICS Turbine Pump
	Süppression Pool Storage (Passive)	Water Supply for RCICS Pumps
	Nuclear Boiler Steam	Turbine Motivation
HPCI	DC Power System	Control Circuit Valve Power, Lube Oil Pump
	Equipment Area Cooling System	Cool Area of HPCI Turbine Pump
	Suppression Pool Storage (Passive)	Water Supply for HPCI Pump
	Nuclear Boiler Steam	Turbine Motivation
RHRS Suppression Pool Cooling (RHRS-Containment Spray Cooling)	Auxiliary AC Power System	Valve and Pump Power
	DC Power System	Pump Breaker Control
	Emergency Service Water System	RHRS Pump Cooler
	RHRS Service Water System	RHRS Heat Exchangers
	Equipment Area Cooling System	Cool Area of RHR Equipment
RHRS LPCI	Auxiliary AC Power System	Valve and Pump Power
	DC Power System	Pump Breaker Control and Control Logic

AUXILIARY SAFETY SYSTEMS

	AUXILIARY SYSTEM	
	Emergency Service Water System	RHRS Pump Cooler
	Equipment Area Cooling System	Cool Area of RHRS Equipment
	Suppression Pool Storage (Passive)	Water Supply to LPCI Pumps
RHRS Shutdown Cooling Mode	Auxiliary AC Power System	Valve and Pump Power
	DC Power System	Valve Power, Pump Breaker Control and Control Logic
	Emergency Service Water System	RHRS Pump Cooler
	Equipment Area Cooling System	Cool Area of RHRS Equipment
	RHRS Service Water System	RHRS Heat Exchangers
ADS and Manual Relief Valve Operation	Suppression Pool Storage (Passive)	Steam Condensation
	DC Power System	Relief Valve Controls Sensors Logic and Solenoids
	Instrument Gas Accommulator System	
CSCS	Auxiliary AC Power System	Valve and Pump Power
	DC Power System	Breaker Control Control Logic
	Equipment Area Cooling System	Cool Area of Spray Equipment
	Suppression Pool Storage (Passive)	Water Supply to Pumps
Standby Liquid Control System	Auxiliary AC Power System	Pump Power Tank Heaters Valve Firing Circuits

AUXILIARY SYSTEM

Code Pressure Relief System	Suppression Pool Storage (Passive)	Steam Condensation
Neutron Monitoring System	DC Power System	

SUSQUEHANNA SES

AUXILIARY SAFETY SYSTEM

SYSTEM	AUXILIARY SYSTEMS	COMMENTS
Control Structure Chilled Water System	Auxiliary AC Power System	Chiller and Pump Power
	DC Power System	Control Power
	Emergency Service Water System	Cool Chiller
Primary Containment and Reactor Vessel Isolation Control System	DC Power System	Valve and Control Power
	Auxiliary AC Power System	Valve Power
Incident Detection Circuitry	DC Power System	Power Control Circuitry
Containment (Passive)	Suppression Pool Storage (Passive)	Pressure Suppression
	Containment Vacuum Relief System	Reactor Building/ Containment Differental Pressure Control
	Drywell Vacuum Relief System	Drywell/Suppression Pool Differential Pressure Control
Offsite AC Power System	DC Power System	Breaker Control
Standby AC Power System	DC Power System	Diesel and Breaker Control
	Emergency Service Water System	Diesel Cooling
	Diesel Fuel Oil Storage and Transfer System	
	Combustion Air Supply to Diesel Room	

AUXILIARY SAFETY SYSTEMS

SYSTEM	AUXILIARY SYSTEMS	COMMENTS
	Equipment Area Cooling	D/G & Switch Gear Areas Cooling
Control Room Heating Ventilating and Air Conditioning System	Auxiliary AC Power System	Power to Air Conditioning Equipment
	Control Structure Chilled Water System	Air Coolers
Emergency Service Water System	DC Power System	Pump Breaker Control Power
	Auxiliary AC Power System	Valve and Pump Power
	Equipment Areas Cooling System	Cool Areas of ESW Pump
Standby Gas Treatment	DC Power System	Control Power
	Auxiliary AC Power System	Deliver Power to Blowers and Heaters
Equipment Area Cooling System	Emergency Service Water System	Cool Area Coolers
	Auxiliary AC Power System	Power to Blowers
RHRS Service Water System	Auxiliary AC Power System	Valve and Pump Power
	DC Power System	Pump Breaker Control Power
	Equipment Area Cooling System	Cool Areas of RHRS Service Water Pump
Hydrogen Control System	DC Power System	Control Power
	Auxiliary AC Power System	Recombiner Fan Power
MSLIV	DC Power System	Control Power
	Auxiliary AC Power System	Control Power

AUXILIARY SAFETY SYSTEMS

SYSTEM	AUXILIARY SYSTEMS	COMMENTS
	Instrument Gas Accumulator System	
Diesel Oil Storage and Transfer System	DC Power System	Control and Pump Power
Auxiliary AC Power System	Standby AC Power System or Offsite AC Power System	
	DC Power System	Breaker Control

III. COMPONENT JUSTIFICATIONS FOR INTERIM OPERATION

All Class 1E components which will not be environmentally qualified by Unit 1 fuel load (forecast for July 1, 1982) and which will be located in a harsh environment following a design basis event have been evaluated to ascertain whether the SSES plant can be safely operated pending completion of the environmental qualification program.

A. Criteria for Justifications

In evaluating individual components for interim justifications, the considerations given in proposed rule 10 CFR 50.49(j), as follows, were applied:

"1) Accomplishing the safety function by some designated alternative equipment that has been adequately qualified and satisfies the single-failure criterion if the principal equipment has not been demonstrated to be fully qualified.

2) The validity of partial test data in support of the original qualification.

3) Limited use of administrative controls over equipment that has not been demonstrated to be fully qualified.

4) Completion of the safety function prior to exposure to the ensuing accident environment and the subsequent failure of the equipment does not degrade any safety function or mislead the operator.

5) No significant degradation of any safety function or misleading of the operator as a result of failure of equipment under the accident environment". (49 F.R. 2879, January 20, 1982).

These considerations were further defined and expanded to cover other situations; this activity resulted in the development of a set of General Guidelines, listed in Table III.A-1, which were followed in determining the detailed component justifications (see Section III.B). For the purposes of this study, two other significant criteria were factored into the general guidelines: (1) a component not yet qualified which is not required for the preferred cold shutdown path is considered to be justified so long as failure of such a component will not prevent achieving and maintaining cold shutdown, and (2) Class 1E equipment in a mild environment is generically justified (see Introduction).

In addition, the results of a recent recalculation of total integrated doses (TIDs) have been factored into this report. This recalculation was conducted in accordance with the guidance of NUREG-0588 and demonstrated a reduction in the calculated post-accident doses in certain areas of the plant from those previously calculated. The results of the TID recalculation will be made available for the NRC at the May, 1982 Environmental Qualification audit; however, because the study is so recent, the revised doses may not appear in the FSAR or be reflected in the SSES Environmental Qualification Files at the time of the audit.

Low Risk Operation during Low Power Testing

In addition to the above, the risk of public health and safety is substantially less during the low power testing phase than after the plant has gone into commercial operation. This fact has been recognized specifically by the Nuclear Regulatory Commission. As stated in the introduction to the notice of proposed rulemaking for 10 CFR 50.47 (regarding emergency planning and preparedness):

> "The Commission's position is that several factors contribute to a substantial reduction in risk and potential accident consequences for low power testing as compared to the higher risks in continuous full power operation. First, the fission product inventory generated during low power testing is much less than during full power operation due to the lower level of reactor activity and short period of operation. Second, at low power, there is a reduction in the required capacity of systems designated to mitigate the consequences of an abnormal occurrence under full power operation. Third, the time scale for taking actions to identify accident causes and mitigate accident consequences is much longer than at full power. This means the operators should have sufficient time to prevent a release from occurring." (46 F.R. 61133, December 15, 1981)

The rationale propounded above is directly applicable to the justification for interim operation until ascension to full power for Class 1E components which are not yet environmentally qualified.

The following discussion shows how the considerations given in proposed rule 10 CFR 50.49 (j) on Environmental Qualification of Electric Equipment for Nuclear Power Plants relate to the above rationale:

- 10 CFR 50.49 (j)(1): "Accomplishing the safety function by some designated alternative equipment that has been adequately qualified and satisfies the single-failure criterion if the principal equipment has not been demonstrated to be fully qualified".

  Applicability:

  During the low-power testing phase, the energy available in the core is much less than during full power operation; therefore the operators have a longer time period to identify an accident and to take appropriate mitigating actions. This would allow the operators to use systems not normally called upon to mitigate accidents. Also, since the plant is not connected to the power grid during the low power testing phase, an accident would not cause a transient on the grid such that a loss of offsite power simultaneous with a DBA is much less likely; therefore, Class 1E offsite power supplies would most likely be available.

- 10 CFR 50.49 (j)(2): "The validity of partial test data in support of the original qualification".

  Applicability:

  Partial test data for a given component may be adequate to indicate that the component is able to withstand the less severe environment resulting from the postulated accident. This consideration may also apply where the manufacturer has stated and documented that its equipment will work in the accident environment but not all supporting data is available.

- 10 CFR 50.49 (j)(4): "Completion of the safety function prior to exposure to the ensuing accident environment and the subsequent failure of the equipment does not degrade any safety function or mislead the operator".

  Applicability:

  The fission product inventory during the low power testing period will be much lower than during full power operation; consequently, the total integrated dose from a postulated accident would be much lower. At low power the required capacity of systems designed to mitigate accident consequences is much less than at full power; therefore, fewer responding systems should be required to operate. Lack of equipment aging data can be justified because the low power test program has a short duration. The temperature profile for harsh environments during low power operation will be less severe. Although the temperature peak would be about the same as for full power operation (because the temperature and pressure of the reactor coolant inventory is the same), the total energy available from the reactor core is less, so that the core cooling systems will overcome decay heat faster which means that equipment space temperatures would be reduced earlier.

Finally, and perhaps most important, the probability of a design basis accident occurring during the low power testing phase is much lower than later in the plant life. This is because the equipment and piping is new, such that there will have been insufficient time for flaws to develop or propagate after the initial NDE and hydrotest. Also, there has been limited thermal cycling of the equipment and piping, and long-term phenomena such as Intergranular Stress Corrosion Cracking would not have had time to pose a problem.

B. Detailed Justifications

The detailed component justifications appear on the forms found in Appendix C of this report. These forms give basic information on each component which is not yet qualified and is located in a harsh environment. In many cases, for convenience, several components were grouped together for evaluation - especially where such components have a common safety function and environment.

For BOP equipment, the design basis accident(s) for which a component must be qualified are listed according to the number codes described in Section II.A. Also, the justifications are coded according to the applicable general guidelines of Table III.A-1. A brief explanation is included where necessary to clarify how each general guideline applies to the specific component being reviewed. For most of the components under review, several justifications for interim operation have been advanced. Thus, it can be seen that the determination of whether the plant can be safely operated in the interim rests upon the combination of justifications, rather than upon a single rationale.

In some cases the JIO form indicates that a future activity (for example, testing) is planned to complete the environmental qualification for a given component type. The activities mentioned are those intended at the time this report was prepared; if there is a change in plans, the NRC will be informed.

TABLE III.A-1

JUSTIFICATIONS FOR INTERIM OPERATION (JIOs) - GENERAL GUIDELINES

1. Component is not in the preferred Cold Shutdown (CSD) path. Failure of this component will not affect the ability to achieve and maintain cold shutdown. This component is electrically and physically separate from equipment on the Cold Shutdown path.

2. Designated alternate component is available to accomplish safety function; this alternate component is qualified or is located in a mild environment.

3. The component is designed in a redundant pair; each redundant component is separated from the other, with only one redundant component subjected to a harsh environment (e.g., containment isolation valves inside and outside containment).

4. The component completes its safety function in a period of time after an accident such that the component does not experience adverse effects from the accident environmental conditions in this time period.

5. The most likely mode of failure for the component is "fail safe".

6. Similar items have been qualified for the required environmental conditions; differences between the qualified items and the component under review are not expected to affect the component's ability to perform its safety function.

7. Operator action (administrative controls) can be taken in the case of component failure.

8. Failure of the component will not have any adverse impact on the effectiveness of the system to perform its safety-related function (e.g., failure of a minimum flow valve).

9. The component provides safety-related information only. Failure of the component would not affect safety equipment operation. Other instruments are available to provide the same information. Instrument failure should not mislead the operator.

10. Partial test data is available for postulated environmental conditions.

11. No credit for the component has been taken in the safety analysis.

12. There is confidence that the component is qualified for its service conditions because of conservative design practices and materials of fabrication and that the level of stress experienced by the component will not adversely affect the component's ability to perform its safety-related function.

13. The component (e.g., solenoid valve, a motor-operated containment isolation valve, etc.) is normally in the position required for accident mitigation.

14. Environmental parameters previously given were conservatively calculated and have been reduced by a more realistic analysis while still retaining sufficient safety margin. These reduced environmental conditions can be met by the component.

15. Justification that the component is qualified for its service conditions can be deduced from the successful operating history of similar components at operating plants.

16. When viewing accident scenario mechanistically, it is apparent that it is physically impossible for the component to be exposed to a harsh environment before the component attains its safe position or state.

17. The unqualified component will be replaced by a qualified component after fuel load but before ascension to full power.

IV. CONCLUSION

Justification for interim operation of the Susquehanna Steam Electric Station Unit 1 pending completion of environmental qualification has been demonstrated on three levels. First, a comprehensive, high-quality program has been underway for several years to environmentally qualify Class 1E electric equipment to the appropriate category of NUREG-0588. Second, this study has shown that a single, clear path to cold shutdown can be achieved employing either environmentally qualified or justified Class 1E components. Failure of unqualified equipment will not affect the plant's ability to achieve and maintain a safe, cold shutdown. Finally, as discussed in Section III.A.1, there is a low risk of operating the plant during the interim period. As can be demonstrated by SSES' Environmental Qualification Files, most Class 1E equipment is presently qualified, and resolution of all outstanding qualification concerns related to justification for interim operation is anticipated before ascension to full power operation.

SUSQUEHANNA STEAM ELECTRIC STATION

PROTECTIVE LOGIC DIAGRAMS

This appendix is a set of Protective Logic Diagrams (from FSAR Appendix 15A) for Initial Core Cooling and Extended Core Cooling, which demonstrates the options available. The great variety of systems, sequences and timing is evident. The effect of removing a system can qualitatively be evaluated as was done by the "X"ing out of HPCI, RCIC and CS systems. "X"ing out HPCI and RCIC completely eliminated Initial Core Cooling Protective Logic I applicable to Event 40. However, it is possible to use ADS/LPCI in lieu of HPCI/RCIC as shown in Initial Core Cooling Logic V.

The "Plant States" listed on pages 5 and 6 of this appendix are those defined in the SSES FSAR Table 15A.3-1, namely:

A = Shutdown with reactor vessel head off
B = Not shutdown with reactor vessel head off
C = Shutdown with reactor vessel head on
D = Not shutdown with reactor vessel head on.

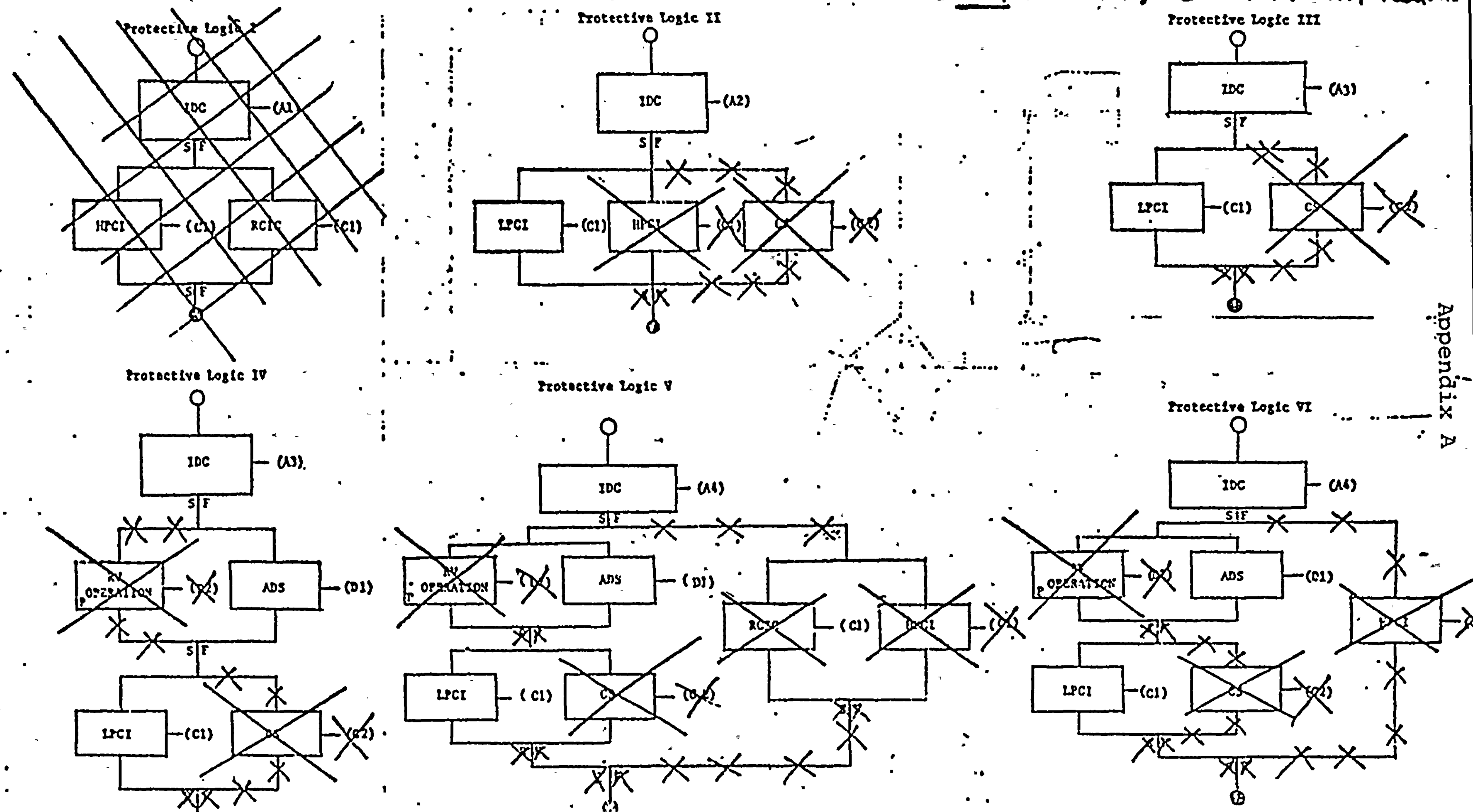
NOTES:

1) NO CREDIT FOR HPCI AND RCIC OPERATION
2) USE ADS FOR DEPRESSURIZATION
3) USE LPCI FOR INJECTING WATER
4) SINCE SINGLE FAILURE NOT ASSUMED, CS AND RV NOT REQUIR

Safety Function: Decay Heat Removal

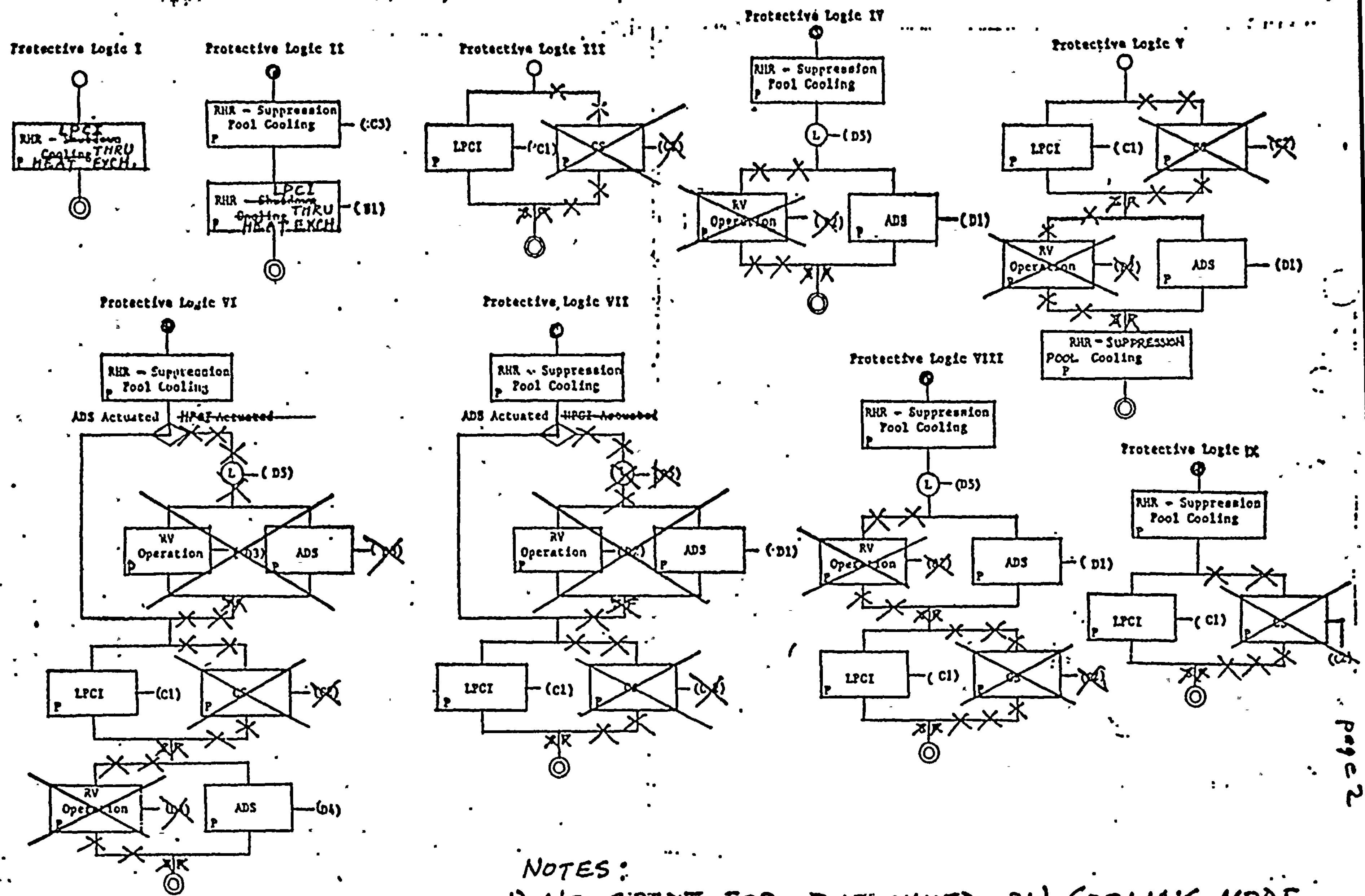
Safety Task: Initial Core Cooling

Protective Logic Diagrams



Appendix A

Safety Function: Decay Heat Removal
Safety Task: Extended Core Cooling
Protective Logic Diagrams



NOTES:

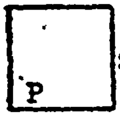
1) NO CREDIT FOR RHR SHUTDOWN COOLING MODE. USE RHR IN LPCI MODE THROUGH HEAT EXCHANGERS WITH ADS VALVES OPEN.
2) SINGLE FAILURE ~~NOT~~ ASSUMED THEREFORE CS AND RV NOT REQUIRED.

Page 2

FORMAT AND NOTES FOR PROTECTIVE LOGIC DIAGRAMS

I. Format (Follows SSES FSAR, Figure 15A.4-1).

1. S/F: Single Failure Proof.

2. : Operator Action Required.

3.  : Indicates that one or more of the key process parameters must be limited to satisfy nuclear safety operational criteria.

4.  : Different Plant Conditions.

5.  : Initial Condition

6.  : Arriving the Initial Core Cooling State

7.  : Arriving the Extended Core Cooling State

II. Notes:

1. (AX): Detect Reactor Protective Parameters, and Initiate Safety Systems, where:

   A1 = Detect Low Water Level. Initiate HPCI and RCIS Systems.

   A2 = Detect Low Water Level or High Drywell Pressure. Initiate HPCI, CS, and LPCI Systems on Respective Trip Setting.

   A3 = Detect Low Water Level. Initiate ADS, LPCI and CS Systems on Respective Trip Setting

   A4 = Detect Low Water Level. Initiate HPCI, RCIC ADS, CS and LPCI Systems on Respective Trip Setting.

2. (BX): Reactor Pressure Conditions, Where:

   B1 = When Reactor Pressure < 98 psig Start the System

3. (CX): Cooling process, Where:

   C1 = Restore Water Level and Maintain Core Cooling by Flooding.

   C2 = Restore Water Level and Maintain Core Cooling by Spraying.

   C3 = Remove Decay Heat from Suppression Pool.

4. (DX): Depressurization, Where:

   D1 = 7 or Less Valves Required to Depressurize Reactor.

   D2 = Depressurize Reactor.

   D3 = 2 or Less Valves Required to Maintain Depressurization.

   D4 = 2 or Less Valves Required to Control Depressurization.

   D5 = Suppression Pool Temperature Limit, Start Depressurization.

Function: Decay Heat Removal

Task: Initial Core Cooling

Events	Plant States	Event Conditions
~~Protective Logic Type I~~		
8	A,B	
12	C,D	
13	D	2 Pumps Trip
14	C,D	
20	C,D	Reactor Pressure > 98 psig
22	C,D	
23	C,D	
24	C,D	Second Pressure Regulator Failure
25	D	
26	C,D	
27	D	Reactor Power > 30% Rated
28	C,D	Reactor Pressure > 98 psig
29	C,D	Reactor Pressure > 98 psig
30	D	Reactor Power > 30% Rated
31	D	Reactor Power > 30% Rated
38	D	
39	D	
40	D	
51	B,C,D	Reactor Isolated from Main Condenser Reactor Pressure > 98 psig
52	C,D	Reactor Isolated from Main Condenser Reactor Pressure > 98 psig
53	B,D	Reactor Isolated from Main Condenser Reactor Pressure > 98 psig
Protective Logic Type II		
42	C,D	Large Breaks
Protective Logic Type III		
43	C,D	RHR Shutdown Cooling Break
44	C,D	RHR Shutdown Cooling Break
45	C,D	RHR Shutdown Cooling Break
Protective Logic Type IV		
42	C,D	Small or Intermediate Break Which Incapacitate HPCI
~~Protective Logic V~~		
~~15~~	~~C,D~~	

Initial Core Cooling

Events	Plant States	Event Conditions
Protective Logic Type VI		
42	C,D	Small or Intermediate Break which Doesn't Incapacitate HPCI
43	C,D	Not RHR Shutdown Cooling Break
44	C,D	Not RHR Shutdown Cooling Break
45	C,D	Not RHR Shutdown Cooling Break

Function: Decay Heat Removal

Task: Extended Core Cooling

Events	Plant States	Event Conditions
Protective Logic Type I		
51	C,D	Reactor Isolated from Main Condenser Reactor Pressure < 98 psig
51	B	
52	C,D	Reactor Isolated from Main Condenser Reactor Pressure < 98 psig
52	B	
53	D	Reactor Isolated from Main Condenser Reactor Pressure < 98 psig
53	B	
Protective Logic Type II		
51	C,D	Reactor Isolated from Main Condenser Reactor Pressure > 98 psig
52	C,D	Reactor Isolated from Main Condenser Reactor Pressure > 98 psig
53	D	Reactor Isolated from Main Condenser Reactor pressure > 98 psig
Protective Logic Type III		
18	A,B	Isolation of Shutdown Cooling Suction Line
29	A,B	
Protective Logic Type IV		
43	C,D	RHRS Shutdown Cooling Break
44	C,D	RHRS Shutdown Cooling Break
45	C,D	RHRS Shutdown Cooling Break
Protective Logic Type V		
~~18~~	~~C,D~~	~~Isolation of Shutdown Cooling Suction Line~~ ~~Reactor Pressure > 98 psig~~
Protective Logic Type VI		
~~15~~	~~C,D~~	
42	C,D	BREAK SIZE NOT SUFFICIENT FOR DECAY HEAT REMOVA
43	C,D	Not RHRS Shutdown Cooling Break
44	C,D	Not RHRS Shutdown Cooling Break
45	C,D	Not RHRS Shutdown Cooling Break

Decay Heat Removal

Extended, Core Cooling

Events	Plant States	Events Conditions
Protective Logic Type VII		
42	C,D	BREAK SIZE SUFFICIENT FOR DECAY HEAT REMOVAL
Protective Logic Type VIII		
~~19~~	~~C,D~~	
20	C,D	Reactor Pressure > 98 psig
22	C,D	
24	C,D	Second Pressure Regulator Failure
26	D	
27	D	
28	C,D	Reactor Pressure > 98 psig
29	C,D	Reactor Pressure > 98 psig
38	D	
~~39~~	~~D~~	
40	D	
PROTECTIVE LOGIC TYPE IX		
42		LARGE RECIRCULATION LINE BREAK

SYSTEM ENVIRONMENTAL DATA SHEETS

ELECTRICAL/MECHANICAL COMPONENTS

(HARSH ENVIRONMENT)

The System Environmental Data Sheets provide a detailed identification of each system with respect to the major components required for the minimum shutdown path under a harsh environment. It also identifies the events for which the system is required, lists the safety actions which the system are providing/supporting and provides a best estimate of the time required for the components to operate.

The electrical and control components necessary to support the listed equipment are not listed specifically but are rather implicitly included with their associated mechanical/electrical components. For example, MCC, switchgear, panels, time delay relays, cable, transformer, etc., have not been specifically identified.

Revision: 0
Date: 4-2-82
By: [illegible]
Checked: [illegible]

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: Condensate & Refueling H_2O Storage P&ID M-108 Rev. 20

Safety Related Operation: supply H_2O to HPCI/RCIC system

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	
#42	Pipe Break Inside Containment	
#43,44,45	Pipe Break Outside Containment	

Action Being Implemented:

		40	42	43-45	
Scram					a
Establish Prim. Containment					b
Establish Sec. Containment					c
Suppression Pool Cooling					d
Initial Core Cooling					e
Extended Core Cooling					f
Control Room Env. Control					g

Notes (where referenced)

(1) Event numbers refer to FSAR Section 15

(2) To be fail-safe past qualification time (i.e. Long Term)

(3) Unrelated to normal system function

(4) L.T. means Long Term

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
Not on preferred CSD shutdown path		

Revision: 2
Date: 4-22-82
By: L.G. Small
Checked: [illegible]

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: Service Water P&ID M-109 Rev. 17

Safety Related Operation: Provide ESW pressure boundary

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	✓	(3)
#42	Pipe Break Inside Containment	✓	(3)
#43,44,45	Pipe Break Outside Containment	✓	(3)

Action Being Implemented:

		40	42	43-45	
Scram					a
Establish Prim. Containment		✓	✓	✓ (5)	b
Establish Sec. Containment		✓	✓		c
Suppression Pool Cooling		✓	✓	✓	d
Initial Core Cooling		✓	✓	✓	e
Extended Core Cooling		✓	✓	✓	f
Control Room Env. Control		✓	✓	✓	g

Notes (where referenced)

(1) Event numbers refer to FSAR Section 15

(2) To be fail-safe past qualification time (i.e. Long Term)

(3) Unrelated to normal system function

(4) L.T. means Long Term

(5) Reactor Vessel Isolation only

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
SV-10943 A & B (N.D.) due to HV-11143 A & B on P&ID-M-111 (HV-10943A2 & B2 are not required because associated check valves performs their function)	b-g (System Pressure Boundry)	0 (2)

Revision: 0
Date: 4-1-82
By: [illegible]
Checked: [illegible]

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: Service Water P&ID M-110 Rev. 10

Safety Related Operation: Isolate ESWS from service water system

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	✓	(3)
#42	Pipe Break Inside Containment	✓	(3)
#43,44,45	Pipe Break Outside Containment	✓	(3)

Action Being Implemented: (5)

		40	42	43-45	
Scram					a
Establish Prim. Containment					b
Establish Sec. Containment					c
Suppression Pool Cooling					d
Initial Core Cooling					e
Extended Core Cooling					f
Control Room Env. Control					g

Notes (where referenced)
(1) Event numbers refer to FSAR Section 15

(2) To be fail-safe past qualification time (i.e. Long Term)

(3) Unrelated to normal system function

(4) L.T. means Long Term

(5) Maintain ESWS pressure boundary

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
SV-1024A, B are normally de-energized & must remain so.	(5)	0 (2)

Revision: 0
Date: 4-1-82
By: [signature]
Checked: [initials]

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: Emergency Service Water P&ID M-111 Rev. Sheet 1 Rev 14, Sheet 2 Rev 12

Safety Related Operation: Provide component and area cooling

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	✓
#42	Pipe Break Inside Containment	✓
#43,44,45	Pipe Break Outside Containment	✓

Action Being Implemented:

		40	42	43-45	
Scram					a
Establish Prim. Containment		✓	✓	✓ (5)	b
Establish Sec. Containment		✓	✓		c
Suppression Pool Cooling		✓	✓	✓	d
Initial Core Cooling		✓	✓	✓	e
Extended Core Cooling		✓	✓	✓	f
Control Room Env. Control		✓	✓	✓	g

Notes (where referenced)
(1) Event numbers refer to FSAR Section 15
(2) To be fail-safe past qualification time (i.e. Long Term)
(3) Unrelated to normal system function
(4) L.T. means Long Term
(5) Reactor Vessel Isolation Only

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
Sheet #1 all components are in a non-harsh environment.	b - g	—
Sheet #2 HV-11143A & B (NC & FC) — SEE SV-10993 A & B, P&ID M109	b-g (System pressure boundary)	0 (2)

Revision: 0
Date: 4-1-82
By: Smuk
Checked: [illegible]

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: RHR Service Water P&ID M-112 Rev. 17

Safety Related Operation: Provide cooling (Long Term) for the reactor core and for suppression Pool.

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	✓
#42	Pipe Break Inside Containment	✓
#43,44,45	Pipe Break Outside Containment	✓

Action Being Implemented:

		40	42	43-45	
Scram					a
Establish Prim. Containment					b
Establish Sec. Containment					c
Suppression Pool Cooling		✓	✓	✓	d
Initial Core Cooling					e
Extended Core Cooling		✓	✓	✓	f
Control Room Env. Control					g

Notes (where referenced)

(1) Event numbers refer to FSAR Section 15

(2) To be fail-safe past qualification time (i.e. Long Term)

(3) Unrelated to normal system function

(4) L.T. means Long Term

(5) If opened immediately, then could change from L.T. to 10 min.

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
HV-11210 A&B; HV-11215 A&B	d & f	L.T.(5)
FT-1N007 A&B	Monitor system operation	L.T.
HV-1F073 A&B (NC-MO valves)	Sys. press. boundry	0 (2)
Remainder of system is in a non-harsh environment.		

Revision: 0
Date: 4-1-82
By: HG
Checked: [signature]

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: Reactor Bldg. Closed Cooling Water P&ID M-113 Rev. 18

Safety Related Operation: Establish primary containment

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	✓ (3)
#42	Pipe Break Inside Containment	✓ (3)
#43,44,45	Pipe Break Outside Containment	

Action Being Implemented:

		40	42	43-45	
Scram					a
Establish Prim. Containment		✓(3)	✓(3)		b
Establish Sec. Containment					c
Suppression Pool Cooling					d
Initial Core Cooling					e
Extended Core Cooling					f
Control Room Env. Control					g

Notes (where referenced)
(1) Event numbers refer to FSAR Section 15
(2) To be fail-safe past qualification time (i.e. Long Term)
(3) Unrelated to normal system function
(4) L.T. means Long Term

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
Either the inboard or outboard isolation valves i.e. HV-11346 or HV-11314 and HV-11345 or HV-11313	b	<10 min (2)

Revision: 0
Date: 4-1-82
By: Lloyd Smell
Checked: HG

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: Diesel Oil Storage & Transfer P&ID M-120 Rev. 8

Safety Related Operation: Provide fuel oil to D/G to supply stand-by AC Power

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	✓
#42	Pipe Break Inside Containment	✓
#43,44,45	Pipe Break Outside Containment	✓

Action Being Implemented:

		40	42	43-45	
Scram					a
Establish Prim. Containment		✓	✓	✓	b
Establish Sec. Containment		✓	✓		c
Suppression Pool Cooling		✓	✓	✓	d
Initial Core Cooling		✓	✓	✓	e
Extended Core Cooling		✓	✓	✓	f
Control Room Env. Control		✓	✓	✓	g

Notes (where referenced)

(1) Event numbers refer to FSAR Section 15

(2) To be fail-safe past qualification time (i.e. Long Term)

(3) Unrelated to normal system function

(4) L.T. means Long Term

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
System is in a non-harsh environment		

Revision: 1
Date: 4-22-82
By: TLG
Checked: [illegible]

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: Process Sampling P&ID M-123 Sh 5 Rev. 1

Safety Related Operation: provide pressure boundary for containment

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	
#42	Pipe Break Inside Containment	
#43,44,45	Pipe Break Outside Containment	

Action Being Implemented:

		40	42	43-45	
Scram					a
Establish Prim. Containment					b
Establish Sec. Containment					c
Suppression Pool Cooling					d
Initial Core Cooling					e
Extended Core Cooling					f
Control Room Env. Control					g

Notes (where referenced)
(1) Event numbers refer to FSAR Section 15
(2) To be fail-safe past qualification time (i.e. Long Term)
(3) Unrelated to normal system function
(4) L.T. means Long Term

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
For the preferred CSD path, primary containment is provided by the valves at the containment. Also, the valves (Q-listed) on this P&ID are N.C., F.C. solenoid valves.	—	—

Revision: 0
Date: 4-1-82
By: [illegible]
Checked: [illegible]

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: Containment Instrument Gas   P&ID M-126   Rev. 14

Safety Related Operation: a) depressurization of RV & provide a coolant flow path for both Initial & Extended Core Cooling
b) provide primary containment isolation

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	✓
#42	Pipe Break Inside Containment	✓
#43,44,45	Pipe Break Outside Containment	✓

Action Being Implemented:

	40	42	43-45	
Scram				a
Establish Prim. Containment	(3) ✓	(3) ✓		b
Establish Sec. Containment				c
Suppression Pool Cooling				d
Initial Core Cooling	✓	✓	✓	e
Extended Core Cooling	✓	✓	✓	f
Control Room Env. Control				g

Notes (where referenced)
(1) Event numbers refer to FSAR Section 15
(2) To be fail-safe past qualification time (i.e. Long Term)
(3) Unrelated to normal system function
(4) L.T. means Long Term

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
SV-12654A&B (N.O. & N.O.)	e & f	0 (2)
SV-12643, 12644, 12648, 12649 & PT-12648 & 12643 (De-energizes if/when normal instr. Air is lost)	e & f	L.T.
SV-12605 or HV-12603	b (3)	<10 min (2)
SV-12671, 12651, 12661	b (3)	—

Revision: 0
Date: 4-1-82
By: [illegible]
Checked: [illegible]

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: Diesel Auxiliaries P&ID M-134 Rev. 9

Safety Related Operation: Provide Standby AC Power

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	✓
#42	Pipe Break Inside Containment	✓
#43,44,45	Pipe Break Outside Containment	✓

Action Being Implemented:

		40	42	43-45	
Scram					a
Establish Prim. Containment		✓	✓	✓	b
Establish Sec. Containment		✓	✓		c
Suppression Pool Cooling		✓	✓	✓	d
Initial Core Cooling		✓	✓	✓	e
Extended Core Cooling		✓	✓	✓	f
Control Room Env. Control		✓	✓	✓	g

Notes (where referenced)
(1) Event numbers refer to FSAR Section 15

(2) To be fail-safe past qualification time (i.e. Long Term)

(3) Unrelated to normal system function

(4) L.T. means Long Term

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
System is in a non-harsh environment.		

Revision: 0
Date: 4-2-82
By: [illegible]
Checked: [illegible]

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: MSIV Leakage control Syst P&ID M-139 Rev. 4

Safety Related Operation: Prevents the main steam line from becoming a pathway to bypass the SBGT system

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	✓
#42	Pipe Break Inside Containment	✓
#43,44,45	Pipe Break Outside Containment	

Action Being Implemented:

	40	42	43-45	
Scram				a
Establish Prim. Containment				b
Establish Sec. Containment	✓	✓		c
Suppression Pool Cooling				d
Initial Core Cooling				e
Extended Core Cooling				f
Control Room Env. Control				g

Notes (where referenced)
(1) Event numbers refer to FSAR Section 15

(2) To be fail-safe past qualification time (i.e. Long Term)

(3) Unrelated to normal system function

(4) L.T. means Long Term

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
PT-1N056	C	L.T.
PT-1N055		
HV-1F008		
HV-1F009		
HV-1F006		
HV-1F007		
1K-209A or B		
PT-1N058		
RE-1N006 A & B		
HV-1F001 B,F,K,P		
PS-1N015 A,B		

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: Nuclear Boiler P&ID M-141 Rev. 14

Safety Related Operation: Isolate Reactor Vessel and detect main steam line failure

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	✓
#42	Pipe Break Inside Containment	✓
#43,44,45	Pipe Break Outside Containment	✓

Action Being Implemented:

		40	42	43-45	
Scram					a
Establish Prim. Containment		(3) ✓	(3) ✓	(3) ✓	b
Establish Sec. Containment					c
Suppression Pool Cooling					d
Initial Core Cooling					e
Extended Core Cooling					f
Control Room Env. Control					g

Notes (where referenced)
(1) Event numbers refer to FSAR Section 15
(2) To be fail-safe past qualification time (i.e. Long Term)
(3) Unrelated to normal system function
(4) L.T. means Long Term

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
HV-1F022A, B, C, D & associated S.V. or HV-1F028A, B, C, D & associated S.V.	b	< 10 min (2)
HV-1F019 or 1F016	b	< 10 min (2)
FIS-1N006 A & B, 007 A & B, 008 A & B, 009 A & B	b	< 10 min
TE-1N014A, B, C, D 1N016A, B, C, D 1N010A, B, C, D	b	<< 10 min

Revision: 0
Date: 4/2/82
By: [signature]
Checked: [initials]
Sheet 2 of 3

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: Nuclear Boiler P&ID M-141 Rev. —

Safety Related Operation: —

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	
#42	Pipe Break Inside Containment	
#43,44,45	Pipe Break Outside Containment	

Action Being Implemented:

		40	42	43-45	
Scram					a
Establish Prim. Containment					b
Establish Sec. Containment					c
Suppression Pool Cooling					d
Initial Core Cooling					e
Extended Core Cooling					f
Control Room Env. Control					g

Notes (where referenced)

(1) Event numbers refer to FSAR Section 15

(2) To be fail-safe past qualification time (i.e. Long Term)

(3) Unrelated to normal system function

(4) L.T. means Long Term

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
HV-1F001 or 1F002 (N.C.)	b	0 (2)

Revision: 0
Date: 4/2/82
By: [signature]
Checked: [initials]
Sheet 3 of 3

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: Nuclear Boiler P&ID M-141 Rev. 14

Safety Related Operation: ADS

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	✓
#42	Pipe Break Inside Containment	✓
#43,44,45	Pipe Break Outside Containment	✓

Action Being Implemented:

	40	42	43-45	
Scram				a
Establish Prim. Containment				b
Establish Sec. Containment				c
Suppression Pool Cooling				d
Initial Core Cooling	✓	✓ (5)	✓	e
Extended Core Cooling	✓	✓ (5)	✓	f
Control Room Env. Control				g

Notes (where referenced)
(1) Event numbers refer to FSAR Section 15
(2) To be fail-safe past qualification time (i.e. Long Term)
(3) Unrelated to normal system function
(4) L.T. means Long Term
(5) For intermediate & small breaks only

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
PSV-1F013 G, K, L, M, N SV-14113 G1, G2 J1, J2 K1, K2 L1, L2 M1, M2 N1, N2	e, f	L.T.

Revision: C 1
Date: 4-12-82
By: [illegible]
Checked: [illegible]

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: Nuclear Boiler Vessel Instrumentation P&ID M-142 Rev. 9

Safety Related Operation: Monitor R.V.; Provide input to Reactor Protection System (Including the Incident Detection Circuitry)

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	✓
#42	Pipe Break Inside Containment	✓
#43,44,45	Pipe Break Outside Containment	✓

Action Being Implemented:

		40	42	43-45	
Scram		✓	✓	✓	a
Establish Prim. Containment					b
Establish Sec. Containment					c
Suppression Pool Cooling					d
Initial Core Cooling		✓	✓	✓	e
Extended Core Cooling					f
Control Room Env. Control					g

Notes (where referenced)
(1) Event numbers refer to FSAR Section 15

(2) To be fail-safe past qualification time (i.e. Long Term)

(3) Unrelated to normal system function

(4) L.T. means Long Term

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
PS 1N021A, C PS-1N022 A thru S PIS-1N021D, B PT-1N055A LIS-1N024A, B LIS-1N042A -1N031A, C, B, D LITS-1N026A, B	a, e	<10min

Revision: 0
Date: 4-2-82
By: [signature]
Checked: [initials]

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: Reactor Recirculation P&ID M-143 Rev. 11

Safety Related Operation: limits coolant flow out of Recirc. Line breaks

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	
#42	Pipe Break Inside Containment	✓
#43,44,45	Pipe Break Outside Containment	

Action Being Implemented:

		40	42	43-45	
Scram					a
Establish Prim. Containment					b
Establish Sec. Containment					c
Suppression Pool Cooling					d
Initial Core Cooling			✓(3)		e
Extended Core Cooling			✓(3)		f
Control Room Env. Control					g

Notes (where referenced)

(1) Event numbers refer to FSAR Section 15

(2) To be fail-safe past qualification time (i.e. Long Term)

(3) Unrelated to normal system function

(4) L.T. means Long Term

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
HV-1F-031 A & B HV-1F-032 A & B	e, f	<10 min (2)
SV-14319 or SV-14320 (NC; FC)	b	0 (2)

Revision: 0
Date: 4-1-82
By: [signature]
Checked: [initials]

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: Reactor Water Clean-up P&ID M-144 Rev. 13

Safety Related Operation: a) Provide RV/containment isolation

b) detect/isolate clean-up pipe break

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	✓	(3)
#42	Pipe Break Inside Containment	✓	(3)
#43,44,45	Pipe Break Outside Containment	✓	(3)

Action Being Implemented:

		40	42	43-45	
Scram					a
Establish Prim. Containment		✓ (3)	✓ (3)	✓ (3)	b
Establish Sec. Containment					c
Suppression Pool Cooling					d
Initial Core Cooling					e
Extended Core Cooling					f
Control Room Env. Control					g

Notes (where referenced)

(1) Event numbers refer to FSAR Section 15

(2) To be fail-safe past qualification time (i.e. Long Term)

(3) Unrelated to normal system function

(4) L.T. means Long Term

(5) Expected to complete its funtion before exposure to hard env.

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
HV-1F001 or 1F004 Establish primary containment	b (3)	< 10 min (2)
Detect large clean-up line break PDSH-1N044A (5)	b (3)	≪ 10 min (5)
Detect small clean-up line leak TE-1N016A1/C1/E1; TE-1N023 A1/C1/E1 TE-1N022A1/C1/E1 (5)	b (3)	< 10 min (5)

Revision: 1
Date: 4-22-82
By: [illegible]
Checked: [illegible]

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: CRD P&ID M-147 Rev. 11

Safety Related Operation: Provide motive power for insertion of the control rods

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	✓
#42	Pipe Break Inside Containment	✓
#43,44,45	Pipe Break Outside Containment	✓

Action Being Implemented:

		40	42	43-45	
Scram		✓	✓	✓	a
Establish Prim. Containment					b
Establish Sec. Containment					c
Suppression Pool Cooling					d
Initial Core Cooling					e
Extended Core Cooling					f
Control Room Env. Control					g

Notes (where referenced)

(1) Event numbers refer to FSAR Section 15

(2) To be fail-safe past qualification time (i.e. Long Term)

(3) Unrelated to normal system function

(4) L.T. means Long Term

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
1S239 Hydraulic control units ZS 14722C3 (ZS is for operator info only)	a	< 10min (2)
SV-1F009	contain Reactor water	<< 10min (2)

Revision: 1
Date: 4-22-82
By: Lloyd Small
Checked: KH

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: Stand-by Liquid Control P&ID M-148 Rev. 9

Safety Related Operation: Back-up to scram system

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	
#42	Pipe Break Inside Containment	
#43,44,45	Pipe Break Outside Containment	

Action Being Implemented:

		40	42	43-45	
Scram					a
Establish Prim. Containment					b
Establish Sec. Containment					c
Suppression Pool Cooling					d
Initial Core Cooling					e
Extended Core Cooling					f
Control Room Env. Control					g

Notes (where referenced)
(1) Event numbers refer to FSAR Section 15

(2) To be fail-safe past qualification time (i.e. Long Term)

(3) Unrelated to normal system function

(4) L.T. means Long Term

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
Not on preferred cold shutdown path		

Revision: 3
Date: 4-22-82
By: L. [illegible]
Checked: HG

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: RCIC   P&ID M-149 / M-150   Rev. 15 / 10

Safety Related Operation: Injects water from condensate storage tank & suppression pool into Reactor Vessel using a steam driven-pump

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	✓	(3)
#42	Pipe Break Inside Containment	✓	(3)
#43,44,45	Pipe Break Outside Containment	✓	(3)

Action Being Implemented:

		40	42	43-45	
Scram					a
Establish Prim. Containment		(3) ✓	(3) ✓	(3) ✓	b
Establish Sec. Containment					c
Suppression Pool Cooling					d
Initial Core Cooling					e
Extended Core Cooling					f
Control Room Env. Control					g

Notes (where referenced)
(1) Event numbers refer to FSAR Section 15
(2) To be fail-safe past qualification time (i.e. Long Term)
(3) Unrelated to normal system function
(4) L.T. means Long Term
(5) Detects RCIC steam Break (R.V. isolation)

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
Containment Isolation HV 1F007 or HV 1F008 & HV 1F031 (N.C.)	b (3) b (3)	< 10 MIN (2) 0 (2)
Detect RCIC Line break DPIS 1N017 & HV 1F007	b (3) (5) b (3)	<< 10 min << 10 min (2)
TE-1N011A TE-1N021A TE-1N022A TE-1N023A TE-1N025A, C TE-1N026A, C TE-1N027A, C	b (3) (5)	<< 10 min

Revision: 2
Date: 4-22-82
By: [illegible]
Checked: [illegible]
page 1 of 2

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: R.H.R

P&ID M-151 Sh 1 / M-151 Sh2 Rev. 19 / 18

Safety Related Operation: Injects suppression pool water into the Reactor Vessel & cool injection water & cool suppression pool

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	✓
#42	Pipe Break Inside Containment	✓
#43,44,45	Pipe Break Outside Containment	✓

Action Being Implemented:

		40	42	43-45	
Scram					a
Establish Prim. Containment					b
Establish Sec. Containment					c
Suppression Pool Cooling		✓	✓	✓	d
Initial Core Cooling		✓	✓	✓	e
Extended Core Cooling		✓	✓	✓	f
Control Room Env. Control					g

Notes (where referenced)

(1) Event numbers refer to FSAR Section 15

(2) To be fail-safe past qualification time (i.e. Long Term)

(3) Unrelated to normal system function

(4) L.T. means Long Term

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
1P202 A, B, C & D PS-1N016 A, B, C & D PS-1N020 A, B, C, & D HV-1F048 A, B HV-1F015 A, B HV-1F028 A, B HV-1F024 A, B FT-1N015 A, B PSH-1N002 A, B, C, D PS-1N010 A, C TE-1N009 A & C TE-1N029 A & C TE-1N030 A & C	d, e, f	L.T.

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: RHR continued P&ID M-151 Sh1 & Sh2 Rev. —

Safety Related Operation: —

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	
#42	Pipe Break Inside Containment	see page 1
#43,44,45	Pipe Break Outside Containment	

Action Being Implemented:

		40	42	43-45	
Scram					a
Establish Prim. Containment					b
Establish Sec. Containment					c
Suppression Pool Cooling		see page 1			d
Initial Core Cooling					e
Extended Core Cooling					f
Control Room Env. Control					g

Notes (where referenced)

(1) Event numbers refer to FSAR Section 15

(2) To be fail-safe past qualification time (i.e. Long Term)

(3) Unrelated to normal system function

(4) L.T. means Long Term

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
HV-1F004 A,B,C,D (N.O.) HV-1F047 A,B (N.O.) HV-1F003 A, B (N.O.) SV-1515/A,B or SV-15152 A,B; 15189 A,B; 1F179 A,B; 1F111 A,B HV-1F026 A,B (N.C.) HV-1F017 A,B (N.O.) HV-1F016 A,B (N.C.)	d, e, f	0 (2)
HV-1F021 A,B or 1F016 A,B	b (2)	0 (2)

Revision: 2
Date: 4-22-82
By: [illegible]
Checked: [illegible]

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: Core Spray P&ID M-152 Rev. 15

Safety Related Operation: Inject water into the Reactor Vessel

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	✓
#42	Pipe Break Inside Containment	✓
#43,44,45	Pipe Break Outside Containment	✓

Action Being Implemented:

		40	42	43-45	
Scram					a
Establish Prim. Containment		(3) ✓	(3) ✓	(3) ✓	b
Establish Sec. Containment					c
Suppression Pool Cooling					d
Initial Core Cooling					e
Extended Core Cooling					f
Control Room Env. Control					g

Notes (where referenced)

(1) Event numbers refer to FSAR Section 15

(2) To be fail-safe past qualification time (i.e. Long Term)

(3) Unrelated to normal system function

(4) L.T. means Long Term

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
CONTAINMENT ISOLATION HV-1F001A & HV-1F001B (N.O.)	b (3)	1 HR. (2)
Remainder of CS. system are NOT ON MINIMUM CSD PATH	—	—

Revision: 0
Date: 4-1-82
By: HG
Checked: [illegible]

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: Fuel Pool Cooling & Clean-up P&ID M-153 Rev. 17

Safety Related Operation: connect to RHR for emergency cooling & connect to ESW for emergency make-up.

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	✓
#42	Pipe Break Inside Containment	✓
#43,44,45	Pipe Break Outside Containment	✓

Action Being Implemented: (5)

		40	42	43-45	
Scram					a
Establish Prim. Containment					b
Establish Sec. Containment					c
Suppression Pool Cooling					d
Initial Core Cooling					e
Extended Core Cooling					f
Control Room Env. Control					g

Notes (where referenced)
(1) Event numbers refer to FSAR Section 15

(2) To be fail-safe past qualification time (i.e. Long Term)

(3) Unrelated to normal system function

(4) L.T. means Long Term

(5) Fuel Pool Emergency Cooling & Make-up

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
Only manual valves on this P&ID. No electrical components	Fuel pool cooling/level	L.T.

Revision: 3
Date: 4-22-82
By: HG
Checked: [illegible]

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: HPCI   P&ID M-156 / M-155   Rev. 12 / 13

Safety Related Operation: Inject water from Condensate Storage Tank & Suppression Pool into the Reactor Vessel using a steam driven turbine pump

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	✓
#42	Pipe Break Inside Containment	✓
#43,44,45	Pipe Break Outside Containment	✓

Action Being Implemented:

		40	42	43-45	
Scram					a
Establish Prim. Containment		(3) ✓	(3) ✓	(3) ✓	b
Establish Sec. Containment					c
Suppression Pool Cooling					d
Initial Core Cooling		(5) ✓	✓	✓	e
Extended Core Cooling					f
Control Room Env. Control					g

Notes (where referenced)

(1) Event numbers refer to FSAR Section 15

(2) To be fail-safe past qualification time (i.e. Long Term)

(3) Unrelated to normal system function

(4) L.T. means Long Term

(5) Except for HPCI Break

(6) Detects HPCI steam line break (R.V.10.)

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
Containment Isolation HV-1F002 or HV-1F003 and HV-1F042 (N.C.)	b(3) b(3)	<10 MIN.(2) 0(2)
Detect HPCI Line break PDIS 1N004 HV 1F002	b(3)(6) b(3)	<<10 min <<10 min(2)
Detect HPCI Line break TE-1N024A TE-1N028A TE-1N029A TE-1N030A	b(3)(6)	<< 10 min

Revision: 1
Date: 4-12-82
By: [illegible]
Checked: HG

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: Containment Atm Control P&ID M-157 Sh 1 Rev. 17

Safety Related Operation: a) H_2 recombination b) Containment isolation

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	✓ (3)
#42	Pipe Break Inside Containment	✓
#43,44,45	Pipe Break Outside Containment	

Action Being Implemented:

		40	42	43-45	
Scram					a
Establish Prim. Containment		✓ (3)	✓		b
Establish Sec. Containment					c
Suppression Pool Cooling					d
Initial Core Cooling					e
Extended Core Cooling					f
Control Room Env. Control					g

Notes (where referenced)

(1) Event numbers refer to FSAR Section 15

(2) To be fail-safe past qualification time (i.e. Long Term)

(3) Unrelated to normal system function

(4) L.T. means Long Term

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
Recombiners 1E 440 A, B, C, D	b	L.T.
Containment Isolation Valves (N.O.; F.C.) i.e. SV-15740B or SV-15742B; & { SV-15776B or (SV-15774B & SV-15767) } and SV-15750B or SV-15752B and SV-15736B or (SV-15734B & SV-15737) and SV-15780B or SV-15782B	b (3)	<10 min (3)
Containment Isolation Valves (N.C.; F.C.) SV-15722 or (SV-15723 & SV-15721); SV-15725 or (SV-15724 & SV-15721), SV-15782A or SV-15782A SV-15713 or (SV-15714 & 15711) SV-15740A or SV-15742A SV-15776A or SV-15774A	b (3)	0 (2)

CONT'D, NEXT SH.

Revision: 1
Date: 4-12-82
By: HC
Checked: [illegible]

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: CONTAINMENT ATM. CONTROL P&ID M-157-Sh.1 Rev. 17

Safety Related Operation: a) H_2 RECOMBINER b) CONTAINMENT ISOLATION.

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	
#42	Pipe Break Inside Containment	see page 1
#43,44,45	Pipe Break Outside Containment	

Action Being Implemented:

		40	42	43-45	
Scram					a
Establish Prim. Containment					b
Establish Sec. Containment					c
Suppression Pool Cooling		see page 1			d
Initial Core Cooling					e
Extended Core Cooling					f
Control Room Env. Control					g

Notes (where referenced)
(1) Event numbers refer to FSAR Section 15
(2) To be fail-safe past qualification time (i.e. Long Term)
(3) Unrelated to normal system function
(4) L.T. means Long Term

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
CONTD.- SV-15750A OR SV-15752A SV-15703 OR (SV-15704 & SV-15705) SV-15736A OR SV-15734A. HV-15766 or HV-15768	b (3)	0 (2)
NOTE: H_2 RECOMBINER ASSUMED TO NOT FAIL, THEREFORE AIR PURGE NOT ON MINIMUM CSD PATH.		

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: Containment Atm Control P&ID M-157 Sh 2 Rev. 70

Safety Related Operation: H2 recombination

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	
#42	Pipe Break Inside Containment	✓
#43,44,45	Pipe Break Outside Containment	

Action Being Implemented:

	40	42	43-45	
Scram				a
Establish Prim. Containment		✓		b
Establish Sec. Containment				c
Suppression Pool Cooling				d
Initial Core Cooling				e
Extended Core Cooling				f
Control Room Env. Control				g

Notes (where referenced)

(1) Event numbers refer to FSAR Section 15

(2) To be fail-safe past qualification time (i.e. Long Term)

(3) Unrelated to normal system function

(4) L.T. means Long Term

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
Recombiner Power Supplies 1C 215 A, B, C, D	b	L.T.
Note H_2 recombiners assumed to NOT fail & assume they are turned-on early in the event so H_2, O_2 are not on the minimum shutdown path		

Revision: 2
Date: 4-22-82
By: [illegible]
Checked: [illegible]
page 4 of 4

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: Containment Atm Control P&ID M-157 sh 3 Rev. 3

Safety Related Operation: a) Interlocks with safety-related equipment

b) provide operator with containment parameters

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	
#42	Pipe Break Inside Containment	✓
#43,44,45	Pipe Break Outside Containment	

Action Being Implemented:

		40	42	43-45	
Scram					a
Establish Prim. Containment			✓		b
Establish Sec. Containment					c
Suppression Pool Cooling					d
Initial Core Cooling					e
Extended Core Cooling					f
Control Room Env. Control					g

Notes (where referenced)
(1) Event numbers refer to FSAR Section 15

(2) To be fail-safe past qualification time (i.e. Long Term)

(3) Unrelated to normal system function

(4) L.T. means Long Term

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
TE-15790 A&B, TE-15799 A&B (Interlocked with drywell fan for pre-event only)		
TE-15725, 15751, 15752, 15753, 1575[illegible], 15761, 15764 LT-15776 A&B, 15775 A&B, HSS-5110 A PT-15709 A&B, 15710 A&B RE-15720 A&B	Monitor Drywell/ Suppression Chamber.	L.T.
All the above provide the operator with information only. They do not cause automatic operation of any post accident components		

Revision: 0
Date: 4-1-82
By: Floyd Smid
Checked: HG

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: Liquid Radwaste Collection P&ID M-161 sheet 1 Rev. 16

Safety Related Operation: Establish primary containment

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	✓ (3)
#42	Pipe Break Inside Containment	✓ (3)
#43,44,45	Pipe Break Outside Containment	

Action Being Implemented:

		40	42	43-45	
Scram					a
Establish Prim. Containment		(3)	(3)		b
Establish Sec. Containment					c
Suppression Pool Cooling					d
Initial Core Cooling					e
Extended Core Cooling					f
Control Room Env. Control					g

Notes (where referenced)
(1) Event numbers refer to FSAR Section 15

(2) To be fail-safe past qualification time (i.e. Long Term)

(3) Unrelated to normal system function

(4) L.T. means Long Term

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
Either the inboard or outboard isolation valves i.e SV-16108A1 or SV-16108A2 and SV-10116A1 or SV-1611CA2	b	(2) < 10 min

Revision: 1
Date: 4-13-82
By: [illegible]
Checked: [illegible]
Sheet 1 of 3

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

M-175 16

System: HVAC Reactor Bldg Zone III P&ID VC-175 sh1 Rev. 7

Safety Related Operation: Recirculation System & SBGT & associated pressure boundries

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	✓
#42	Pipe Break Inside Containment	✓
#43,44,45	Pipe Break Outside Containment	

Action Being Implemented:

		40	42	43-45	
Scram					a
Establish Prim. Containment					b
Establish Sec. Containment		✓	✓		c
Suppression Pool Cooling					d
Initial Core Cooling					e
Extended Core Cooling					f
Control Room Env. Control					g

Notes (where referenced)
(1) Event numbers refer to FSAR Section 15

(2) To be fail-safe past qualification time (i.e. Long Term)

(3) Unrelated to normal system function

(4) L.T. means Long Term

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
OV 201A or B (Recirc Fan) HDM 07545A or B	C	LT
SV 07543 A or B (N.E.; N.C.; F.O.) SV 07534 A thru H (N.E; NO; F.C.) SV 17576 A or B (NE; N.O., F.C) SV 17564 A or B (NE; N.O., F.C.) SV 17586 A or B (NE, N.O., F.C.)	C	10 MIN.(2)

Revision: 1
Date: 4-13-82
By: [illegible]
Checked: [illegible]
sheet 2 of 3

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: HVAC Reactor Bldg Zone III P&ID VC-175 Sh 2 Rev. 9

Safety Related Operation: Provide Pressure Boundary for Recirc & SBGT systems. Initiate SBGT system

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	✓
#42	Pipe Break Inside Containment	✓
#43,44,45	Pipe Break Outside Containment	

Action Being Implemented:

		40	42	43-45	
Scram					a
Establish Prim. Containment					b
Establish Sec. Containment		✓	✓		c
Suppression Pool Cooling					d
Initial Core Cooling					e
Extended Core Cooling					f
Control Room Env. Control					g

Notes (where referenced)
(1) Event numbers refer to FSAR Section 15

(2) To be fail-safe past qualification time (i.e. Long Term)

(3) Unrelated to normal system function

(4) L.T. means Long Term

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
SV-17502A or SV-17502B (NE; FC) SV-17514A or B (NE; F.C.) SV-17524A or B (NE; F.C.)	C	10 MIN.(2)

Revision: 1
Date: 4/12/82
By: [illegible]
Checked: [illegible]

Sheet 3 of 3

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: Stand-by Gas Treatment Sys P&ID VC-175 Sheet 3 Rev. 10

Safety Related Operation: Maintain Reactor Bldg at a negative pressure via a processed exhaust

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	✓
#42	Pipe Break Inside Containment	✓
#43,44,45	Pipe Break Outside Containment	

Action Being Implemented:

		40	42	43-45	
Scram					a
Establish Prim. Containment					b
Establish Sec. Containment		✓	✓		c
Suppression Pool Cooling					d
Initial Core Cooling					e
Extended Core Cooling					f
Control Room Env. Control					g

Notes (where referenced)
(1) Event numbers refer to FSAR Section 15
(2) To be fail-safe past qualification time (i.e. Long Term)
(3) Unrelated to normal system function
(4) L.T. means Long Term

Equipment/Instrument/Valve (plus associated Controls)	Actions Being Implemented	Time Required
Fan OV-109A (FDM-07551A1) PDDM-07554A FDM-07551A2 OE-101A OE-103A OE-104A	C	LT
SV-17508 A or B NC/FC HDM-07553A NO/FO HDM 07552A NO/FO SV-07550A NC/FC	C	O (2)

Date: 4-13-82
By: [illegible]
Checked: [illegible]

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

VC-176 9

System: HVAC Reactor Bldg Zone I P&ID M-176 Rev. 14

Safety Related Operation: Maintain equipment cool & Recirculation System

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	✓
#42	Pipe Break Inside Containment	✓
#43,44,45	Pipe Break Outside Containment	

Action Being Implemented:

	40	42	43-45	
Scram				a
Establish Prim. Containment				b
Establish Sec. Containment	✓	✓		c
Suppression Pool Cooling	✓	✓	✓	d
Initial Core Cooling	✓	✓	✓	e
Extended Core Cooling	✓	✓	✓	f
Control Room Env. Control				g

Notes (where referenced)
(1) Event numbers refer to FSAR Section 15
(2) To be fail-safe past qualification time (i.e. Long Term)
(3) Unrelated to normal system function
(4) L.T. means Long Term
(5) Detects & isolate room containing steam line break

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
Unit coolers 1V-210A, B, C & D Cooling unit (Emerg. SWGR & Load Center) 1V222A & B; HDM 7630A & B. FSL-17630A & B; TSH-17631A & B	d, e, f	L. T.
HDM 17657 A or B 17602 A or B 17601 A or B	c	L.T
HDM 17651 (NC; FC)	c	0 (2)
SV-17604A or B; 17603A or B, 17667A or B, 17652A SV-17674A or B; 17675A or B, 17605 A or B, 17652B SV-17671A or B; 17670 A or B, 1760C A or B	(5)	probably before harsh env.

see schedule No 3 on VC-176 for rest of SOLENOID VALVES AND ASSOCIATED DIFFERENTIAL PRESSURE SWITCHES (PDSH) (Appendix D).

Revision: 0
Date: 4-2-82
By: [illegible]
Checked: [illegible]

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: Drywell Air Flow P&ID M-177 Rev. 8

Safety Related Operation: Mix drywell atmosphere to prevent Localized build-up of H_2

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	
#42	Pipe Break Inside Containment	✓
#43,44,45	Pipe Break Outside Containment	

Action Being Implemented:

		40	42	43-45	
Scram					a
Establish Prim. Containment			✓		b
Establish Sec. Containment					c
Suppression Pool Cooling					d
Initial Core Cooling					e
Extended Core Cooling					f
Control Room Env. Control					g

Notes (where referenced)

(1) Event numbers refer to FSAR Section 15

(2) To be fail-safe past qualification time (i.e. Long Term)

(3) Unrelated to normal system function

(4) L.T. means Long Term

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
Fans 1V-414A or B	b	L.T.
1V-416A or B		
1V-415A or B		

Revision: 2
Date: 4-12-82
By: [signature]
Checked:

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

VC-178 Sh 1 9
VC-178 Sh 2 8

System: Control Structure HVAC P&ID M-178 Rev. 12

Safety Related Operation: Cool the Control Structure

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	
#42	Pipe Break Inside Containment	
#43,44,45	Pipe Break Outside Containment	

Action Being Implemented:

		40	42	43-45	
Scram					a
Establish Prim. Containment					b
Establish Sec. Containment		✓	✓		c
Suppression Pool Cooling					d
Initial Core Cooling					e
Extended Core Cooling					f
Control Room Env. Control		✓	✓	✓	g

Notes (where referenced)
(1) Event numbers refer to FSAR Section 15

(2) To be fail-safe past qualification time (i.e. Long Term)

(3) Unrelated to normal system function

(4) L.T. means Long Term

Equipment/Instrument/Valve (plus associated controls)	Actions Being Implemented	Time Required
HDM-07814A SV-07833A HDM-07812A OE-143A OV101A HDM-07811A SV-07802A	g	L.T.
OV118A or B ; RE-0V017A,B HDM 07841A or B FSL-07841A or B, TSH 07841A or B, TSL-07841A or B	c	L.T.
SV-07813A (ND)		0 (2)

Revision: 0
Date: 4-2-82
By: [illegible]
Checked: [illegible]

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: Air Flow - D/G & ESSW pumphouse P&ID {VC-182 4, M-182 Rev. 4}

Safety Related Operation: cool safety-related components

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	✓
#42	Pipe Break Inside Containment	✓
#43,44,45	Pipe Break Outside Containment	✓

Action Being Implemented:

		40	42	43-45	
Scram					a
Establish Prim. Containment			✓		b
Establish Sec. Containment		✓	✓	✓	c
Suppression Pool Cooling		✓	✓	✓	d
Initial Core Cooling		✓	✓	✓	e
Extended Core Cooling		✓	✓	✓	f
Control Room Env. Control		✓	✓	✓	g

Notes (where referenced)
(1) Event numbers refer to FSAR Section 15
(2) To be fail-safe past qualification time (i.e. Long Term)
(3) Unrelated to normal system function
(4) L.T. means Long Term

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
Equip. not in harsh environment		

Revision: 0
Date: 4-2-82
By: [signature]
Checked: [signature]

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: Control Structure Chilled H_2O P&ID M-186 Rev. 14

Safety Related Operation: Provide cooling to Control Room & associated rooms

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	✓
#42	Pipe Break Inside Containment	✓
#43,44,45	Pipe Break Outside Containment	✓

Action Being Implemented:

		40	42	43-45	
Scram					a
Establish Prim. Containment					b
Establish Sec. Containment			✓		c
Suppression Pool Cooling					d
Initial Core Cooling					e
Extended Core Cooling					f
Control Room Env. Control		✓	✓	✓	g

Notes (where referenced)
(1) Event numbers refer to FSAR Section 15
(2) To be fail-safe past qualification time (i.e. Long Term)
(3) Unrelated to normal system function
(4) L.T. means Long Term

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
TV-08612 A & B , TV-08643 A & B HV-08613 A & B FT-08612 A & B TE-08612 A & B , TT-08612A&B, TIC 08612A&B OK-112 A & B (Chiller) SV-08621 A & B TE-08621A1 & B1 TE-08621 A & B FT-08623A & B OP-162 A&B (circ. pump) & OP-171A&B (EM.COND. WTR.CIRC PP.) HV-08601 A & B ; HV-08603 A & B	c & g	L.T.

Date: 4-1-82
By: [signature]
Checked: [initials]

System Environmental Data Sheet
Electrical Components
(Harsh Environment)

System: Reactor Bldg Chilled Water P&ID M-187 sheet 2 Rev. 11

Safety Related Operation: Establish primary containment

Events Resulting in Abnormal Enviornment Which Require Some System Action (1)

#40	Control Rod Drop Accident	✓ (3)
#42	Pipe Break Inside Containment	✓ (3)
#43,44,45	Pipe Break Outside Containment	

Action Being Implemented:

		40	42	43-45	
Scram					a
Establish Prim. Containment		✓ (3)	✓ (3)		b
Establish Sec. Containment					c
Suppression Pool Cooling					d
Initial Core Cooling					e
Extended Core Cooling					f
Control Room Env. Control					g

Notes (where referenced)

(1) Event numbers refer to FSAR Section 15

(2) To be fail-safe past qualification time (i.e. Long Term).

(3) Unrelated to normal system function

(4) L.T. means Long Term

Equipment/Instrument/Valve	Actions Being Implemented	Time Required
Either the inboard or outboard isolation valves e.g. SV 1878281 or 18781A1 (8 sets of valves)	b	<10 min (2)

APPENDIX C

DETAILED COMPONENT

JUSTIFICATION FOR INTERIM OPERATION

FORMS

Refer to Section III and Table III.A-1 of this report for an explanation of how these forms are used to demonstrate component justifications.

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: Agastat 7000 Series Relay

Component Name: Time Delay Relays

System: Standby AC Power Purchase Order: E-109D

1. Component(s) Safety Function:

Control switching, interlocks, etc. in the 4.16 KV switchgear system.

2. Accident(s) for which Component(s) must be Qualified:

40, 42, 43, 44, 45

3. Justification for Interim Operation:

17. The unqualified component will be replaced by a qualified component (Model E-7000 after fuel load but before ascension to full power (before initial criticality).

4. Interim Operation is [X] Justified [ ] Not Justified

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: Potter and Brumfield type MDR-5062 Auxiliary Relays

Component Name: Isolation Relays

System: Standby AC Power Purchase Order: E-109D

1. Component(s) Safety Function:

Control switching & isolation in the 4.16 KV switchgear system.

2. Accident(s) for which Component(s) must be Qualified:

40, 42, 43, 44, 45

3. Justification for Interim Operation:

17. Equipment is qualified, except that the pigtail attached to the relay is teflon coated wire which is not qualified for the specified Beta dose.

    A suitable sleeving material (Raychem Splicing Kit) will be used to cover each pigtail to protect the teflon pigtails from Beta radiation. Field implementation will be made before initial criticality.

4. Interim Operation is [X] Justified [ ] Not Justified

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: GE Pushbutton Type CR-2940

Component Name: Pushbutton Switch

System: Standby AC Power Purchase Order: E-109D

1. Component(s) Safety Function:

None. (These pushbuttons are used for resetting trip alarm relays only.)

2. Accident(s) for which Component(s) must be Qualified:

None

3. Justification for Interim Operation:

1,11. These pushbuttons are used only to reset alarm trip relays and have no impact on attainment of safe, cold shutdown. Potential impact on operator should devices fail is expected to be minor annoyance due to alarms not being reset.

10, 17. Devices are qualified for seismic & hydrodynamic loads. Modification kit to replace materials which lack document traceability can be installed after fuel load, but before initial criticality.

4. Interim Operation is [X] Justified Not Required [ ] Not Justified

TM1/2/3

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: Amphenol Connector

Component Name: Penetration Assembly

System: Neutron Monitoring (SRM, IRM, LPRM, APRM) Purchase Order: E-135

1. Component(s) Safety Function:

   a. SRM, IRM: None

   b. LPRM, APRM: Neutron Flux Scram

2. Accident(s) for which Component(s) must be Qualified:

   40

3. Justification for Interim Operation:

   a.) 1,9,11. The connectors for the SRM, IRM monitors are not required to achieve cold shutdown. Verification that the reactor has scrammed can be obtained from the rod bottom indicators and scram valve position indicators.

   b.) 10,12. The connector for the LPRM, APRM monitors has been qualified for the TID due to gamma; however, the qualification does not cover thermal aging, seismic & hydrodynamic loads, beta radiation and temperature ramp after the LOCA. These connectors were previously tested by Westinghouse to a less severe set of environmental parameters. The connector will be retested to Category I requirements for SSES environmental parameters; based on the previous test results, there is confidence that these connectors will prove to be fully qualified. The testing is currently scheduled to be completed by fuel load; however, should the schedule slip, there would be no safety concern so long as the testing is completed by initial criticality.

4. Interim Operation is [X] Justified [ ] Not Justified

   4. Since these monitors are needed only to initiate a neutron flux scram, their functionality is required only for a few seconds after the accident occurs. Subsequent failure would have no safety significance.

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: See attached list

Component Name: Bailey Controls on Panel OC-883 A&B

System: Standby Gas Treatment   Purchase Order: J-03C

1. Component(s) Safety Function:

Controls and indication for the SGTS

2. Accident(s) for which Component(s) must be Qualified:

40, 42   with TID=$1.6x10^3$ Rads, taking credit for the recent recalculation of TIDs

3. Justification for Interim Operation:

10, 12. All controls and instrumentation purchased originally through P.O. J-03B have been replaced by Bailey controls procured under J-03C. These new instruments are qualified for seismic and hydrodynamic loads; however, environmental qualification is in progress. The qualification of these models is scheduled to be completed by June, 1982. Since those only environmental parameter which creates a harsh environment for these instruments is radiation with a relatively low TID ($1.6x\ 10^3$ Rads), it is expected that these instruments will be qualified by fuel load.

Should the above schedule slip, there would be no safety concern so long as qualification is achieved before initial criticality.

4. Interim Operation is [x] Justified [ ] Not Justified

TM1/2/7

ATTACHMENT TO JIO FOR BAILEY CONTROLS ON OC-883 A & B

Instrument	Tag No.	System
PDSL	07554A1	Standby Gas Treatment System
PDSL	07554A2	Standby Gas Treatment System
PDSL	07554A3	Standby Gas Treatment System
PDSL	07554B1	Standby Gas Treatment System
PDSL	07554B2	Standby Gas Treatment System
PDSL	07554B3	Standby Gas Treatment System
PDSL	07550A	SGTS Inlet Header Relay
PDY	07550A	Standby Gas Treatment System
PDSL	07550B	SGTS Inlet Header System
PDY	07550B	Standby Gas Treatment System
FSL	07551A	Standby Gas Treatment System
FY	07551A	SGTS Discharge Treatment System
FSL	07551B	Standby Gas Treatment System
FY	07551B	SGTS Discharge Systenm B
TDSL	07552A	Standby Gas Treatment System
TIC	07552A	SGTS El Heater 0E101A System
TDIC	07552A	Standby Gas Treatment System
TDY	07552A	Standby Gas Treatment System
TY	07552A1	Standby Gas Treatment System
TT	07552A2	Standby Gas Treatment System
TDIC	07552B	Standby Gas Treatment Systen
TDSL	07552B	Standby Gas Treatment System
TIC	07552B	SGTS El Heater 0E101B System
TDY	07552B	Standby Gas Treatment System
TY	07552B1	Standby Gas Treatment System
PDSL	07553A	SGTS Heaters
PDSHL	07553A	SGTS Filter Train PD System
PDSL	07553B	SGTS Heaters
PDSHL	07553B	SGTS Filter Train PD System
FY	07555	SGTS O.A. Make-Up

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: TI-07552A1/B1, TT-07552A1/B1, TY-07552

Component Name: Temperature Instruments - Bailey Controls on Panel OC-883 A&B

System: Standby Gas Treatment Purchase Order: J-03C

1. Component(s) Safety Function:

Measurement of temperature upstream and downstream of the SGTS filter train heater for indication and to generate a high/low differential temperature signal for alarm and SGTS fan trip.

2. Accident(s) for which Component(s) must be Qualified:

40, 42 with TID = 1.6×10^3 rads, taking credit for the recent recalculation of TIDs

3. Justification for Interim Operation:

1, 8, 9, 11 The temperature indications provided by TI-07552A1/B1 are not used by the operator to perform any safety-related function. Low differential temperature indicates failure of the filter train heater, which controls the humidity of the air reaching the filter. For purposes of this study, random failures of environmentally qualified equipment are not postulated. The heater is environmentally qualified. Thus, these instruments are not required for, and have no effect on, the attainment of safe cold shutdown.

10. All controls and instrumentation purchased originally through P.O. J-03B have been replaced by Bailey controls procured under J-03C. These new instruments are qualified for seismic and hydrodynamic loads.

4. Interim Operation is [X] Justified [ ] Not Justified

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: See attached list

Component Name: Bailey Controls on Panel OC-876 A&B

System: Control Structure Emergency Outside Air Supply System (CSEOASS) Purchase Order: J-03C

1. Component(s) Safety Function:

Controls and indication for the CSEOASS.

2. Accident(s) for which Component(s) must be Qualified:

40, 42, 43, 44, 45 with TID=1.6×10^3 rads, taking credit for the recent recalculation of TIDs

3. Justification for Interim Operation:

10, 12. All controls and instrumentation purchased originally through P.O. J-03B have been replaced by Bailey controls procured under J-03C. These new instruments are qualified for seismic and hydrodynamic loads; however, environmental qualification is in progress. The qualification of these models is scheduled to be completed by June, 1982. Since the only environmental parameter which creates a harsh environment for these instruments is radiation with a relatively low TID (1.6×10^3 Rads), it is expected that these instruments will be qualified by fuel load.
Should the above schedule slip, there would be no safety concern so long as qualification is achieved before initial criticality.

4. Interim Operation is [X] Justified [ ] Not Justified

TM1/2/10

ATTACHMENT TO JIO for BAILEY CONTROLS ON OC-876

Instrument	Tag. No.	System
FSL	07811A	Control Structure O/A 0V101
TDSHL	07811A	Control Structure Emergency O/A Sup
FSL	07811B	Control Structure Emergency O/A 0V101
TDSHL	07811B	Control Structure Emergency O/A Sup
TSY	07811B	Emergency Outside Air Supply
PDSH	07814A	Emergency O.A Supp 1 St HEPA
PDSH	07814B	Emergency O.A Supp 1 St HEPA
FY	07816A1	Emergency Outside Air Supply
FY	07816B1	Emergency Outside Air Supply
TDY	07811A	Emergency Outside Air Supply

TM1/3/2

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: TI-07811A/B and TI-07814 A/B

Component Name: Temperature Indicator - Bailey Controls on Panel OC-876 A&B

System: Control Structure Emergency Outside Air Supply System (CSEOASS) Purchase Order: J-03C

1. Component(s) Safety Function:

None. (Temperature indication of CSEAOSS filter train inlet and outlet)

2. Accident(s) for which Component(s) must be Qualified:

None

3. Justification for Interim Operation:

1, 9, 11. These temperature indicators are not used by the operator to perform any safety-related function.

10. All controls and instrumentation purchased originally through P.O. J-03B have been replaced by Bailey controls procured under J-03C. These new instruments are qualified for seismic and hydrodynamic loads.

4. Interim Operation is [X] Justified Not Required [ ] Not Justified

TM1/2/11

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: TT-07811A/B and TT-07814A/B

Component Name: Temperature Transmitter - Bailey Controls on Panel OC-876

System: Control Structure Emergency Outside Air Supply System (CSEOASS) Purchase Order: J03C

1. Component(s) Safety Function:

Temperature transmitter provides signal of CSEOASS filter train inlet & outlet temperature for indication and to generate a high/low differential temperature signal for alarm and CSEOASS fan trip.

2. Accident(s) for which Component(s) must be Qualified:

40, 42, 43, 44, 45 with TID = 1.6×10^3 rads, taking credit for the recent recalculation of TIDs

3. Justification for Interim Operation:

1, 8, 9, 11 Indication function is not required. See JIO form for TI-07811 A/B and -07814A/B. Alarm function is not safety-related. Low differential temperature indicates failure of the filter train heater, which controls the humidity of the air reaching the filter. For purposes of this study, random failures of environmentally qualified equipment are not postulated. The heater is environmentally qualified. Thus, these instruments are not required for, and have no effect on, the attainment of safe, cold shutdown.

10. All controls and instrumentation purchased originally through P.O. J-03B have been replaced by Bailey controls procured under J-03C. These new instruments are qualified for seismic and hydrodynamic loads.

4. Interim Operation is [X] Justified [ ] Not Justified

TM1/2/12

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: See attached list

Component Name: Instruments on Remote Shutdown Panel (Bailey Controls)

System: Remote Shutdown Purchase Order: J-03C

1. Component(s) Safety Function:

None (Various indicators on Remote Shutdown Panel)

2. Accident(s) for which Component(s) must be Qualified:

None: Evacuation of Main Control Room is not postulated simultaneous with a DBA.

3. Justification for Interim Operation:

1, 11. Remote shutdown panel indications are not required post-accident. These instruments are isolated from their corresponding instruments in the Main Control Room by transfer switches.

4. Interim Operation is [X] Justified Not Required [ ] Not Justified

TM1/2/13

ATTACHMENT TO JIO FOR BAILEY CONTROLS ON REMOTE SD PANEL

Instrument	Tag. No.	System
FY	11207B2	RHR Heat Exchanger B SW Inlet
TI	15751	Suppression Pool Temperature
TI	15752	Suppression Pool Temperature
TR	15790A1	Containment Atmos Temp
TR	15790B1	Containment Atmos Temp
FSL	11207A	RHR Heat Exchanger A SW Input
FY	11207A1	RHR Heat Exchanger A SW Input
FSL	11207B	RHR Heat Exchanger B SW Input
FI	11207B	RHR Heat Exchanger B SW Discharge
FY	11207B1	RHR Heat Exchanger B SW Inlet
FY	15105	RHR Loop B
FI	15105	RHR Loop B
FIC	14903	RCIC Turbine Pump Discharge
FY	14903	RCIC Turbine Pump Discharge
FI	14903	RCIC Pump Injection
ES	14903	RCIC Turbine Pump Discharge
FY	14903A	RCIC Turbine Pump Discharge
SI	15001B	RCIC Turbine Speed List
SY	15001B	RCIC Turbine Speed
TI	15725B	Suppression Pool Air Purge Line
TT	15725B	Suppression Pool Air Purge Line
LI	15776B2	Suppression Pool Level
PI	15728B	Primary Containment Drywell Pressure
TI	15790B2	Containment Atmospheric Temperature
TT	15790B2	Containment Atmospheric Temperature
PI	14262	Reactor Vessel
LI	14262	Reactor Vessel

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: PDIC-07550A/B

Component Name: Differential Pressure Indicating Controller: Bailey Controls on Panel OC-883A/B

System: Standby Gas Treatment System Purchase Order: J-03C

1. Component(s) Safety Function:

   Measures dP of outside air to reactor bldg. supply header to regulate SGTS fan damper.

2. Accident(s) for which Component(s) must be Qualified:

   40, 42 with TID = 1.6×10^3 rads, taking credit for the recent recalculation of TIDs

3. Justification for Interim Operation:

   8. This controller regulates the SGTS intake damper position. This function is not crucial to the safe operation of the SGTS because the intake damper is preset to always maintain a minimum flowrate of 40% rated; thus removal of radioactivity from the secondary containment will not be prevented by failure of this instrument.

   10. All controls and instrumentation purchased originally through PO J-03B has been replaced by Bailey Controls procured under J-03C. These new instruments are qualified for seismic and hydrodynamic loads.

4. Interim Operation is [X] Justified [ ] Not Justified

TM1/2/62

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: HIC-07555A/B

Component Name: Indicating Controller Bailey Controls on Panel OC-883A/B

System: Standby Gas Treatment System Purchase Order: J-03C

1. Component(s) Safety Function:

None

2. Accident(s) for which Component(s) must be Qualified:

None

3. Justification for Interim Operation:

1, 11. This controller is used to regulate a bypass damper for charcoal cooling when the SGTS is not operating. It is not required post-accident, because the SGTS fan causes airflow through the charcoal for cooling.

10. All controls and instrumentation purchased originally through PO J-03B has been replaced by Bailey Controls procured under J-03C. These new instruments are qualified for seismic and hydrodynamic loads.

Interim Operation is [X] Justified [ ] Not Justified

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: PDY-07554A/B

Component Name: Differential Pressure Relay Bailey Controls on Panel OC-883A/B

System: Standby Gas Treatment Purchase Order: J-03C

1. Component(s) Safety Function:

Measures dP of Reactor Bldg. header to outside air to the reactor bldg. recirculation system supply dampers positions.

2. Accident(s) for which Component(s) must be Qualified:

40, 42

3. Justification for Interim Operation:

4, 5, 16. This instrument will be used during the first few minutes following an accident to regulate the position of dampers PDD-07554 A&B. After the initial pressure spike in the reactor bldg., the SGTS should stabilize. Since the dampers fail as-is, subsequent failure of these PDYs will not prevent removal of radioactivity from the secondary containment.

All controls and instrumentation purchased originally through PO J-03B has been replaced by Bailey Controls procured under J-03C. These new instruments are qualified for seismic and hydrodynamic loads.

4. Interim Operation is [x] Justified [ ] Not Justified

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ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: 1C-226 A, B

Component Name: Containment H_2/O_2 Analyzer Sample Pump

System: Containment Atmospheric Control Purchase Order: J-17

1. Component(s) Safety Function:

Indication and alarm of containment H_2 and O_2 concentrations

2. Accident(s) for which Component(s) must be Qualified:

42

3. Justification for Interim Operation:

9. H_2O_2 analyzer provides indication and alarm only of containment H_2 & O_2 concentrations. With inerted containment plus hydrogen recombiners, there is a low risk of explosive concentrations developing, particularly since the accident must be one in which fuel damage occurs before hydrogen generation becomes a problem. Current meter on hydrogen recombiner control panel indicates that recombination is taking place. (Hydrogen recombiner and controls are environmentally qualified.)

7. FSAR (figure 6.2-50) shows that, for worst case, there would be ample time (1-1/2 days) after a LOCA before H_2 concentration would be expected to exceed the lower combustible limit of 4 v/o. Therefore, pending environmental qualification of this component, the operators will be instructed to turn on the hydrogen recombiners early in the post-LOCA recovery phase, placing more reliance on the H_2 recombiner current meter than the H_2/O_2 analyzer.

4. Interim Operation is [x] Justified [ ] Not Justified

TM1/2/24

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: TE-15751 through -15770

Component Name: Suppression Pool RTDs

System: SPOTMOS

Purchase Order: J-51B

1. Component(s) Safety Function:

Suppression pool water temperature indication and alarm. Indication used by operator to determine when to manually initiate pool cooling mode of RHR system.

2. Accident(s) for which Component(s) must be Qualified:

40, 42, 43, 44, 45

3. Justification for Interim Operation:

6, 12. Environmental qualification testing is scheduled to be completed by June, 1982.

RTDs of similar material and construction have already been qualified; thus, there is high confidence that these detectors will be qualified.

Should the above schedule slip, there would be no safety concern so long as qualification is achieved before initial criticality.

4. Interim Operation is [X] Justified [ ] Not Justified

TM1/2/15

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: PT-15702, PT-15728A, PT-15728B, PT-15709A, PT-15709B, PT-15710A, PT-15710B, LT-15775A, LT-15775B, LT-15776A, LT-15776B, PT-12643, PT-12648, FT-18612A, FT-08623A

Component Name: Pressure & Differential Pressure Transmitters (Barton)

System: Containment Atmos. Control, Containment Inst. Gas, Control Struc. Chilled Water   Purchase Order: J-56A

1. Component(s) Safety Function:

Monitor drywell and suppression chamber
Maintain Control Room temperatures
(Low pressure isolation for Containment Instrument Gas bottles)

2. Accident(s) for which Component(s) must be Qualified:

40, 42,43, 44,45

3. Justification for Interim Operation:

6,12. Testing program underway; to be completed by end of June, 1982. Identical model has been qualified for environments in other nuclear power plants.

4. Interim Operation is [x] Justified [ ] Not Justified

TM1/2/16

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ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

VE-14180 A1 thru A8 and B1 thru B8

Component Ident. No(s).: VT-14180 A1 thru A8 and B1 thru B8

Component Name: MSS/RV Position Indication: accelerometer, cable, charge converter

System: Nuclear Boiler Purchase Order: J-63

1. Component(s) Safety Function:

   Indication of Safety Relief Valve position (acoustic monitor)

2. Accident(s) for which Component(s) must be Qualified:

   40,42 (small & intermediate size breaks only), 43,44,45

3. Justification for Interim Operation:

   1,9,11: The addition of acoustic monitors for determining SRV position is a post-TMI backfit (NUREG-0737, II.D.3). These monitors are not in the preferred CSD path; their failure would not affect the ability to achieve safe, cold shutdown. The position of the SRVs can be verified indirectly by the operator by observing reactor vessel pressure and suppression pool temperature.

   10. LOCA test must be reperformed and Beta radiation must be addressed. Sensors are qualified for seismic & Hydrodynamic loads. Testing is scheduled to be completed by June 1, 1982, (i.e. before fuel load). However, should this schedule slip, there is no safety concern based upon the above justification.

4. Interim Operation is [X] Justified [ ] Not Justified

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: SV-11274 A, B

Component Name: Solenoid Pilot Valve

System: RHR Service Water Purchase Order: J-69B/J-69
(Replacement valves purchased under P.O. J-69B)

1. Component(s) Safety Function:

None

2. Accident(s) for which Component(s) must be Qualified:

None

3. Justification for Interim Operation:

1,5,8,11 Valves are RHRSW bypass to LRW and are not needed for CSD path. They are "valved-out" from rest of RHRSW system by keylocked closed valves. Thus, failure of these valves cannot affect safe cold shutdown.

These valves will be replaced with qualified SVs before startup following the first refueling outage.

12. Environmental qualification tests (for replacement valves) are scheduled to be completed May 20, 1982; there is high confidence of successful testing, because environment is not extremely severe so that these SVs are not expected to be overstressed.

4. Interim Operation is [X] Justified Not Required [ ] Not Justified

TM1/2/19

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: SV-07833 A, B

Component Name: Solenoid Pilot Valve

System: Control Structure HVAC Purchase Order: J-69B

1. Component(s) Safety Function:

Isolates Control Room Relief Air Fan (OV-119) from rest of CS-HVAC system by venting air from damper air operator. Valves also receive a high-chlorine-at-CS-outside-air-intake trip signal.

2. Accident(s) for which Component(s) must be Qualified:

None

3. Justification for Interim Operation:

1,5,8,11 Valves serve no safety function during postulated accidents. Chlorine release is not postulated to occur simultaneously with a DBA.

12. (See page 21)

4. Interim Operation is [x] Justified [ ] Not Justified
Not Required

TM1/2/20

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: SV-07813 A, B

Component Name: Solenoid Pilot Valve

System: Control Structure Emergency Outside Air Supply System (CSEOASS) Purchase Order: J-69B

1. Component(s) Safety Function:

Admit air to operator of deluge valve to initiate fire suppression of CSEOASS filters.

2. Accident(s) for which Component(s) must be Qualified:

40, 42, 43, 44, 45

3. Justification for Interim Operation:

4,5,8,11,13. Solenoid valve is normally-deenergized, and air-operated valve is normally-closed, fail-closed. There is no credible failure mode which could cause the SV to move to the non-fail-safe position. Safety function of valve during DBA is to be closed, since a fire in CSEOASS is not postulated simultaneously with a DBA.

12. (See page 21)

4. Interim Operation is [X] Justified [ ] Not Justified

TM1/2/21

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: SV-07543 A & B

Component Name: Pilot Solenoid Valve

System: Reactor Bldg Zone III HVAC   Purchase Order: J-69B

1. Component(s) Safety Function:

Admit air to operator of dampers in Reactor Bldg HVAC Recirculation System to recirculate secondary containment atmosphere; supply to SGTS.

2. Accident(s) for which Component(s) must be Qualified:

40, 42

3. Justification for Interim Operation:

4, 5. SV is normally-energized, fails to admit air to air operator of normally-closed, fail open damper. Dampers are redundant and arranged in parallel; should one SV fail in a non-safe direction, the other damper would probably remain open. If both SV's fail in a non-safe direction, the Reactor Building HVAC Recirculation system would be inoperable, and the SGTS would not be able to remove radioactivity from the secondary containment atmosphere. Thus, reactor building radioactivity would build up to unacceptable levels and unmonitored leakage could occur.

16. However, inasmuch as the only concern for these valves is mechanical operability (i.e. SV moves to its "fail" position upon deenergization), the sole failure mode of concern is valve jamming due to degradation of organic seals from radiation exposure. This failure should not happen during the time the valve is required to be operable, since the valves reposition during the first few minutes following the LOCA. Airborne dose in reactor building is insignificant during this period.

12. (See page 21)

4. Interim Operation is [X] Justified [ ] Not Justified

TM1/2/22

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: SV-17508 A & B

Component Name: Pilot Solenoid Valve

System: Standby Gas Treatment Purchase Order: J-69B

1. Component(s) Safety Function:

None.
(For DBAs 40 and 42, function of valves is to isolate containment purge from SGTS to protect the filters and to preclude a release from containment.)

2. Accident(s) for which Component(s) must be Qualified:

None

3. Justification for Interim Operation:

1, 2, 11. The dampers controlled by these SVs are downstream of the containment purge isolation valves which isolate automatically on a LOCA signal. Thus, these dampers are merely a backup means of isolating the containment purge lines, and are not needed for the attainment of a safe cold shutdown.

4, 5, 13. SV is normally-deenergized; air-operated damper is normally-closed, fail-closed. There is no credible failure mode which could cause the SV to move to its non-fail-safe position.

16. Despite the above, it should be noted that these solenoid valves also receive a LOCA signal and de-energize to cause the associated dampers to close long before they will be exposed to the harsh environment.

12. (See page 21)

4. Interim Operation is |X| Justified Not Required | | Not Justified

TM1/2/23

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: SV-10943 A & B and SV-11024 A & B

Component Name: Solenoid Pilot Valve

System: Service Water/Emergency Service Water Purchase Order: J-69B

1. Component(s) Safety Function:

Isolate Emergency Service Water from TBCCW and RBCCW heat exchangers by venting air off air operators of isolation valves.

2. Accident(s) for which Component(s) must be Qualified:

40, 42, 43, 44, 45

3. Justification for Interim Operation:

1,4,5,8,11,13. Solenoid valve is normally-deenergized and air-operated valves are normally-closed, fail-closed. There is no credible failure mode which could cause the SV to move to its non-fail-safe-position. It is an off-normal situation for ESW to be cross-tied with the TBCCW or RBCCW heat exchangers; These valves are opened only after a loss of office power.

7. Operating procedures specify that these valves should be remote-manually closed immediately after an accident.

12. (See page 21)

4. Interim Operation is [X] Justified [ ] Not Justified

TM1/2/24

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: SV-17502 A/B, -17514 A/B, -17564 A/B, -17524 A/B
SV-17586 A/B, -17534 A thru H, -17576 A/B

Component Name: Pilot Solenoid Valve

System: Reactor Bldg Zone III HVAC Purchase Order: J-69B

1. Component(s) Safety Function:

Isolate reactor bldg HVAC systems from Recirculation System and SGTS to establish secondary containment by bleeding air off operators of isolation dampers. Also isolates air locks for same reason (i.e. establish secondary containment).

2. Accident(s) for which Component(s) must be Qualified:

40, 42

3. Justification for Interim Operation:

4, 5, These SVs are normally-energized and supply air to normally open, fail-closed isolation dampers. Except for dampers for the air-locks, each flow path is isolated by two series dampers. The SVs receive isolation signals upon initiation of a LOCA. If the SVs fail to the vent position, the isolation dampers will close, as they should. If, however, the SVs fail to reposition, secondary containment would not be achieved.

16. However, inasmuch as the only concern for these valves is mechanical operability (i.e. SV moves to its "fail" position upon deenergization), the sole failure mode of concern is valve jamming due to degradation of organic seals from radiation exposure. This failure should not happen during the time the valve is required to be operable, since the valves reposition during the first few minutes following the LOCA. Airborne dose in reactor building is insignificant during this period.

12. (See page 21)

4. Interim Operation is [X] Justified [ ] Not Justified

TM1/2/25

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: SV-15151A/B, - 15152A/B, - 15153A/B, -15188A/B, -15189A/B, -15191A/B, -15170A/B

Component Name: Pilot Solenoid Valve

System: RHR (Steam Condensing Mode) Purchase Order: J-69B

1. Component(s) Safety Function:

Isolate RHR system from HPCI, RCIC, and LRW Steam Condensing Mode cross-ties by bleeding air off air-operated isolation valves to prevent diversion of RHR water or HPCI steam.

2. Accident(s) for which Component(s) must be Qualified:

40,42,43,44,45

3. Justification for Interim Operation:

4,5,13. Except for SV-15170A/B, all these solenoid valves are normally-deenergized, and the associated air-operated valves are normally-closed, fail-closed. There is no credible failure mode which could cause these SVs to move to their non-fail-safe position. SV-15170A/B are normally-energized, and their associated air-operated valves are normally-open, fail-closed.

12, (see page 21)

1,2. SV-15153A/B are not on CSD path, since isolation of steam condensing mode isolation return line is provided by HV-1F026A/B.

1,11. SV-15188A/B has no safety function; only used as steam trap bypass. SV-15170A/B not on CSD path, because they will be valved out from RHR system by SV-15151A/B and SV-15152A/B.

4. Interim Operation is [X] Justified [ ] Not Justified

TM1/2/26

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: SV-15004, -15005, -15625 and -15626

Component Name: Pilot Solenoid Valves

System: RCIC and HPCI Purchase Order: J-69B

1. Component(s) Safety Function:

   RCIC/HPCI condensate line drain valve isolation.

2. Accident(s) for which Component(s) must be Qualified:

   40,42,43,44,45

3. Justification for Interim Operation:

   1,4,5,11. HPCI and RCIC are not on preferred Cold Shutdown Path. Turbine startup signal initiates air-operated valve closure. These valves are used only to drain the barometric condenser vacuum tank on high level when the system is in standby, and are not needed when the system is in operation.

   13. The drain line in each system contains two valves in series. Upstream valves are normally-closed, fail-closed. There is no credible failure mode which could cause the upstream SVs to move to their non-fail-safe position.

   12. (See page 21)

4. Interim Operation is [x] Justified [ ] Not Justified

TM1/2/27

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: SV-14320

Component Name: Pilot Solenoid Valve

System: Reactor Recirculation Purchase Order: J-69B

1. Component(s) Safety Function:

   Reactor Recirc Loop B sample line isolation and containment isolation.

2. Accident(s) for which Component(s) must be Qualified:

   40,42

3. Justification for Interim Operation:

   3,4,5,13. SV is normally-deenergized; air-operated isolation valve is normally-closed, fail-closed. There is no credible failure mode which could cause these SVs to move to their non-fail-safe position. Air-operated valve is an outboard containment isolation valve; inboard valve will ensure isolation for harsh environments in reactor building.

   12. (See page 21)

4. Interim Operation is [x] Justified [ ] Not Justified

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: SV-15703, -15704, -15705, -15711, -15713, -15714, -15721, -15722, -15723, -15724, -15725

Component Name: Pilot Solenoid Valve

System: Containment Atmosphere Control

Purchase Order: J-69B/P-31A (Replacement valves were purchased under J-69B)

1. Component(s) Safety Function:

Isolates containment purge & vent lines by bleeding air off operators of isolation valves.

2. Accident(s) for which Component(s) must be Qualified:

40, 42

3. Justification for Interim Operation:

4,5,13,16. Solenoid valves are normally-deenergized; air-operated isolation valves are normally-closed, fail-closed. There is no credible failure mode which could cause these SVs to move to their non-fail-safe position. Containment purging/ inerting is performed on an infrequent basis. All valves are outside containment, and thus will not be exposed to a harsh environment during the time they are required to function. Isolation valves are in series pairs.

12. (See page 21; applies to replacement valves)

17. The replacement valves will be installed after fuel load but before ascension to full power.

4. Interim Operation is [x] Justified [ ] Not Justified

TM1/2/29

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: SV-14924, -15521, -15122A/B, -15203A/B

Component Name: Pilot Solenoid Valves

System: RCIC, HPCI, RHR, Core Spray

Purchase Order: J-69C/J-69B (Replacement valves were purchased under PO J-69C)

1. Component(s) Safety Function:

   Containment isolation: these are all 1" solenoid operated bypass valves which are used to equalize pressure across the main isolation valves.

2. Accident(s) for which Component(s) must be Qualified:

   40, 42

3. Justification for Interim Operation:

   4,5,13. These solenoid valves function as pressure-equalizing valves around containment isolation valves. They are normally-deenergized, normally-closed, fail-closed. There is no credible failure mode which could cause these SVs to move to their non-fail-safe position.

   3. These valves are inboard containment isolation valves; for each, a redundant outboard valve exists.

   12, Only deficiency in EQ for the replacement valves is completion of seismic/hydrodynamic load qualification, in progress, forecast for the end of June, 1982. The replacement valves will be installed before startup following the first refueling outage.

4. Interim Operation is [x] Justified [ ] Not Justified

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: SV-14319

Component Name: Pilot Solenoid Valve

System: Reactor Recirc.

Purchase Order: J-69C/J-69B (The replacement valve was purchased under PO J-69C)

1. Component(s) Safety Function:

   Containment isolation - inboard valve

2. Accident(s) for which Component(s) must be Qualified:

   40,42

3. Justification for Interim Operation:

   4,5,13. SV is normally de-energized; air-operated isolation valve is normally-closed, fail-closed. There is no credible failure mode which could cause these SVs to move to their non-fail-safe position.

   3. Air-operated valve is an inboard containment isolation valve; outboard valve will ensure isolation for harsh environments inside containment.

   12. Only deficiency in EQ for the replacement valves is seismic/hydrodynamic load qualification, in progress, forecast for the end of June, 1982.

   17. The replacement valve will be installed after fuel load but before ascension to full power.

4. Interim Operation is [x] Justified [ ] Not Justified

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: SV-18792A1/A2/B1/B2, -18782A1/A2/B1/B2

Component Name: Pilot Solenoid Valve

System: Reactor Bldg. Chilled Water

Purchase Order: J-69C/J-69
(The replacement valves were purchased under PO J-69C)

1. Component(s) Safety Function:

Containment isolation - inboard valves (actuator for air-operated CIVs)

2. Accident(s) for which Component(s) must be Qualified:

40, 42

3. Justification for Interim Operation:

3,4,5: Solenoid valves are normally-energized. Air-operated valves are normally open, fail closed. Redundant CIVs outside containment will ensure containment isolation for the system in the event of harsh environment inside containment, even if the subject SV does not move to its fail-safe position.

12: Only deficiency in EQ for the replacement valves is seimsic/hydrodynamic load qualification, in progress, forecast for the end of June, 1982.

17. The replacement valves will be installed after fuel load but before ascension to fullpower.

4. Interim Operation is [x] Justified [ ] Not Justified

TM1/2/32

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: SV-15150A/B, -15206A/B

Component Name: Pilot Solenoid Valve

System: RHR, Core Spray

Purchase Order: J-69C/J-69B (Replacement valves were purchased under PO J-69C)

1. Component(s) Safety Function:

None

2. Accident(s) for which Component(s) must be Qualified:

None

3. Justification for Interim Operation:

1,4,5,11,13: These valves are actuators for air-operators on check valves used for containment isolation. The SVs are used for testing only; in the event containment isolation of these lines is required (break in line outside containment), check valve will close, because the air operator is not strong enough to overpower the check valve when reverse dp is applied. Therefore, failure of the solenoid valve has no effect on attainment of cold shutdown. Likewise, SV failure cannot cause loss of RHR/Core Spray system.

12: Only deficiency in EQ for the replacement valves is seismic/hydrodynamic load qualification, in progress, forecast for the end of June, 1982.

17. The replacement valves will be installed after fuel load but before ascension to full power.

4. Interim Operation is [x] Justified [ ] Not Justified

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

D

Component Ident. No(s).: SV-14925, -14926, -15528, -15529

Component Name: Pilot Solenoid Valve

System: RCIC, HPCI

Purchase Order: J-69C/J-69
(Replacement valves were purchased under PO J-69C)

1. Component(s) Safety Function:

Isolate RCIC/HPCI steam supply line drain trap on a RCIC/HPCI initiation signal.

2. Accident(s) for which Component(s) must be Qualified:

40,42,43,44,45

D

3. Justification for Interim Operation:

1. RCIC & HPCI are not in preferred CSD path.

4,5,8. These SVs are normally-energized; air-operated valves are normally-open, fail-closed. Should the SVs not move to their fail-safe position, a percentage of the steam being supplied to the RCIC and HPCI turbines will be bypassed through the drain line to the main condenser. This may prevent the HPCI/RCIC systems from supplying adequate flow to the RPV; should this occur, the ADS system would function to depressurize the vessel, and LCPI (and Core Spray) would provide core cooling.

16. Nevertheless, inasmuch as the only concern for these valves is mechanical operability (i.e., SV moves to "fail" position upon depressurization), the sole failure mode of concern is valve jamming due to degradation of organic seals from radiation exposure. This failure should not happen during the time the valve is required to be operable, since the valves reposition during the first few minutes following a LOCA. Airborne dose in the reactor building is insignificant during this period.

12. Only deficiency in EQ for the replacement valves is seismic/hydro-dynamic load qualification, in progress, forecast for the end of June, 1982.

C

17. The replacement valves will be installed after fuel load but before ascension to full power.

4. Interim Operation is [x] Justified [ ] Not Justified

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: OK-112A/B

Component Name: Centrifugal Water Chiller

System: Control Structure HVAC Purchase Order: M-310/M-411

1. Component(s) Safety Function:

   Provide cooling to the Control Structure

2. Accident(s) for which Component(s) must be Qualified:

   40, 42, 43, 44, 45 (TID = 1.0×10^3, taking credit for recent reanalysis of TIDs)

3. Justification for Interim Operation:

   10, 12. The major class 1E components (i.e. motor, solid state module, etc.) of the chiller are qualified to NUREG-0588 Category II. However, some of the control panel components and machine-mounted instruments were not included by the vendor in the generic requalification of the chiller. The entire control panel and the machine-mounted components will be replaced by 12/30/83 during the upgrading of chiller capacity for Unit 2 operation.

4. Interim Operation is [X] Justified [ ] Not Justified

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: PDT-07814 A/B

Component Name: Tavis 2-wire Pressure Differential Transmitter

System: Control Structure - HVAC Purchase Order: M-320

1. Component(s) Safety Function:
   None. (High differential pressure alarm for filter OF-124 A/B)

2. Accident(s) for which Component(s) must be Qualified:
   None

3. Justification for Interim Operation:
   1, 11. Alarm function is not safety-related
   8,9. If filter dp becomes high, fan will trip on low flow, thus starting standby train. In any case, filters have been sized so that they should not become overloaded during the accident recovery period, assuming regular maintenance has been performed.
   This unit is scheduled to be replaced with a qualified, 3-wire Tavis PDT at first refueling outage.

4. Interim Operation is |X| Justified/Not Required | | Not Justified

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: PDT-07554 A1/A3/B1/B3

Component Name: Tavis 2-wire Pressure Differential Transmitter

System: Reactor Bldg. - SGTS Purchase Order: M-320

1. Component(s) Safety Function:
   A1/B1: Monitors and controls reactor bldg. U1 pressure at -0.25" w.g. (Zone I)
   A3/B3: Monitors and controls reactor bldg U1 pressure at -0.25" w.g. (Zone III)

2. Accident(s) for which Component(s) must be Qualified:
   40, 42 (TID = 4.9×10^4 rads at its location)

3. Justification for Interim Operation:
   8, 13. The most likely failure mode for the dampers controlled by these PDT's is fail in last position. Dampers serve to modulate air flow to regulate Reactor Bldg. negative pressure; so long as fans continue to operate, reactor bldg. pressure should remain negative, thus preventing an uncontrolled release.

   17. These PDT's are scheduled to be replaced with qualified (to 1.4×10^6 rads) 3-wire Tavis units after fuel load but before ascension to full power.

4. Interim Operation is [X] Justified [ ] Not Justified

TM1/2/53

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: FT-07555; FT-07557

Component Name: Tavis 2-wire Flow Transmitter

System: Reactor Bldg - SGTS   Purchase Order: M-320

1. Component(s) Safety Function:
   None (FT-07555: Make up air CFM indication)
   (FT-07557: CFM indication for the exhaust from reactor Bldg.)

2. Accident(s) for which Component(s) must be Qualified:
   None

3. Justification for Interim Operation:
   8. Scheduled to be replaced by qualified Tavis 3-wire model during next refueling outage. Failure of this unit will not impair functioning of SGTS system.
   1, 11. These transmitters serve no safety-related function; their associated indicators are not Q-listed nor Class 1E.

4. Interim Operation is [X] Justified Not Required [ ] Not Justified

TM1/2/45

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: FT-07816 A/B

Component Name: Tavis 2-wire Flow Transmitter

System: Control Structure HVAC (CSEOASS) Purchase Order: M-320

1. Component(s) Safety Function:
   Trips running CSEOASS fan OV-101 A or B on low flow to start standby unit.

2. Accident(s) for which Component(s) must be Qualified:
   40, 42, 43, 44, 45

   (TID = 1.6×10^5 rads, taking credit for recent recalculation of TIDs)

3. Justification for Interim Operation:
   17. Purchase order for replacements with qualified 3-wire Tavis PDT's will be placed by 4/30/82 with installation by September, 1982. These replacement units are presently qualified for TID of 1.4×10^6 rads.

4. Interim Operation is [X] Justified [ ] Not Justified

TM1/2/46

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: PDT-07553 A/B

Component Name: Tavis 2-wire Pressure Differential Transmitter

System: Standby Gas Treatment System Purchase Order: M-320

1. Component(s) Safety Function:
   This component measures dP of HEPA filter OF-170 A/B; this signal in conjunction with dT signal controls heating element OE-101 A/B. Failure of heater will trip SGTS exhaust fan OV-109 A/B and initiate startup of standby unit.

2. Accident(s) for which Component(s) must be Qualified:
   40, 42. (TID = 1.2×10^7 rads, direct contact dose on SGTS filter housing, taking credit for recent recalculation of TIDs)

3. Justification for Interim Operation:
   17. Purchase order for replacements with 3-wire Tavis PDT's will be placed by 4/30/82 with installation by September 1982. The replacement units are qualified for TID of 1.4×10^6 rads. Further reduction of the Total Integrated Dose (factor of approximately 9) which these devices must survive will be accomplished by relocating the transmitter further away from the SGTS filter. This modification will be done in the same time frame as replacement of the transmitter. Modification and replacement will both be completed before ascension to full power.

Interim Operation is [X] Justified [ ] Not Justified

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: PDT-07550 A/B

Component Name: Tavis 2-wire Pressure Differential Transmitter

System: Standby Gas Treatment System Purchase Order: M-320

1. Component(s) Safety Function:

Controls flowrate of SGTS exhaust fan OV-109A/B and makeup air by measuring dP of SGTS supply header from the reactor bldg. compared to outside air intake.

2. Accident(s) for which Component(s) must be Qualified:

42 with TID = 2.4×10^3 Rads at its location, taking credit for recent recalculation of TIDs

3. Justification for Interim Operation:

17. Purchase order for replacements with qualified 3-wire Tavis PDTs will be placed by 4/30/82 with installation before September, 1982. These replacement units are qualified for TID of 1.4×10^6 rads.

8. This PDT regulates ratio of outside air makeup to reactor bldg. air being supplied to the SGTS exhaust fan by controlling the position of the outside air supply dampers and the position of the damper on the SGTS exhaust fan intake. This function is not crucial to the safe operation of the SGTS for two reasons: (1) failure of this PDT will not prevent or inhibit removal of radioactivity from the secondary containment, and (2) the SGTS exhaust fan inlet damper is preset to always maintain a minimum flowrate of 40% of rated.

4. Interim Operation is [X] Justified [ ] Not Justified

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: FT-07551 A/B

Component Name: Tavis 2-wire Flow Transmitter

System: Reactor Bldg. SGTS Purchase Order: M-320

1. Component(s) Safety Function:
   Controls flowrate of SGTS exhaust fan OV-109 A/B and trips fan on low flow to start standby unit.

2. Accident(s) for which Component(s) must be Qualified:
   40, 42 (TID = 2.4×10^3 rads, taking credit for recent recalculation of TIDs)

3. Justification for Interim Operation:
   17. Purchase order for replacements with qualified 3-wire Tavis FT's will be placed by 4/30/82 with installation by September, 1982. These replacement units are qualified for TID of 1.4×10^6 rads.

4. Interim Operation is [X] Justified [ ] Not Justified

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: OC-888A/B

Component Name: Alison Temperature Detection Unit

System: Standby Gas Treatment System Purchase Order: M-320

1. Component(s) Safety Function:

   Monitors temperature of charcoal filter OF-169A/B within SGTS filter housing. Will also alarm and initiate water deluge system if filter overheats, and will trip running SGTS fan, thereby initiating startup of standby fan.

2. Accident(s) for which Component(s) must be Qualified:

   40, 42 (TID = 2.4×10^5 rads, taking credit for recent recalculation of TIDs)

3. Justification for Interim Operation:

   14. This equipment is qualified to IEEE 323-1974. Integrated circuit (I/C) P/N LM124A, is qualified to 2.5×10^5 rads, which exceeds the required TID given above. This equipment is fully qualified for all other environmental parameters of concern.

4. Interim Operation is [X] Justified [ ] Not Justified

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: 1V-208A/B, 1V-209A/B, 1V-211A/B/C/D

Component Name: ECCS Unit Cooler Fan Motors for HPCI, RCIC and CSS Rooms

System: Reactor Bldg. (Zone I) HVAC

Purchase Order: M-315
(Replacement to be purchased under P.O. M-399)

1. Component(s) Safety Function:

   Maintain ECCS pump room temperature $\leq$ 130°F following a DBA. Support system to ECCS.

2. Accident(s) for which Component(s) must be Qualified:

   40, 42, 43, 44, 45

3. Justification for Interim Operation:

   1. HPCI, RCIC and Core Spray systems are not on the preferred CSD path. Thus, cooling of their equipment rooms is not required. These HVAC systems are electrically and physically independent of the unit coolers required for CSD; thus, failure of these fan motors will not affect safe, cold shutdown.

   10, 12. These 8 motors (with type "F" insulation) can be operated for a limited time (3 years maximum) until replacements are installed. Motors will be replaced with qualified motors (with type "H" insulation) prior to startup following the first refueling outage.

4. Interim Operation is [X] Justified [ ] Not Justified

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: 1V-210A/B/C/D

Component Name: RHR Pump Rooms Unit Cooler Fan Motor

System: Reactor Bldg. (Zone I) HVAC   Purchase Order: M-315/ M-399 for replacement motors

1. Component(s) Safety Function:
Maintain RHR pump room temperature $\leq$ 130°F following a DBA. Support systems to LPCI and suppression pool cooling modes of RHR.

2. Accident(s) for which Component(s) must be Qualified:

40, 42, 43, 44, 45

3. Justification for Interim Operation:

17. The 4 existing motors (with type "F" insulation) will be replaced with qualified motors (with type "H" insulation) after scheduled fuel load but before full power ascension. Replacement is forecast for October 5, 1982.

4. Interim Operation is [X] Justified [ ] Not Justified

TM1/2/50

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: OC-883A/B

Component Name: Local HVAC Panel

System: Standby Gas Treatment System   Purchase Order: M-334/M-412 (M-412 for qualification activity only)

1. Component(s) Safety Function:

Local Control Panel for SGTS and its associated controls.

2. Accident(s) for which Component(s) must be Qualified:

40, 42 (TID = 1.6×10^3 Rads, taking credit for recent recalculation of TIDs)

3. Justification for Interim Operation:

10,12   These panels are being qualified by analysis; the vendor has submitted an EQ report, but it is not considered complete. The qualification of these panels is currently scheduled to be completed after fuel load (July 30, 1982). Since these panels will be subjected to only 10^3 Rads after the accident with no change in temperature, pressure or humidity, there is confidence that they will prove to be qualified.

4. Interim Operation is [X] Justified [ ] Not Justified

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: OC-876A/B

Component Name: Local HVAC Panel

System: Control Structure Emergency Outside Air Supply System (CSEOASS)

Purchase Order: M-334/M-412 (M-412 for qualification activity only)

1. Component(s) Safety Function:

Local Control Panel for CSEOASS and its associated controls.

2. Accident(s) for which Component(s) must be Qualified:

40, 42 (TID = 1.6×10^3 Rads, taking credit for recent recalculation of TIDs)

3. Justification for Interim Operation:

10,12. These panels are being qualified by analysis; the vendor has submitted an EQ report, but it is not considered complete. The qualification of these panels is currently scheduled to be completed after fuel load (July 30, 1982). Since these panels will be subjected to only 10^3 Rads after the accident with no change in temperature, pressure or humidity, there is confidence that they will prove to be qualified.

4. Interim Operation is |X| Justified | | Not Justified

TM1/2/60b

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: HDM-07553 A&B, HDM-07555 A&B

Component Name: Damper Actuators (hydromotor)

System: Standby Gas Treatment System   Purchase Order: M-336A

1. Component(s) Safety Function:

   a) HDM-07553A/B: inlet dampers to SGTS train A/B; must reposition on train switchover.

   b) HDM-07555A/B: outside air bypass damper for charcoal cooling; used only in event of extreme overheating of charcoal bed.

2. Accident(s) for which Component(s) must be Qualified:

   40, 42 (TID = 1.2×10^6 Rads, taking credit for recent recalculation of TIDs)

3. Justification for Interim Operation:

   14. These damper actuators are qualified for a total integrated dose of 2.3×10^7 Rads while the capacitor in the actuator is qualified for 5.5×10^6 Rads. These values exceed the required TID given above. These actuators are fully qualified for all other environmental parameters of concern.

4. Interim Operation is [X] Justified [ ] Not Justified

TM1/2/60c

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: OV-109A/B

Component Name: SGTS Exhaust Fan Motor

System: Standby Gas Treatment Purchase Order: M-362
(Replacement P.O. M-399)

1. Component(s) Safety Function:

   a) Maintain -0.25 in. wg. negative pressure in the secondary containment post-accident.

   b) Exhaust filtered air from the secondary containment to limit the offsite dose.

   c) Filter and exhaust discharge from MSIVLCS.

2. Accident(s) for which Component(s) must be Qualified:

   40, 42 (TID = 1.5×10^5 Rads), taking credit for recent recalculation of TIDs.

3. Justification for Interim Operation:

   10, 12. Motor vendor has test documentation showing that motors have been tested for 2×10^6 Rads. Based on the existing test documents, the vendor has stated that the presently installed motors can be used for up to 3 years; therefore these motors will be replaced prior to startup following the first refueling outage with qualified motors having type "H" insulation.

4. Interim Operation is [X] Justified [ ] Not Justified

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: ZS-10943A2, ZS-10943B2, ZS-10924A1, ZS-11024A2, ZS-11024B1, ZS-11024B2, ZS-11143A, ZS-11143B

Component Name: Valve Position Limit Switches

System: Emergency Service Water Purchase Order: P-16A

1. Component(s) Safety Function:

Valve position indication for air-operated valves which isolate emergency service water from the service water connections to the TBCCW and RBCCW heat exchangers.

2. Accident(s) for which Component(s) must be Qualified:

40, 42, 43, 44, 45

3. Justification for Interim Operation:

4, 13, , The valves for which these limit switches provide position indication are normally closed. These valves are opened remote-manually only in the event of a loss-of-offsite power without a LOCA. In the unlikely event that a DBE occurs during this situation, the operator will reclose the valves; lack of position indication should not confuse the operator. The limit switches will be replaced with qualified switches before startup following the first refueling outage.

4. Interim Operation is [X] Justified [ ] Not Justified

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: ZS-15004, ZS-15005

Component Name: Valve Position Limit Switch

System: RCIC Purchase Order: J-65

1. Component(s) Safety Function:

   Position indication for RCIC vacuum tank condensate pump discharge line drain valves HV-E51-1F004 & -1F005.

2. Accident(s) for which Component(s) must be Qualified:

   None

3. Justification for Interim Operation:

   1, 11. RCIC System is not on the preferred CSD path. RCIC System is not taken credit for in accident analysis. Failure of these limit switches will not affect ability to achieve and maintain cold shutdown. Barometric condenser is not needed for operation of RCIC System.

   4. These valves get a closure signal when the RCIC turbine steam supply valve opens.

   13. The upstream valve is normally-closed, fail-closed.

   16, 9. The only environmental parameter for which these limit switches are not yet qualified is temperature due to a RCIC steam line break; since this event will cause automatic isolation of the steam supply line, the operators would not be concerned about the position of the drain valves.

4. Interim Operation is [X] Justified [ ] Not Justified

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: ZS-15625, ZS-15626

Component Name: Valve Position Limit Switch

System: HPCI   Purchase Order: I-65

1. Component(s) Safety Function:

Position indication for HPCI vacuum tank condensate pump discharge line drain valves HV-E41-1F025 & -1F026.

2. Accident(s) for which Component(s) must be Qualified:

40, 42, 43, 44, 45

3. Justification for Interim Operation:

1, 11. HPCI System is not on the preferred CSD path. Failure of these limit switches will not affect ability to achieve and maintain cold shutdown. Barometric condenser is not needed for operation of HPCI System.

4. These valves get a closure signal when the HPCI turbine steam supply valve opens

13. The upstream valve is normally-closed, fail-closed.

16, 9. The only environmental parameter for which these limit switches are not yet qualified is temperature due to a HPCI steam line break; since this event will cause automatic isolation of the steam supply line, the operators would not be concerned about the position of the drain valves.

4. Interim Operation is [X] Justified [ ] Not Justified

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: ZS-15528, ZS-15529

Component Name: Valve Position Limit Switch

System: HPCI Purchase Order: J-65

1. Component(s) Safety Function:

   Position indication for HPCI steam supply line drain valves HV-E41-1F028 & -1F029.

2. Accident(s) for which Component(s) must be Qualified:

   40, 42, 43, 44, 45

3. Justification for Interim Operation:

   1. HPCI system is not in the preferred CSD path. Failure of these limit switches will not affect ability to achieve and maintain cold shutdown.

   4. These valves are closed automatically on a LOCA signal.

   16, 9. The only environmental parameter for which these limit switches are not yet qualified is temperature due to an HPCI steam line break; since this event will cause automatic isolation of the steam supply line, the operators would not be concerned about the position of the drain valves.

4. Interim Operation is [X] Justified [ ] Not Justified

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: ZS-14925, ZS-14926

Component Name: Valve Position Limit Switch

System: RCIC Purchase Order: J-65

1. Component(s) Safety Function:

Position indication for RCIC steam supply line drain valves HV-E51-1F025 & -1F026.

2. Accident(s) for which Component(s) must be Qualified:

None

3. Justification for Interim Operation:

1, 11 RCIC system is not in the preferred CSD path. RCIC system is not taken credit for in accident analysis. Failure of these limit switches will not affect ability to achieve and maintain cold shutdown.

4. These valves are closed automatically on a LOCA signal.

16, 9 The only environmental parameter for which these limit switches are not yet qualified is temperature due to an RCIC steam line break; since this event will cause automatic isolation of the steam supply lines the operators would not be concerned about the position of the drain valves.

4. Interim Operation is [X] Justified [ ] Not Justified

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: ZS-11274 A, B

Component Name: Valve Position Limit Switch

System: RHR Service Water **Purchase Order:** J-65

1. **Component(s) Safety Function:**

   None (Position indication for telltale drain valve for RHRSW/RHR crosstie correction)

2. **Accident(s) for which Component(s) must be Qualified:**

   None

3. **Justification for Interim Operation:**

   1, 11, 9. This valve is not in the preferred CSD path. It is valved out from the RHR and RHRSW systems by normally - keylocked closed crosstie isolation valves. The need to crosstie RHR to RHRSW requires multiple component failures and need not be assumed for purposes of this study. Failure of this valve limit switch will not affect the ability to attain or maintain safe, cold shutdown condition, and the operator does not rely on position indication of this valve to perform any safety action.

4. **Interim Operation is** [X] Justified [ ] Not Justified

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ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Component Ident. No(s).: ZS-15151 A&B, ZS-15152 A&B, ZS-15153 A&B

Component Name: Valve Position Limit Switches

System: RHR   Purchase Order: J-65

1. Component(s) Safety Function:

Position indication for RHR Steam Condensing Mode isolation valves HV-E11-1F051 A, B, 1F052 A, B, and -1F053 A, B.

2. Accident(s) for which Component(s) must be Qualified:

40, 42, 43, 44, 45

3. Justification for Interim Operation:

1. HV-E11-1F052 A, B and 1F053 A, B are not on the preferred path to cold shutdown.

9. Limit switches provides valve position indication only.

13. Valves are normally-closed; steam condensing mode of RHR is seldom, if ever, used.

4,16. Valves receive automatic LOCA isolation signal; limit switches should not be exposed to harsh environment during early post-accident period. Subsequent failure of limit switches should not confuse operator.

4. Interim Operation is [X] Justified [ ] Not Justified

NSSS EQUIPMENT

The NSSS equipment is arranged by EQEL number. Each EQEL may have multiple sheets to accommodate various system reqirements for Justification for Interim Operation.

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Technical Document No: 2400:MAV-025

E.Q.E.L. Item No. 025

Date 4-28-82 Revision C

Prepared by M. Gitterman

Item Name Level Switch/Transmitter

Revised by E. Gagnon

Reviewed by Mekerdugo

System: Nuclear Boiler

Tag No: B21-N026C,D (LITS-1N026C,D)

1. Interim Operation is: x Justified ___ Not Justified

2. Justification for Interim Operation:

The safety functions of the switch and transmitter are also provided by qualified components (LITS-1N026A&B) on the cold shutdown path. Switch failure could cause inadvertent MSIV closure which is analyzed as a DBE. Transmitter failure causing erroneous indication in the control room can be determined by comparison with the qualified component indication (LITS-1N026 A&B). Any failure of these components will not preclude any qualified component from performing its safety function or the plant achieving and maintaining cold shutdown.

3. Component(s) Safety Function:

Switch: Initiates MSIV closure on low reactor vessel water level.

Transmitter: Provides reactor vessel water level (above fuel zone) signal to recorders and indicators in the control room.

4. Accident(s) for which Component(s) must be Qualified For Interim Operation:

None.

Owner : Pennsylvania Power & Light
Facility : Susquehanna Unit 1 (SSES #1)

Project No. 2400

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

E.Q.E.L. Item No. 025

Item Name Level Switch/Transmitter

System: Nuclear Boiler

Tag No: B21-N037A,B (LITS-1N037A,B)

Technical Document No: 2400:MAV:025
Date 4-29-82 Revision D
Prepared by M. Gitterman
Revised by E. Gagnon
Reviewed by [signature]

1. Interim Operation is: x Justified ___ Not Justified

2. Justification for Interim Operation:

The switch has no safety function and has no failure consequences since it is disconnected. The transmitter function (fuel zone water level) is adequately provided by LITS-1N026A,B (above fuel zone water level) which are on the cold shutdown path. Except for a few seconds following a LOCA, the justified systems on the cold shutdown path maintain the water level within the range of the above qualified components. Transmitter failure causing erroneous indication in the control room can be determined by comparison with the above qualified component indication. Any failure of this component will not prevent any qualified component from performing its safety function or achieving and maintaining cold shutdown.

3. Component(s) Safety Function:

Switch: None. Switch disconnected.

Transmitter: Provides reactor vessel water level (fuel zone) signal to indicator in the control room.

4. Accident(s) for which Component(s) must be Qualified For Interim Operation:

None

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Technical Document No: 2400:MAV-031
E.Q.E.L. Item No. 031
Date 4-28-82 Revision C
Prepared by M. Gitterman
Item Name Pressure Switch
Revised by M. Gitterman
Reviewed by [signature]
System: Core Spray

Tag No: E21-N008 A,B (PS-1N008 A,B)

E21-N009 A,B (PS-1N009 A,B)

1. Interim Operation is: X Justified ___ Not Justified

2. Justification for Interim Operation:

The safety function, core cooling, of the core spray system is also provided by environmentally justified system (ADS + LPCI mode of RHR system) on the cold shutdown path. Switch failure will not actuate the ADS or prevent actuation since a permissive is also provided by the RHR pump discharge pressure switches (PS-1N016, PS-1N010) on the cold shutdown path. Any failure of these switches will not prevent the above justified systems from achieving and maintaining a cold shutdown.

3. Component(s) Safety Function:

Provide permissive signal to the ADS when the core spray system pump discharge pressure is $\geq$130 psig.

4. Accident(s) for which Component(s) must be Qualified For Interim Operation:

None

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

E.Q.E.L. Item No. 031

Item Name Pressure Switch

Technical Document No: 2400:MAV-031
Date 4/28/82 Revision C
Prepared by M. Gitterman
Revised by M. Gitterman
Reviewed by M. Ver...

System: High Pressure Coolant Injection (HPCI)

Tag No: E41-N001 A,B,C,D (PSL-1N001 A,B,C,D)

1. Interim Operation is: X Justified ___ Not Justified

2. Justification for Interim Operation:

The safety function, core cooling, of the HPCI system is also provided by environmentally justified systems (ADS + LPCI mode of RHR system) on the cold shutdown path. Switch failure could prevent HPCI startup or lead to turbine/pump maloperation and/or the loss of the HPCI system. Any failure of these switches will not prevent the above justified systems from achieving and maintaining a cold shutdown.

3. Component(s) Safety Function:

Isolate HPCI turbine steam supply and pump discharge lines on low steam supply pressure.

4. Accident(s) for which Component(s) must be Qualified For Interim Operation:

None

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

E.Q.E.L. Item No. 031

Item Name Pressure Switch

Technical Document No: 2400:MAV-031
Date 4-28-82 Revision C
Prepared by M. Gitterman
Revised by M. Gitterman
Reviewed by M. Verdugo

System: High Pressure Coolant Injection

Tag No: E41-N027 (PSH-1N027)

1. Interim Operation is: X Justified ___ Not Justified

2. Justification for Interim Operation:

The safety function, core cooling, of the HPCI system is also provided by environmentally justified systems (ADS + LPCI mode of RHR system) on the cold shutdown path. Switch failure will not cause opening of the valve but could prevent opening of the valve which could lead to HPCI pump damage and loss of the HPCI system. Any failure of this switch will not prevent the above justified systems from achieving and maintaining cold shutdown.

3. Component(s) Safety Function:

Provides permissive signal to open the HPCI pump low flow bypass valve when pump discharge pressure is $\geq$125 psig.

4. Accident(s) for which Component(s) must be Qualified For Interim Operation:

None

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Technical Document No: 2400:MAV-031

E.Q.E.L. Item No. 031 Date 4/28/82 Revision C

Prepared by E. P. Gagnon

Item Name: Pressure Switch Revised by E. P. Gagnon

Reviewed by M Verdugo

System: Reactor Core Isolation Cooling (RCIC)

Tag No: E51-N009 A, B (PSH-1N009 A,B)

1. Interim Operation is: X Justified ___ Not Justified

2. Justification for Interim Operation:

The safety function, core cooling, of the RCIC system is also provided by environmentally justified systems (ADS + LPCI mode of the RHR system) on the cold shutdown path. Switch failures could prevent RCIC startup or lead to RCIC turbine failure and/or the loss of the RCIC system. Any failure of these switches will not prevent the above justified systems from achieving and maintaining a cold shutdown.

3. Component(s) Safety Function:

Provides trip signals to the RCIC turbine controls on high turbine exhaust pressure.

4. Accident(s) for which Component(s) must be Qualified For Interim Operation:

None.

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Technical Document No: 2400:MAV-031

E.Q.E.L. Item No. 031

Date 4/28/82 Revision C

Prepared by E. Gagnon

Item Name Pressure Switch

Revised by E. Gagnon

Reviewed by MAVerdugo

System: Reactor Core Isolation Cooling (RCIC)

Tag No: E51-N012 A, B, C, D (PSH-1N012 A, B, C, D).

1. Interim Operation is: X Justified ___ Not Justified

2. Justification for Interim Operation:

The safety function, core cooling, provided by the RCIC system is also provided by environmentally justified systems (ADS + LPCI mode of the RHR system) on the cold shutdown path. Switch failure could prevent RCIC startup or lead to RCIC turbine failure and/or the loss of the RCIC systems. Any failure of these switches will not prevent the above justified systems from achieving and maintaining cold shutdown.

3. Component(s) Safety Function:

The pressure switches provide an RCIC system isolation signal to close the steam supply isolation valves and trip the RCIC turbine when the pressure downstream of the first rupture disk in the turbine exhaust header exceeds 10 PSIG.

4. Accident(s) for which Component(s) must be Qualified For Interim Operation:

None.

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

E.Q.E.L. Item No. 031

Item Name Pressure Switch

Technical Document No: 2400:MAV-031
Date 4-28-82 Revision C
Prepared by M. Gitterman
Revised by M. Gitterman
Reviewed by M. Verdugo

System: Reactor Core Isolation Cooling (RCIC)

Tag No: E51-N020 (PSH-1N020)

1. Interim Operation is: X Justified ___ Not Justified

2. Justification for Interim Operation:

The safety function, core cooling, of the RCIC system is also provided by environmentally justified systems (ADS + LPCI mode of RHR system) on the cold shutdown path. Switch failure will not cause opening of the valve but could prevent opening the valve which could lead to RCIC pump damage and loss of the RCIC system. Any failure of this switch will not prevent the above justified system from achieving and maintaining a cold shutdown.

3. Component(s) Safety Function:

Provides permissive signal to open the RCIC pump low flow bypass valve when pump discharge pressure is $\geq$125 psig.

4. Accident(s) for which Component(s) must be Qualified For Interim Operation:

None

Owner : Pennsylvania Power & Light
Facility : Susquehanna Unit 1 (SSES #1)

Project No. 2400

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Technical Document No: 2400:MAV-036

E.Q.E.L. Item No. 036
Date 4-6-82 Revision B
Prepared by E. Gagnon
Item Name FLOW ELEMENT
Revised by E. Gagnon
Reviewed by M. Ludwig
System: MSIV-LEAKAGE CONTROL (MSIV-LCS)

Tag No: E32-N006, B, F, K, P (FE-1N006 B, F, K, P; Inboard System)

1. Interim Operation is: X Justified ___ Not Justified

Provided that the operator is instructed to not initiate the inboard MSIV-LCS subsystem.

2. Justification for Interim Operation:

The inboard system is not part of the cold shutdown path and should not be used in response to a LOCA until it is fully qualified. The system must be manually actuated, and the subject components only function to inhibit system operation. Should these components fail in the permissive mode, the system would still not start automatically. Therefore, failure of these components is tolerable and has no effect on the ability of other systems to achieve and maintain a cold shutdown.

3. Component(s) Safety Function:

To supply flow signals to flow transmitters, FT-N053 B, F, K & P, to isolate inboard MSIV-LCS on high leakage flow through the inboard MSIV's.

4. Accident(s) for which Component(s) must be Qualified For Interim Operation:

None.

Owner : Pennsylvania Power & Light
Facility : Susquehanna Unit 1 (SSES #1)

Project No. 2400

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Technical Document No: 2400:MAV-037

E.Q.E.L. Item No. 037

Date 4-6-82 Revision A

Prepared by M. Gitterman

Item Name Detector, Power Range

Revised by

Reviewed by M. Verdugo

System: Neutron Monitoring System

Tag No: B11-D193 -- Power Range Monitors

1. Interim Operation is: X Justified ___ Not Justified

   For Control Rod Drop Accident Only.

2. Justification for Interim Operation:

   PRM's provide no safety function in LOCA or HELB accidents since reactor scram signal is provided by Qualified Instruments, reactor vessel low water level and/or high containment pressure (LOCA) or MSIV closure (HELB). In a rod drop accident, the high flux scram signal is generated in less than one second (FSAR Table 15.4-8) at 120% power. Over this time frame, ambient conditions to which the PRM's are exposed do not change significantly and thus for the rod drop accident the PRM's can be considered exposed only to a benign environment. Should the PRM's fail to provide a scram signal, the initial power excursion is terminated by the Doppler coefficient and a backup scram signal is generated by closure of the MSIV's on detection of high radioactivity in the main steam lines. Therefore, failure of these components will not preclude the ability to accomplish or maintain cold shutdown.

3. Component(s) Safety Function:

   Generate scram signal at 120% power.

4. Accident(s) for which Component(s) must be Qualified For Interim Operation:

   Rod drop accident.

Owner : Pennsylvania Power & Light
Facility : Susquehanna Unit 1 (SSES #1)

Project No. 2400

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Technical Document No: 2400:MAV-038
E.Q.E.L. Item No. 038
Date 4-28-82 Revision C
Prepared by E. Gagnon
Item Name Flow Transmitter
Revised by E. Gagnon
Reviewed by [signature]
System: MSIV-Leakage Control (MSIV-LCS)

Tag No: E32-N053 B, F, K, P (FT-1N053 B, F, K, P; Inboard System)

1. Interim Operation is: X Justified ___ Not Justified

Provided that the operator is instructed to not initiate the inboard MSIV-LCS subsystem.

2. Justification for Interim Operation:

The inboard system is not part of the cold shutdown path and should not be used in response to a LOCA until it is fully qualified. The system must be manually actuated, and the subject components only function to inhibit system operation. Should these components fail in the permissive mode, the system would still not start automatically. Therefore, failure of these components is tolerable and has no effect on the ability of other systems to achieve and maintain a cold shutdown.

3. Component(s) Safety Function:

Flow elements, FE-1N006 B, F, K & P supplies signals to the flow transmitters FT-1N053 B, F, K, & P which isolates the inboard MSIV-LCS on high leakage flow through the inboard MSIV's.

4. Accident(s) for which Component(s) must be Qualified For Interim Operation:

None.

Owner : Pennsylvania Power & Light
Facility : Susquehanna Unit 1 (SSES #1)

Project No. 2400

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Technical Document No: 2400:MAV-048
Date 4/5/82 Revision C
Prepared by M. Gitterman
Revised by M. Gitterman
Reviewed by M. Verdugo

E.Q.E.L. Item No. 048

Item Name: Pressure Transmitter

System: Nuclear Boiler

Tag No: B21-N055B (PT-1N055B)

1. Interim Operation is: X Justified ___ Not Justified

2. Justification for Interim Operation:

The safety function provided by this transmitter is also provided by an environmentally qualified transmitter (PT-1N055A) on the cold shutdown path. Transmitter failure causing erroneous indication in the control room can be determined by comparison with the above qualified component indication. Failure of this component will not prevent the qualified component from performing its safety function or achieving and maintaining cold shutdown.

3. Component(s) Safety Function:

Supplies a pressure signal to the reactor vessel wide range recorder in the control room in the same manner that PT-1N055A supplies PR-1R623A

4. Accident(s) for which Component(s) must be Qualified For Interim Operation:

None.

Owner : Pennsylvania Power & Light
Facility : Susquehanna Unit 1 (SSES #1)

Project No. 2400

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Technical Document No: 2400:MAV-048
Date 4/5/82 Revision C
Prepared by R. Wise
Revised by R. Wise
Reviewed by Marcudugo

E.Q.E.L. Item No. 048

Item Name: Flow Transmitter

System: Core Spray (CS)

Tag No: E21-N003A/B(FT-1N003A/B)

1. Interim Operation is: X Justified ___ Not Justified

2. Justification for Interim Operation:

The safety function, provided by the core spray system, which is not on the cold shutdown path, is also provided by environmentally justified systems on the cold shutdown path (ADS + LPCI mode of RHR system). Failure of these components could give the operator erroneous information concerning the system. However, mis-operation or total loss of the system would be of no consequence because the system is not on the cold shutdown path. Therefore, failure of the component will not preclude the accomplishment of the ability to achieve and maintain cold shutdown.

3. Component(s) Safety Function:

Provides flow signals to indicators in the control room for each loop of the core spray system which provides core cooling when the reactor vessel is depressurized.

4. Accident(s) for which Component(s) must be Qualified For Interim Operation:

None.

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

E.Q.E.L. Item No. 048

Item Name PRESSURE & FLOW TRANSMITTERS

Technical Document No: 2400:MAV-048
Date 4/2/82 Revision B
Prepared by M. Gitterman
Revised by R. Wise
Reviewed by [signature]

System: MSIV-LEAKAGE CONTROL SYSTEM (MSIV-LCS)

Tag No: E32-N050; N051 B, F, K, P; N054; N060; N061B, F, K, P

(PT-1N050; PT-1N051B, F, K, P; FT-1N054; PT-1N060; PT-1N061 B,F,K,P)

1. Interim Operation is: X Justified ___ Not Justified

Provided that the operator is instructed to not initiate the inboard MSIV LCS subsystem.

2. Justification for Interim Operation:

The inboard system is not part of the cold shutdown path and should not be used in response to a LOCA until it is fully qualified. The system must be manually actuated, and the subject components only function to inhibit system initiation. Should these components fail in the permissive mode, the system would still not start automatically. Therefore, failure of these components is tolerable and has no effect on the ability of other systems to achieve and maintain a cold shutdown.

3. Component(s) Safety Function:

PT-N051 B,F,K,P - To provide signals, based on pressure upstream of outboard MSIV. These signals feed a switch and timer which close the inlet bleed and depressurization valves, when pressure is above 5 psig, 1 minute after system initiation.

PT-N061 B,F,K,P - To provide signals to a switch which prevents opening of the bleed valves when pressure upstream of outboard MSIV is above 35 psig.

PT-N050 & 60 - To provide signals which prevent blower initiation when reactor pressure is above 35 psig. Either instrument reading less than 35 psig will allow blower initiation.

FT-N054 - To provide a flow signal based on the differential pressure across a flow element in the dilution air intake line. This signal prevents opening of the bleed valves when flow is below the setpoint and closes the valves if flow decreases to an inadequate level during operation.

4. Accident(s) for which Component(s) must be Qualified For Interim Operation:

None

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Technical Document No: 2400:MAV-048

E.Q.E.L. Item No. 048

Date 4-2-82 Revision A

Prepared by R. Wise

Item Name Flow Transmitter

Revised by

Reviewed by [signature]

System: MSIV Leakage Control System (outboard subsystem)

Tag No: E32-N059 (FT-1N059)

1. Interim Operation is: X Justified ___ Not Justified

2. Justification for Interim Operation:

This flow transmitter is in a system which is part of the cold shutdown path. However, failure of the subject component is of no consequence since it has no control function. Failure of this component would be significant only if there is a blockage in the dilution air intake line; but, because no failures in the qualified equipment of the cold shutdown path are assumed, there will be no failure for the subject component to detect. Therefore, failure of the subject component can not prevent achievement and maintenance of cold shutdown.

3. Component(s) Safety Function:

To provide a signal based on flow in the dilution air intake line. The signal is used as input to an alarm and indicator in the control room.

4. Accident(s) for which Component(s) must be Qualified For Interim Operation:

None.

Owner : Pennsylvania Power & Light
Facility : Susquehanna Unit 1 (SSES #1)

Project No. 2400

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Technical Document No: 2400:MAV-048

E.Q.E.L. Item No.: 048

Date: 4/5/82 Revision C

Prepared by R. Wise

Item Name: Flow Transmitter

Revised by R. Wise

Reviewed by [signature]

System: High Pressure Coolant Injection (HPCI)

Tag No: E41-N008 (FT-1N008)

1. Interim Operation is: X Justified ___ Not Justified

2. Justification for Interim Operation:

The safety function, core cooling, provided by the HPCI system which is not in the cold shutdown path is also provided by environmentally justified systems on the cold shutdown path (ADS + LPCI mode of RHR). Failure of this component may cause erratic operation of a system for which no credit has been taken for the cold shutdown path. Therefore, failure of this component will not preclude the justified systems from achieving and maintaining cold shutdown.

3. Component(s) Safety Function:

Supplies a flow signal to the HPCI turbine control so that the system flow can be changed to meet the requirements for core cooling during the times when reactor vessel pressure is too high to use the low pressure systems.

4. Accident(s) for which Component(s) must be Qualified For Interim Operation:

None.

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

E.Q.E.L. Item No. 048

Item Name Pressure Transmitter

Technical Document No: 2400:MAV-048
Date 4-5-82 Revision B
Prepared by E. Gagnon
Revised by
Reviewed by [signature]

System: High Pressure Coolant Injection (HPCI)

Tag No: E41-N009 (PT-1N009)

1. Interim Operation is: X Justified ___ Not Justified

2. Justification for Interim Operation:

The safety functions, core cooling, of the HPCI system is also provided by environmentally justified systems (ADS + LPCI mode of RHR system) on the cold shutdown path. Transmitter failure could cause erroneous indication in the control room and lead to HPCI pump damage and/or loss of the HPCI system. Any failure of this transmitter will not prevent the above justified system from achieving and maintaining a cold shutdown.

3. Component(s) Safety Function:

Provides HPCI pump discharge pressure signal to indicator in control room.

4. Accident(s) for which Component(s) must be Qualified For Interim Operation:

None

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Technical Document No: 2400:MAV-048

E.Q.E.L. Item No.: 048

Date 4/5/82 Revision C

Prepared by R. Wise

Item Name Flow Transmitter

Revised by R. Wise

Reviewed by M Verdugo

System: Reactor Core Isolation Cooling (RCIC)

Tag No: E51-N003 (FT-1N003)

1. Interim Operation is: X Justified ___ Not Justified

2. Justification for Interim Operation:

The safety function, core cooling, provided by the RCIC system which is not on the cold shutdown path, is also provided by environmentally justified systems on the cold shutdown path (ADS + LPCI mode of RHR). Failure of this component may cause erratic operation in the system for which no credit is taken for the cold shutdown path. Therefore, failure of this component will not preclude the accomplishment of the ability to achieve and maintain cold shutdown.

3. Component(s) Safety Function:

Provides a flow signal input to the RCIC turbine controls so that the system flow can be changed to meet the requirements for core cooling during the times when reactor vessel pressure is too high to use the low pressure systems.

4. Accident(s) for which Component(s) must be Qualified For Interim Operation:

None.

Owner : Pennsylvania Power & Light
Facility : Susquehanna Unit 1 (SSES #1)

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Technical Document No: 2400:MAV:048

E.Q.E.L. Item No. 048

Date 4-5-82 Revision B

Prepared by E. Gagnon

Item Name Pressure Transmitter

Revised by

Reviewed by

System: Reactor Core Isolation Cooling (RCIC)

Tag No: E51-N004 (PT-1N004)

1. Interim Operation is: X Justified ___ Not Justified

2. Justification for Interim Operation:

The safety function, core cooling, of the RCIC system is also provided by environmentally justified systems (ADS + LPCI mode of RHR system) on the cold shutdown path. Transmitter failure could cause erroneous indication in the control room and lead to RCIC pump failure and/or loss of the RCIC system. Any failure of this transmitter will not prevent the above justified systems from achieving and maintaining a cold shutdown.

3. Component(s) Safety Function:

Provides RCIC pump discharge pressure signal to indicator in the control room.

4. Accident(s) for which Component(s) must be Qualified For Interim Operation:

None

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

E.Q.E.L. Item No. 048

Item Name Flow Transmitters

Technical Document No: 2400:048
Date 4-6-82 Revision B
Prepared by M. Gitterman
Revised by R. Wise
Reviewed by [signature]

System: Reactor Water Cleanup (RWCU)

Tag No: G33-N012, 036, 041 (FT-1N012, 036, 041).

1. Interim Operation is: x Justified ___ Not Justified

2. Justification for Interim Operation:

Failure of these components is of no consequence because their function can be performed by other qualified equipment. In addition, this system is automatically isolated in response to a LOCA or HELB. These items are not part of a system which is required for the cold shutdown path. Therefore, these components will not affect the ability to achieve and maintain cold shutdown.

3. Component(s) Safety Function:

To detect small leaks by comparing system inlet and outlet flows and supply a signal to isolate the system. PDSH-N044A supplies a similar leak detection function by detecting high flow in the RWCU system. In addition, small leaks can be detected by the temperature portion of the isolation logic. TE-1N016A/F supplies isolation signals when they detect high ambient temperature in the RWCU equipment area, and TE-1N022A/F in conjunction with TE-1N023A/F supplies isolation signal when they detect high differential temperature between the inlet and outlet of the equipment area ventillation ducts. The temperature measurement is also part of the leak detection and isolation instrumentation. PDSH-N044A and all of the listed temperature elements are qualified.

4. Accident(s) for which Component(s) must be Qualified For Interim Operation:

None.

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

E.Q.E.L. Item No. 054

Item Name Pressure Switch

System: Nuclear Boiler

Technical Document No: 2400:054
Date 4-28-82 Revision C
Prepared by E. Gagnon
Revised by E. Gagnon
Reviewed by [signature]

Tag No: B21-N020 A,B,C,D (PS-1N020A,B,C,D)

1. Interim Operation is: X Justified ___ Not Justified

2. Justification for Interim Operation:

These components have no safety function when the reactor mode switch is in the 'run' position. With the mode switch in other positions (e.g. 'startup'), pressure switch failure could prevent the scram on MSIV closure. However, the attendent pressure increase and subsequent coolant flow through the safety/relief valves will result in a scram on low reactor vessel water level (LIS-1N024 A,B). Both the valves and level switches are environmentally qualified components on the cold shutdown path. Any failure of these pressure switches will not prevent any qualified component from performing its safety function or achieving and maintaining a cold shutdown.

3. Component(s) Safety Function:

Provides a signal to restore the MSIV closure scram function when reactor pressure is above 600 psig and the reactor mode switch is not in 'run' position.

4. Accident(s) for which Component(s) must be Qualified For Interim Operation:

None.

Owner : Pennsylvania Power & Light
Facility : Susquehanna Unit 1 (SSES #1)

Project No. 2400

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

E.Q.E.L. ITEM No. 054

Technical Document No: 2400:MAV:048
Date 5-13-82 Revision A
Prepared by J. Rakowski
Revised by
Reviewed by

Item Name Pressure Switch

System: Nuclear Boiler

Tag No.: B21-N021A,C (PS-1N021A,C)

1. Interim Operation is: X Justified ___ Not Justified

2. Justification for Interim Operation:

These switches shall be replaced (per letter TPLP-158) prior to a power level where they would experience a damaging radiation level in the event of an accident.

3. Component(s) Safety Function:

Monitors reactor vessel pressure.

4. Accident(s) which Component(s) must be Qualified for Interim Operation:

40,42,43,44 & 45

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

E.Q.E.L. Item No. 054

Item Name Pressure Switch

Technical Document No: 2400:054
Date 4-28-82 Revision C
Prepared by E. Gagnon
Revised by E. Gagnon
Reviewed by [signature]

System: Nuclear Boiler

Tag No: B21-N022, A,B,C,D,E,F,G,H,J,K,L,M,N,P,R,S
(PS-1N022, A,B,C,D,E,F,G,H,J,K,L,M,N,P,R,S)

1. Interim Operation is: X Justified ___ Not Justified

2. Justification for Interim Operation:

The safety function provided by these switches is also provided by the environmentally justified safety mode (spring actuated) of the safety/relief valves. Failures which actuate the relief mode of the valves produce a LOCA which is within the spectrum of depressurization events analyzed. Any failure will not prevent any valve safety mode from performing its safety function or achieving and maintaining a cold shutdown.

3. Component(s) Safety Function:

These components provide a pressure signal to actuate the pressure relief mode of the safety/relief valves at a selected pressure lower than the valve safety mode (spring) actuation for events requiring control of reactor vessel pressure increases.

4. Accident(s) for which Component(s) must be Qualified For Interim Operation:

None. Components are not required to operate during a LOCA or HELB accident.

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Technical Document No: 2400:054
Date 4-28-82 Revision C
Prepared by E. Gagnon
Revised by R. Wise
Reviewed by [signature]

E.Q.E.L. Item No. 054

Item Name Pressure Switch

System: Nuclear Boiler

Tag No: B21-N023 A,B,C,D

(PS-1N023 A,B,C,D)

1. Interim Operation is: X Justified ___ Not Justified

2. Justification for Interim Operation:

These switches do not have a safety function in response to a LOCA because a LOCA results in decreasing reactor pressure. For the main steam line outside of containment, the environmentally qualified inboard MSIV limit switches will cause a reactor trip when the MSIV is closed. Failure of the subject switches could cause either a spurrious reactor trip (an unwanted but not serious transient) or could prevent the generation of the high pressure trip. The latter failure will not prevent the achievement of safe shutdown because there are several other qualified trip signals that will scram the reactor (and shall scram the reactor before the high pressure trip is reached. FSAR 15.2). Examples are: MSIV limit switches, low water level, high reactor power, turbine stop valve and control valve closure signals. These switches are not part of the cold shutdown path and their failure has no effect on the cold shutdown path. Therefore, failure of these pressure switches will not affect the ability to achieve and maintain cold shutdown.

3. Component(s) Safety Function:

Provides pressure signals to trip reactor on high reactor vessel pressure for events wherein the reactor is not tripped by other means (e.g. MSIV Limit Switches).

4. Accident(s) for which Component(s) must be Qualified For Interim Operation:

None.

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Technical Document No: 2400:054

E.Q.E.L. Item No. 054

Date 4-28-82 Revision C

Prepared by E. Gagnon

Item Name Pressure Switch

Revised by R. Wise

Reviewed by Masterdugo

System: Residual Heat Removal System (RHR)

Tag No: E11-N022 A,B (PSH-1N022 A,B)

1. Interim Operation is: X Justified ___ Not Justified

2. Justification for Interim Operation:

The safety function provided by this switch is also provided by the environmentally qualified flow indicator (FI-1R603A) which will adequately indicate the existence of a flow restriction in the RHR system. Failure of these switches to indicate a high pressure condition would be of no consequence because the system flow is monitored by the qualified FI-1R603A. A failure such that a spurious alarm is received would lead the operator to check that the system is operating properly by verifying system flow using the qualified flow indicator FI-1R603A. Therefore, the failure of the subject pressure switches will not affect the ability to achieve and maintain cold shutdown.

3. Component(s) Safety Function:

Provides a pressure signal to the RHR system high pressure alarm in the control room for all operating modes, except steam-condensing, as an indication of possible flow restriction in the RHR line subsequent to a LOCA or an HELB.

4. Accident(s) for which Component(s) must be Qualified For Interim Operation:

None.

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

E.Q.E.L. Item No. 054

Item Name Pressure Switch

Technical Document No: 2400:054
Date 4-28-82 Revision B
Prepared by R. Wise
Revised by E. Gagnon
Reviewed by [signature]

System: Nuclear Boiler

Tag No: B21- N021 E,G

(PS-1N021 E,G)

1. Interim Operation is: X Justified ___ Not Justified

2. Justification for Interim Operation:

The safety function provided by these switches are also provided by environmentally qualified switches (PS-N021 B,D) which are on the cold shutdown path. Failure of the subject switches such that an erroneous low pressure signal is generated will not cause any automatic action because a diesel generator running signal is also needed. Failure of these switches so that a low pressure is not detected will not cause any difficulties because the above qualified components will provide the needed signals. Any failure of the subject switches does not affect the qualified components and does not affect the ability to achieve and maintain cold shutdown.

3. Component(s) Safety Function:

Supply a reactor vessel pressure ($\leq$310 psig) signals to close the recirc pump discharge and bypass valves. A diesel generator running signal is also needed to close these valves.

4. Accident(s) for which Component(s) must be Qualified For Interim Operation:

None

Owner : Pennsylvania Power & Light
Facility : Susquehanna Unit 1 (SSES #1)

Project No. 2400

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

E.Q.E.L. Item No. 059

Technical Document No: 2400:MAV-059
Date 4/28/82 Revision D
Prepared by E. Gagnon
Revised by E. Gagnon
Reviewed by [signature]

Item Name SENSOR & CONVERTER

System: PROCESS RADIATION MONITORING

Tag No: D12-N010 A&B (RE-1N010 A&B), D12-N015 A&B (RE-1N015 A&B), D12-N016 A&B (RE-1N016 A&B)

1. Interim Operation is: x Justified ___ Not Justified

For the non-refueling part of interim plant operation only.

2. Justification for Interim Operation:

These sensors/converters do not perform a safety function for a LOCA or HELB accident. There are no high energy lines in the area where these items are located. Switch failure can cause inadvertant Zone III isolation and SGTS startup which is an analyzed event (FSAR, App. 15A, Event 41 & 50). The need to detect high activity is precluded by not handling spent fuel in the plant during the non-refueling part of interim plant operation. Any failure of these components will not prevent any qualified component from performing its safety function or achieving and maintaining a cold shutdown.

3. Component(s) Safety Function:

These items isolate Zone III heating and ventilation of the reactor building (refueling bay and railroad access tunnel) and start the Standby Gas Treatment System upon detection of high activity.

4. Accident(s) for which Component(s) must be Qualified For Interim Operation:

None for the non-refueling part. For refueling, these components are required for spent fuel handling accidents and drop of spent fuel shipping cask but not required for LOCA or HELB.

Owner: Pennsylvania Power & Light
Facility: Susquehanna Unit 1 (SSES #1)

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

E.Q.E.L. Item No. 059

Technical Document No: 2400:MAV-059
Date 5/2/82 Revision A
Prepared by E. Gagnon
Revised by
Reviewed by Maxendugo

Item Name SENSOR & CONVERTER

System: PROCESS RADIATION MONITORING

Tag No: D12-N017 A&B

1. Interim Operation Is: X Justified ___ Not Justified

2. Justification for Interim Operation:

The radiation detectors are not part of the preferred cold shutdown path. The failure of these components will not impair operability of the Standby Gas Treatment System because the filter units have been designed to handle the maximum credible postulated event.

The failure of the monitor will result either a fail open or closed output. With train B operating and train A on Standby; fail open, continue to operate which is designed to handle the event. Fail closed, isolate train B and start standby train A automatically.

With train B operating and train A not on standby; fail open, continue to operate train B which is designed to handle the event. Fail closed, isolate train B, the system tries to start standby train A but, train A is not available. The operator can then place train B on standby which automatically starts B.

In addition, effluents can be monitored by using both the stack radiation monitor and periodic grab samples.

Therefore, failure of these components will not affect the operability of the Standby Gas Treatment System or the ability to achieve and maintain cold shut-down.

The following actions are recommended: (1) Operate on SGTS filter unit "B" so there is no direct radiation shine path to the radiation detector. (2) By the end of the first refueling outage, move and/or shield the new detectors to ensure that the radiation levels will be sufficiently below background levels to achieve functional adaquacy without spurrious isolation/trip actions.

3. Component(s) Safety Function:

The radiation detectors isolate the selected on-line SGTS filter unit on high radiation in the SGTS common filter exhaust duct. An alarm informs the operator of high radiation in the exhaust duct and isolation of the SGTS filter unit has occurred.

4. Accident(s) for which Component(s) must be Qualified for Interim Operation:

None

Owner : Pennsylvania Power & Light
Facility : Susquehanna Unit 1 (SSES #1)

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Technical Document No: 2400:MAV-069
Date 4/1/82 Revision B
Prepared by E. Gagnon
Revised by E. Gagnon
Reviewed by [signature]

E.Q.E.L. Item No. 069

Item Name: Safety/Relief Valve Actuator

System: Nuclear Boiler

Tag No: B21-F013A, B, C, D, E, F, H, P, R, S (non-ADS valves)

(PSV-1F013A, B, C, D, E, F, H, P,R,S)

1. Interim Operation is: X Justified ___ Not Justified

2. Justification for Interim Operation:

The safety function provided by these actuators is also provided by the qualified ADS valve actuators (PSV-10F013 G, J, K, L. M, N) on the cold shutdown path. Failures which inadvertently actuate the relief mode of the valves produce a LOCA which is within the spectrum of depressurization events analyzed. Failure to actuate the relief mode is accommodated by the safety mode (spring actuated) and/or the qualified ADS valves. Any failure will not prevent the ADS valves or any valve safety mode from performing their safety function or achieving and maintaining a cold shutdown.

3. Component(s) Safety Function:

Actuates pressure relief mode of the valves at a selected pressure lower than the valve safety mode (spring) actuation for events requiring control of reactor vessel pressure increases.

4. Accident(s) for which Component(s) must be Qualified For Interim Operation:

None.

Owner : Pennsylvania Power & Light
Facility : Susquehanna Unit 1 (SSES #1)

Project No. 2400

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Technical Document No: 2400: MAV-074

E.Q.E.L. Item No.: 074

Date 4/28/82 Revision C

Prepared by R. Wise

Item Name: RCIC Turbine

Revised by R. Wise

Reviewed by Maxendugh

System: Reactor Core Isolation Cooling (RCIC)

Tag No: E51-C002

1. Interim Operation is: X Justified ___ Not Justified

2. Justification for Interim Operation:

The safety function, core cooling, provided by the RCIC system which is not on the cold shutdown path is also provided by environmentally justified systems on the cold shutdown path (ADS + LPCI mode of RHR system). Failure of this component may cause inadequate performance of the system for which no credit is taken for the cold shutdown path. Therefore, failure of this component will not preclude accomplishment of the ability to achieve and maintain cold shutdown.

3. Component(s) Safety Function:

Provides core cooling for events in which reactor vessel pressure remains too high to use the low pressure systems.

4. Accident(s) for which Component(s) must be Qualified For Interim Operation:

None.

Owner : Pennsylvania Power & Light
Facility : Susquehanna Unit 1 (SSES #1)

Project No. 2400

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Technical Document No: 2400:078

E.Q.E.L. Item No. 078

Date 4-28-82 Revision B

Prepared by M. Gitterman

Item Name MSIV ACTUATORS

Revised by M. Gitterman

Reviewed by [signature]

System: NUCLEAR BOILER

Tag No: B21-F028 A,B,C,D (HV-1F028 A,B,C,D)

B21-F022 A,B,C,D (HV-1F022 A,B,C,D)

1. Interim Operation is: X Justified ___ Not Justified

2. Justification for Interim Operation:

Justification for Initial Plant Operation with Non-Qualified Actuators for the MSIV's (HV-1F022 A/B/C/D and HV-1F028 A/B/C/D.)

MSIV's are required to close to prevent release of excessive radioactivity for LOCA, main steam line breaks, and rod drop accidents. For the rod drop accident, environmental conditions do not change and the total radiation dose to the valve actuators during the time the valves must close is not significant. For main steam line breaks outside containment, the inboard MSIV's (HV-1F022 A/B/C/D) are not subjected to any change in their normal environment (temperature, pressure, humidity, or radiation) and would thus be considered to be in a "mild" environment.

For LOCA inside containment, the outboard MSIV's are protected from changes in ambient temperature, pressure, and humidity, but are subjected to increased gamma radiation. Justification for initial plant operation, until these valve actuators have been tested, is presented below. It is anticipated that actuator testing will be completed by the end of 1983, some 18 months after scheduled plant startup.

It is anticipated that during the initial 30-month operating period of the plant, no more than 18-months of equivalent full power operation will be achieved considering the normal startup problems encountered by most nuclear plants. On this basis, the total radiation dose to the actuators due to normal operation would be about 6.57×10^4 rads. On this same basis, the estimated integrated radiation dose for two hours following the LOCA would be about 1.94×10^4 rads. This accident dose is conservative since the valves would have closed some 10 seconds after occurrence of the accident. Subsequent failure of the actuators is of no concern since such failure can not cause the valves to reopen (the valves are held shut by springs).

The radiation dose due to normal operation thus represents 78% of the (normal + accident) dose expected at the end of the first 30 months of plant operation, and the total dose is almost an order of magnitude less than the

radiation damage threshold of the most susceptible material (Viton A) in the actuator package.

Design of the valve actuators permits testing by partially stroking the valves during plant operation. Over the first 30 month period of plant operation, full stroke testing of all the valves prior to each startup, together with partial stroke testing of each valve once per week should provide adequate assurance of valve operability.

On the basis of the relatively low radiation dose to which the valve actuators could be subjected plus the proposed periodic stroke testing of the valves, it is our judgement that there is adequate justification to permit plant operation for 30 months.

3. Component(s) Safety Function:

Closes the MSIV's upon signal from several sources for events requiring isolation of the reactor vessel and primary containment.

4. Accident(s) for which Component(s) must be Qualified For Interim Operation:

None.

Owner : Pennsylvania Power & Light
Facility : Susquehanna Unit 1 (SSES #1)

Project No. 2400

ENVIRONMENTAL QUALIFICATION - JUSTIFICATION FOR INTERIM OPERATION

Technical Document No: 2400:MAV-080

E.Q.E.L. Item No. 080

Date 4-28-82 Revision C

Prepared by R. Wise

Item Name HPCI Turbine Governor

Revised by R. Wise

Reviewed by [signature]

System: High Pressure Coolant Injection (HPCI)

Tag No: E41-C002

1. Interim Operation is: X Justified ___ Not Justified

2. Justification for Interim Operation:

The safety function, core cooling, provided by the HPCI system which is not on the cold shutdown path, is also provided by environmentally justified systems on the cold shutdown path (ADS + LPCI mode of RHR system). Failure of this component may cause inadequate performance of a system which no credit is taken on the cold shutdown path. Therefore, the failure of this component will not preclude the accomplishment of the ability to achieve and maintain cold shutdown.

3. Component(s) Safety Function:

Controls HPCI turbine speed in order for the HPCI system to provide the required amount of core cooling when reactor vessel pressure is too high to use the low pressure systems.

4. Accident(s) for which Component(s) must be Qualified For Interim Operation:

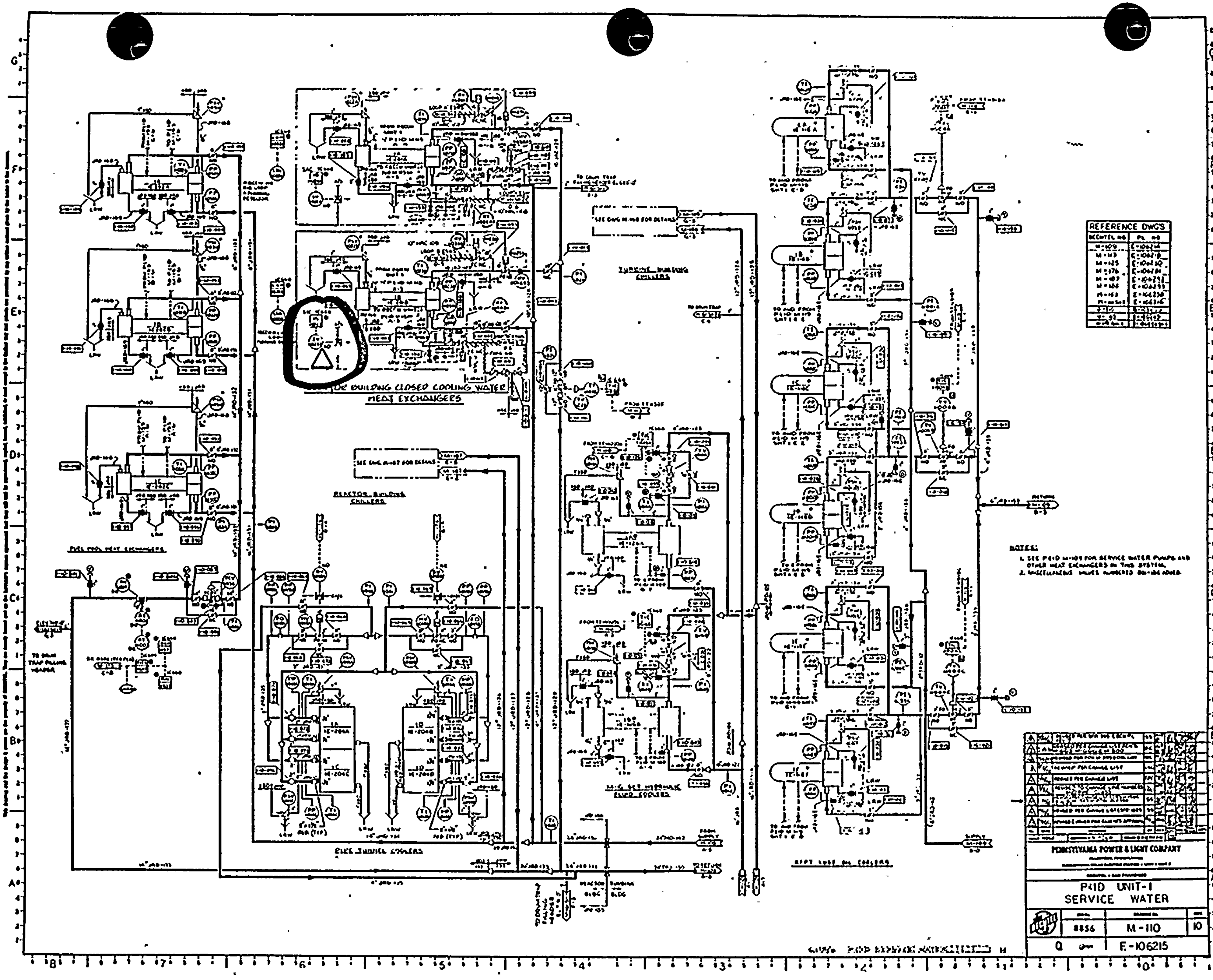
None.

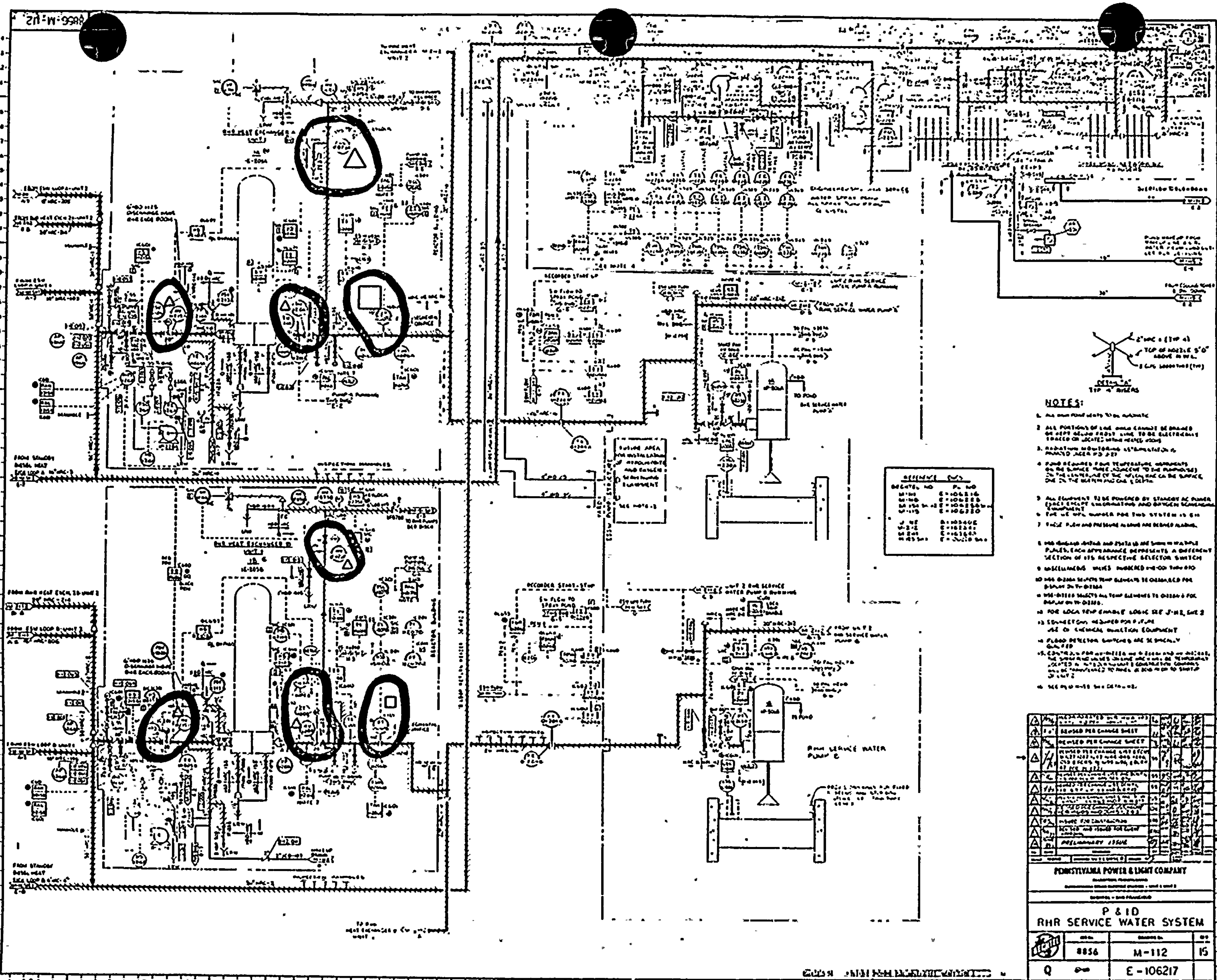
SAFETY RELATED P&ID MARK-UP

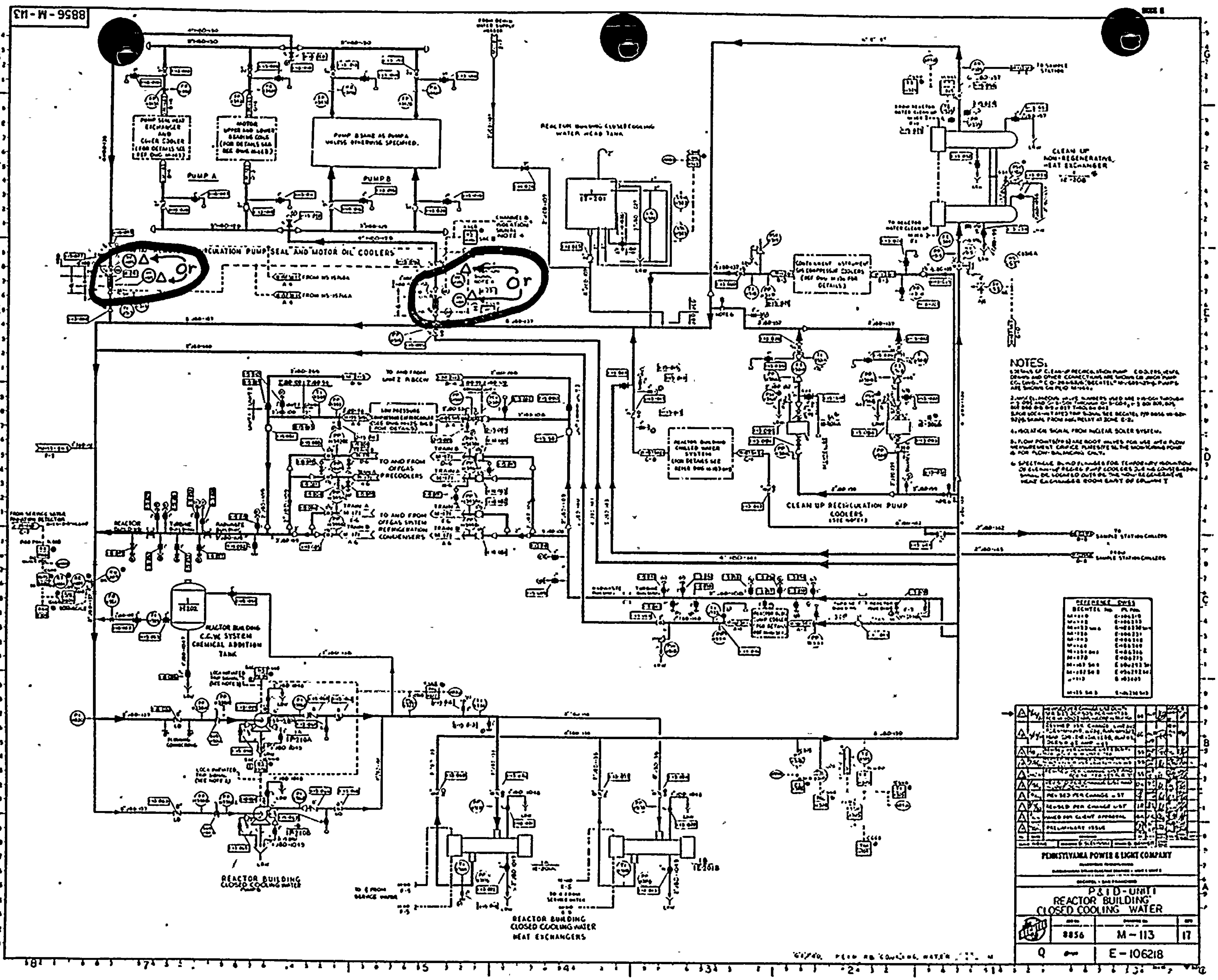
The attached P&IDs have been marked-up to identify the electrical/ mechanical components which are both on the minimum CSD path and in a harsh environment. The triangle identifies those components provided by Bechtel while the square identifies those components provided by GE. These mark-ups provides the basis for Appendix B.

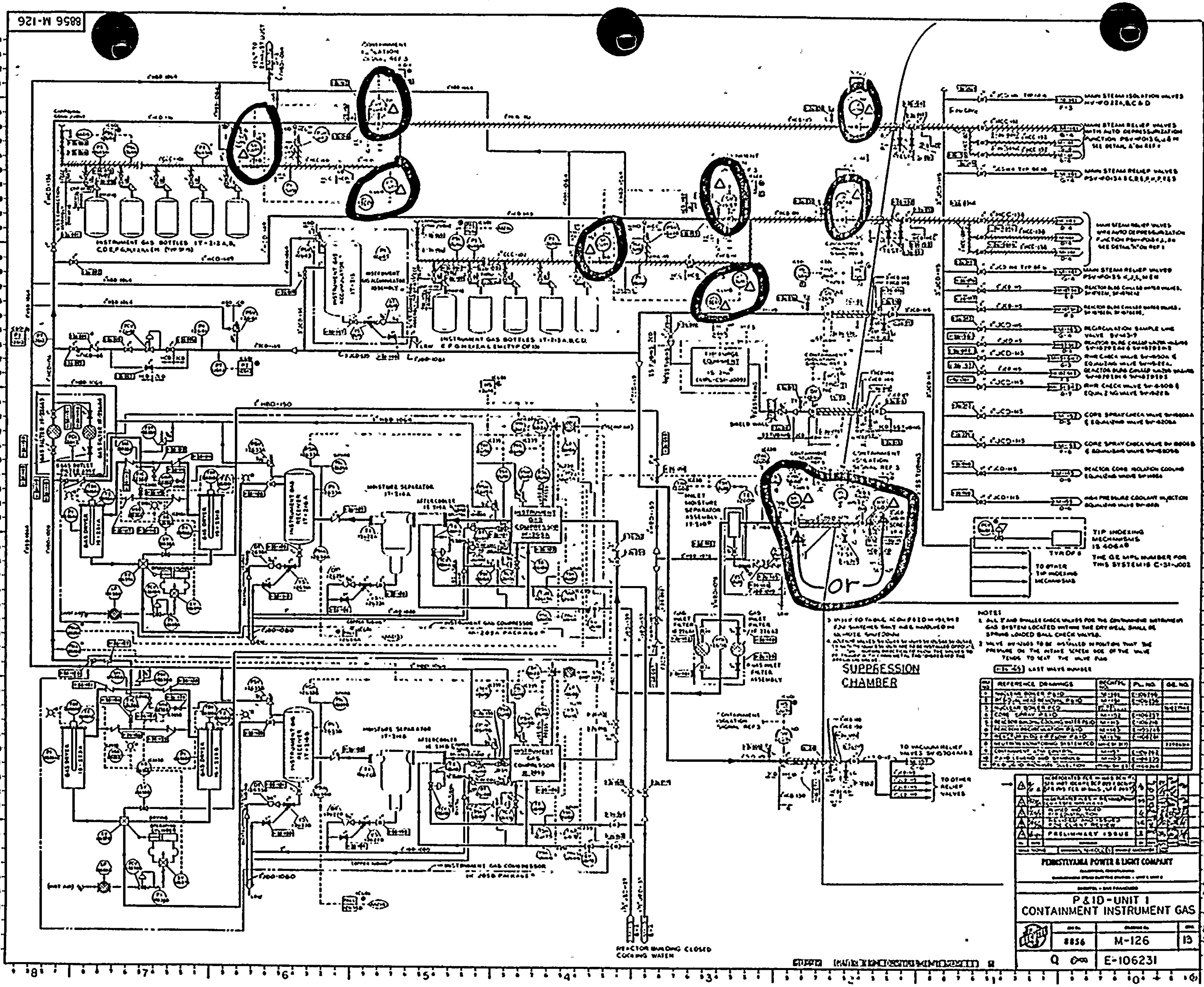
The P&IDs which are included in this appendix are:

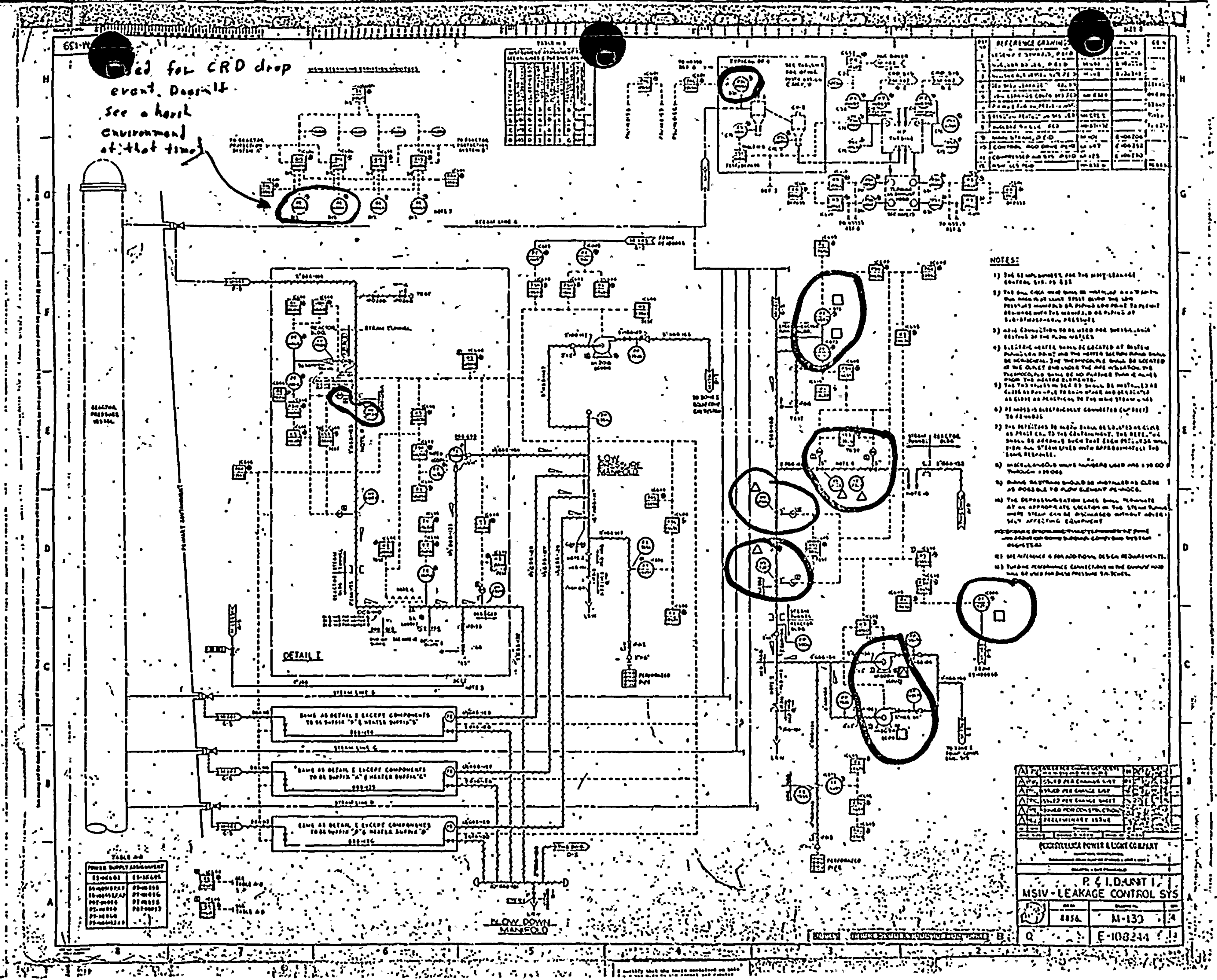
M-110
M-112
M-113
M-126
M-139
M-141
M-142
M-143
M-144
M-147
M-149
M-150
M-151, Sht. 1
M-151, Sht. 2
M-152
M-155
M-156
M-157, Sht. 1
M-157, Sht. 2
M-157, Sht. 3
M-161, Sht. 1
M-175
VC-175, Sht. 1
VC-175, Sht. 2
VC-175, Sht. 3
M-176
VC-176
M-177
M-178
VC-178, Sht. 1
VC-178, Sht. 2
M-186
M-187, Sht. 2


REFERENCE DWGS
REACTOR BUILDING CLOSED COOLING WATER
HEAT EXCHANGERS
TURBINE BUILDING CHILLERS
REACTOR BUILDING CHILLERS
PIPE TUNNEL COOLERS
M-G SET HYDRAULIC FLUID COOLERS
RFPT LUBE OIL COOLERS
NOTES:
PENNSYLVANIA POWER & LIGHT COMPANY
P&ID UNIT-1
SERVICE WATER
8856
M-110
10
Q
E-106215

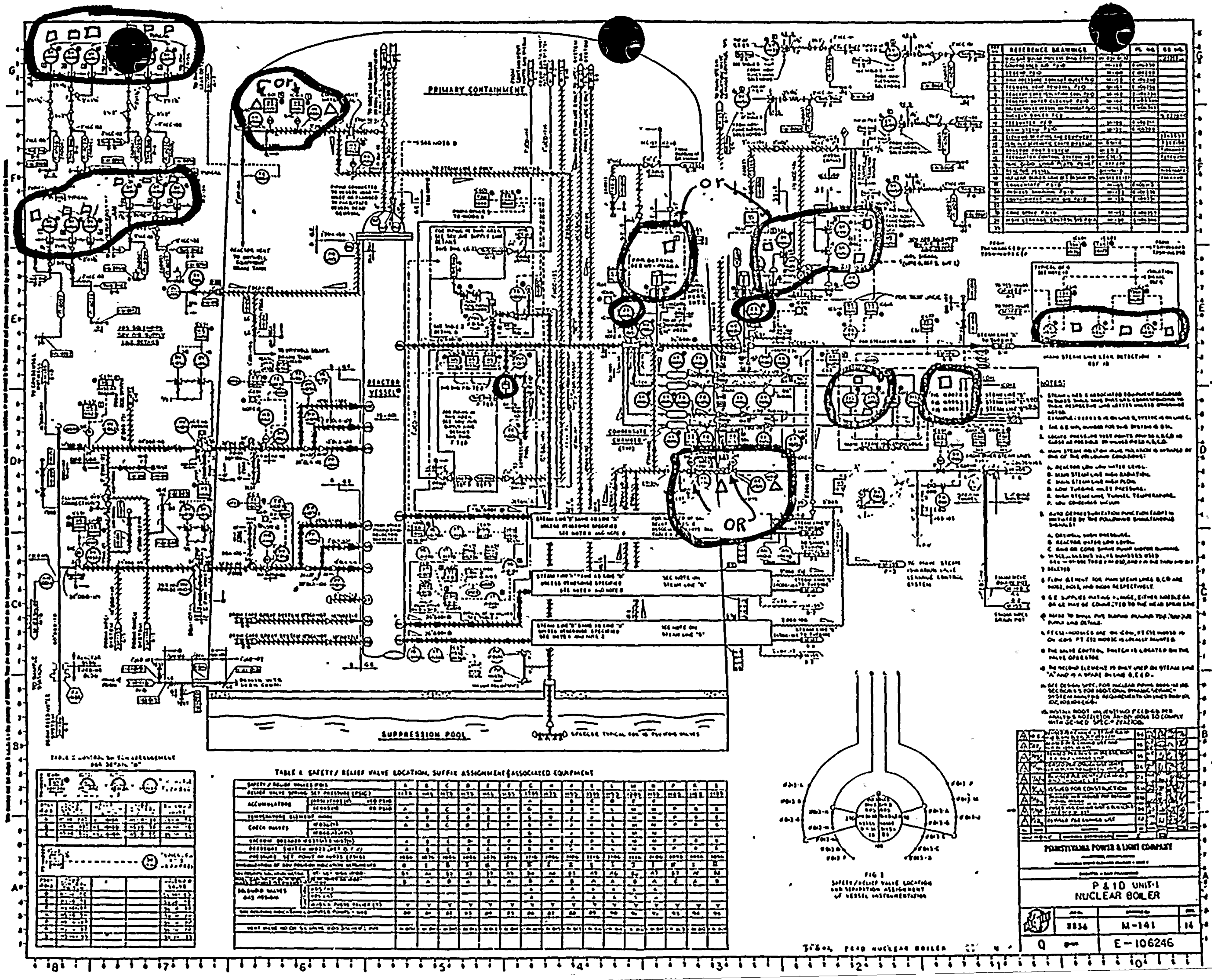

NOTES:
REVISED PER CHANGE SHEET
PRELIMINARY ISSUE
PENNSYLVANIA POWER & LIGHT COMPANY
P & ID
RHR SERVICE WATER SYSTEM
8856
M-112
15
Q
E-106217

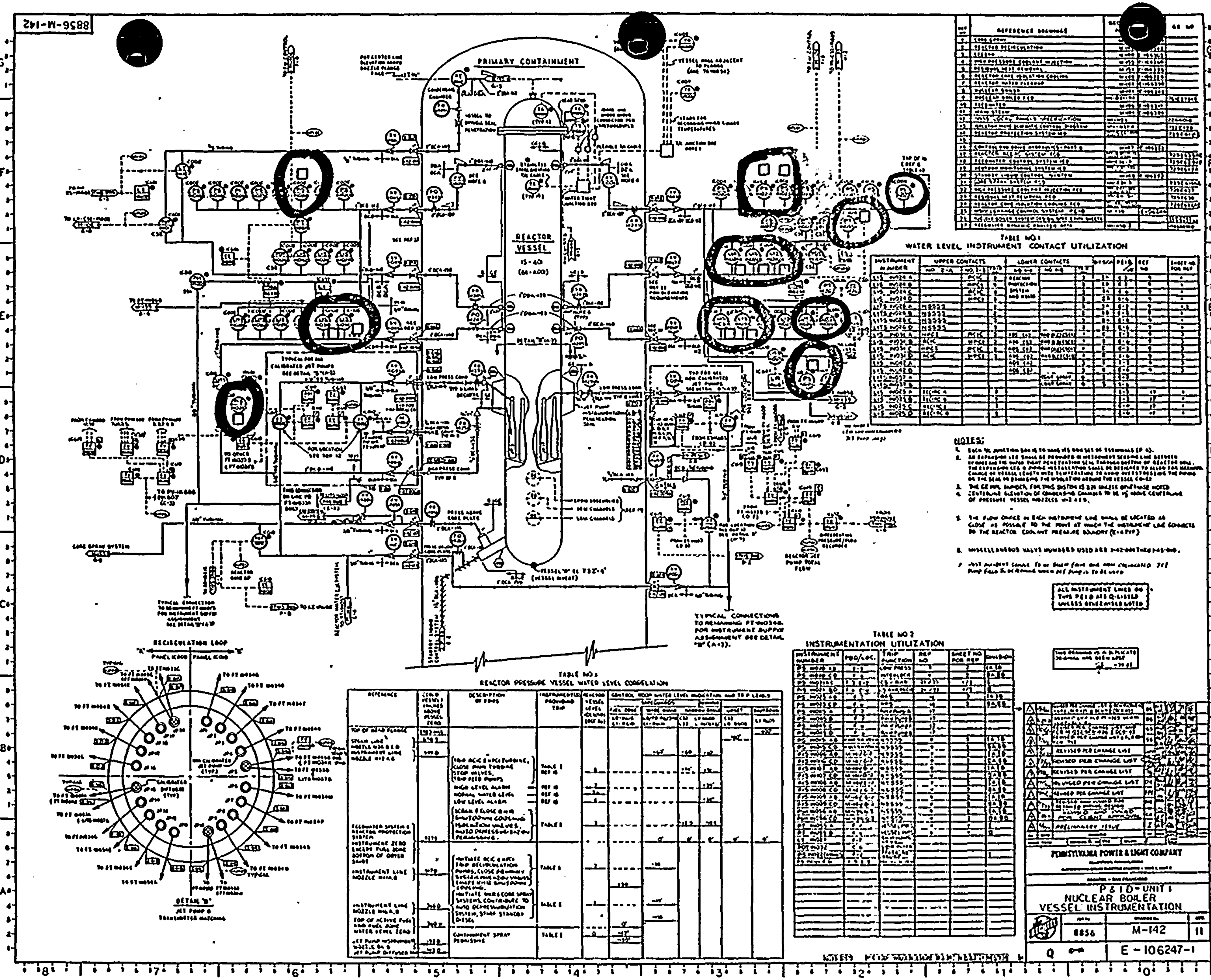

8856-M-113
PUMP A
PUMP B
PUMP B SAME AS PUMP A UNLESS OTHERWISE SPECIFIED.
REACTOR BUILDING CLOSED COOLING WATER HEAD TANK
CLEAN UP NON-REGENERATIVE HEAT EXCHANGER
RECIRCULATION PUMP SEAL AND MOTOR OIL COOLERS
CONTAINMENT INSTRUMENT GAS COMPRESSOR COOLERS
TO AND FROM OFFGAS PRECOOLERS
TO AND FROM OFFGAS SYSTEM REFRIGERATION CONDENSERS
CLEAN UP RECIRCULATION PUMP COOLERS
REACTOR BUILDING CHILLED WATER SYSTEM
TO SAMPLE STATION CHILLERS
FROM SAMPLE STATION CHILLERS
NOTES:
REACTOR BUILDING C.C.W. SYSTEM CHEMICAL ADDITION TANK
REACTOR BUILDING CLOSED COOLING WATER PUMPS
REACTOR BUILDING CLOSED COOLING WATER HEAT EXCHANGERS
REFERENCE DWGS
PENNSYLVANIA POWER & LIGHT COMPANY
P&ID-UNIT 1
REACTOR BUILDING
CLOSED COOLING WATER
8856
M-113
17
Q
E-106218

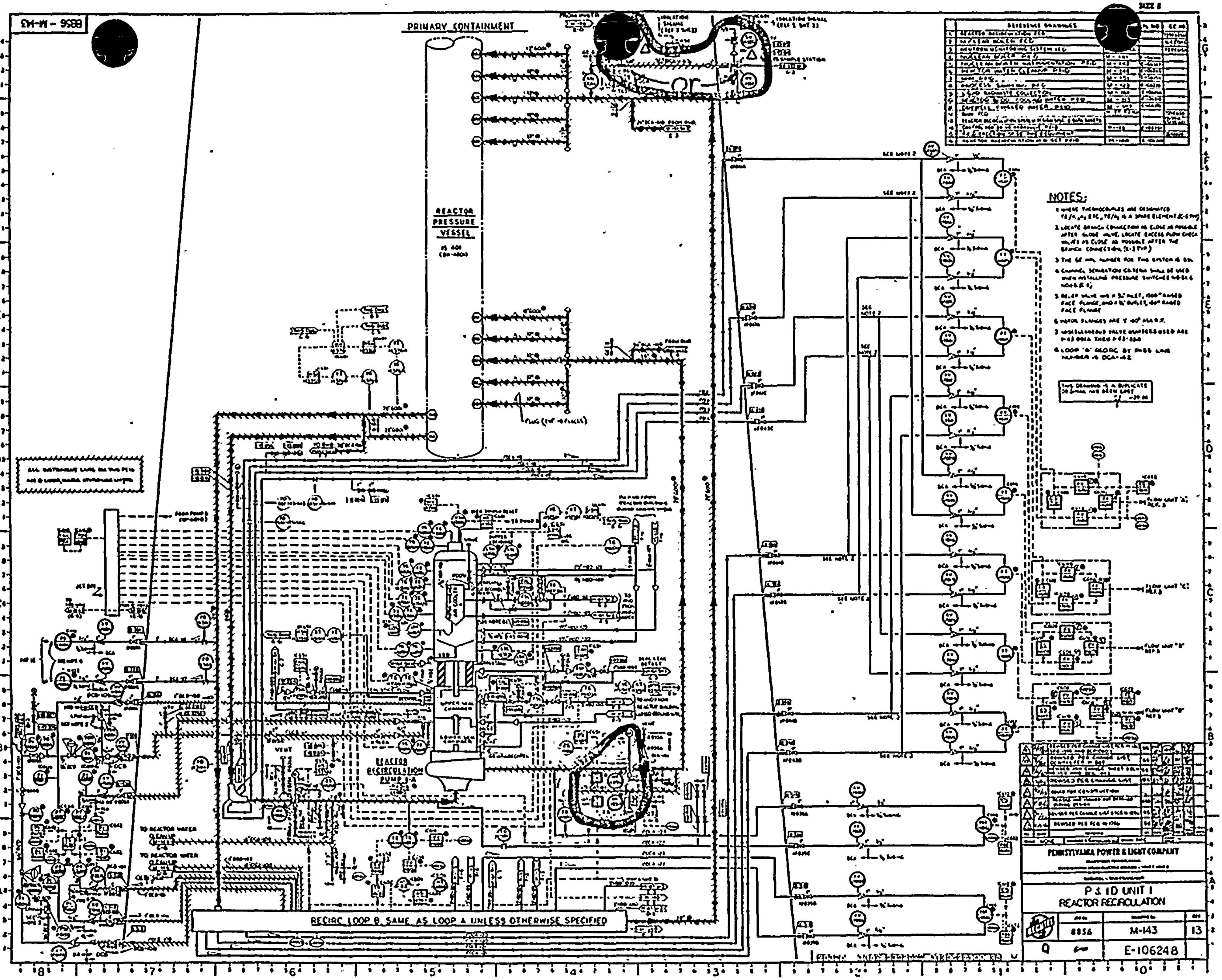

8856 M-126
INSTRUMENT GAS BOTTLES
MOISTURE SEPARATOR
INSTRUMENT GAS COMPRESSOR
SUPPRESSION CHAMBER
REACTOR BUILDING CLOSED COOLING WATER
TO OTHER RELIEF VALVES
TIP INDEXING MECHANISMS
NOTES
REFERENCE DRAWINGS
PRELIMINARY ISSUE
PENNSYLVANIA POWER & LIGHT COMPANY
P & ID - UNIT 1
CONTAINMENT INSTRUMENT GAS
8856
M-126
13
E-106231



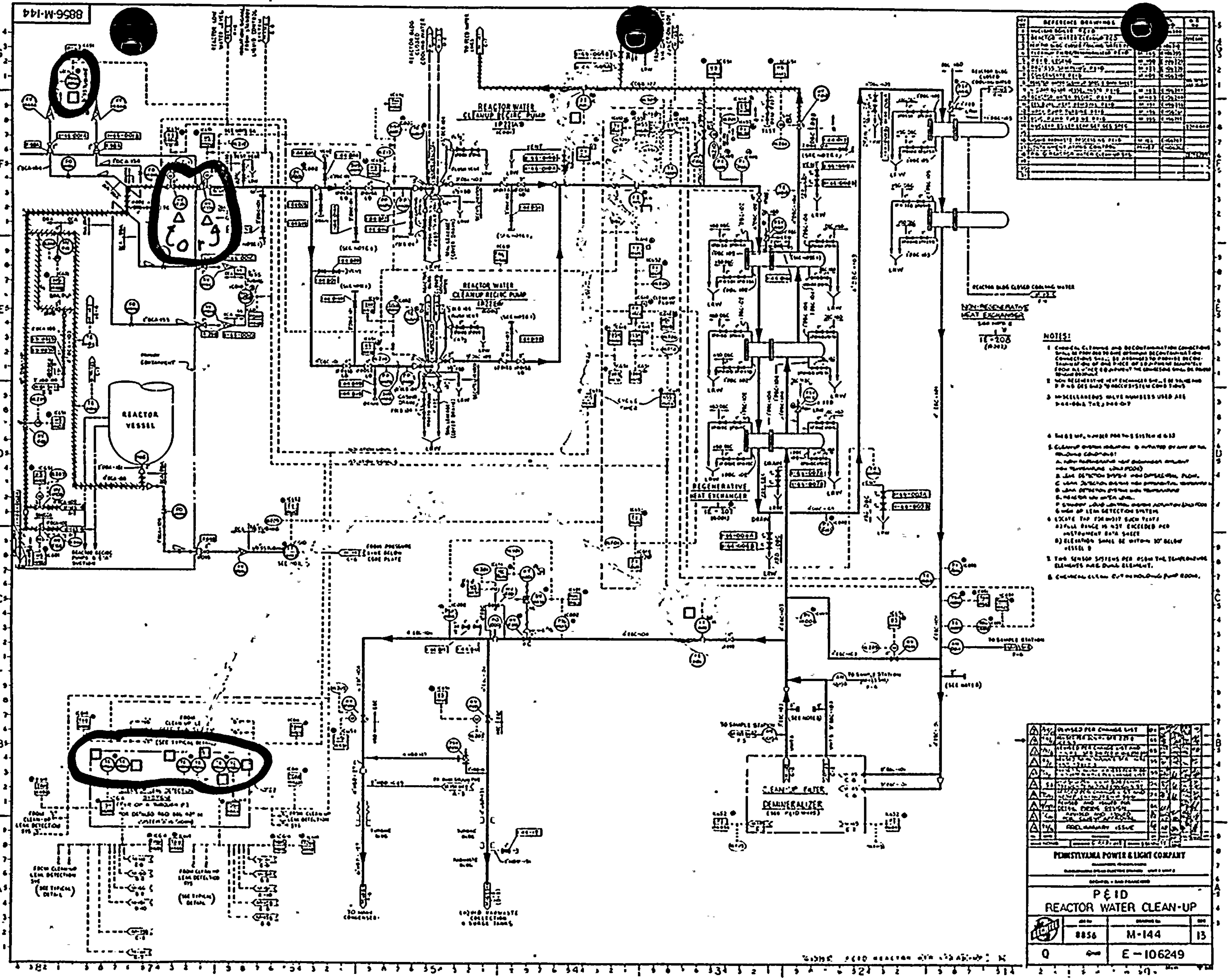
…ed for CRD drop event. Doesn't see a harsh environment at that time
NOTES:
DETAIL I
LOW PRESSURE MANIFOLD
BLOW DOWN MANIFOLD
REACTOR PRESSURE VESSEL
STEAM LINE A
STEAM LINE B
STEAM LINE C
STEAM LINE D
P. & I.D.-UNIT 1, MSIV-LEAKAGE CONTROL SYS
M-130
E-108244


or
or
PRIMARY CONTAINMENT
REACTOR VESSEL
SUPPRESSION POOL
REFERENCE DRAWINGS
NOTES:
OR
PENNSYLVANIA POWER & LIGHT COMPANY
P & ID UNIT-1
NUCLEAR BOILER
M-141
E-106246

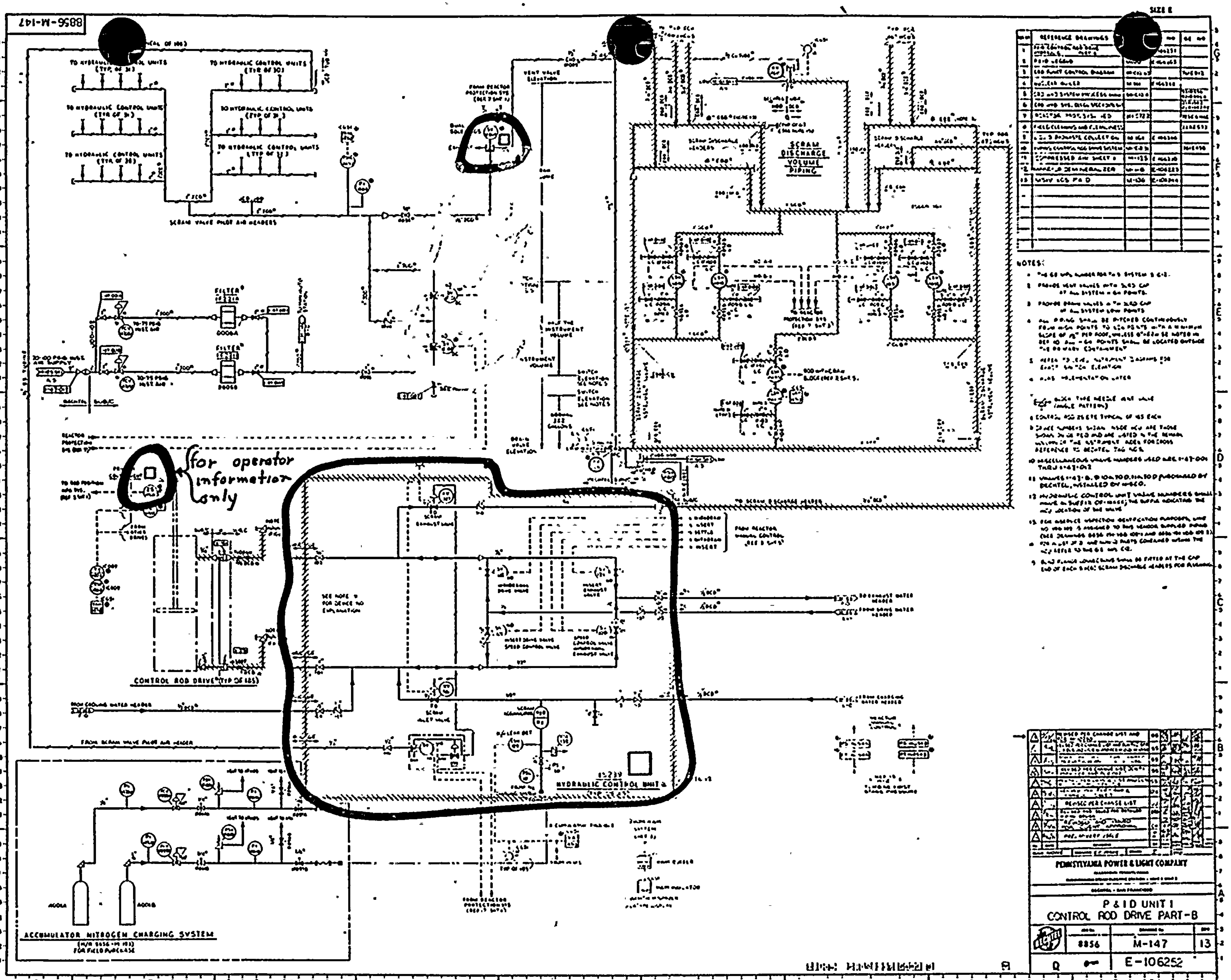

8856-M-142
PRIMARY CONTAINMENT
REACTOR VESSEL
REFERENCE DRAWINGS
TABLE NO 1
WATER LEVEL INSTRUMENT CONTACT UTILIZATION
NOTES:
ALL INSTRUMENT LINES ON THIS P&ID ARE Q-LISTED UNLESS OTHERWISE NOTED
TYPICAL CONNECTIONS TO REMAINING PT-N036B. FOR INSTRUMENT SUPPLY ASSIGNMENT SEE DETAIL "B" (A-7).
RECIRCULATION LOOP
DETAIL "B"
TABLE NO 3
REACTOR PRESSURE VESSEL WATER LEVEL CORRELATION
TABLE NO 2
INSTRUMENTATION UTILIZATION
PRELIMINARY ISSUE
PENNSYLVANIA POWER & LIGHT COMPANY
P & I D - UNIT 1
NUCLEAR BOILER
VESSEL INSTRUMENTATION
8856
M-142
11
Q
E - 106247-1

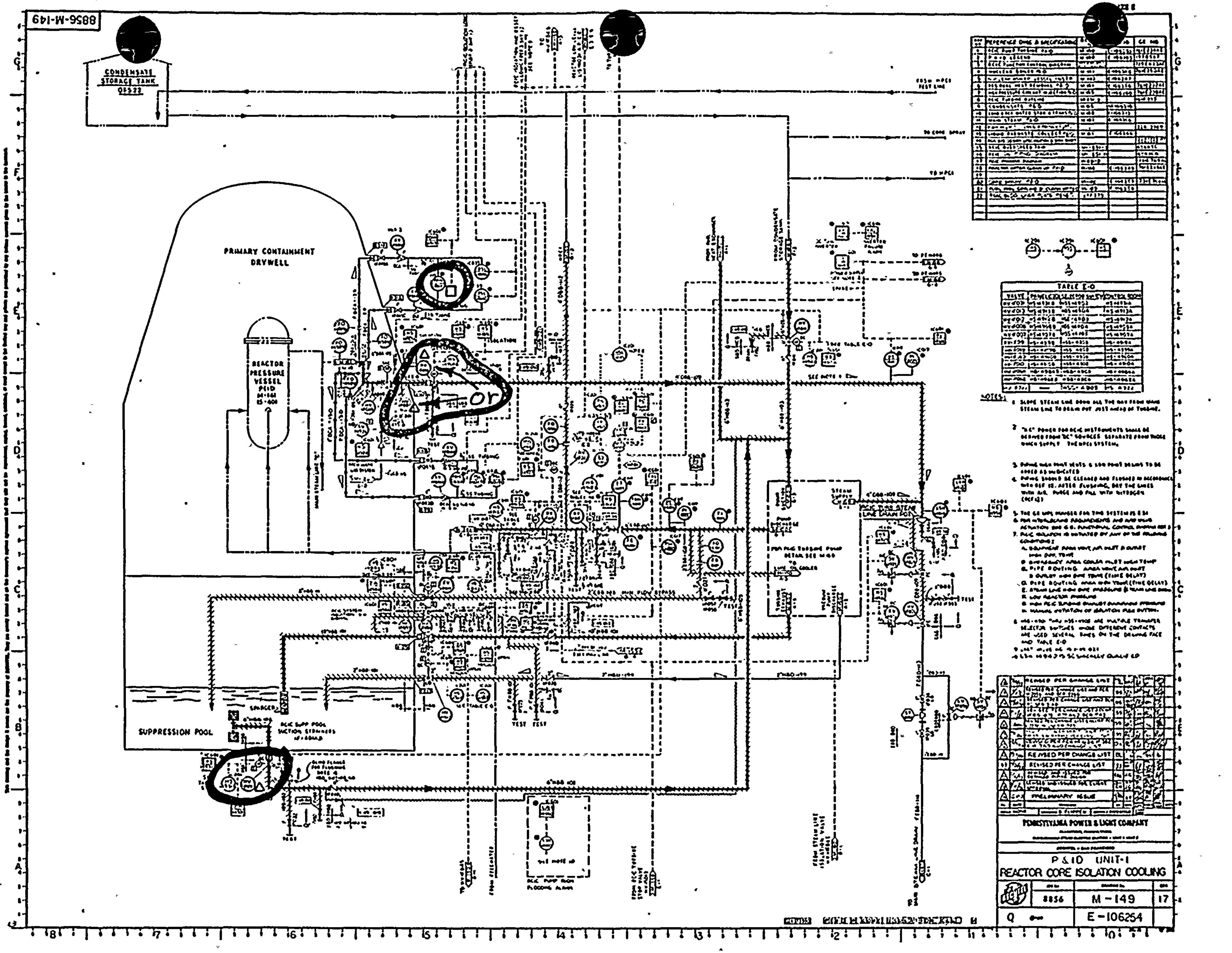


8856 - M-143
PRIMARY CONTAINMENT
REACTOR PRESSURE VESSEL
NOTES:
REACTOR RECIRCULATION PUMP 1-A
TO REACTOR WATER CLEANUP
RECIRC LOOP B SAME AS LOOP A UNLESS OTHERWISE SPECIFIED
PENNSYLVANIA POWER & LIGHT COMPANY
P & ID UNIT 1
REACTOR RECIRCULATION
8856
M-143
13
E-106248

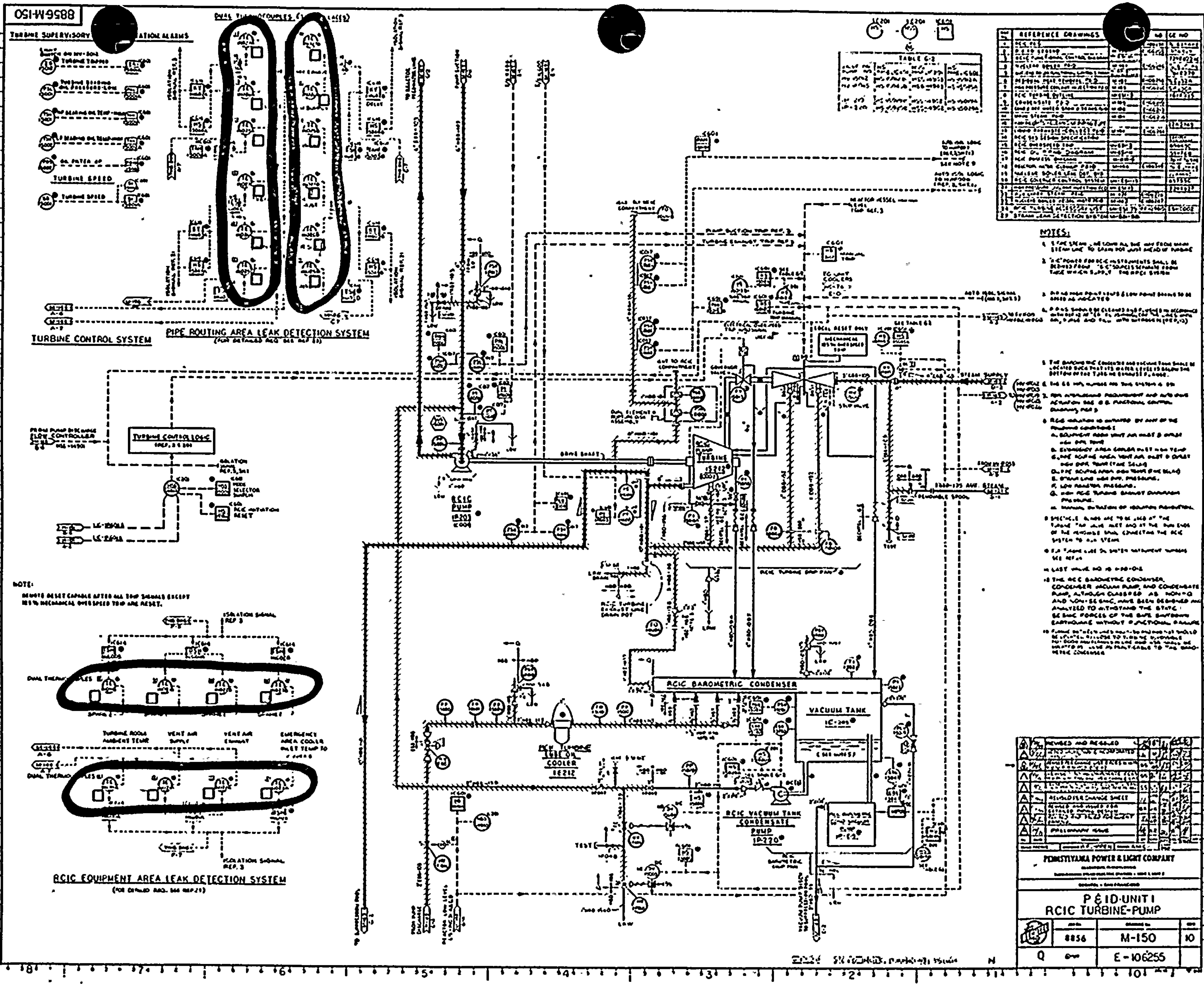


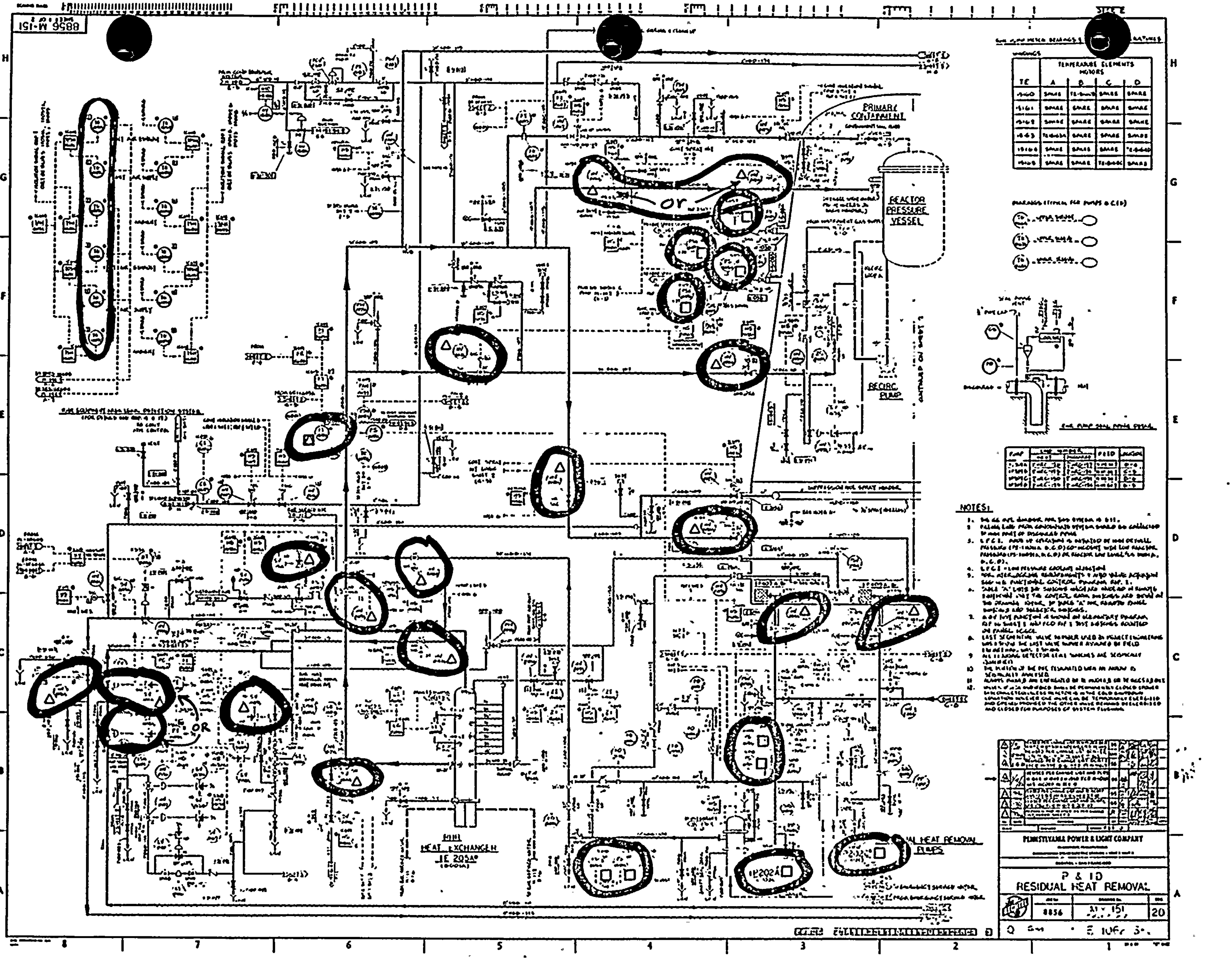
8856-M-144
REACTOR WATER CLEANUP RECIRC PUMP
REACTOR WATER CLEANUP RECIRC PUMP
REACTOR VESSEL
REGENERATIVE HEAT EXCHANGER
NON-REGENERATIVE HEAT EXCHANGER
NOTES:
CLEAN-UP FILTER DEMINERALIZER
PRELIMINARY ISSUE
PENNSYLVANIA POWER & LIGHT COMPANY
P & ID
REACTOR WATER CLEAN-UP
8856
M-144
13
Q
E-106249

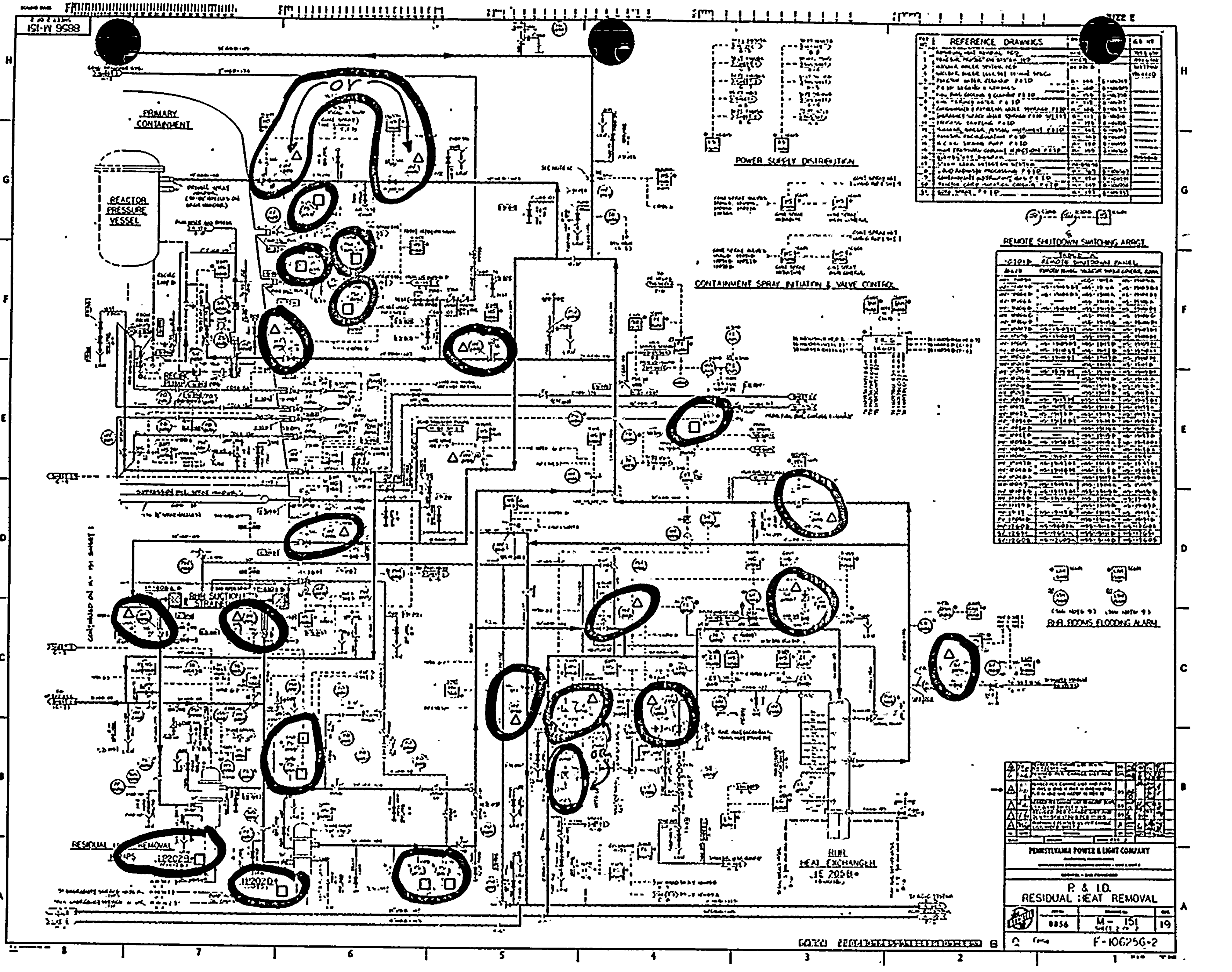

8856-M-147
SIZE E
TO HYDRAULIC CONTROL UNITS (TYP OF 30)
SCRAM VALVE PILOT AIR HEADERS
SCRAM DISCHARGE VOLUME PIPING
for operator information only
CONTROL ROD DRIVE (TYP OF 185)
HYDRAULIC CONTROL UNIT
ACCUMULATOR NITROGEN CHARGING SYSTEM
FOR FIELD PURCHASE
NOTES:
PENNSYLVANIA POWER & LIGHT COMPANY
P & I D UNIT I
CONTROL ROD DRIVE PART-B
8856
M-147
13
E-106252

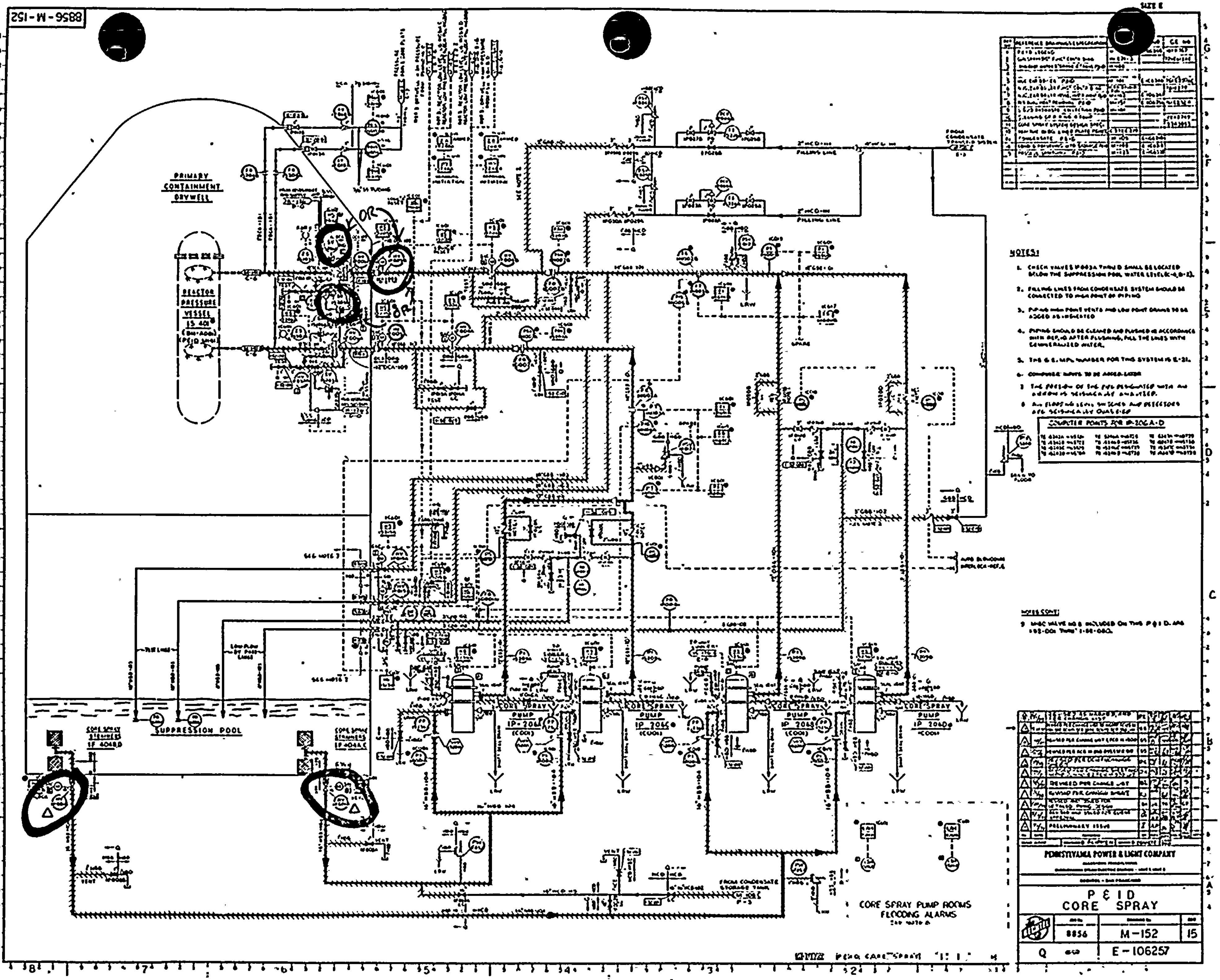


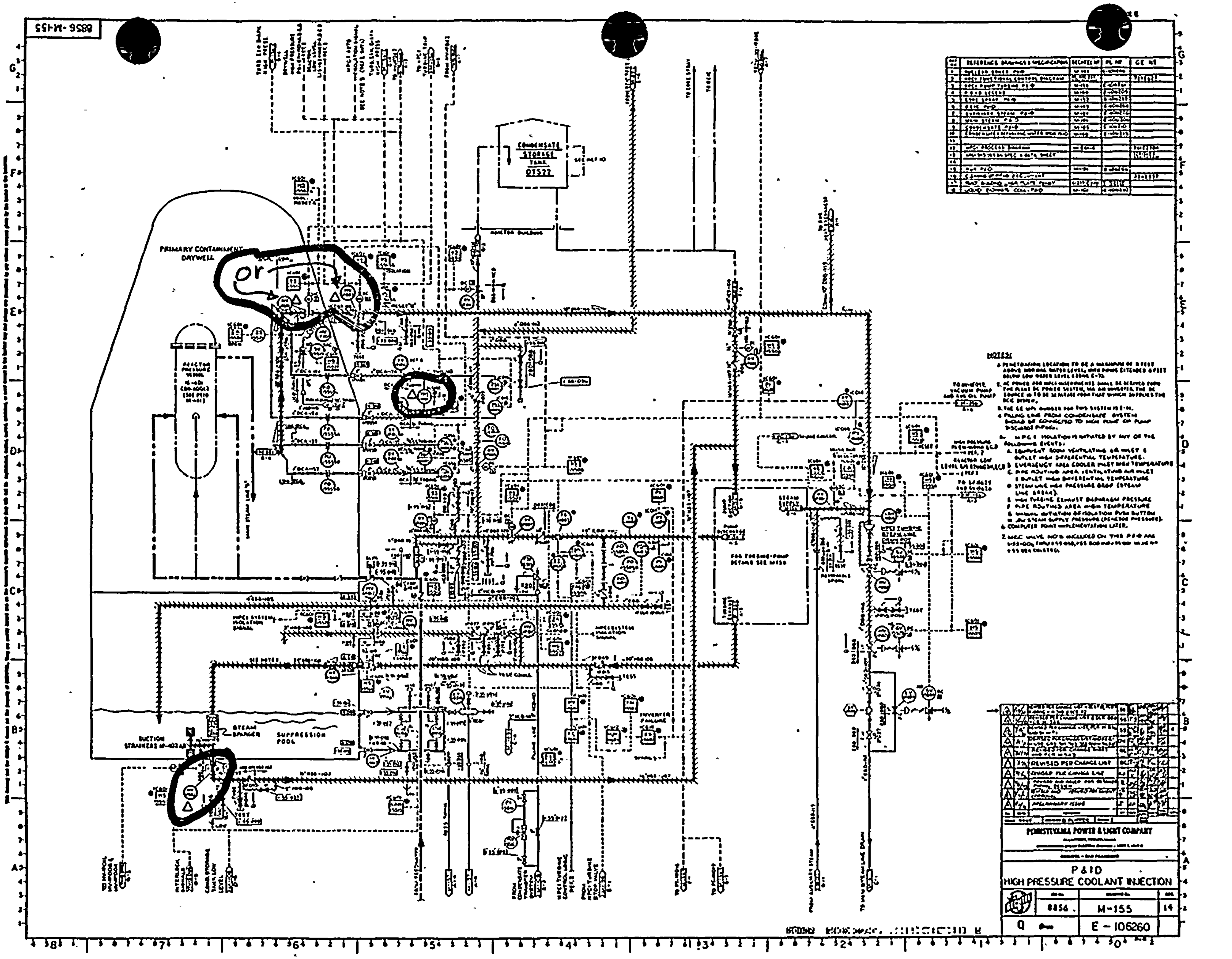
8856-M-149
CONDENSATE STORAGE TANK
PRIMARY CONTAINMENT DRYWELL
REACTOR PRESSURE VESSEL
SUPPRESSION POOL
TABLE E-O
NOTES:
or
PENNSYLVANIA POWER & LIGHT COMPANY
P&ID UNIT-1
REACTOR CORE ISOLATION COOLING
8856
M-149
17
E-106254

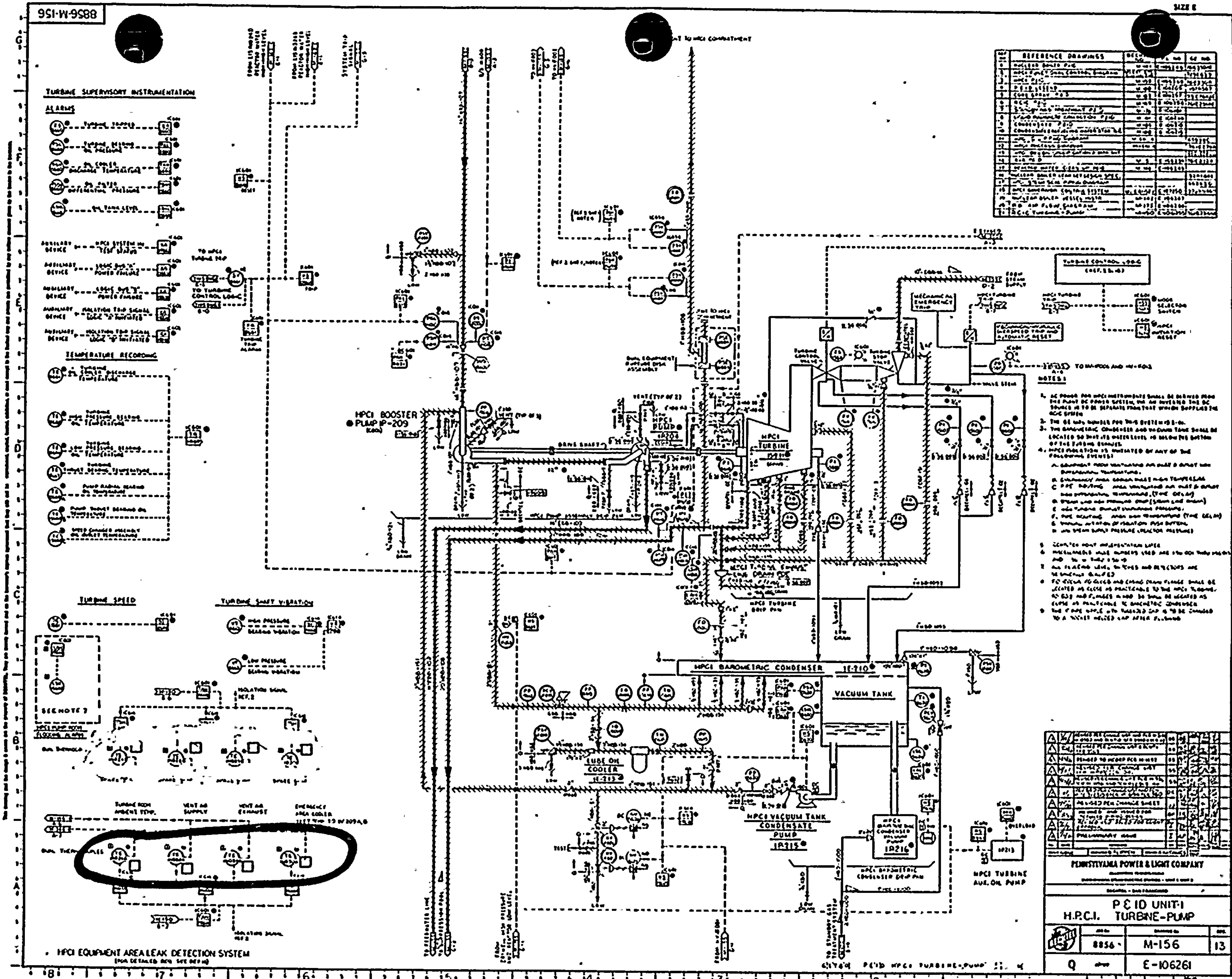

8856-M-150
TURBINE CONTROL SYSTEM
PIPE ROUTING AREA LEAK DETECTION SYSTEM
TURBINE CONTROL LOGIC
RCIC PUMP
RCIC TURBINE
DRIVE SHAFT
STEAM SUPPLY
RCIC BAROMETRIC CONDENSER
VACUUM TANK
RCIC VACUUM TANK CONDENSATE PUMP
1P220
RCIC EQUIPMENT AREA LEAK DETECTION SYSTEM
NOTES:
REFERENCE DRAWINGS
TABLE 6-2
PENNSYLVANIA POWER & LIGHT COMPANY
P & ID-UNIT 1
RCIC TURBINE-PUMP
8856
M-150
10
Q
E-106255

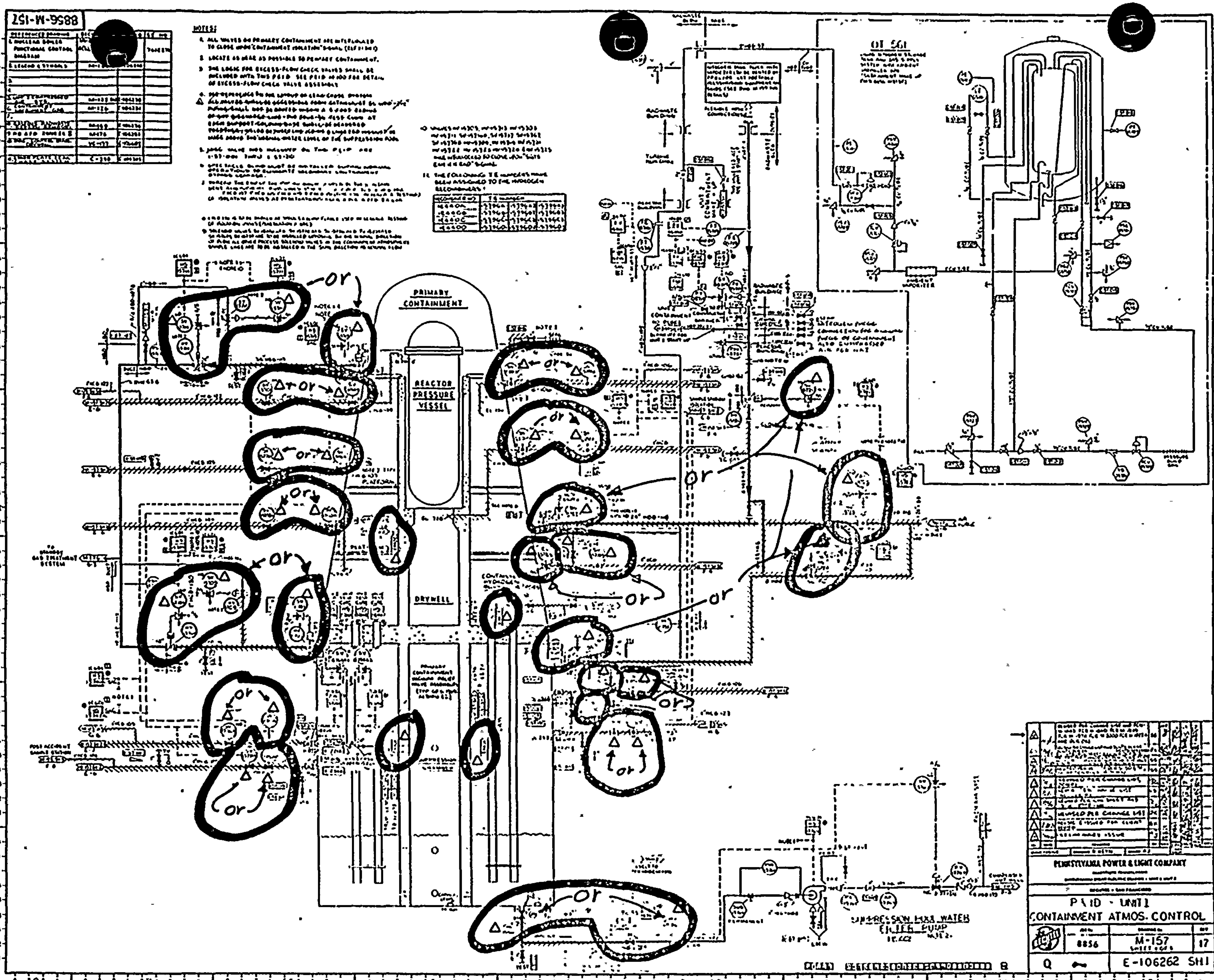

8856 M-151
PRIMARY CONTAINMENT
REACTOR PRESSURE VESSEL
RECIRC PUMP
OR
RHR HEAT EXCHANGER 1E 205A
NOTES:
PENNSYLVANIA POWER & LIGHT COMPANY
P & ID
RESIDUAL HEAT REMOVAL
8856
20

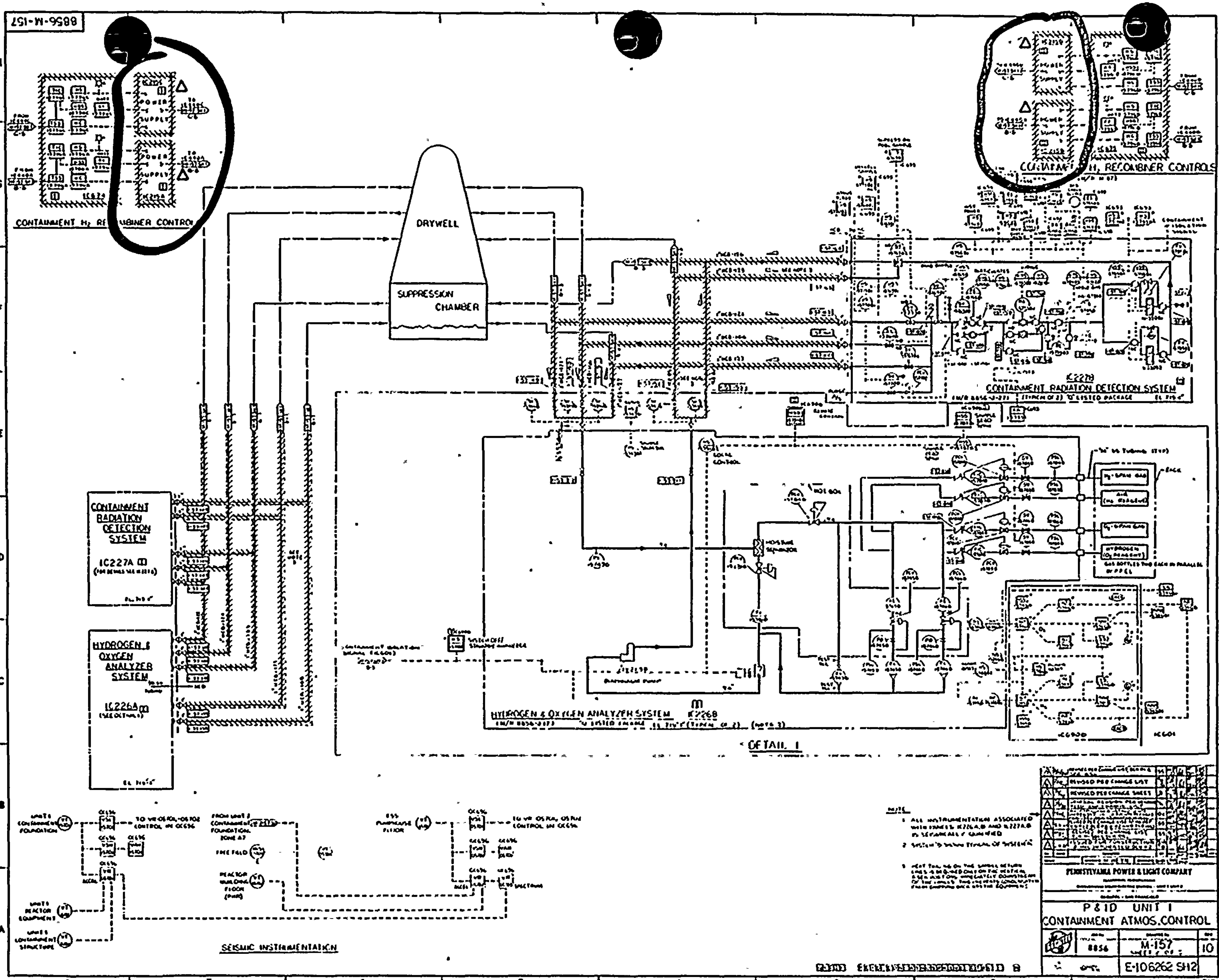

or
PRIMARY CONTAINMENT
REACTOR PRESSURE VESSEL
RECIRC PUMP
RHR SUCTION STRAINER
RESIDUAL HEAT REMOVAL PUMPS
RHR HEAT EXCHANGER 1E 205B
POWER SUPPLY DISTRIBUTION
CONTAINMENT SPRAY INITIATION & VALVE CONTROL
REFERENCE DRAWINGS
REMOTE SHUTDOWN SWITCHING ARRGT.
TABLE A
RHR ROOMS FLOODING ALARM
PENNSYLVANIA POWER & LIGHT COMPANY
P. & I.D.
RESIDUAL HEAT REMOVAL
8856
M-151
19
F-106256-2

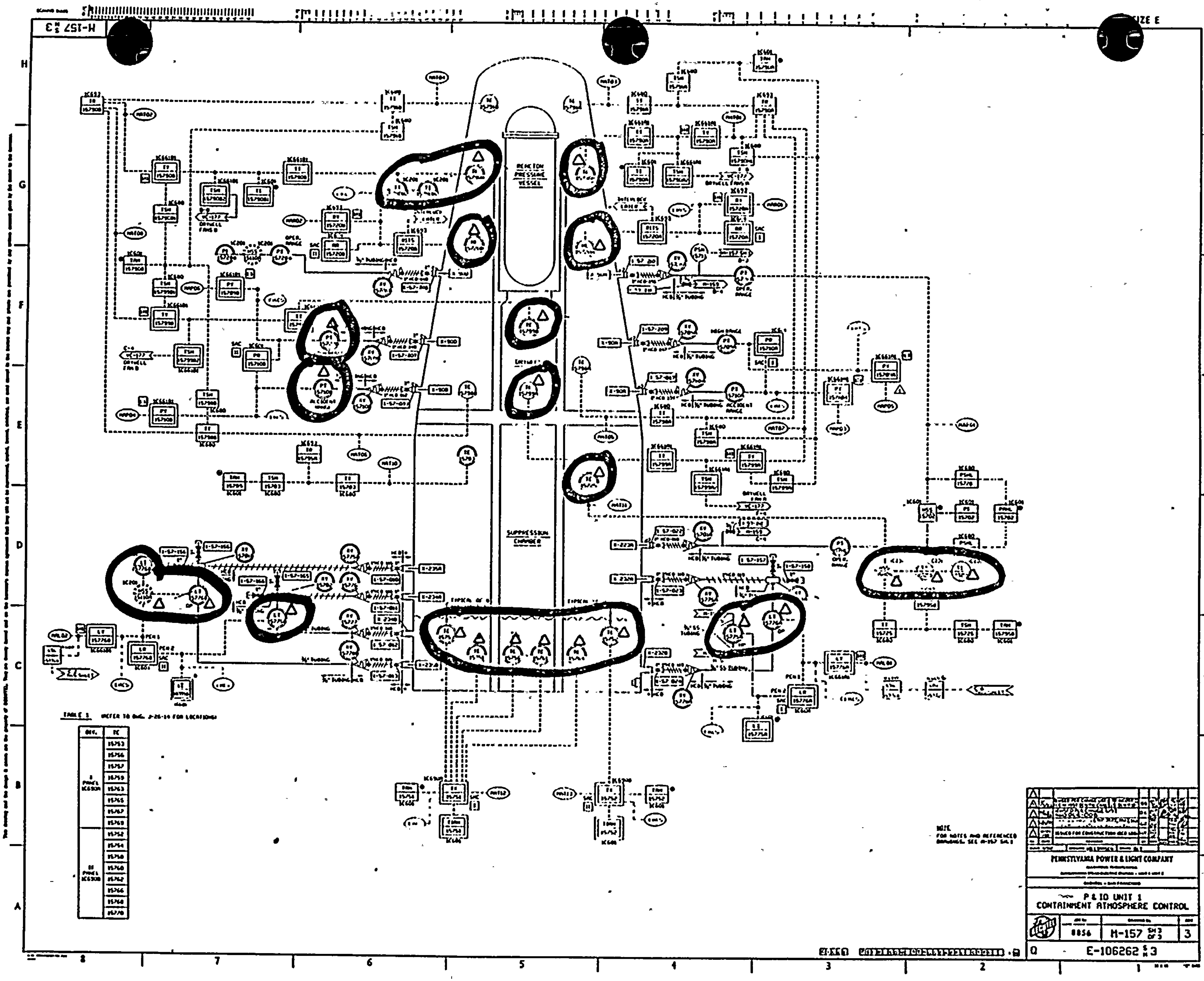

8856-M-152
PRIMARY CONTAINMENT DRYWELL
REACTOR PRESSURE VESSEL 1S 401
SUPPRESSION POOL
CORE SPRAY STRAINERS 1F 404B,D
CORE SPRAY STRAINERS 1F 404A,C
CORE SPRAY PUMP 1P 206A
CORE SPRAY PUMP 1P 206B
CORE SPRAY PUMP 1P 206C
CORE SPRAY PUMP 1P 206D
FILLING LINE
FROM CONDENSATE STORAGE TANK
CORE SPRAY PUMP ROOMS FLOODING ALARMS
NOTES:
1. CHECK VALVES F003A THRU D SHALL BE LOCATED BELOW THE SUPPRESSION POOL WATER LEVEL
2. FILLING LINES FROM CONDENSATE SYSTEM SHOULD BE CONNECTED TO HIGH POINT OF PIPING
3. PIPING HIGH POINT VENTS AND LOW POINT DRAINS TO BE ADDED AS INDICATED
4. PIPING SHOULD BE CLEANED AND FLUSHED IN ACCORDANCE WITH REF. AFTER FLUSHING, FILL THE LINES WITH DEMINERALIZED WATER.
5. THE G.E. MPL NUMBER FOR THIS SYSTEM IS E-21.
6. COMPUTER INPUTS TO BE ADDED LATER
COMPUTER POINTS FOR 1P-206A-D
PRELIMINARY ISSUE
PENNSYLVANIA POWER & LIGHT COMPANY
P & ID
CORE SPRAY
8856
M-152
15
Q
E-106257


8856-M-155
CONDENSATE STORAGE TANK
PRIMARY CONTAINMENT DRYWELL
or
STEAM SPARGER
SUPPRESSION POOL
SUCTION STRAINERS
NOTES:
PENNSYLVANIA POWER & LIGHT COMPANY
P&ID
HIGH PRESSURE COOLANT INJECTION
8856
M-155
14
Q
E-106260

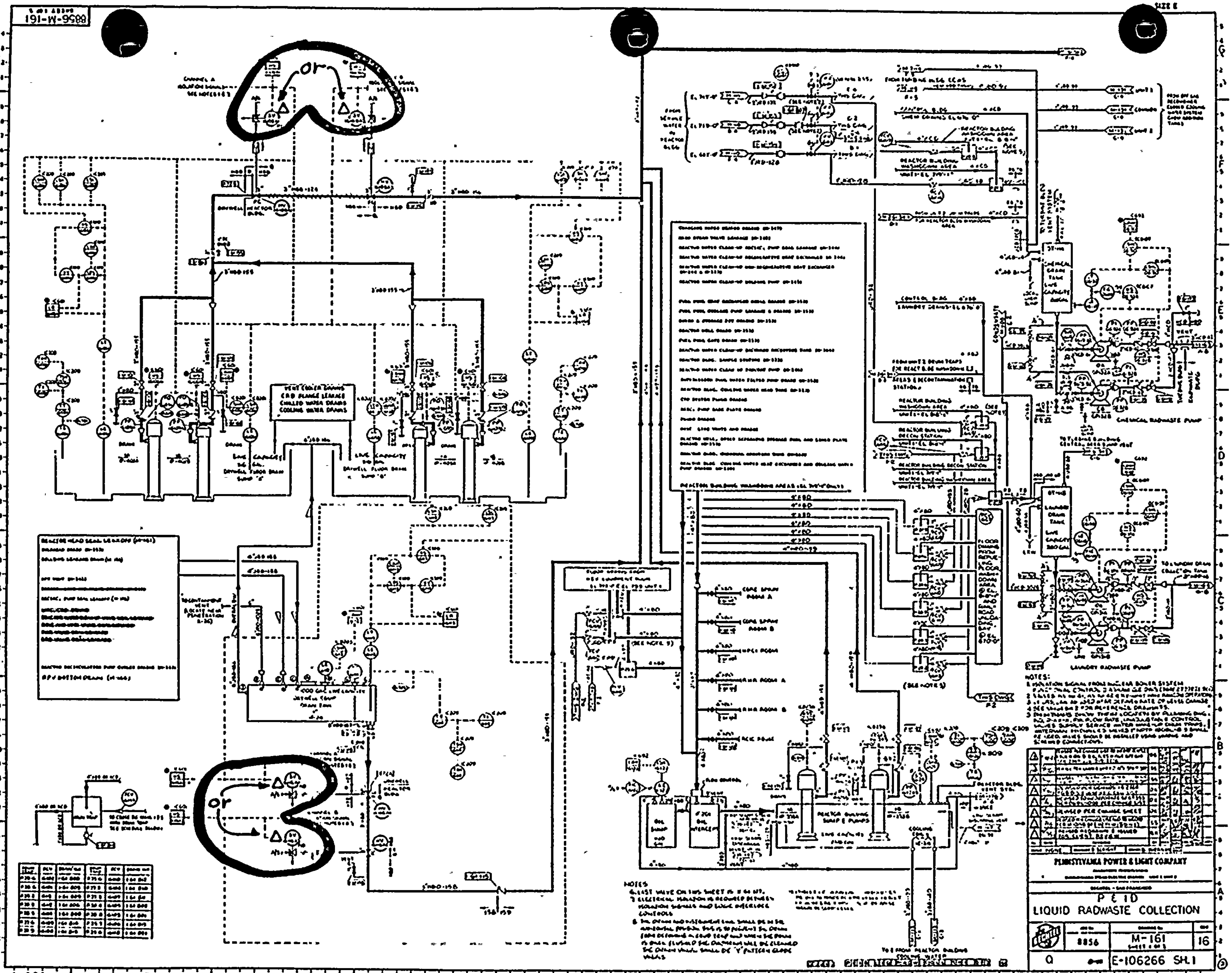

8856-M-156
TURBINE SUPERVISORY INSTRUMENTATION
ALARMS
TEMPERATURE RECORDING
TURBINE SPEED
TURBINE SHAFT VIBRATION
SEE NOTE 7
HPCI BOOSTER PUMP 1P-209
DRIVE SHAFT
HPCI PUMP
HPCI TURBINE
MECHANICAL EMERGENCY TRIP
TURBINE CONTROL LOGIC
REFERENCE DRAWINGS
NOTES:
HPCI BAROMETRIC CONDENSER
1E-210
VACUUM TANK
LUBE OIL COOLER
HPCI VACUUM TANK CONDENSATE PUMP
1P215
HPCI TURBINE AUX. OIL PUMP
HPCI EQUIPMENT AREA LEAK DETECTION SYSTEM
PENNSYLVANIA POWER & LIGHT COMPANY
P & ID UNIT-1
H.P.C.I. TURBINE-PUMP
8856
M-156
13
E-106261

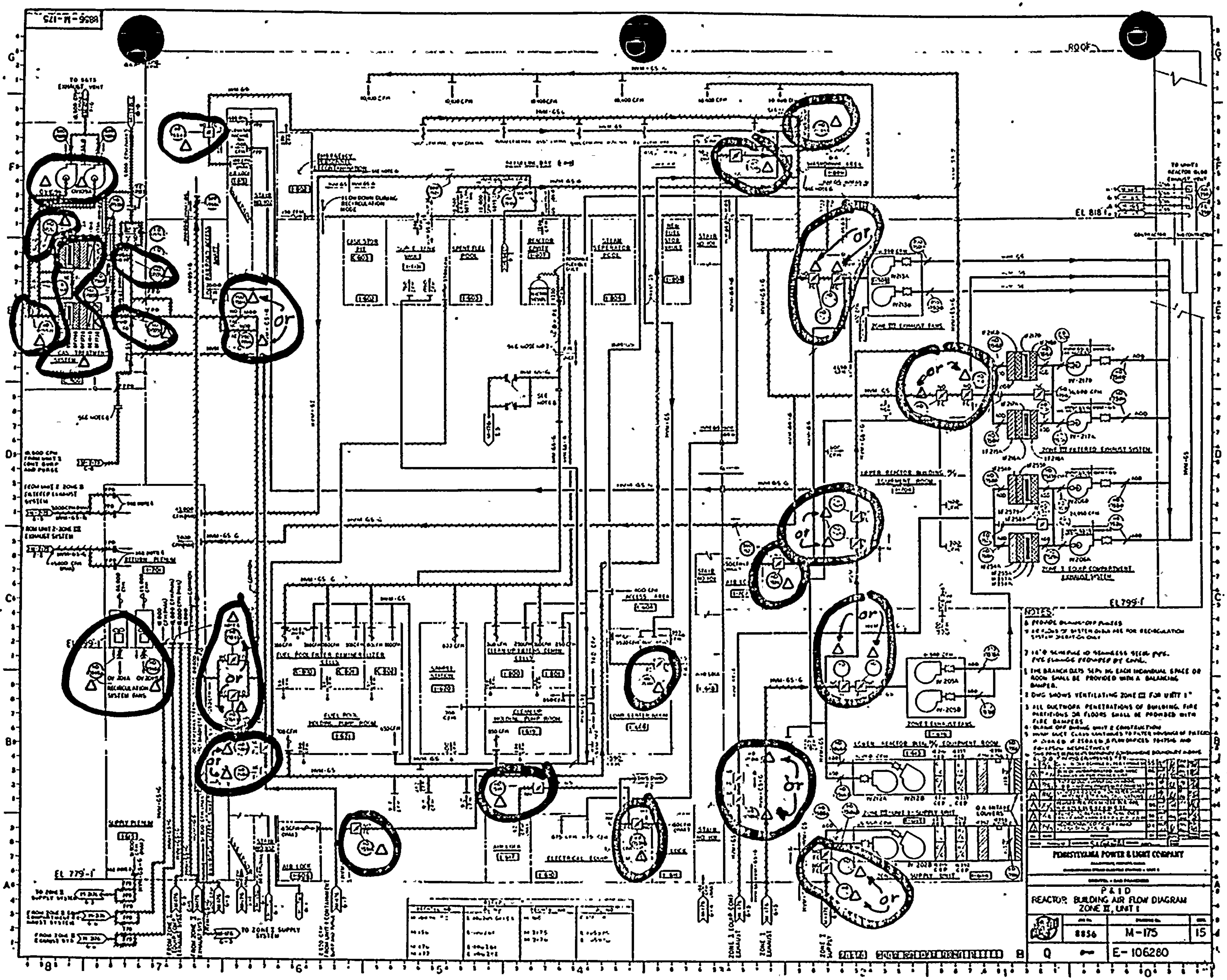

8856-M-157
NOTES:
PRIMARY CONTAINMENT
REACTOR PRESSURE VESSEL
DRYWELL
or
SUPPRESSION POOL WATER FILTER PUMP
PENNSYLVANIA POWER & LIGHT COMPANY
P&ID - UNIT 1
CONTAINMENT ATMOS. CONTROL
8856
M-157
17
Q
E-106262 SH1

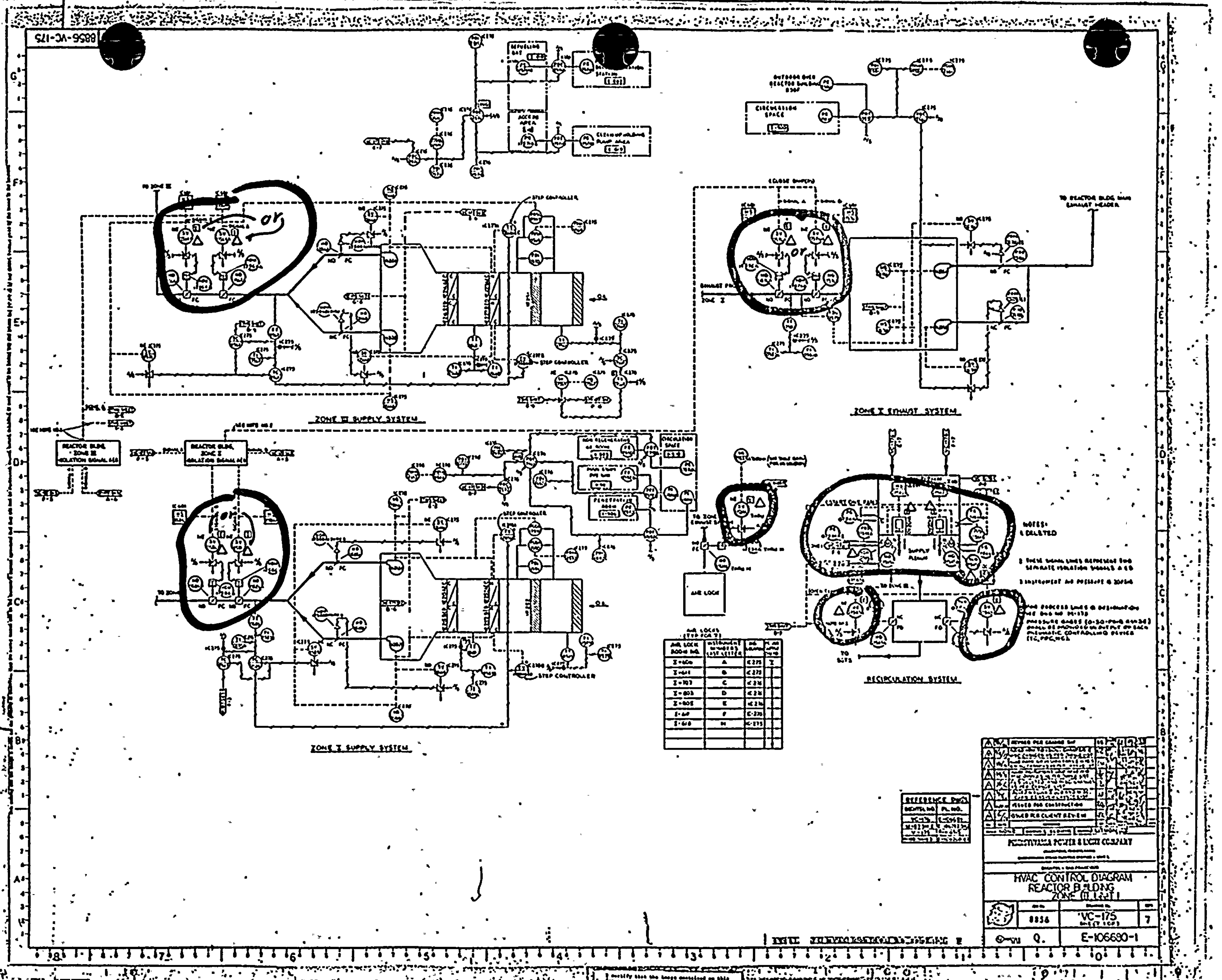

8856-M-157
CONTAINMENT H2 RECOMBINER CONTROL
POWER SUPPLY
CONTAINMENT H2 RECOMBINER CONTROLS
DRYWELL
SUPPRESSION CHAMBER
CONTAINMENT RADIATION DETECTION SYSTEM
1C227A
1C227B
CONTAINMENT RADIATION DETECTION SYSTEM
HYDROGEN & OXYGEN ANALYZER SYSTEM
1C226A
HYDROGEN & OXYGEN ANALYZER SYSTEM
1C226B
DETAIL 1
SEISMIC INSTRUMENTATION
NOTE:
PENNSYLVANIA POWER & LIGHT COMPANY
P & ID UNIT 1
CONTAINMENT ATMOS. CONTROL
8856
M-157
10
E-106262 SH2



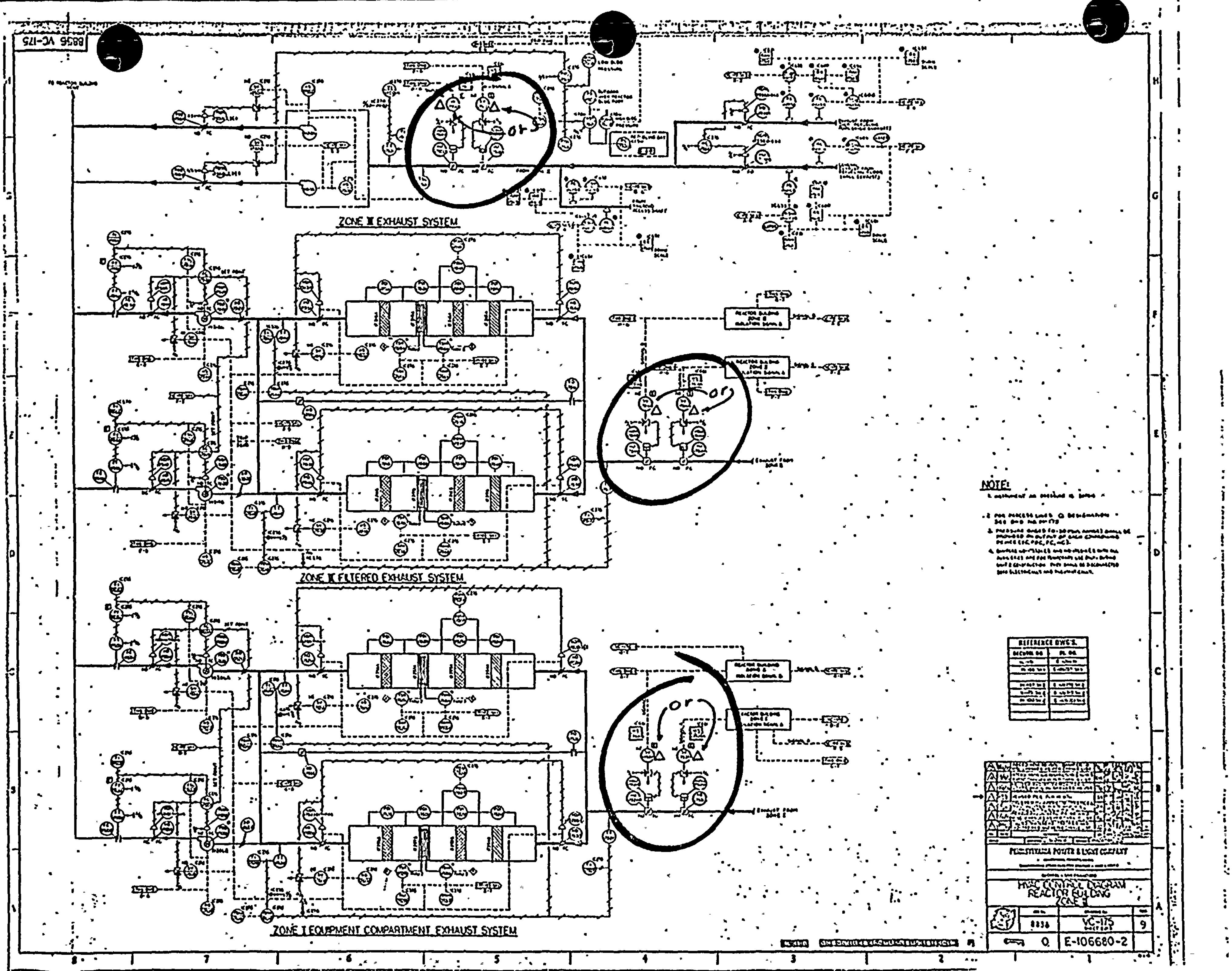
SIZE E
M-157 SH 3
REACTOR PRESSURE VESSEL
SUPPRESSION CHAMBER
DRYWELL FANS
TABLE 1
NOTE
FOR NOTES AND REFERENCED DRAWINGS, SEE M-157 SH 1
PENNSYLVANIA POWER & LIGHT COMPANY
P & ID UNIT 1
CONTAINMENT ATMOSPHERE CONTROL
8856
M-157 SH 3 OF 3
3
E-106262 SH 3

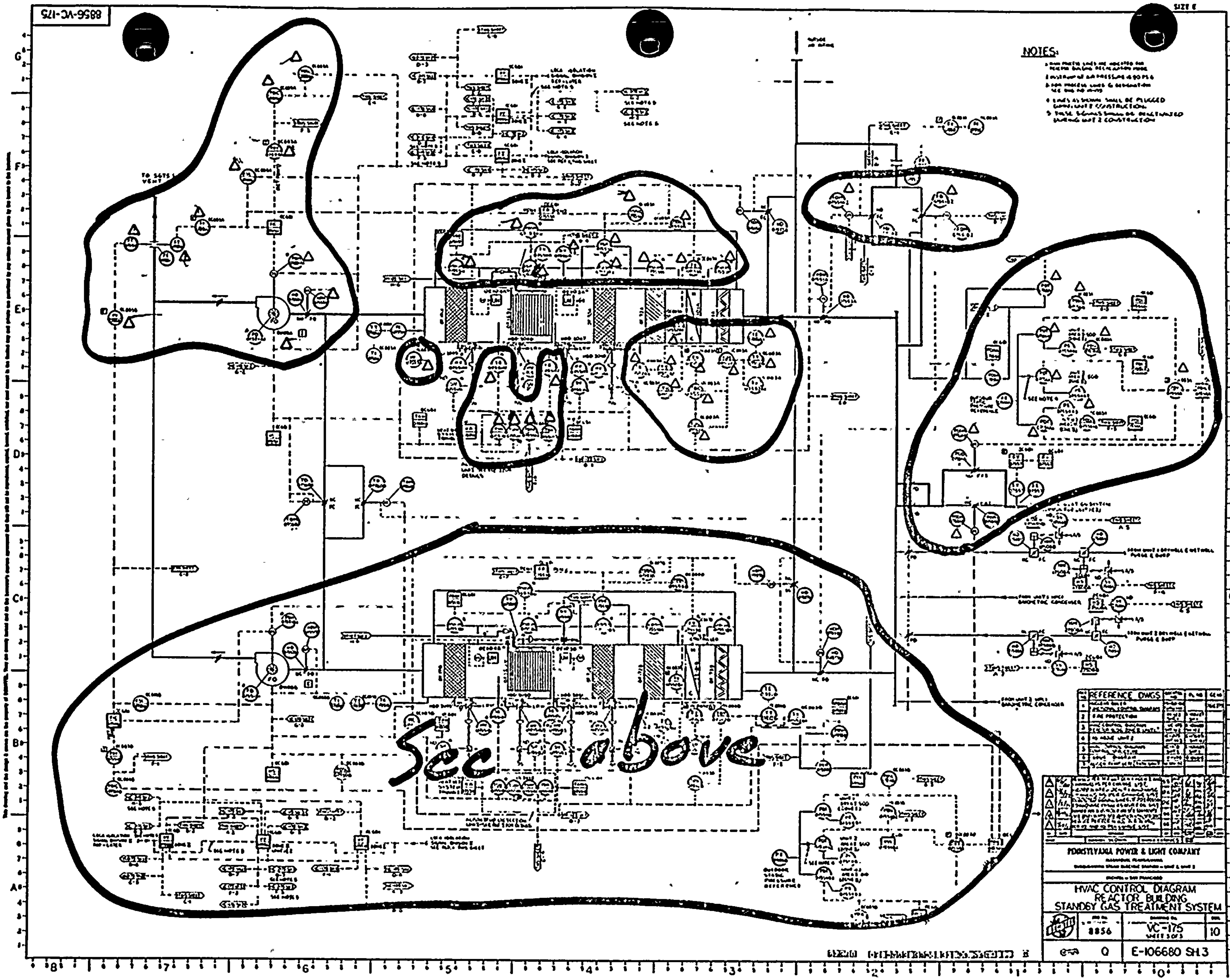

8856-M-161
or
or
VENT COOLER DRAINS
CRD FLANGE LEAKAGE
CHILLED WATER DRAINS
COOLING WATER DRAINS
CHEMICAL RADWASTE PUMP
LAUNDRY RADWASTE PUMP
NOTES:
PENNSYLVANIA POWER & LIGHT COMPANY
P & ID
LIQUID RADWASTE COLLECTION
8856
M-161
16
E-106266 SH.1

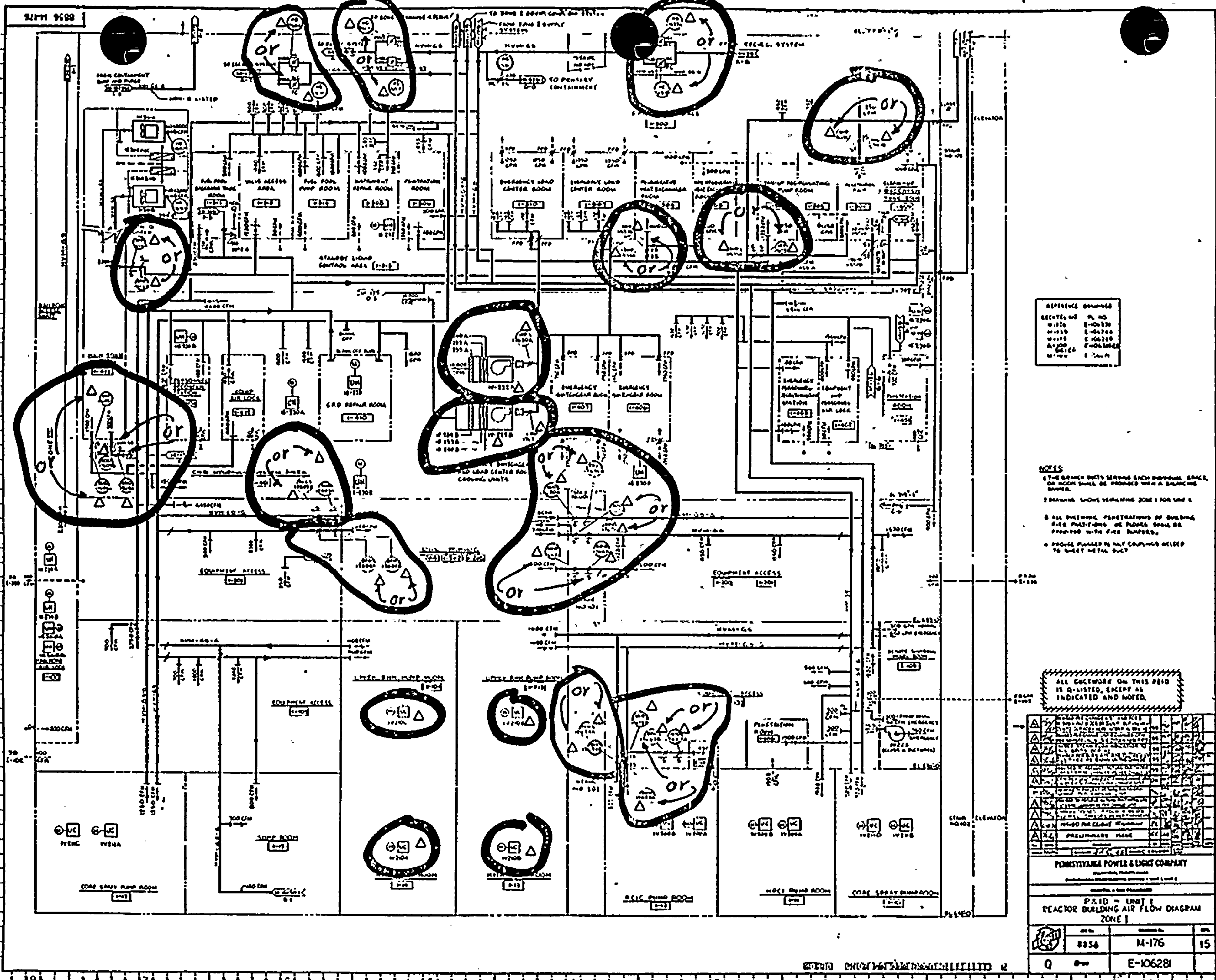

ROOF
EL 818'-1"
EL 799'-1"
EL 779'-1"
NOTES:
or
PENNSYLVANIA POWER & LIGHT COMPANY
P & I D
REACTOR BUILDING AIR FLOW DIAGRAM
ZONE II, UNIT 1
8856
M-175
15
Q
E-106280
8856-M-175



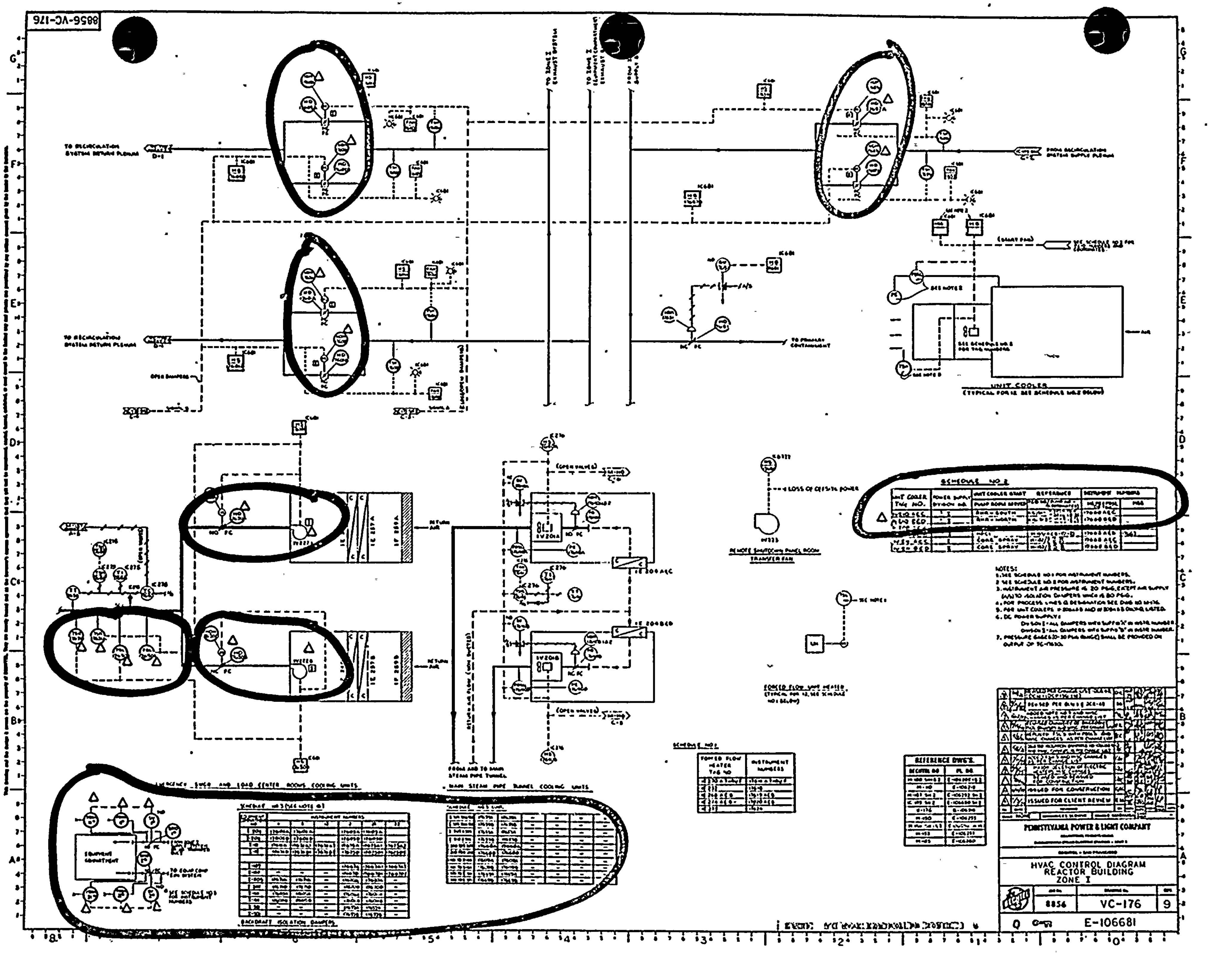
ZONE III SUPPLY SYSTEM
ZONE I EXHAUST SYSTEM
ZONE I SUPPLY SYSTEM
RECIRCULATION SYSTEM
STEP CONTROLLER
STEP CONTROLLER
STEP CONTROLLER
AIR LOCK
or
or
NOTES:
HVAC CONTROL DIAGRAM
REACTOR BUILDING
8856
VC-175
7
Q.
E-106680-1


8856 VC-175
ZONE II EXHAUST SYSTEM
or
or
ZONE II FILTERED EXHAUST SYSTEM
or
ZONE I EQUIPMENT COMPARTMENT EXHAUST SYSTEM
NOTE:
REFERENCE DWGS.
PENNSYLVANIA POWER & LIGHT COMPANY
HVAC CONTROL DIAGRAM
REACTOR BUILDING
8856
VC-175
9
E-106680-2

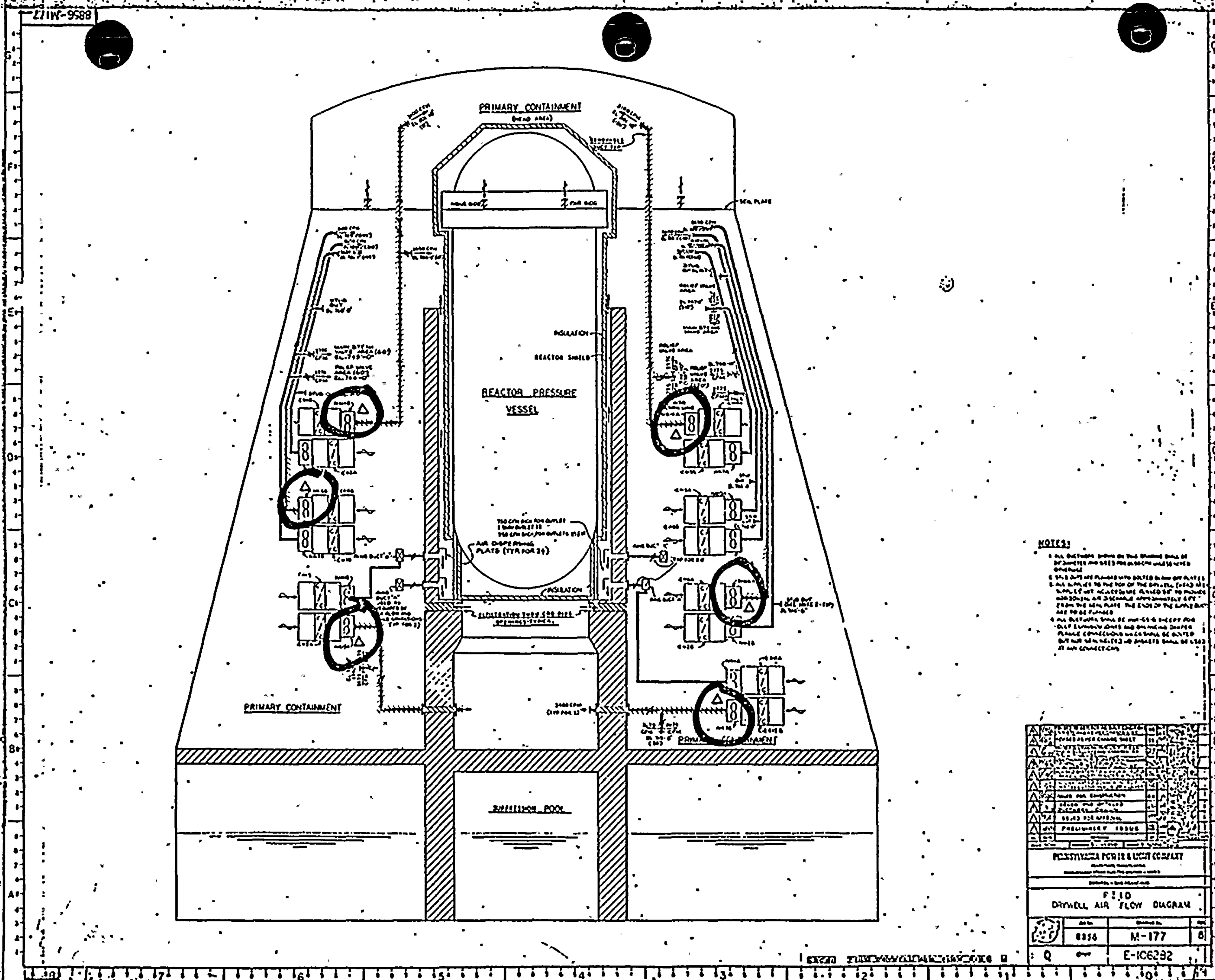

8856-VC-175
NOTES:
REFERENCE DWGS
See above
PENNSYLVANIA POWER & LIGHT COMPANY
HVAC CONTROL DIAGRAM
REACTOR BUILDING
STANDBY GAS TREATMENT SYSTEM
8856
VC-175
10
Q
E-106680 SH.3

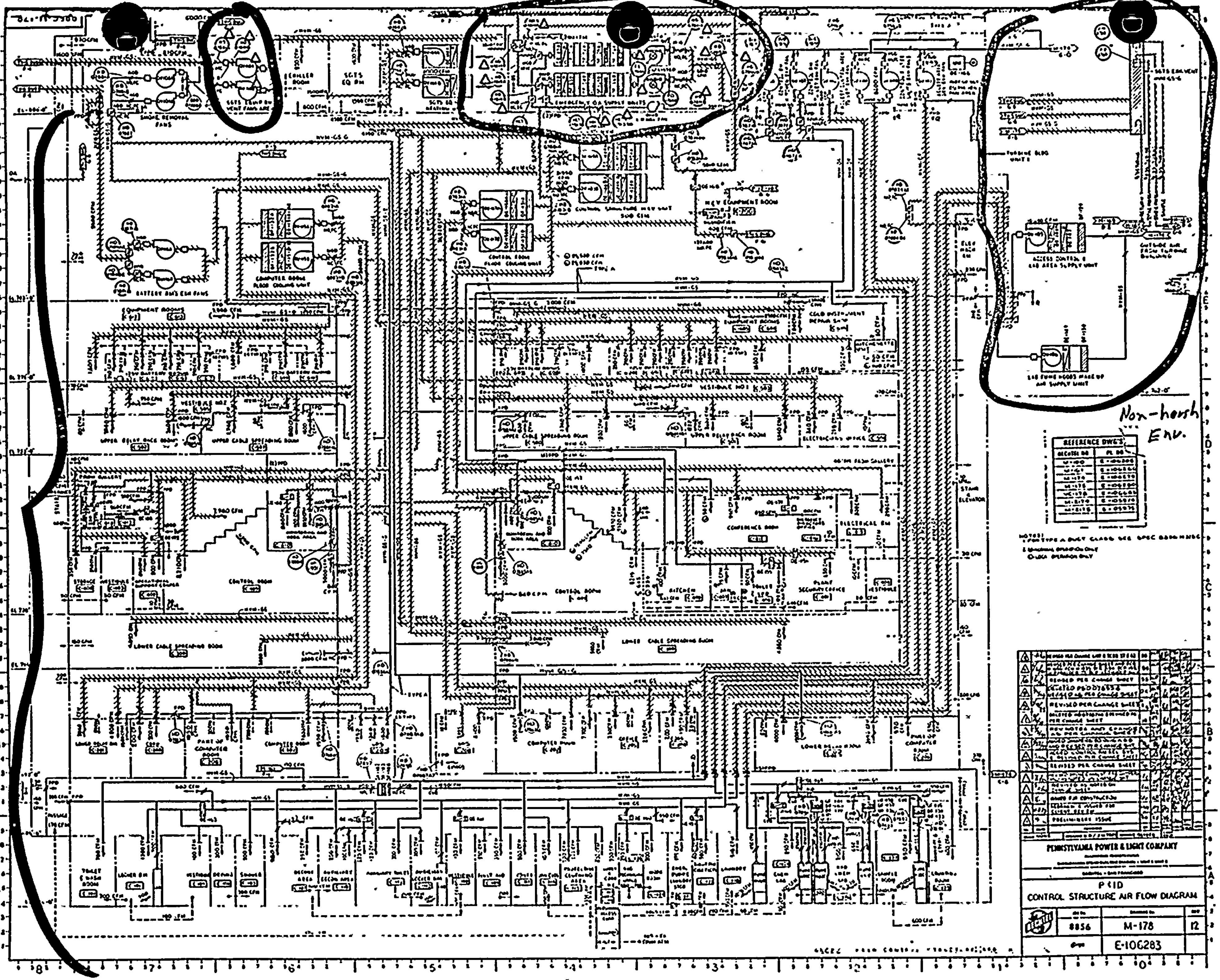


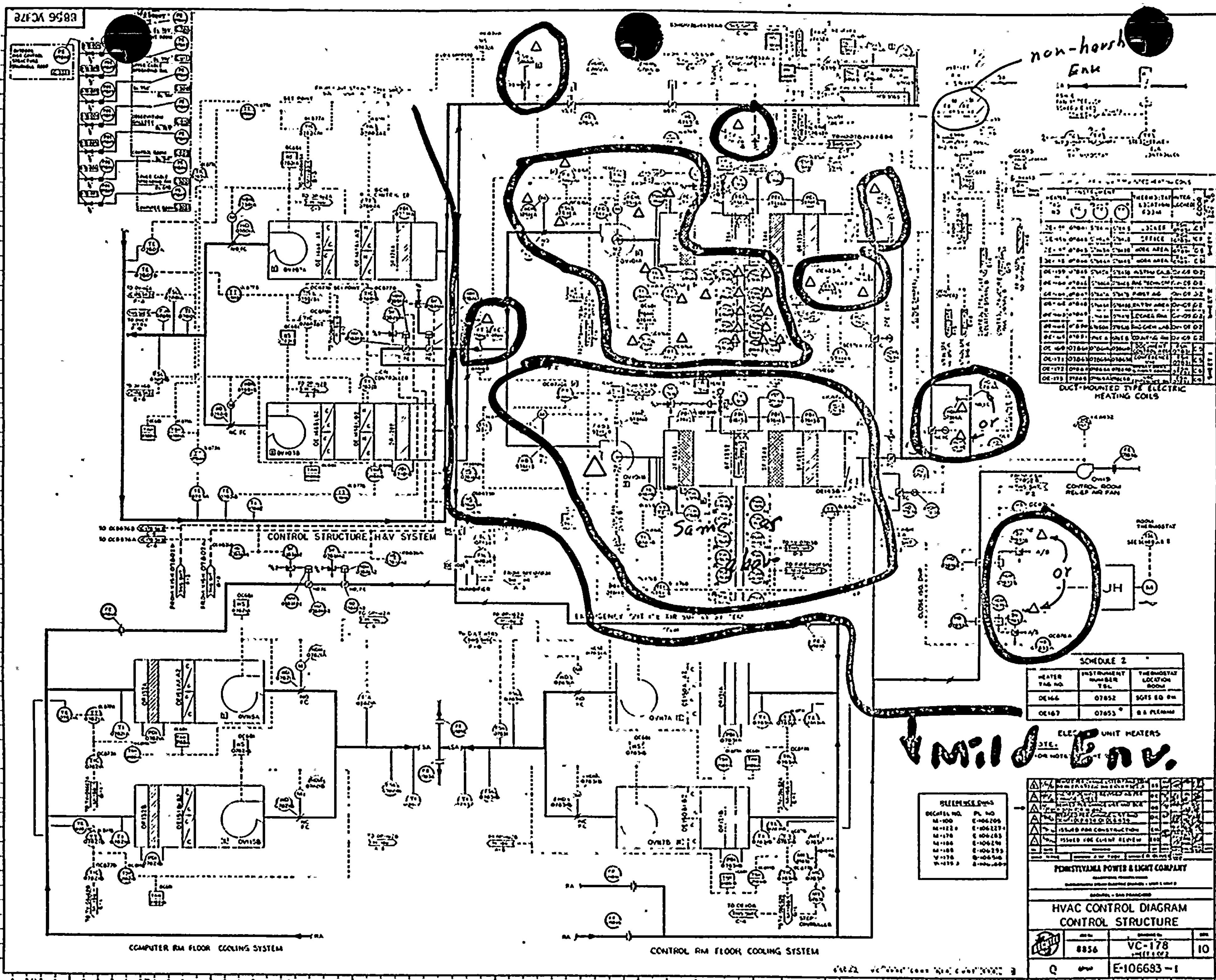
8856 M-176
ALL DUCTWORK ON THIS P&ID IS Q-LISTED, EXCEPT AS INDICATED AND NOTED.
EQUIPMENT ACCESS
PENNSYLVANIA POWER & LIGHT COMPANY
P&ID - UNIT 1
REACTOR BUILDING AIR FLOW DIAGRAM
ZONE 1
8856
M-176
15
Q
E-106281

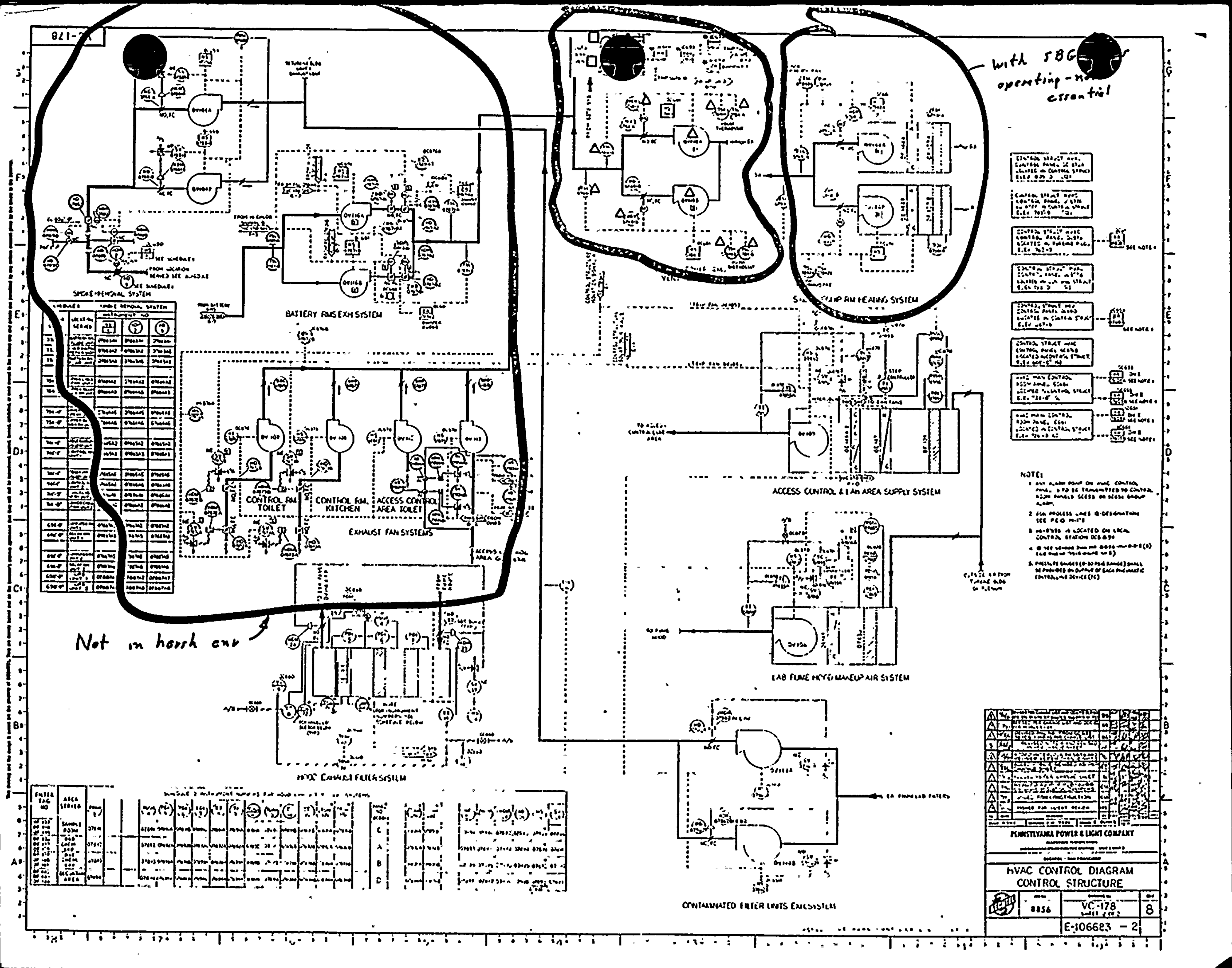


8856-VC-176
UNIT COOLER
SCHEDULE NO 2
REFERENCE DWG'S
NOTES:
ISSUED FOR CONSTRUCTION
ISSUED FOR CLIENT REVIEW
PENNSYLVANIA POWER & LIGHT COMPANY
HVAC CONTROL DIAGRAM
REACTOR BUILDING
ZONE I
8856
VC-176
9
E-106681

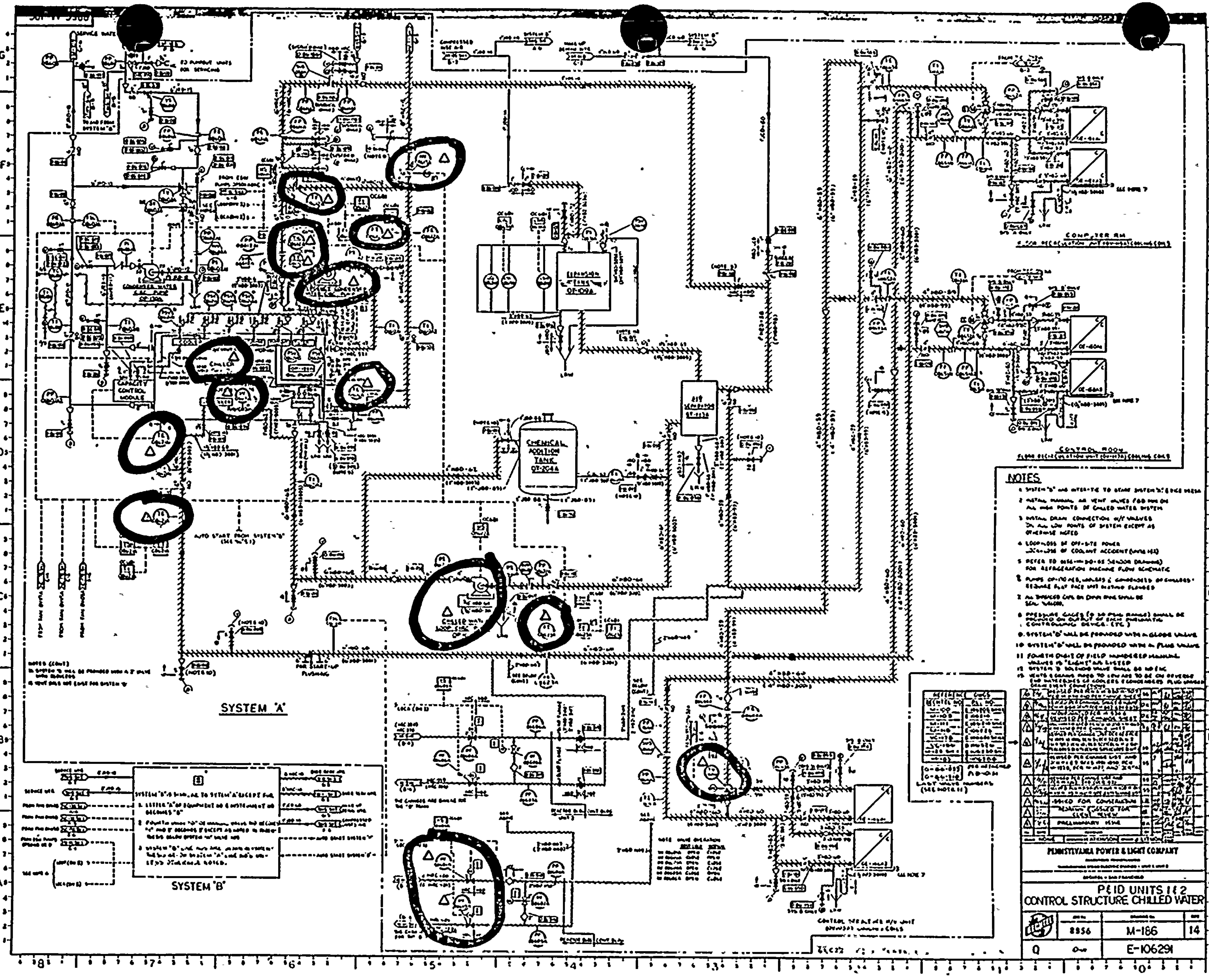

8856-M177
PRIMARY CONTAINMENT
REACTOR PRESSURE VESSEL
INSULATION
REACTOR SHIELD
PRIMARY CONTAINMENT
PRIMARY CONTAINMENT
SUPPRESSION POOL
NOTES:
PENNSYLVANIA POWER & LIGHT COMPANY
DRYWELL AIR FLOW DIAGRAM
8856
M-177
E-106292

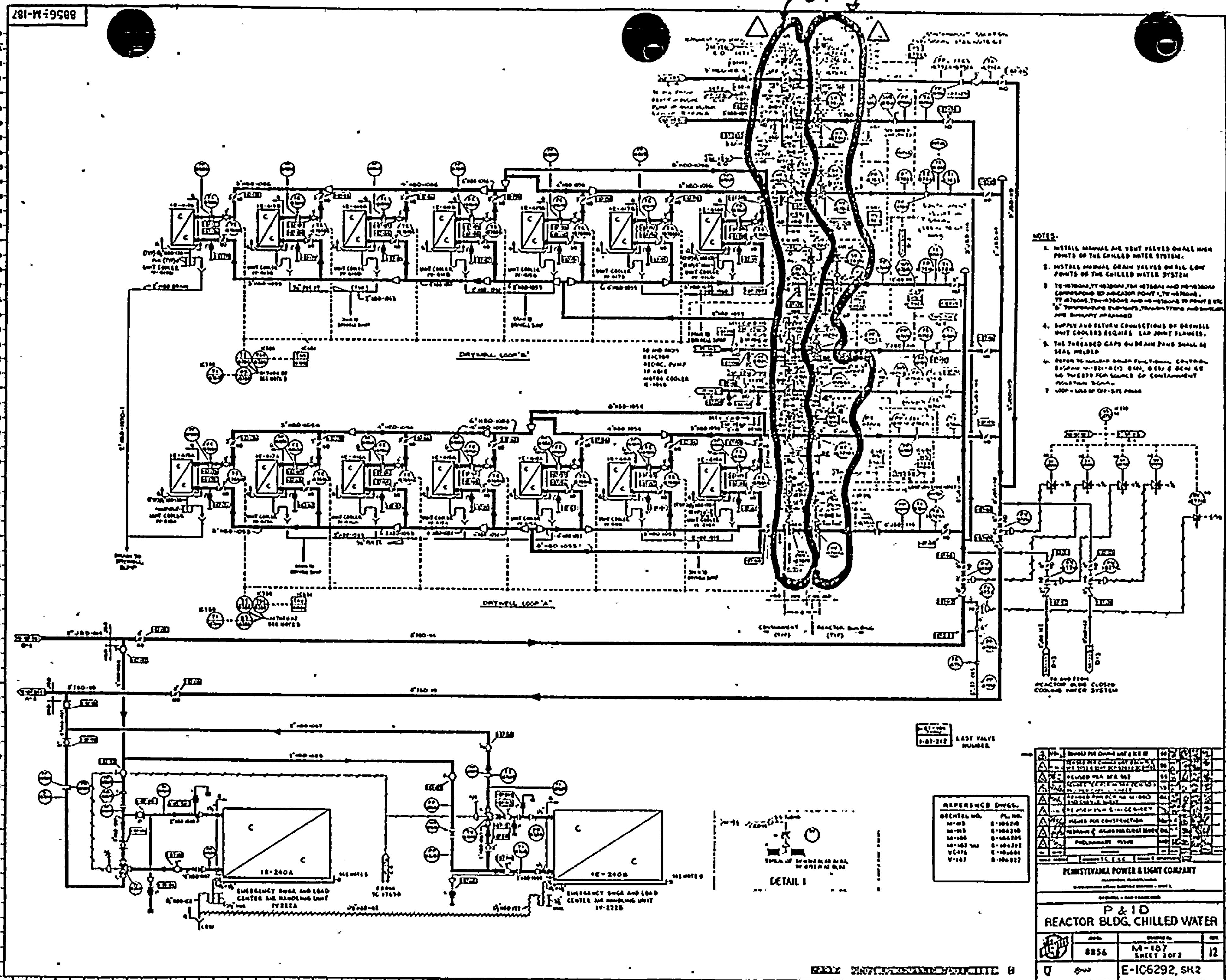

Non-harsh Env.
SMOKE REMOVAL FANS
BATTERY RMS EXH FANS
COMPUTER ROOM FLOOR COOLING UNIT
CONTROL ROOM FLOOR COOLING UNIT
ACCESS CONTROL & LAB AREA SUPPLY UNIT
LAB FUME HOODS MAKE UP AIR SUPPLY UNIT
CONTROL ROOM
LOWER CABLE SPREADING ROOM
CONFERENCE ROOM
KITCHEN
PLANT SECURITY OFFICE
ELECTRICAL RM
REFERENCE DWG'S
REVISED PER CHANGE SHEET
PRELIMINARY ISSUE
PENNSYLVANIA POWER & LIGHT COMPANY
P & ID
CONTROL STRUCTURE AIR FLOW DIAGRAM
8856
M-178
12
E-106283


non-harsh Env
CONTROL STRUCTURE H&V SYSTEM
DUCT-MOUNTED TYPE ELECTRIC HEATING COILS
CONTROL ROOM RELIEF AIR FAN
Same as above
or
or
JH
M
SCHEDULE 2
HEATER TAG NO.
INSTRUMENT NUMBER TSL
THERMOSTAT LOCATION ROOM
OE166
07652
SGTS EQ RM
OE167
07653
ELEC. UNIT HEATERS
Mild Env.
COMPUTER RM FLOOR COOLING SYSTEM
CONTROL RM FLOOR COOLING SYSTEM
REFERENCE DWGS
PENNSYLVANIA POWER & LIGHT COMPANY
HVAC CONTROL DIAGRAM
CONTROL STRUCTURE
8856
VC-178
10
E-106683-1



VC-178
SMOKE REMOVAL SYSTEM
BATTERY RMS EXH SYSTEM
CONTROL RM TOILET
CONTROL RM. KITCHEN
ACCESS CONTROL AREA TOILET
EXHAUST FAN SYSTEMS
HVAC EXHAUST FILTER SYSTEM
Not in harsh env
with SBG
operating - no
essential
RM HEATING SYSTEM
ACCESS CONTROL & LAB AREA SUPPLY SYSTEM
LAB FUME HOOD MAKEUP AIR SYSTEM
CONTAMINATED FILTER UNITS EXH SYSTEM
NOTES:
PENNSYLVANIA POWER & LIGHT COMPANY
HVAC CONTROL DIAGRAM
CONTROL STRUCTURE
8856
VC-178
8
E-106683 - 2


SYSTEM 'A'
SYSTEM 'B'
CHEMICAL ADDITION TANK OT-204A
EXPANSION TANK OT-09A
COMPUTER RM
CONTROL ROOM
CAPACITY CONTROL MODULE
NOTES
ISSUED FOR CONSTRUCTION
PRELIMINARY ISSUE
PENNSYLVANIA POWER & LIGHT COMPANY
P&ID UNITS 1&2
CONTROL STRUCTURE CHILLED WATER
8856
M-186
14
Q
E-106291


8856-M-187
NOTES:
DRYWELL LOOP "B"
DRYWELL LOOP "A"
DETAIL I
LAST VALVE NUMBER
REFERENCE DWGS.
EMERGENCY SWGR AND LOAD CENTER AIR HANDLING UNIT
1E-240A
1E-240B
TO AND FROM REACTOR BLDG CLOSED COOLING WATER SYSTEM
PENNSYLVANIA POWER & LIGHT COMPANY
P & ID
REACTOR BLDG. CHILLED WATER
8856
M-187 SHEET 2 OF 2
12
E-106292, SH.2