

**ENCLOSURE 1  
ATTACHMENT 16**

**NEXTERA ENERGY POINT BEACH, LLC  
POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2**

**LICENSE AMENDMENT REQUEST 261  
EXTENDED POWER UPRATE  
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION**

**PBNP-994-21-15, REVISION 2, HELB RECONSTITUTION PROGRAM - TASK 15,  
REQUIRED EQUIPMENT LIST**



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**CALCULATION SHEET**

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**Client:** FP&L Energy

**Revision:** 2

**Station:** Point Beach Nuclear Plant

**Prepared By:** CE Agan, E Ziller

**Calc. Title:** HELB Reconstitution Program – Task 15, Required Equipment List

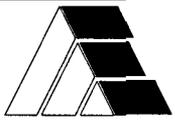
**Reviewed By:** R Krukowski

**Safety Related**      Yes       No

**Date:** 10/29/09

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**1.0 Purpose and Summary Results:**

The December 19, 1972 AEC letter (Design Input 5.1) and its enclosure (Items 11 and 13), as clarified in January 1973, required the identification of those systems and components required to detect and mitigate HELB events and to ultimately bring the unit to cold shutdown. Point Beach responded to the letter by submitting information in FSAR Appendix 10A. However, Appendix A.2 does not include a required equipment list.

The purpose of this calculation is to document the selection of the equipment required to respond to HELB events in those systems, or portions thereof, that were identified in HELB Reconstitution Program Task 2, Calculation #PBNP-994-21-02, Table 6.0-1 (Design Input 5.2) as meeting the definition of high energy and provide the basis for revising FSAR Appendix A.2. The required equipment list is provided in two levels of detail - (1) at a detail level commensurate for inclusion in the FSAR and (2) additional information for each component, such as power source, duration required to operate, reason for being included, etc.. Any sub-tier component associated with a listed component (i.e. control switch, push button, etc.) that is required for proper operation of the listed component will have to be identified and its physical location determined. The identification of these sub-tier components is not within the current scope of the HELB Reconstitution Program or this calculation.

The results of this calculation will be used as input to HELB Reconstitution Program Task 20, 10CFR50.59 Evaluation and USAR Appendix A.2 Revision. It will also be transmitted to the Point Beach EQ Program engineer for evaluation of potential effects on the program, but that activity is not included in the HELB Reconstitution Program.

These systems, or portions thereof, meeting the definition of high energy are:

- |                       |   |
|-----------------------|---|
| Main Steam (MS)       | Feedwater (FW)                                |
| CVCS Letdown (CV)     | Steam Generator Blowdown (SB)                 |
| Condensate (CS)       | Heater Drain Tank Pump Discharge (FD)         |
| Extraction Steam (EX) | Heater and Reheater Vents & Drains (FD & MSR) |

Section 6.0 provides a discussion for each of the systems. Tables 6.0-1 and 6.0-2 provide the required equipment list for the various HELB events.



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**2.0 Methodology:**

Applicable sections of the FSAR (6, 9, 10, A.2, 14, etc.) and Emergency Operating Procedures (Design Input 5.3) were reviewed to identify the plant's response to the various postulated high energy line break accidents. For each of the high energy line breaks, the applicable flow diagrams (Design Input 5.4) and Electrical Master Data Book (Design Input 5.5) were reviewed and flow paths selected to accomplish the actions identified below to ultimately place the plant in a cold shutdown condition.

- \* Reactor trip
- \* Reactivity control
- \* RCS pressure control
- \* RCS inventory control
- \* Decay heat removal
- \* Event monitoring

All components, except passive components (tanks, filters, manual valves, etc.) in the selected flow paths were identified. The instrumentation required to detect, initiate protective action and monitor plant response to the postulated accidents was also identified. Component numbers, locations, power supplies, etc. were obtained from the Point Beach Passport File (Design Input 5.6) and related 499B466 elementary wiring diagrams.

The equipment required to respond to each of the high energy system line breaks is listed in attached Tables 6.0-1 (FSAR format) and 6.0-2 (detailed format). A discussion of the selection process for each of the HELB events is included in Section 6.0. The tables provide a matrix of all of the required equipment and the accident for which is required.

**3.0 Acceptance Criteria:**

The acceptance criteria for this calculation is compliance with the requirements of the December 19, 1972 AEC letter as clarified in January 1973, the AEC SER and FSAR Appendix A.2.

The AEC documents do not identify any minimum acceptable list, only that the accident unit must be ultimately brought to cold shutdown. They also do not identify an acceptable time period, although the December 1972 AEC letter requests that times be provided. There is no indication that this time related information was ever submitted to the AEC.



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## 4.0 Assumptions

The flow diagrams and the Electrical Master Data Book properly reflect the current plant conditions.

The component numbers, locations, power supplies, etc. in the Point Beach Passport Files are correct.

In numerous sections of the FSAR (i.e. 7.5.4) Point Beach is a “safe shutdown = hot shutdown” plant. This requires going to and remaining at hot shutdown automatically or manually. There are no criteria on how long the plant can remain at hot shutdown before ultimately achieving cold shutdown.

All identified required equipment is capable of being powered by the emergency diesel generators or the batteries and can be operated from the Control Room or is accessible for manual operation.

A loss of off-site power may occur concurrently with the HELB event or delayed for up to ten (10) minutes.

The only HELB required components identified that are located in the Turbine Hall are associated with the feedwater flow control valves, feedwater pumps and condensate storage tank level. The feedwater components are required to terminate flow to a faulted steam generator (main steam or blowdown HELB event). The EPU Project will be adding a fast closing valve in each feedwater line in the Facade, thereby relegating the flow control valves and feedwater pumps to the status of back-up to the new valves. The condensate storage tank level was identified as a Reg Guide 1.97 component and is mentioned in numerous emergency procedures. The auxiliary feedwater pumps are protected by safety related low suction pressure switches located in the safety related portion of the Turbine Hall and can be supplied from the safety-related service water system. However, the condensate storage tank level transmitters were retained on the FSAR Appendix A.2 required equipment list. Since the swing battery and associated components are not normally aligned systems they were removed from the required equipment list.

The other identified high energy systems are located entirely within the Turbine Hall (condensate, heater drain tank pump discharge, heater drains, etc.) and do not require any of the previously mentioned components, except condensate storage tank level. As noted in Sections 6.6, 6.7, 6.8 and 6.9 the plant response to a HELB event in these systems would be the same as a feedwater system HELB event. Therefore, it was determined that their inclusion as a HELB event column was not required.

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Safety Related	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Date: 10/29/09	

## 5.0 Design Inputs:

- 5.1 AEC letter to WEP dated December 19, 1972, A Giambusso to JG Quale
- 5.2 AES Calculation PBNP-994-21-02, Rev. 0
- 5.3 Emergency Operating Procedures
  - 1 EOP-0, Rev. 47/49, Reactor Trip or Safety Injection
  - 2 EOP-0.1, Rev. 34/33, Reactor Trip Response
  - 3 EOP-0.2, Rev. 26/26, Natural Circulation Cooldown
  - 4 EOP-1, Rev. 38/37, Loss of Reactor or Secondary Coolant
  - 5 EOP-1.2, Rev. 28/28, Small Break LOCA Cooldown and Depressurization
  - 6 EOP-2, Rev. 20/20, Faulted Steam Generator Isolation
  - 7 ECA-1.2, Rev. 18/18, LOCA Outside Containment
- 5.4 Piping and Instrument Drawings – See Attachment 8.1
- 5.5 Electrical Master Data Book
- 5.6 PBNP Passport Files

## 6.0 Design Calculations:

The December 19, 1972 AEC letter (Design Input 5.1) and its enclosure, as clarified in January 1973, identify requirements such as loss of redundancy, ability to reach cold shutdown, identification of required equipment, operation of equipment from the Control Room, etc. The Point Beach Emergency Operating Procedures, including the background documents, (Design Input 5.5) and various FSAR Sections describe the plant's response to HELB events and were used as guidance for identifying the required equipment.



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6.1 All HELB Events

The following functions are applicable to all postulated HELB events:

- 1 The plant must be capable of meeting the single failure criteria.
2. Safety injection pumps provide borated water to the core, thereby limiting any core power transient and bringing the reactor to a sub-critical condition.
3. Following a reactor trip, core decay heat removal will be required, which would be accomplished by the Auxiliary Feedwater System and steam generator power operated relief valves.
4. The auxiliary feedwater system and main steam atmospheric relief valves will provide the heat removal capability for reducing the temperature of the reactor coolant system to approximately 350° F. Normally, the residual heat removal (RHR) system would be used to cool the plant from this point until reaching a cold shutdown condition. The use of the auxiliary feedwater system to fill and dump the steam generators will require a much longer time to reach cold shutdown than the use of the RHR System.
5. Reactor Coolant System pressure will be maintained by utilizing the pressurizer heaters to maintain pressurizer saturation temperature sufficiently above the primary coolant loop temperature to ensure adequate primary system sub-cooling. The Reactor Coolant System is protected against overpressure by safety valves and pressurizer power operated relief valves.
6. Reactor Coolant System inventory control will be maintained by the Safety Injection System. For break sizes that do not reduce the reactor coolant pressure sufficiently below the safety injection pump shutoff head, the pressurizer power operated relief valves would be operated to reduce system pressure enough to permit safety injection flow.
7. Reactivity control will be provided by the Safety Injection System delivery of boric acid from the refueling water storage tank to assure adequate shutdown margin.

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8. Event monitoring will be provided by selected instrumentation identified in the plant's response to Regulatory Guide 1.97. Since the postulated HELB events are in the Facade, Primary Auxiliary Building and Turbine Building, no containment monitoring instrumentation (sump level, radiation, pressure, hydrogen, etc.) is included. The HELB events assume a loss of off-site power, therefore, no Category 3 instruments are provided.

10. Support system components such as service water, component cooling water, control room ventilation, etc. are also identified.

## 6.2 Main Steam

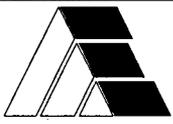
The scope of the main steam system includes the main steam lines from the containment penetrations to the turbine inlet nozzles and all branch lines servicing other components. These lines include the supply to the turbine driven auxiliary feedwater pump, steam dump to atmosphere and condenser, steam supply to the moisture separator reheaters, steam to primary and secondary air ejectors, radwaste, etc.

For a large break, the safeguards sequence would be actuated by low steam line pressure in the affected steam line. The actuation of the safeguards sequence would initiate safety injection, reactor trip and start various components. Either high-high steam flow or high steam flow coincident with low  $T_{avg}$  will initiate automatic closure of the main steam line isolation valves.

Following initiation of safety injection, the safety injection pumps will deliver boric acid from the refueling water storage tank (minimum 2,700 ppm), which will insert sufficient negative reactivity to ultimately bring the reactor to a cold shutdown condition.

For the large steam line break, the following equipment will be available to accomplish safety functions:

1. Safety injection to pump borated water into the core, thereby limiting the core power transient following the break and bringing the reactor to a subcritical condition.
2. Closure of the main steam isolation valves (MSIV) to limit reactor coolant system cooldown. For breaks upstream of an MSIV, the closure of the non-return check valve or closure of the other MSIV will limit the mass/energy release to one steam generator.



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For breaks downstream of the MSIVs, it is assumed that one of the MSIVs fails to close, thereby allowing one steam generator to blow down.

3. Isolation of main feedwater to the steam generators to limit the reactor coolant system cooldown. Isolation of main feedwater is redundantly accomplished by closing the feedwater containment isolation valves and control valves, tripping the feedwater pumps and closing their discharge valves.
4. Following reactor trip, feedwater will be required to dissipate core decay heat. This would be accomplished by the Auxiliary Feedwater System.

After the affected steam generator has emptied or after the break has been isolated, the auxiliary feedwater system and main steam atmospheric relief valves will provide the heat removal capability for reducing the temperature of the reactor coolant system. Normally, the residual heat removal system would be used to cool the plant to the cold shutdown condition. In accordance with Item 4 of Section 6.1, RHR is not available and auxiliary feedwater is utilized.

Main steam line breaks at power that are not large enough to cause safeguards actuation will result in the continued loss of water from the secondary side of the plant and will eventually result in the emptying of the condenser hotwell. Emptying the hotwell will result in loss of feedwater and the reactor will be tripped on low-low steam generator level or low steam generator level coincident with feed flow/steam flow mismatch. The cooldown would continue until the steam generator feeding the break empties and safety injection initiated on either low pressurizer pressure, low steam line pressure or manually.

**6.3**      Feedwater

The scope of the feedwater system is from the feedwater pump discharge nozzles to the #5 A&B feedwater heater inlet nozzles and from the #5 A&B feedwater heater outlet nozzles to the Containment penetrations, including the .regulating by-pass lines.

Large breaks would result in a reactor trip due to low-low steam generator water level or low steam generator level coincident with steam flow/feed flow mismatch. Safety injection would have to be initiated manually. In order to bring the plant to cold shutdown boron concentration and maintain reactor coolant inventory, the safety injection pumps and pressurizer power operated relief valves would be utilized.



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Breaks that are not large enough to cause a reactor trip would be detected by the operations staff, who have numerous devices (steam flow versus feedwater flow, steam generator pressure and level, etc.) to assess the event. The operations staff would assess the plant conditions (location of break, ability to isolate, equipment available, etc.) and determine the actions to be taken. If deemed necessary by the operations staff, shutdown of the plant would be achieved by manually initiating a reactor trip or safety injection. A small feedwater break (crack) would result in a loss of secondary side water inventory in a manner similar to a small main steam break as discussed in Section 6.2.

#### 6.4 CVCS Letdown

The scope of the CVCS Letdown system is from the Containment penetration to the non-regenerative heat exchanger inlet nozzle.

Large breaks would exceed the capacity of one charging pump and would result in closure of the RCS loop isolation valves on low pressurizer level. This would terminate the HELB event. This HELB event could also be terminated by manual closure of the inside containment isolation valves or RCS loop isolation valves prior to the low level trip.

Breaks that are not large enough to cause closure of the RCS loop isolation valves would be detected by the operations staff, who have numerous devices (pressurizer level and pressure, increased charging flow, decreasing volume control tank level, area radiation monitors, etc.) to assess the event.

Attaining cold shutdown would be accomplished by the actions described in Sections 6.1 and 6.2.

#### 6.5 Steam Generator Blowdown

The scope of the steam generator blowdown system is from the Containment penetrations to the steam generator blowdown tank and heat exchanger inlet nozzles.

Large breaks in the steam generator blowdown lines would eventually lead to reactor trip on low-low steam generator level. The HELB event could be terminated by closure of the redundant containment isolation valves. However, one of the postulated break locations is located between the two valves and the plant cannot meet the single failure criteria. Therefore,

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<b>Safety Related</b>	<b>Yes</b> X <b>No</b>	<b>Date:</b> 10/29/09	
<p>feedwater addition to the faulted steam generator must be isolated and the event will continue until the faulted steam generator empties.</p> <p>Attaining cold shutdown would be accomplished by the actions described in Sections 6.1 and 6.2.</p> <p>6.6 <u>Condensate</u></p> <p>The scope of the condensate system is from the #2 A&amp;B feedwater heater tube side outlet nozzles to the #3 A&amp; B feedwater heater inlet nozzles, the #3 A&amp; B feedwater outlet nozzles to the #4 A&amp;B feedwater inlet nozzles and the #4 A&amp;B feedwater heater outlet nozzles to the feedwater pump suction nozzles. The condensate return line from the steam generator blowdown heat exchangers is also included.</p> <p>The plant response to a HELB event in the system would be the same as a feedwater system HELB event.</p> <p>6.7 <u>Heater Drain Tank Pump Discharge</u></p> <p>This scope of the heater drain system is from the heater drain tank pump discharge nozzles to the connection to the common feedwater pump suction header.</p> <p>The plant response to a HELB event in the system would be the same as a feedwater system HELB event.</p> <p>6.8 <u>Extraction Steam</u></p> <p>The scope of the extraction steam system includes the extraction lines from the high pressure turbine nozzles to the #5 A&amp; B feedwater heater shell side inlet nozzles and the high pressure turbine exhaust nozzles to the #4 A&amp;B feedwater heaters and the heating steam system.</p> <p>The plant response to a HELB event in the system would be the same as a feedwater system HELB event.</p>			



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6.9 Heater & Reheater Vent and Drain Systems

The scope these systems is from #5 A&B feedwater heater drain nozzles to the heater drain tank, heater drain tank vent to #4 A&B feedwater heaters, #2 A&B, #3 A&B, #4 A&B, #5 A&B feedwater heater vent nozzles to various locations and reheater drain tank drain nozzles to the #5 A&B feedwater heaters and condensers.

The plant response to a HELB event in the system would be the same as a feedwater system HELB event.

6.10 Support System Flow Paths

The support systems include those portions of the Service Water, Component Cooling Water, Safety Injection, Control Room Ventilation, Reactor Protection, Diesel Generator, 4160/480v Electrical, etc. systems necessary to support the identified required equipment.

7.0 **Conclusions:**

Table 6.0-2 identifies the required equipment for each of the identified HELB events. Table 6.0-1 presents the required equipment in a format for FSAR Appendix A.2.

8.0 **Attachments:**

8.1 Piping and Instrument Drawings

8.2 Electrical and Logic Drawings



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Attachment 8.1

Piping and Instrument Drawing List

- 541F091, Sheet 1, Rev. 45, Unit 1 Reactor Coolant System
- 541F091, Sheet 3, Rev. 42, Unit 1 Reactor Coolant System
- 541F445, Sheet 1, Rev. 44, Unit 2 Reactor Coolant System
- 541F445, Sheet 3, Rev. 40, Unit 2 Reactor Coolant System
- 684J741, Sheet 2, Rev. 68, Unit 1 Chemical & Volume Control
- 684J741, Sheet 3, Rev. 15, Unit 1 Chemical & Volume Control
- 685J175, Sheet 2, Rev. 56, Unit 2 Chemical & Volume Control
- 685J175, Sheet 3, Rev. 16, Unit 2 Chemical & Volume Control
- 110E018, Sheet 2, Rev. 21, Unit 1 Auxiliary Coolant System
- 110E018, Sheet 3, Rev. 40, Unit 1 Auxiliary Coolant System
- 110E029 Sheet 2, Rev. 17, Unit 2 Auxiliary Coolant System
- 110E029, Sheet 3, Rev. 43, Unit 2 Auxiliary Coolant System
- 110E017, Sheet 1, Rev. 53, Unit 1 Safety Injection System
- 110E017, Sheet 2, Rev. 57, Unit 1 Safety Injection System
- 110E035, Sheet 1, Rev. 48, Unit 2 Safety Injection System
- 110E035, Sheet 2, Rev. 50, Unit 2 Safety Injection System
- PBM-227, Rev. 31, Radwaste Steam Supply



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Attachment 8.1 (Continued)

Piping and Instrument Drawing List

M-201, Sheet 1, Rev. 52, Unit 1 Main & Reheat Steam System

M-201, Sheet 3, Rev. 27, Unit 1 S. G. Blowdown System

M-2201, Sheet 1, Rev. 45, Unit 2 Main & Reheat Steam System

M-2201, Sheet 3, Rev. 28, Unit 2 S. G. Blowdown System

M-202, Sheet 2, Rev. 43, Unit 1 Feedwater System

M-2202, Sheet 2, Rev. 45, Unit 2 Feedwater System

M-207, Sheet 1, Rev. 64, Unit 1 Service Water

M-207, Sheet 1A, Rev. 25, Unit 1 Service Water

M-207, Sheet 2, Rev. 45, Unit 1 Service Water

M-207, Sheet 3, Rev. 58, Unit 1 Service Water

M-207, Sheet 4, Rev. 22, Unit 1 Service Water

M-2207, Sheet 1, Rev. 56, Unit 2 Service Water

M-2207, Sheet 2, Rev. 10, Unit 2 Service Water

M-209, Sheet 12, Rev. 19, Unit 1, EM. Diesel Air Starting Sys.

M-209, Sheet 14, Rev. 11, Unit 1 & 2 Starting & Service Air System Diesel Generator Building

M-209, Sheet 15, Rev. 11, Unit 1 & 2 Starting Air System Diesel Generator Building

M-217, Sheet 1, Rev. 73, Unit 1 & 2, Auxiliary Feedwater System



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## Attachment 8.1 (Continued)

### Piping and Instrument Drawing List

M-217, Sheet 2, Rev. 46, Unit 1 & 2 Auxiliary Feedwater System

M-219, Sheet 1, Rev. 42, Unit 1 Fuel Oil System

M-219, Sheet 2, Rev. 12, Unit 1 & 2 Fuel Oil System Diesel Generator Building

M-219, Sheet 3, Rev. 14, Unit 1 & 2 Fuel Oil System Diesel Generator Building

M-227, Sheet 1, Rev. 10, Unit 1 & 2 Glycol Cooling System Diesel Generator Building

M-227, Sheet 2, Rev. 9, Unit 1 & 2 Glycol Cooling System Diesel Generator Building

M-144, Sheet 2, Rev. 16, Unit 1 & 2 Heating & Ventilation Temperature Control



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## Attachment 8.2

### Electrical and Logic Drawings

883D195, Sheet 2, Rev. 09, Units 1 & 2 Reactor Trip Signals

883D195, Sheet 7, Rev. 21, Units 1 & 2 Safeguards Actuation Signals

883D195, Sheet 13, Rev. 05, Units 1 & 2 Pressurizer Trip Signals

883D195, Sheet 14, Rev. 08, Units 1 & 2 Steam Generator Trip Signals

POINT BEACH NUCLEAR PLANT HELB RECONSTITUTION PROGRAM FSAR APPENDIX A.2 REQUIRED EQUIPMENT LIST  
TABLE 6.0-1

COMPONENT ID	COMPONENT	ROOM	MS	FD	CV	SB
<b>A. MECHANICAL COMPONENTS</b>						
1(2)P-11A & B	Component Cooling Water Pumps	142 NE	X	X	X	X
1(2)P-15A & B	Safety Injection Pumps/1500 PSI	151 E	X	X	X	X
COMMON P38A & B.	Motor Driven Auxiliary Feedwater Pumps	304S & 304N	X	X	X	X
1(2)P-29	Turbine Driven Auxiliary Feedwater Pump	304S & 304N	X	X	X	X
1(2)P28A & B	Main Feed water pumps	301 NW & 583 SW	X	X		X
COMMON P32A,B,C,D,E, & F	Service Water Pumps	552	X	X	X	X
COMMON BS-2911 & DPIS	Service Water Strainer North Hdr	552	X	X	X	X
COMMON BS-2912 & DPIS	Service Water Strainer South Header	552	X	X	X	X
1(2)Z-27-1, -2, -3, & -4	Traveling Water Screens	552	X	X	X	X
COMMON G-01 & G-02	Emergency Diesel Generators Train "A"	308 & 309	X	X	X	X
T-60A-F & T-61A-F	Train A Diesel Generators G01 & G02 Redundant Starting Air Receivers	308 & 309	X	X	X	X
P-206A & P-207A	Train A DG G01 & G02 Fuel Oil Transfer Pumps	771	X	X	X	X
G-01-P-FTC1 & FTC2	G01 Fuel Oil to Bottoms Tank Pumps	308 & 309	X	X	X	X
G-02-P-FTC1 & FTC2	G02 Fuel Oil to Bottoms Tank Pumps	308 & 309	X	X	X	X
P-241A & P-241B	G01 & G02 DC Fuel Oil Pumps	308 & 309	X	X	X	X
W12A & B, W12C & D	Train A DG G01 & G02 Room Exhaust Fans	308 & 309 Ovrhds	X	X	X	X
COMMON G-03 & G-04	Emergency Diesel Generators Train "B"	770 & 775	X	X	X	X
T-170A -D & T-171A-D	Train B Diesel Generators G03 & G04 Redundant Starting Air Receivers	770 & 775	X	X	X	X
P-206B & P-207B	Train B DG G03 & G04 Fuel Oil Transfer Pumps	776	X	X	X	X
P-209A & P-209B	G03 & G04 DC Fuel Oil Pumps	770 & 775	X	X	X	X
W-181A1, A2, & A3	G03 Radiator HX-265A Glycol Cooling Fans	780	X	X	X	X
W-181B1, B2, & B3	G04 Radiator HX-265B Glycol Cooling Fans	783	X	X	X	X
COMMON W-183B & C	G03 EDG Rm Small & Large Fans	785	X	X	X	X
COMMON W-183C & B	G04 EDG Rm Small & Large Fans	784	X	X	X	X
W-13B1 & W13B2	Control Room Recirculation Fans	337	X	X		X
W-14A & W-14B	Control Room Charcoal Filter Fans	337	X	X		X
<b>B. AIR OPERATED CONTROL VALVES</b>						
1(2)CS-466	Main Feedwater Reg Valve for SG 1A	301 W & 583 W	X	X		X
1(2)CS-476	Main Feedwater Reg Valve for SG 1B	301 W & 583 W	X	X		X
1(2)CS-480	MFRV Bypass Valve for SG 1A	301 W & 583 W	X	X		X
1(2)CS-481	MFRV Bypass Valve for SG 1B	301 W & 583 W	X	X		X
1(2)MS-2090	TDAFWP 1(2)P-29 Service Water Bearing Cool	304S & 304N	X	X	X	X
1(2)AF-4002	TDAFWP 1(2)P-29 Minimum Recirculation Valve	304S & 304N	X	X	X	X
COMMON AF-4007 & 4014	MDAFWP P-38A & P-38B Minimum Recirculation Valves	304S & 304N	X	X	X	X
COMMON AF-4012 & 4019	MDAFWP P-38A & B Disch Pres Control Valves	304S & 304N	X	X	X	X
1(2)MS-5958	SG 1A & 2B Blowdown Containment Isolation Valves	511 & 611	X	X		X
1(2)MS-5959	SG 1B & 2A Blowdown Containment Isolation valves	511 & 611	X	X		X
1(2)MS-2018	Main Steam Isolation Valve for SG A	524 & 596	X	X	X	X
1(2)MS-2017	Main Steam Isolation Valve for SG B	524 & 596	X	X	X	X
1(2)MS-2016	Steam Generator A Atmospheric Relief Valves	524 & 596	X	X	X	X
1(2)MS-2015	Steam Generator B Atmospheric Relief Valves	524 & 596	X	X	X	X
1(2)RC-430	Pressurizer Power Operated Relief Valves	520 & 618	X	X	X	X

POINT BEACH NUCLEAR PLANT HELB RECONSTITUTION PROGRAM FSAR APPENDIX A.2 REQUIRED EQUIPMENT LIST  
TABLE 6.0-1

COMPONENT ID	COMPONENT	ROOM	MS	FD	CV	SB
1(2)RC-431C	Pressurizer Power Operated Relief Valves	520 & 618	X	X	X	X
1(2)RC-761A	RCP P-1A CCW Thermal Barrier Return Hi-Flow Isol	511 & 611	X	X	X	X
1(2)RC-761B	RCP P-1B CCW Thermal Barrier Return Hi Flow Isol	511 & 611	X	X	X	X
1(2)RC-371A	CVCS Letdown Line Containment Isolation Valve	511 & 611			X	
1(2)CV-200A, B, & C	CVCS Letdown Orifice Isolation Valves	511 & 611			X	
1(2)CV-371	CVCS Letdown Line Containment Isolation Valve	146 & 145			X	
1SW-12A & 2SW-12D	Component Cooling 1HX-12A & 2HX-12D CC OutletTemp Control Valves	237	X	X	X	X
COMMON SW-12B & 12C	Component Cooling HX-12B & HX-12C CC OutletTemp Control Valves	237	X	X	X	X
COMMON RS-SA-9	Unit 1 MS Supply to Radwaste Steam System	237	X			
COMMON RS-SA-10	Unit 2 MS Supply to Radwaste Steam System	237	X			
COMMON RS-SA-1	Radwaste Steam System Pressure Control Valve	238 E	X			
<b>C. MOTOR OPERATED VALVES</b>						
1(2)SI-825A & B	Safety Injection Pumps P-15A & B Combined Suction From RWST	151	X	X	X	X
1(2)SI-896A & B	Safety Injection Pump P-15A & B Individual Suctions From RWST	151	X	X	X	X
1(2)SI-866A	SI Train A Cold Leg Injection (P15A via MOV 878D & B)	155 & 162	X	X	X	X
1(2)SI-866B	SI Train B Redundant Cold Leg Injection (P15B via Manual SI-878E & F)	155 & 162	X	X	X	X
1(2)SI-878D & B	Safety Injection Loop A & B Cold Leg Injection	511 & 611	X	X	X	X
1(2)SI-878A & C	SI High Pressure Core Injection	511 & 611	X	X	X	X
1(2)MS-2020	TDAFWP 1(2)P-29 Steam Supply from SG 1A	326	X	X	X	X
1(2)MS-2019	TDAFWP 1(2)P-29 Steam Supply from SG 1B	326	X	X	X	X
1(2)MS-2082	TDAFWP 1(2)P-29 Trip and Throttle Valves	304S & 304N	X	X	X	X
1(2)AF-4001	TDAFWP 1(2)P-29 Discharge to SG 1A	304S & 304N	X	X	X	X
1(2)AF-4000	TDAFWP 1(2)P-29 Discharge to SG 1B	304S & 304N	X	X	X	X
1(2)AF-4006	TDAFWP 1(2)P-29 Suction from Service Water System	304S & 304N	X	X	X	X
COMMON AF-4009 & 4016	MDAFWP P-38A & B Suctions from Service Water respectively	304S & 304N	X	X	X	X
COMMON AF-4023 & 4022	MDAFWP P-38A Disch to Steam Generator 1A & 2A respectively	304S	X	X	X	X
COMMON AF-4021 & 4020	MDAFWP P-38B Disch to Steam Generator 1B & 2B respectively	304N	X	X	X	X
COMMON SW-2891 & 2870	South Service Water Header Isolation valves	304S & 187	X	X	X	X
COMMON SW-2890 & 2869	North Service Water Header Isolation valves	304S & 187	X	X	X	X
COMMON SW-2816	South SW Hdr Supply to Primary Auxilliary Building Cooling (Redundant)	187	X	X	X	X
COMMON SW-4479	South SW Hdr Supply to Primary Auxilliary Building Cooling (Redundant)	187	X	X	X	X
COMMON SW-2817	North SW Hdr Supply to Water Treatment & Area Cooling (Redundant)	304N	X	X	X	X
COMMON SW-4478	North SW Hdr Supply to Water Treatment & Area Cooling (Redundant)	304N	X	X	X	X
COMMON SW-2927A	West SW Hdr Supply to Spent Fuel Cooling, HX-13A Inlet	238	X	X	X	X
COMMON SW-2930A	Spent Fuel Cooling Heat Exchanger HX-13A SW Outlet	238	X	X	X	X
COMMON SW-2927B	West SW Hdr Supply to Spent Fuel Cooling, HX-13B Inlet	238	X	X	X	X
COMMON SW-2930B	Spent Fuel Cooling Heat Exchange HX-13B SW Outlet	238	X	X	X	X
1(2)SW-2907 & 2908	CONT Coolers 1(2)HX-15A-D SW Combined Return (Parallel Valves)	187	X	X	X	X
1(2)RC-516 & 515	Pressurizer PORV 430 & 431C Isolation Valves	520 & 618	X	X	X	X
1(2)RC-427	Letdown Line In-Loop Isolation (from Loop B Cold Leg)	515 & 615			X	
1(2)CC-719	Component Cooling Supply to Containment	140 & 137	X	X	X	X
1(2)CC754A & B	Component Cooling Supply to RCP P-1A & P-1B	140 & 137	X	X	X	X
1(2)CC-759A & B	Component Cooling Return From RCP P-1A & P-1B	140 & 137	X	X	X	X
1(2)CS-2190 & 2189	Feedwater Pump P-28A & P-28B Discharge Valves	301 NW & 583 SW	X	X		X
<b>D. SOLENOID VALVES</b>						

POINT BEACH NUCLEAR PLANT HELB RECONSTITUTION PROGRAM FSAR APPENDIX A.2 REQUIRED EQUIPMENT LIST  
TABLE 6.0-1

COMPONENT ID	COMPONENT	ROOM	MS	FD	GV	SB
COMMON DA-6318A-S	G01 Diesel Generator Starting Air (from T-60A, B, & C) (+DA-3057B)	308	X	X	X	X
COMMON DA-6318B-S	G01 Diesel Generator Starting Air (from T-60D, E, & F) (+DA-3057A)	308	X	X	X	X
COMMON DA-6319A-S	G02 Diesel Generator Starting Air (from T61A, B, & C) (+DA-3058B)	309	X	X	X	X
COMMON DA-6319B-S	G02 Diesel Generator Starting Air (from T61D, E, & F) (+DA-3058A)	309	X	X	X	X
COMMON DA-6360A-S	G03 Diesel Generator Starting Air (from T-170A & B) (+DA-6364A)	770	X	X	X	X
COMMON DA-6360B-S	G03 Diesel Generator Starting Air (from T-170C & D) (+DA-6364B)	770	X	X	X	X
COMMON DA-6361A-S	G04 Diesel Generator Starting Air (from T-171A & B) (+DA-6365A)	775	X	X	X	X
COMMON DA-6361B-S	G04 Diesel Generator Starting Air (from T-171C & D) (+DA-6365B)	775	X	X	X	X
COMMON AF-4007 & 4014	MDAFWP P-38A & B Service Water Bearing Cooling	304S & 304N	X	X	X	X
<b>E. INSTRUMENTATION</b>						
1(2) N-00041	NIS Power Range 41	326	X	X	X	X
1(2) N-00042	NIS Power Range 42	326	X	X	X	X
1(2) N-00043	NIS Power Range 43	326	X	X	X	X
1(2) N-00044	NIS Power Range 44	326	X	X	X	X
1(2) N-00035	NIS Intermediate Range 35	326	X	X	X	X
1(2) N-00036	NIS Intermediate Range 36	326	X	X	X	X
1(2) N-00031	NIS Source Range 31	326	X	X	X	X
1(2) N-00032	NIS Source Range 32	326	X	X	X	X
1(2) N-00040	Gamma-Metrics Flux Monitor - Wide Range	304N	X	X	X	X
1(2) TE-401A & B	CH-1 Red T-hot & T-cold Loop A Temperature Sensor (RTD's)	511 & 611	X	X	X	X
1(2) TE-402A & B	CH-2 White T-hot & T-cold Loop A Temperature Sensor (RTD's)	511 & 611	X	X	X	X
1(2) TE-403A & B	CH-3 Blue T-hot & T-cold Loop B Temperature Sensor (RTD's)	511 & 611	X	X	X	X
1(2) TE-404A & B	CH-4 Yellow T-hot & T-cold Loop B Temperature Sensor (RTD's)	511 & 611	X	X	X	X
1(2) TE-405A & B	RC Loop A T-hot & T-cold Temp Sensor (RTD's) SPARE	511 & 611	X	X	X	X
1(2) TE-406A & B	RC Loop A T-hot & T-cold Temp Sensor (RTD's) SPARE	511 & 611	X	X	X	X
1(2) TE-407A & B	RC Loop B T-hot & T-cold Temp Sensor (RTD's) SPARE	511 & 611	X	X	X	X
1(2) TE-408A & B	RC Loop B T-hot & T-cold Temp Sensor (RTD's) SPARE	511 & 611	X	X	X	X
1(2) PT-420A	RC Loop A Intermediate Leg Wide Range Pressure	511 & 611	X	X	X	X
1(2) PT-420B	RC Loop B Intermediate Leg Wide Range Pressure	511 & 611	X	X	X	X
1(2) PT-420C	RC Loop A Hot Leg Wide Range Pressure	516 & 615	X	X	X	X
1(2) TE-450A	RC Loop A Wide Range Cold Leg Temp RTD	516 & 615	X	X	X	X
1(2) TE-450B	RC Loop A Wide Range Hot Leg Temp RTD	516 & 615	X	X	X	X
1(2) TE-450C	RC Loop A Wide Range Cold Leg Temp RTD	516 & 615	X	X	X	X
1(2) TE-450D	RC Loop A Wide Range Hot Leg Temp RTD	516 & 615	X	X	X	X
1(2) TE-451A	RC Loop B Wide Range Cold Leg Temp RTD	516 & 615	X	X	X	X
1(2) TE-451B	RC Loop B Wide Range Hot Leg Temp RTD	516 & 615	X	X	X	X
1(2) TE-451C	RC Loop B Wide Range Cold Leg Temp RTD	516 & 615	X	X	X	X
1(2) TE-451D	RC Loop B Wide Range Hot Leg Temp RTD	516 & 615	X	X	X	X
1(2) LT-426	Pressurizer Level Narrow Range Transmitter	516 & 615	X	X	X	X
1(2) LT-427	Pressurizer Level Narrow Range Transmitter	516 & 615	X	X	X	X
1(2) LT-428	Pressurizer Level Narrow Range Transmitter	516 & 615	X	X	X	X
1(2) PT-429	Pressurizer Pressure Transmitter	516 & 615	X	X	X	X
1(2) PT-430	Pressurizer Pressure Transmitter	516 & 615	X	X	X	X
1(2) PT-431	Pressurizer Pressure Transmitter	516 & 615	X	X	X	X
1(2) PT-449	Pressurizer Pressure Transmitter	516 & 615	X	X	X	X
1(2) TE-424	Pressurizer Liquid Space RTD	516 & 615	X	X	X	X

POINT BEACH NUCLEAR PLANT HELB RECONSTITUTION PROGRAM FSAR APPENDIX A.2 REQUIRED EQUIPMENT LIST  
TABLE 6.0-1

COMPONENT ID	COMPONENT	ROOM	MS	FD	CV	SB
1(2) TE-425	Pressurizer Vapor Space RTD	516 & 615	X	X	X	X
1(2) LT-461	Steam Generator 1A Level Transmitter	511 & 611	X	X	X	X
1(2) LT-462	Steam Generator 1A Level Transmitter	511 & 611	X	X	X	X
1(2) LT-463	Steam Generator 1A Level Transmitter	511 & 611	X	X	X	X
1(2) LT-471	Steam Generator 1B Level Transmitter	511 & 611	X	X	X	X
1(2) LT-472	Steam Generator 1B Level Transmitter	511 & 611	X	X	X	X
1(2) LT-473	Steam Generator 1B Level Transmitter	511 & 611	X	X	X	X
1(2) LT-460A & 460B	Steam Generator 1A Wide Range Level Transmitter	511 & 611	X	X	X	X
1(2) LT-470A & 470B	Steam Generator 1B Wide Range Level Transmitter	511 & 611	X	X	X	X
1(2) PT-468	Steam Generator 1A Pressure Transmitter	238	X	X	X	X
1(2) PT-469	Steam Generator 1A Pressure Transmitter	238	X	X	X	X
1(2) PT-482	Steam Generator 1A Pressure Transmitter	238	X	X	X	X
1(2) PT-478	Steam Generator 1B Pressure Transmitter	272 & 273	X	X	X	X
1(2) PT-479	Steam Generator 1B Pressure Transmitter	272 & 273	X	X	X	X
1(2) PT-483	Steam Generator 1B Pressure Transmitter	272 & 273	X	X	X	X
1(2) FT-464 & 465	1A Main Steam Line Flow Transmitter	520 & 618	X	X	X	X
1(2) FT-474 & 475	1B Main Steam Line Flow Transmitter	520 & 618	X	X	X	X
1(2) FT-466 & 467	1A Main Feedwater Line Flow Transmitter	360 & 224	X	X		X
1(2) FT-476 & 477	1B Main Feedwater Line Flow Transmitter	360 & 224	X	X		X
1(2) FT-4002	1(2)P-29 Discharge Flow Transmitter	304S & 304N	X	X	X	X
COMMON FT-4007 & 4014	P-38A & B Discharge Flow Transmitter	304S & 304N	X	X	X	X
1(2) FT-4036 & 4037	Auxiliary Feedwater to SG 1A & 1B Flow Transmitter	142	X	X	X	X
COMMON PT-4042	P-38A AFP Suction Pressure Transmitter (Includes pump trip protection)	304S	X	X	X	X
COMMON PT-4043	P-38B AFP Suction Pressure Transmitter (Includes pump trip protection)	304N	X	X	X	X
1(2) PT-4044	1(2) P-29 AFP Suction Pressure Transmitters (plus pump trip protection)	304S & 304N	X	X	X	X
1(2) RE-231	1A Main Steam Line Release Radiation Monitor	524 NW & 596 SW	X			
1(2) RE-232	1B Main Steam Line Release Radiation Monitor	524 E & 596 E	X			
1(2) FIC-609	Reactor Coolant Pump P-1A CC Return Flow	142 S & N	X	X	X	X
1(2) FIC-613	Reactor Coolant Pump P-1B CC Return Flow	142 S & N	X	X	X	X
1(2) FIS-650	Safety Injection P-15A/B CC Return Flow	151 West	X	X	X	X
1FT-134	CVCS Letdown Line Flow	151 West				X
2FT-134	CVCS Letdown Line Flow	142 North				X
1(2) LT-972	Refueling Water Storage Tank Level	524 NE & 596 SE	X	X	X	X
1(2) LT-973	Refueling Water Storage Tank Level	524 NE & 596 SE	X	X	X	X
1(2) FT-925	P-15A Safety Injection Flow	159 & 162	X	X	X	X
1(2) FT-924	P-15B Safety Injection Flow	159 & 162	X	X	X	X
COMMON LT-4038	Condensate Water Storage Tank T-24A Level	301 NE	X	X		X
COMMON LT-4040	Condensate Water Storage Tank T-24A Level	301 NE	X	X		X
COMMON LT-4039	Condensate Water Storage Tank T-24B Level	301 NE	X	X		X
COMMON LT-4041	Condensate Water Storage Tank T-24B Level	301 NE	X	X		X
COMMON PT-2844 & 2845	North & South SW Header Pressure Transmitter	309 & 308	X	X	X	X
INCORE THERMOCOUPLES	(39 thermocouples per unit)					
1(2) TR-00001A	Core Exit T/C Digital Recorder	326	X	X	X	X
1(2) TR-00001B	Core Exit T/C Digital Recorder	326	X	X	X	X

POINT BEACH NUCLEAR PLANT HELB RECONSTITUTION PROGRAM FSAR APPENDIX A.2 REQUIRED EQUIPMENT LIST  
TABLE 6.0-1

COMPONENT ID	COMPONENT	ROOM	MS	FD	CV	SB
<b>SUBCOOLING</b>						
	(Uses 4 thermocouples/unit)					
1(2) TSS-970	RTD/T/C Input to 1(2) TI-970	326	X	X	X	X
1(2) TSS-971	RTD/T/C Input to 1(2) TI-971	326	X	X	X	X
1(2) TI-970	ASIP Subcooling Digital Indicator	326	X	X	X	X
1(2) TI-971	ASIP Subcooling Digital Indicator	326	X	X	X	X
<b>RVLIS TRAIN "A"</b>						
1(2) TE-499	RV LT Head Vent Sensing T/C	511 & 611	X	X	X	X
1(2) TE-500	RV LT Head Vent Sensing T/C	505 & 611	X	X	X	X
1TE-501	RV LT Thimble Sensing T/C	520	X	X	X	X
2TE-501	RV LT Thimble Sensing T/C	NA (In RV keyway)	X	X	X	X
1(2) TE-502	RV LT Thimble Sensing T/C	505 & 608	X	X	X	X
1TE-503 (Unit 1 Only)	RV LT Thimble Sensing T/C	505	X	X	X	X
1(2) LT-494 & 496	RV Narrow Range Level Transmitter	505 & 608	X	X	X	X
1(2) LI-494 & 496	RV Narrow Range Level Indicators	326	X	X	X	X
<b>RVLIS TRAIN "B"</b>						
1(2) TE-506	RV LT Head Vent Sensing T/C	511 & 611	X	X	X	X
1(2) TE-507	RV LT Head Vent Sensing T/C	505 & 608	X	X	X	X
1TE-508	RV LT Thimble Sensing T/C	520	X	X	X	X
2TE-508	RV LT Thimble Sensing T/C	NA (In RV keyway)	X	X	X	X
1(2) TE-509	RV LT Thimble Sensing T/C	NA (In RV keyway)	X	X	X	X
1TE-510 (Unit 1 Only)	RV LT Thimble Sensing T/C	505	X	X	X	X
1(2) LT-495 & 497	RV Narrow Range Level Transmitter	505 & 611	X	X	X	X
1(2) LI-495 & 497	RV Narrow Range Level Indicators	326	X	X	X	X
1(2) Manual SI Push Buttons	Manual SI Actuation Push Buttons (Each PB Train "A" + "B")	326	X	X	X	X
1(2) Train "A" Block SI CS	SI-A Manual Block/Auto Unblock Control Switch	326	X	X	X	X
1(2) Train "B" Block SI CS	SI-B Manual Block/Auto Unblock Control Switch	326	X	X	X	X
1(2) MS-2018-CS	SG 1A MSIV 2018 Control Switch (Each CS Train "A" + "B")	326	X	X	X	X
1(2) MS-2017-CS	SG 1B MSIV 2017 Control Switch (Each CS Train "A" + "B")	326	X	X	X	X
U1(2) Train "A" Rx Trip PB's	Reactor Trip Breaker Push Button for RTA & BYB	326	X	X	X	X
U1(2) Train "B" Rx Trip PB's	Reactor Trip Breaker Push Button for RTB & BYA	326	X	X	X	X
1(2) 52-RTA & BYA	Reactor Trip Bkrs RTA & BYA [Both on 1(2)C-41]	245 & 246	X	X	X	X
1(2) 52-RTB & BYB	Reactor Trip Bkrs RTB & BYB [Both on 1(2)C-41]	245 & 246	X	X	X	X
DC SYSTEM STATUS	VOLTS & AMPS for all 5 Safety Related Batteries + Charger Status	326	X	X	X	X
COMMON D05	Battery D05 - Train "A" RED	307	X	X	X	X
COMMON D06	Battery D06 - Train "B" BLUE	306	X	X	X	X
COMMON D305	Swing Battery D305	301 NE	X	X	X	X
COMMON D105	Battery D105, WHITE	228	X	X	X	X
COMMON D106	Battery D106, YELLOW	225	X	X	X	X
COMMON D109	Swing Charger D109	227	X	X	X	X
DIESEL GENERATOR STATUS	G01, G02, G03, & G04 KILOWATTS & FREQUENCY	326	X	X	X	X
1(2) A05	4160 Volt Train A Switchgear	305	X	X	X	X
1(2) A06	4160 Volt Train B Switchgear	773 & 777	X	X	X	X
1(2) B03	480 Volt Train A Switchgear	318 S & N	X	X	X	X
1(2) B04	480 Volt Train B Switchgear	318 S & N	X	X	X	X
VITAL AC SYSTEM STATUS	SAFEGUARDS VOLTS 1(2)A05/A06 & 1(2)B03/B04 + Bkr Status	326	X	X	X	X
1(2) T-001C	200 KW Pressurizer Backup Heater Group C	516 & 615	X	X	X	X
1(2) T-001D	200 KW Pressurizer Backup Heater Group D	516 & 615	X	X	X	X

POINT BEACH NUCLEAR PLANT  
HEL B RECONSTRUCTION PROGRAM  
BASELINE REQUIRED EQUIPMENT LIST  
TABLE 6.0-2

Calculation PBNP-994-21-15  
Rev. 0

COMPONENT ID	COMPONENT DESCRIPTION	GOTHIC ROOM	COMPONENT LOCATION	MS	FD	CV	SB
<b>A. MECHANICAL COMPONENTS</b>							
1(2)P-11A & B	Component Cooling Water Pumps	142 NE	PAB 8'	X	X	X	X
1(2)P-15A & B	Safety Injection Pumps/1500 PSI	151 E	PAB 8'	X	X	X	X
COMMON P38A & B	Motor Driven Auxiliary Feedwater Pumps	304S & 304N	CB/AFWPR 8'	X	X	X	X
1(2)P-29	Turbine Driven Auxiliary Feedwater Pump	304S & 304N	CB/AFWPR 8'	X	X	X	X
1(2)P28A & B	Main Feed water pumps	301 NW & 583 SW	8' TB1/TB2 8'	X	X		X
COMMON P32A,B,C,D,E, & F	Service Water Pumps	552	CWPH 8'	X	X	X	X
COMMON BS-2911 & DPIS	Service Water Strainer North Hdr	552	CWPH 8'	X	X	X	X
COMMON BS-2912 & DPIS	Service Water Strainer South Header	552	CWPH 8'	X	X	X	X
1(2)Z-27-1, -2, -3, & -4	Traveling Water Screens	552	CWPH 8'	X	X	X	X
COMMON K-2A & B	Instrument Air Compressors	310	CB/AIR COMP RM 8'	X	X	X	X
COMMON G-01 & G-02	Emergency Diesel Generators Train "A"	308 & 309	8' CB G01 & G02 Rm	X	X	X	X
T-60A-F & T-61A-F	Train A Diesel Generators G01 & G02 Redundant Starting Air Receivers	308 & 309	8' CB G01 & G02 Rm	X	X	X	X
P-206A & P-207A	Train A DG G01 & G02 Fuel Oil Transfer Pumps	771	DG BLDG 28'	X	X	X	X
G-01-P-FTC1 & FTC2	G01 Fuel Oil to Bottoms Tank Pumps	308 & 309	8' CB G01 & G02 Rm	X	X	X	X
G-02-P-FTC1 & FTC2	G02 Fuel Oil to Bottoms Tank Pumps	308 & 309	8' CB G01 & G02 Rm	X	X	X	X
P-241A & P-241B	G01 & G02 DC Fuel Oil Pumps	308 & 309	8' CB G01 & G02 Rm	X	X	X	X
W12A & B \ W12C & D	Train A DG G01 & G02 Room Exhaust Fans	308 & 309 Ovrhd	CB 26' West of CST's	X	X	X	X
COMMON G-03 & G-04	Emergency Diesel Generators Train "B"	770 & 775	DG BLDG 28'	X	X	X	X
T-170A-D & T-171A-D	Train B Diesel Generators G03 & G04 Redundant Starting Air Receivers	770 & 775	DG BLDG 28'	X	X	X	X
P-206B & P-207B	Train B DG G03 & G04 Fuel Oil Transfer Pumps	776	DG BLDG 28'	X	X	X	X
P-209A & P-209B	G03 & G04 DC Fuel Oil Pumps	770 & 775	DG BLDG 28'	X	X	X	X
W-181A1, A2, & A3	G03 Radiator HX-265A Glycol Cooling Fans	780	DG BLDG 50'	X	X	X	X
W-181B1, B2, & B3	G04 Radiator HX-265B Glycol Cooling Fans	783	DG BLDG 50'	X	X	X	X
COMMON W-183B & C	G03 EDG Rm Small & Large Fans	785	DG BLDG 50'	X	X	X	X
COMMON W-183C & B	G04 EDG Rm Small & Large Fans	784	DG BLDG 50'	X	X	X	X
W-13B1 & W-13B2	Control Room Recirculation Fans	337	CB/H&V ROOM 60'	X	X		X
W-14A & W-14B	Control Room Charcoal Filter Fans	337	CB/H&V ROOM 60'				
HX-107A	Control/Cable Spreading Room Backup IA Dryer	337	CB/H&V ROOM 60'	X	X		X
<b>B. AIR OPERATED CONTROL VALVES</b>							
1(2)IA-3047	U1(2)C Instrument Air Inlet Header Control	140 & 137	26' PW-2/PW-3 26'	X	X	X	X
1(2)IA-3048	U1(2)C Instrument Air Inlet Header Control	140 & 137	26' PW-2/PW-3 26'	X	X	X	X
1(2)CS-2180	Main Feed Pump 28A minimum recirc valve	301 NW & 583 SW	8' TB1/TB2 8'	X	X		X
1(2)CS-2188	Main Feed Pump 28B minimum recirc valve	301 NW & 583 SW	8' TB1/TB2 8'	X	X		X
1(2)CS-466	Main Feedwater Reg Valve for SG 1A	301 W & 583 W	26' TB1/TB2 26'	X	X		X
1(2)CS-476	Main Feedwater Reg Valve for SG 1B	301 W & 583 W	26' TB1/TB2 26'	X	X		X
1(2)CS-480	MFRV Bypass Valve for SG 1A	301 W & 583 W	26' TB1/TB2 26'	X	X		X
1(2)CS-481	MFRV Bypass Valve for SG 1B	301 W & 583 W	26' TB1/TB2 26'	X	X		X
1(2)MS-2090	TDAFWP 1(2)P-29 Service Water Bearing Cool	304S & 304N	CB/AFPR 8'	X	X	X	X
1(2)AF-4002	TDAFWP 1(2)P-29 Minimum Recirculation Valve	304S & 304N	CB/AFPR 8'	X	X	X	X
COMMON AF4007 & 4014	MDAFWP P-38A & P-38B Minimum Recirculation Valves	304S & 304N	CB/AFPR 8'	X	X	X	X
COMMON AF4012 & 4019	MDAFWP P-38A & B Disch Pres Control Valves	304S & 304N	CB/AFPR 8'	X	X	X	X

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			A. MECHANICAL COMPONENTS
4	B03 & B04	EOP 0 ATT A, 0.1, 0.2, 1, 1.2, ECA 1.2	1(2)P-11A & B
3	A05 & A06	EOP 0, 0 ATT A, 0.0, 0.2, 1, 1FO, 1.2, 1.2 FO, ECA 1.2	1(2)P-15A & B
4	1B03 & 2B04 (NOTE: These will change to 4.16KV under MR 04-017A & B)	EOP 0, 0.1, 1, 2	COMMON P38A & B
3	Main Steam	EOP 0, 0.1	1(2)P-29
1	A01 & A02...Non-Safeguards	EOP 0, 0.1, 2	1(2)P28A & B
4	P32A-1B03, B-1B03, C-1B04, D-2B04, E-2B04, & F-2B03	EOP 0 ATT A	COMMON P32A, B, C, D, E, & F
4	2B43 from Norm 2B01 or Alt 2B02 & SLELP-3... BS non safeguards, DPIS is.	In Support of Other Required Equipment	COMMON BS-2911 & DPIS
4	SLELP 3 Breakers 9 & 5 respectively (1B42) Both Safeguards.	In Support of Other Required Equipment	COMMON BS-2912 & DPIS
4	(1(2) B43 from Norm 1(2)B01 or Alt 1(2)B02... Redundant non safeguards)	In Support of Other Required Equipment	1(2)Z-27-1, -2, -3, & -4
4	1B32 & 2B42	EOP 0, 0.1, 1	COMMON K-2A & B
3	Multiple train A supplies... AC and DC. Cooled by SW System	EOP 0, 1, 1.2	COMMON G-01 & G-02
1	NA	In Support of Other Required Equipment	T-60A-F & T-61A-F
3	1B30 & 2B30 from 1(2)B32	In Support of Other Required Equipment	P-206A & P-207A
3	480 VAC from G-01 Gen, via shared breaker in C-64	In Support of Other Required Equipment	G-01-P-FTC1 & FTC2
3	480 VAC from G-02 Gen, via shared breaker in C-65	In Support of Other Required Equipment	G-02-P-FTC1 & FTC2
3	RED D26-07 via C78-05 & White D31-08 via C79-05	In Support of Other Required Equipment	P-241A & P-241B
3	W12A-1B32, W12B, C, D all 2B32	In Support of Other Required Equipment	W12A & B \ W12C & D
3	Multiple train B supplies... AC and DC. Cooled by Forced Air Glycol HEX's	EOP 0, 1, 1.2	COMMON G-03 & G-04
1	NA	In Support of Other Required Equipment	T-170A-D & T-171A-D
3	1B40 & 2B40 from 1(2)A06	In Support of Other Required Equipment	P-206B & P-207B
3	C-81 from Norm D28-01 or 09 Alt & C82 from Norm D40-01 or 09 Alt.	In Support of Other Required Equipment	P-209A & P-209B
3	1B40 from 1A06	In Support of Other Required Equipment	W-181A1, A2, & A3
3	2B40 from 2A06	In Support of Other Required Equipment	W-181B1, B2, & B3
3	BOTH 1B40 from 1A06	In Support of Other Required Equipment	COMMON W-183B & C
3	BOTH 2B40 from 2A06	In Support of Other Required Equipment	COMMON W-183C & B
3	2B32 & 1B42	EOP 0, 0.1, 1, ECA 1.2	W-13B1 & W-13B2
3	1B32 & 2B42	EOP 0.1	W-14A & W-14B
3	1Y06-17	In Support of Other Required Equipment	HX-107A
			B. AIR OPERATED CONTROL VALVES
4	MOB-106/D17-03 & MOB161/D17-08	EOP 0, 1	1(2)JA-3047
4	MOB-110/D19-03 & MOB-165/D19-08	EOP 0, 1	1(2)JA-3048
1	MOB-70/1Y05 & MOB-270/2Y05 (1(2)Y05 are non-safeguards)	In Support of Other Required Equipment	1(2)CS-2180
1	MOB-70/1Y05 & MOB-270/2Y05 (1(2)Y05 are non-safeguards)	In Support of Other Required Equipment	1(2)CS-2188
1	MOB-84/D18-13 & MOB-254/D18-13	EOP 0, 0.1, 2, ECA 1.2 FO	1(2)CS-466
1	MOB-65/D18-13 & MOB-265/D18-13	EOP 0, 0.1, 2, ECA 1.2 FO	1(2)CS-476
1	MOB-89/D18-13 & MOB-259/D18-13	EOP 0, 0.1, 2, ECA 1.2 FO	1(2)CS-480
1	MOB-66/D18-13 & MOB-266/D18-13	EOP 0, 0.1, 2, ECA 1.2 FO	1(2)CS-481
3	MOB-71/1Y06 & MOB-271/240/2Y06	In Support of Other Required Equipment	1(2)MS-2090
3	D13-05 & D14-15	In Support of Other Required Equipment	1(2)AF-4002
4	D11-11 & D13-11	In Support of Other Required Equipment	COMMON AF4007 & 4014
4	MOB-271Y01 & MOB-281/2Y02	EOP 0.1	COMMON AF4012 & 4019

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1(2)MS-5958	SG 1A & 2B Blowdown Containment Isolation Valves	511 & 611	CONT 21' E	X	X		X
1(2)MS-5959	SG 1B & 2A Blowdown Containment Isolation Valves	511 & 611	CONT 21' E	X	X		X
1(2)MS-2042	SG 1A & 2A Blowdown Header Control Valve	524 & 596	FAÇADE 26' E	X	X		X
1(2)MS-2045	SG 1B & 2B Blowdown Header Control Valve	524 & 596	FAÇADE 26' E	X	X		X
1(2)MS-2018	Main Steam Isolation Valve for SG A	524 & 596	FAÇADE 88' NE & SE	X	X	X	X
1(2)MS-2017	Main Steam Isolation Valve for SG B	524 & 596	FAÇADE 88' E	X	X	X	X
1(2)MS-2016	Steam Generator A Atmospheric Relief Valves	524 & 596	FAÇADE 88' NE & SE	X	X	X	X
1(2)MS-2015	Steam Generator B Atmospheric Relief Valves	524 & 596	FAÇADE 88' E	X	X	X	X
1(2)RC-430	Pressurizer Power Operated Relief Valves	520 & 618	CONT 76' in Pzr cubicle	X	X	X	X
1(2)RC-431C	Pressurizer Power Operated Relief Valves	520 & 618	CONT 76' in Pzr cubicle	X	X	X	X
1(2)RC-761A	RCP P-1A CCW Thermal Barrier Return Hi-Flow Isol	511 & 611	CONT 21' W	X	X	X	X
1(2)RC-761B	RCP P-1B CCW Thermal Barrier Return Hi Flow Isol	511 & 611	CONT 21' E	X	X	X	X
1(2)RC-371A	CVCS Letdown Line Containment Isolation Valve	511 & 611	CONT 21' E				X
1(2)CV-200A, B, & C	CVCS Letdown Onifice Isolation Valves	511 & 611	CONT 21' at Regen Hex				X
1(2)CV-371	CVCS Letdown Line Containment Isolation Valve	146 & 145	PAB 8' at NonRegen Hex				X
1SW-12A & 2SW-12D	Component Cooling 1HX-12A & 2HX-12D CC OutletTemp Control Valves	237	PAB 46' East	X	X	X	X
COMMON SW-12B & 12C	Component Cooling HX-12B & HX-12C CC OutletTemp Control Valves	237	PAB 46' East	X	X	X	X
COMMON TV-LW-61	SW to 1(2)HX-150 SG B/D Tank Condensers & SG B/D Evap	187	PAB 26' NE of MT's	X	X	X	X
COMMON TV-LW-62	SW from 1(2)HX-150 SG B/D Tank Condensers & SG B/D Evap	187	PAB 26' W of MT's	X	X	X	X
COMMON RS-SA-9	Unit 1 MS Supply to Radwaste Steam System	237	PAB 46' East	X			
COMMON RS-SA-10	Unit 2 MS Supply to Radwaste Steam System	237	PAB 46' East	X			
COMMON RS-SA-1	Radwaste Steam System Pressure Control Valve	238 E	PAB 46' East	X			
<b>C. MOTOR OPERATED VALVES</b>							
1(2)SI-825A & B	Safety Injection Pumps P-15A & B Combined Suction From RWST	151	PAB 8' near P15's	X	X	X	X
1(2)SI-896A & B	Safety Injection Pump P-15A & B Individual Suctions From RWST	151	PAB 8' near P15's	X	X	X	X
1(2)SI-866A	SI Train A Cold Leg Injection (P15A via MOV 878D & B)	155 & 162	PW1/17/PW4	X	X	X	X
1(2)SI-866B	SI Train B Redundant Cold Leg Injection (P15B via Manual SI-878E & F)	155 & 162	PW1/17/PW4	X	X	X	X
1(2)SI-878D & B	Safety Injection Loop A & B Cold Leg Injection	511 & 611	CONT 21' SE & NE	X	X	X	X
1(2)SI-878A & C	SI High Pressure Core Injection	511 & 611	CONT 21' SE & NE	X	X	X	X
1(2)MS-2020	TDAFWP 1(2)P-29 Steam Supply from SG 1A	237	PAB 46' SE & NE	X	X	X	X
1(2)MS-2019	TDAFWP 1(2)P-29 Steam Supply from SG 1B	237	PAB 46' SE & NE	X	X	X	X
1(2)MS-2082	TDAFWP 1(2)P-29 Trip and Throttle Valves	304S & 304N	CB/AFWPR 8'	X	X	X	X
1(2)AF-4001	TDAFWP 1(2)P-29 Discharge to SG 1A	304S & 304N	CB/AFWPR 8'	X	X	X	X
1(2)-4000	TDAFWP 1(2)P-29 Discharge to SG 1B	304S & 304N	CB/AFWPR 8'	X	X	X	X
1(2)AF-4006	TDAFWP 1(2)P-29 Suction from Service Water System	304S & 304N	CB/AFWPR 8'	X	X	X	X
COMMON AF-4009 & 4016	MDAFWP P-38A & B Suctions from Service Water respectively	304S & 304N	CB/AFWPR 8'	X	X	X	X
COMMON AF-4023 & 4022	MDAFWP P-38A Disch to Steam Generator 1A & 2A respectively	304S	CB/AFWPR 8'	X	X	X	X
COMMON AF-4021 & 4020	MDAFWP P-38B Disch to Steam Generator 1B & 2B respectively	304N	CB/AFWPR 8'	X	X	X	X
COMMON SW-2891 & 2870	South Service Water Header Isolation valves (Both 1B32)	552 & 187	CWPH 8' & PAB 26' SW	X	X	X	X
COMMON SW-2890 & 2869	North Service Water Header Isolation valves (Both 2B42)	552 & 187	CWPH 8' & PAB 26' NW	X	X	X	X
COMMON SW-2816	South SW Hdr Supply to Primary Auxiliary Building Cooling (Redundant)	187	PAB 26' SE	X	X	X	X
COMMON SW-4479	South SW Hdr Supply to Primary Auxiliary Building Cooling (Redundant)	187	PAB 26' SE	X	X	X	X
COMMON SW-2817	North SW Hdr Supply to Water Treatment & Area Cooling (Redundant)	304N	CB/AFWPR 8' NW	X	X	X	X
COMMON SW-4478	North SW Hdr Supply to Water Treatment & Area Cooling (Redundant)	304N	CB/AFWPR 8' NW	X	X	X	X
COMMON SW-2927A	West SW Hdr Supply to Spent Fuel Cooling, HX-13A Inlet	238 W	PAB 46' W	X	X	X	X
COMMON SW-2930A	Spent Fuel Cooling Heat Exchanger.....HX-13A Outlet	238 W	PAB 46' W	X	X	X	X
COMMON SW-2927B	West SW Hdr Supply to Spent Fuel Cooling, HX-13B Inlet	238 W	PAB 46' W	X	X	X	X
COMMON SW-2930B	Spent Fuel Cooling Heat Exchanger.....HX-13B Outlet	238 W	PAB 46' W	X	X	X	X
1(2)SW-2907 & 2908	CONT Coolers 1(2)HX-15A-D SW Combined Return (Parallel Valves)	187	PAB 26' S & N	X	X	X	X

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4	MOB-58/D16-07 & MOB-334/D22-07	EOP 2	1(2)MS-5958
4	MOB-59/D16-07 & MOB-335/D22-07	EOP 2	1(2)MS-5959
4	MOB-71/1Y06-3 & MOB-271/2Y06-1	EOP 0.1, 2	1(2)MS-2042
4	MOB-71/1Y06-3 & MOB-271/2Y06-1	EOP 0.1, 2	1(2)MS-2045
1	D16-02/D21-02 & D22-02/D18-02	EOP 0 ATT A, 0.1, 2	1(2)MS-2018
1	D16-02/D21-02 & D22-02/D18-02	EOP 0 ATT A, 0.1, 2	1(2)MS-2017
3	Indication Only MOB-63/D16-07 & MOB-263/D22-07	EOP 0, 0.1, 0.2, 1, 1.2, 2	1(2)MS-2016
3	Indication Only MOB-63/D16-07 & MOB-263/D22-07	EOP 0, 0.1, 0.2, 1, 1.2, 2	1(2)MS-2015
3	MOB-29/D21-08 & MOB-330/D18-08	EOP 0, 0.1, 0.2, 1, 1.2	1(2)RC-430
3	MOB-11/D18-08 & MOB-301/D22-08	EOP 0, 0.1, 0.2, 1, 1.2	1(2)RC-431C
4	MOB-61/D16-07 & MOB-261/D22-07	EOP 0, 0.1, 0.2, 1, 1.2, ECA 1.2	1(2)RC-761A
4	MOB-62/D21-07 & MOB-252/D18-07	EOP 0, 0.1, 0.2, 1, 1.2, ECA 1.2	1(2)RC-761B
1	MOB-20/D21-08 & MOB-321/D18-08	EOP 0.1, 0.2	1(2)RC-371A
1	MOB-306,305, 304 all from D16-08 & MOB-16, 15, 14 all from D22-08	EOP 0.1, 0.2	1(2)CV-200A, B, & C
1	MOB-12/D16-08 & MOB-302/D22-08	EOP 0.1, 0.2	1(2)CV-371
4	NA Direct acting thermobulb pneumatic type controllers	In Support of Other Required Equipment	1SW-12A & 2SW-12D
4	NA Direct acting thermobulb pneumatic type controllers	In Support of Other Required Equipment	COMMON SW-12B & 12C
1	120 VAC From B-46 Control Transformer—Fail Closed on loss of air or power	EOP 0	COMMON TV-LW-61
1	120 VAC From B-46 Control Transformer—Fail Closed on loss of air or power	EOP 0	COMMON TV-LW-62
1	120 VAC From B-46 Control Transformer—Fail Closed on loss of air or power	EOP 0 ATT A, ECA 1.2	COMMON RS-SA-9
1	120 VAC From B-46 Control Transformer—Fail Closed on loss of air or power	EOP 0 ATT A, ECA 1.2	COMMON RS-SA-10
1	120 VAC From B-46 Control Transformer—Fail Closed on loss of air or power	NA	COMMON RS-SA-1
			C. MOTOR OPERATED VALVES
3	B32 & B42	In Support of Other Required Equipment	1(2)SI-825A & B
3	B32 & B42	EOP 0 ATT A	1(2)SI-896A & B
3	B32	EOP 0.2, 1, 1.2, ECA 1.2	1(2)SI-866A
3	B42	EOP 0.2, 1, ECA 1.2	1(2)SI-866B
3	B32 & B42	ECA 0.2, 1.2	1(2)SI-878D & B
3	B32 & B42	ECA 0.2, 1.2	1(2)SI-878A & C
3	D27-15 & D13-05	EOP 0 ATT A, 0.1, 2	1(2)MS-2020
3	D11-15 & D12-15	EOP 0 ATT A, 0.1, 2	1(2)MS-2019
3	D11-18 & D13-18	In Support of Other Required Equipment	1(2)MS-2082
3	D11-16 & D12-16	EOP 2	1(2)AF-4001
3	D27-16 & D13-16	EOP2	1(2)-4000
3	1B32 & 2B42	In Support of Other Required Equipment	1(2)AF-4006
4	1B32 & 2B42	In Support of Other Required Equipment	COMMON AF-4009 & 4016
4	1B32 & 2B32	EOP 0.1, 2	COMMON AF-4023 & 4022
4	1B42 & 2B42	EOP 0.1, 2	COMMON AF-4021 & 4020
4	Both 1B32	In Support of Other Required Equipment	COMMON SW-2891 & 2870
4	Both 2B42	In Support of Other Required Equipment	COMMON SW-2890 & 2869
4	1B32	EOP 0 ATT A	COMMON SW-2816
4	1B42	EOP 0 ATT A	COMMON SW-4479
4	2B42	EOP 0 ATT A	COMMON SW-2817
4	2B32	EOP 0 ATT A	COMMON SW-4478
4	2B42	EOP 0 ATT A	COMMON SW-2927A
4	1B32	EOP 0 ATT A	COMMON SW-2930A
4	2B42	EOP 0 ATT A	COMMON SW-2927B
4	1B42	EOP 0 ATT A	COMMON SW-2930B
4	B32 & B42	EOP 0 ATT A	1(2)SW-2907 & 2908

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1(2)RC-516 & 515	Pressurizer PORV 430 & 431C Isolation Valves	520 & 618	CONT 76' in Pzr Cubicle	X	X	X	X
1(2)RC-427	Letdown Line In-Loop Isolation (from Loop B Cold Leg)	515 & 615	CONT, IN LOOP B 43'			X	
1(2)CC-719	Component Cooling Supply to Containment	140 & 137	PW2L/PW3L	X	X	X	X
1(2)CC754A & B	Component Cooling Supply to RCP P-1A & P-1B	140 & 137	PW2L/PW3L	X	X	X	X
1(2)CC-759A & B	Component Cooling Return From RCP P-1A & P-1B	140 & 137	PW2L/PW3L	X	X	X	X
1(2)CS-2190 & 2189	Feedwater Pump P-28A & P-28B Discharge Valves	301 NW & 583 SW	8' TB1/TB2 8'	X	X		X
<b>D. SOLENOID VALVES</b>							
COMMON DA-6318A-S	G01 Diesel Generator Starting Air (from T-60A, B, & C) (DA-3057B)	308	CB G01 RM 8'	X	X	X	X
COMMON DA-6318B-S	G01 Diesel Generator Starting Air (from T-60D, E, & F) (DA-3057A)	308	CB G01 RM 8'	X	X	X	X
COMMON DA-6319A-S	G02 Diesel Generator Starting Air (from T61A, B, & C) (DA-3058B)	309	CB G02 RM 8'	X	X	X	X
COMMON DA-6319B-S	G02 Diesel Generator Starting Air (from T61D, E, & F) (DA-3058A)	309	CB G02 RM 8'	X	X	X	X
COMMON DA-6360A-S	G03 Diesel Generator Starting Air (from T-170A & B) (DA-6364A)	770	DG BLDG G03 Rm 28'	X	X	X	X
COMMON DA-6360B-S	G03 Diesel Generator Starting Air (from T-170C & D) (DA-6364B)	770	DG BLDG G03 Rm 28'	X	X	X	X
COMMON DA-6361A-S	G04 Diesel Generator Starting Air (from T-171A & B) (DA-6365A)	775	DG BLDG G04 Rm 28'	X	X	X	X
COMMON DA-6361B-S	G04 Diesel Generator Starting Air (from T-171C & D) (DA-6365B)	775	DG BLDG G04 Rm 28'	X	X	X	X
COMMON AF-4007 & 4014	MDAFWP P-38A & B Service Water Bearing Cooling	304S & 304N	CB/AFWPR 8'	X	X	X	X
<b>E. INSTRUMENTATION</b>							
1(2) N-00041	NIS Power Range 41	326	44' CB 1C133 & 2C130	X	X	X	X
1(2) N-00042	NIS Power Range 42	326	44' CB 1C132 & 2C131	X	X	X	X
1(2) N-00043	NIS Power Range 43	326	44' CB 1C131 & 2C132	X	X	X	X
1(2) N-00044	NIS Power Range 44	326	44' CB 1C130 & 2C133	X	X	X	X
1(2) N-00035	NIS Intermediate Range 35	326	44' CB 1C133 & 2C130	X	X	X	X
1(2) N-00036	NIS Intermediate Range 36	326	44' CB 1C132 & 2C131	X	X	X	X
1(2) N-00031	NIS Source Range 31	326	44' CB 1C133 & 2C130	X	X	X	X
1(2) N-00032	NIS Source Range 32	326	44' CB 1C132 & 2C131	X	X	X	X
1(2) N-00040	Gamma-Metrics Flux Monitor - Wide Range	304N	8' CB AFWPR North	X	X	X	X
1(2) TE-401A & B	CH-1 Red T-hot & T-cold Loop A Temperature Sensor (RTD's)	511 & 611	U1C/U2C 34.5'	X	X	X	X
1(2) TE-402A & B	CH-2 White T-hot & T-cold Loop A Temperature Sensor (RTD's)	511 & 611	U1C/U2C 34.5'	X	X	X	X
1(2) TE-403A & B	CH-3 Blue T-hot & T-cold Loop B Temperature Sensor (RTD's)	511 & 611	U1C/U2C 34.5'	X	X	X	X
1(2) TE-404A & B	CH-4 Yellow T-hot & T-cold Loop B Temperature Sensor (RTD's)	511 & 611	U1C/U2C 34.5'	X	X	X	X
1(2) TE-405A & B	RC Loop A T-hot & T-cold Temp Sensor (RTD's) SPARE	511 & 611	U1C/U2C 34.5'	X	X	X	X
1(2) TE-406A & B	RC Loop A T-hot & T-cold Temp Sensor (RTD's) SPARE	511 & 611	CONT P1A CUB 34.5'	X	X	X	X
1(2) TE-407A & B	RC Loop B T-hot & T-cold Temp Sensor (RTD's) SPARE	511 & 611	CONT P1A CUB 34.5'	X	X	X	X
1(2) TE-408A & B	RC Loop B T-hot & T-cold Temp Sensor (RTD's) SPARE	511 & 611	CONT P1B CUB 34.5'	X	X	X	X
1(2) PT-420A	RC Loop A Intermediate Leg Wide Range Pressure	511 & 611	CONT 21' E of U2 keyway	X	X	X	X
1(2) PT-420B	RC Loop B Intermediate Leg Wide Range Pressure	511 & 611	CONT 21' E of U2 ELHX	X	X	X	X
1(2) PT-420C	RC Loop A Hot Leg Wide Range Pressure	516 & 615	CONT 46' N of T-34B	X	X	X	X
1(2) TE-450A	RC Loop A Wide Range Cold Leg Temp RTD	516 & 615	SGA HH ele 44'	X	X	X	X
1(2) TE-450B	RC Loop A Wide Range Hot Leg Temp RTD	516 & 615	SGA HH ele 44'	X	X	X	X
1(2) TE-450C	RC Loop A Wide Range Cold Leg Temp RTD	516 & 615	SGA HH ele 44'	X	X	X	X
1(2) TE-450D	RC Loop A Wide Range Hot Leg Temp RTD	516 & 615	SGA HH ele 44'	X	X	X	X
1(2) TE-451A	RC Loop B Wide Range Cold Leg Temp RTD	516 & 615	SGB HH ele 44'	X	X	X	X
1(2) TE-451B	RC Loop B Wide Range Hot Leg Temp RTD	516 & 615	SGB HH ele 44'	X	X	X	X
1(2) TE-451C	RC Loop B Wide Range Cold Leg Temp RTD	516 & 615	SGB HH ele 44'	X	X	X	X
1(2) TE-451D	RC Loop B Wide Range Hot Leg Temp RTD	516 & 615	SGB HH ele 44'	X	X	X	X
1(2) LT-426	Pressurizer Level Narrow Range Transmitter	516 & 615	U1(2)C 46' T-34B E	X	X	X	X
1(2) LT-427	Pressurizer Level Narrow Range Transmitter	516 & 615	U1(2)C 46' PRT RV Hdr	X	X	X	X
1(2) LT-428	Pressurizer Level Narrow Range Transmitter	516 & 615	U1(2)C 46' E STAIR	X	X	X	X

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OPERATING DURATION	POWER SUPPLY	RELATED EMERGENCY PROCEDURES	COMPONENT ID
3	B42 & B32	EOP 0, 0.1, 0.2, 1	1(2)RC-516 & 515
1	B42	EOP 0, 0.1, 0.2	1(2)RC-427
3	B42	In Support of Other Required Equipment	1(2)CC-719
3	B32	ECA 1.2	1(2)CC754A & B
3	B32	EOP 1.2, ECA 1.2	1(2)CC-759A & B
1	1(2)B41 Non-safeguards. Can be hand opened to cooldown SG's using P-25 & Bypass Reg Valves after SG pressure < P-25 SOH.	In Support of Other Required Equipment	1(2)CS-2190 & 2189
			D. SOLENOID VALVES
1	D31-14	In Support of Other Required Equipment	COMMON DA-6318A-S
1	D26-08 Norm or D31-01 Alt	In Support of Other Required Equipment	COMMON DA-6318B-S
1	D17-12	In Support of Other Required Equipment	COMMON DA-6319A-S
1	D31-05 Norm or D41-01 Alt	In Support of Other Required Equipment	COMMON DA-6319B-S
1	D28-01 from D04 Norm or D40 Alt	In Support of Other Required Equipment	COMMON DA-6360A-S
1	D28-01 from D04 Norm or D40 Alt	In Support of Other Required Equipment	COMMON DA-6360B-S
1	D40-01 from D14 Norm or D28 Alt	In Support of Other Required Equipment	COMMON DA-6361A-S
1	D40-01 from D14 Norm or D28 Alt	In Support of Other Required Equipment	COMMON DA-6361B-S
4	125 VDC Control Power of Pump 480 VAC Supply Bkr (Train A & B)	In Support of Other Required Equipment	COMMON AF-4007 & 4014
			E. INSTRUMENTATION
1	RED 1C133 & 2C130	EOP 0	1(2) N-00041
1	WHITE 1C132 & 2C131	EOP 0	1(2) N-00042
1	BLUE 1C131 & 2C132	EOP 0	1(2) N-00043
1	YELLOW 1C130 & 2C133	EOP 0	1(2) N-00044
1	RED 1C133 & 2C130	EOP 0, 0.1, 1.2	1(2) N-00035
1	WHITE 1C132 & 2C131	EOP 0, 0.1, 1.2	1(2) N-00036
4	RED 1C133 & 2C130	EOP 0.1, 1.2	1(2) N-00031
4	WHITE 1C132 & 2C131	EOP 0.1, 1.2	1(2) N-00032
4	BLUE 1Y02-06 & 2Y02-06	EOP 0	1(2) N-00040
3	RED	EOP 0.1	1(2) TE-401A & B
3	WHITE	EOP 0.1	1(2) TE-402A & B
3	BLUE	EOP 0.1	1(2) TE-403A & B
3	YELLOW	EOP 0.1	1(2) TE-404A & B
NA	NA (Spare Terminated in red rack)	NA --- Spares, Not In-Use	1(2) TE-405A & B
NA	NA (Spare Terminated in White rack)	NA --- Spares, Not In-Use	1(2) TE-406A & B
NA	NA (Spare Terminated in Blue rack)	NA --- Spares, Not In-Use	1(2) TE-407A & B
NA	NA (Spare Terminated in Yellow rack)	NA --- Spares, Not In-Use	1(2) TE-408A & B
4	WHITE	EOP 0, 0.2, 1.2, 1.2 FO, ECA 1.2	1(2) PT-420A
4	YELLOW	EOP 0, 0.2, 1.2, 1.2 FO, ECA 1.2	1(2) PT-420B
4	RED	EOP 0, 0.2, 1.2, 1.2 FO, ECA 1.2	1(2) PT-420C
4	WHITE 1C171B-F & 2C171B-F	EOP 0, 0.1 FO, 0.2, 1.2, 2 FO	1(2) TE-450A
4	YELLOW 1C173B-F & 2C173B-F	EOP 0.1, 0.2, 1.2, 2	1(2) TE-450B
4	YELLOW 1C173B-F & 2C173B-F	EOP 0.1, 0.2, 1.2, 2	1(2) TE-450C
4	WHITE 1C171B-F & 2C171B-F	EOP 0.1, 0.2, 1.2, 2	1(2) TE-450D
4	YELLOW 1C173B-F & 2C173B-F	EOP 0, 0.1 FO, 0.2, 1.2, 2 FO	1(2) TE-451A
4	RED 1C170 & 2C170	EOP 0.1, 0.2, 1.2, 2	1(2) TE-451B
4	RED 1C170 & 2C170	EOP 0.1, 0.2, 1.2, 2	1(2) TE-451C
4	YELLOW 1C173B-F & 2C173B-F	EOP 0.1, 0.2, 1.2, 2	1(2) TE-451D
4	RED	EOP 0, 0.1 FO, 0.2 FO, 1, 1 FO, 1.2 FO	1(2) LT-426
4	WHITE	EOP 0, 0.1 FO, 0.2 FO, 1, 1 FO, 1.2 FO	1(2) LT-427
4	BLUE	EOP 0, 0.1 FO, 0.2 FO, 1, 1 FO, 1.2 FO	1(2) LT-428

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COMPONENT ID	COMPONENT DESCRIPTION	GOTHIC ROOM	COMPONENT LOCATION	MS	FD	CV	SB
1(2) PT-429	Pressurizer Pressure Transmitter	516 & 615	U1(2)C 46' T-34B	X	X	X	X
1(2) PT-430	Pressurizer Pressure Transmitter	516 & 615	U1(2)C 46'/PRT RV	X	X	X	X
1(2) PT-431	Pressurizer Pressure Transmitter	516 & 615	U1(2)C 46'/W STAIR	X	X	X	X
1(2) TE-424	Pressurizer Liquid Space RTD	516 & 615	U1(2)C 53' PZR CUBICLE	X	X	X	X
1(2) TE-425	Pressurizer Vapor Space RTD	516 & 615	U1(2)C 74' PZR CUBICLE	X	X	X	X
1(2) LT-461	Steam Generator 1A Level Transmitter	511 & 611	U1(2)C 21'	X	X	X	X
1(2) LT-462	Steam Generator 1A Level Transmitter	511 & 611	U1C/21'/2T-34A S	X	X	X	X
1(2) LT-463	Steam Generator 1A Level Transmitter	511 & 611	U1C/21'/2T-34A W	X	X	X	X
1(2) LT-471	Steam Generator 1B Level Transmitter	511 & 611	U1C/21'/U2 ELHX E	X	X	X	X
1(2) LT-472	Steam Generator 1B Level Transmitter	511 & 611	U1C/21'/U2 ELHX W	X	X	X	X
1(2) LT-473	Steam Generator 1B Level Transmitter	511 & 611	U1(2)C 21'	X	X	X	X
1(2) LT-460A & 460B	Steam Generator 1A Wide Range Level Transmitter	511 & 611	U1C NW/21'/W STAIR	X	X	X	X
1(2) LT-470A & 470B	Steam Generator 1B Wide Range Level Transmitter	511 & 611	U1(2)C/ 21'/U2 ELHX	X	X	X	X
1(2) PT-468	Steam Generator 1A Pressure Transmitter	238	PAB 46/SFPHX	X	X	X	X
1(2) PT-469	Steam Generator 1A Pressure Transmitter	238	PAB 46/SFPHX	X	X	X	X
1(2) PT-482	Steam Generator 1A Pressure Transmitter	238	PAB 46/SFPHX	X	X	X	X
1(2) PT-478	Steam Generator 1B Pressure Transmitter	272 & 273	PAB 66' U1/2 FAN RM	X	X	X	X
1(2) PT-479	Steam Generator 1B Pressure Transmitter	272 & 273	PAB 66' U1/2 FAN RM	X	X	X	X
1(2) PT-483	Steam Generator 1B Pressure Transmitter	272 & 273	PAB 66' U1/2 FAN RM	X	X	X	X
1(2) FT-464 & 465	1A Main Steam Line Flow Transmitter	520 & 618	U1(2)C/66'/1A SNUBER	X	X	X	X
1(2) FT-474 & 475	1B Main Steam Line Flow Transmitter	520 & 618	U1(2)C/66'/PZR NW	X	X	X	X
1(2) FT-466 & 467	1A Main Feedwater Line Flow Transmitter	360 & 224	MTN MEZZ 39'/WT 26'	X	X		X
1(2) FT-476 & 477	1B Main Feedwater Line Flow Transmitter	360 & 224	MTN MEZZ 39'/WT 26'	X	X		X
1(2) FT-4002	1(2)P-29 Discharge Flow Transmitter	304S & 304N	CB/AFWPR/8'	X	X	X	X
COMMON FT-4007 & 4014	P-38A & B Discharge Flow Transmitter	304S & 304N	CB/AFWPR/8'	X	X	X	X
1(2) FT-4036 & 4037	Auxiliary Feedwater to SG 1A & 1B Flow Transmitter	142	PAB 8'E' & 8' NE at P-11	X	X	X	X
1(2) RE-231	1A Main Steam Line Release Radiation Monitor	524 NW & 596 SW	U1 Facade 88' U2 Façade	X			
"	DAM-03-09, 1Y-114, Yellow & DAM-04-09, 2Y-114, Yellow	245 & 246	U1 EER 46' U2 EER	X			
1(2) RE-232	1B Main Steam Line Release Radiation Monitor	524 E & 596 E	U1 Facade 88' U2 Façade	X			
"	DAM-05-02, 1Y-113, White & DAM-06-02, 2Y-113, White	245 & 246	U1 EER 46' U2 EER	X			
1(2) FIC-609	Reactor Coolant Pump P-1A CC Return Flow	142 S & N	PAB 8' at PW 2&3 Lwr	X	X	X	X
1(2) FIC-613	Reactor Coolant Pump P-1B CC Return Flow	142 S & N	PAB 8' at PW 2&3 Lwr	X	X	X	X
1(2) FIS-650	Safety Injection P-15A/B CC Return Flow	151 West	PAB 8' W of Spray pump	X	X	X	X
1FT-134	CVCS Letdown Line Flow (Yellow)	151 West	PAB 8' W of Spray pump			X	
2FT-134	CVCS Letdown Line Flow (Yellow)	142 North	PAB 8' near PW3 Entr.			X	
1(2) LT-972	Refueling Water Storage Tank Level	524 NE & 596 SE	U1(2)Façade 6.5' at RWST	X	X	X	X
1(2) LT-973	Refueling Water Storage Tank Level	524 NE & 596 SE	U1(2)Façade 6.5' at RWST	X	X	X	X
1(2) FT-925	P-15A Safety Injection Flow (White)	159 & 162	8' PAB Fan Rm & PW4	X	X	X	X
1(2) FT-924	P-15B Safety Injection Flow (Yellow)	159 & 162	8' PAB Fan Rm & PW4	X	X	X	X
COMMON LT-4038	Condensate Water Storage Tank T-24A Level	301 NE	26' TB (S of Batt Rms) at CST	X	X		X
COMMON LT-4040	Condensate Water Storage Tank T-24A Level	301 NE	26' TB (S of Batt Rms) at CST	X	X		X
COMMON LT-4039	Condensate Water Storage Tank T-24B Level	301 NE	26' TB (S of Batt Rms) at CST	X	X		X
COMMON LT-4041	Condensate Water Storage Tank T-24B Level	301 NE	26' TB (S of Batt Rms) at CST	X	X		X
COMMON PT-2844 & 2845	North & South SW Header Pressure Transmitter	309 & 308	8' CB G02 & G01 Room	X	X	X	X
COMMON PT-3084 & 3083	North & South IA Header Pressure Transmitter	310	8' CB AIR COMP Room	X	X	X	X
INCORE THERMOCOUPLES	(39 Per Unit)						
1(2) TR-00001A	Core Exit T/C Digital Recorder	326	44' CB, 1C20 & 2C20	X	X	X	X
1(2) TR-00001B	Core Exit T/C Digital Recorder	326	44' CB 1C20 & 2C20	X	X	X	X
COMMON C-177	Computer input MUX White	333	60' CB COMPUTER RM	X	X	X	X
COMMON C-179	Computer input MUX Yellow	333	60' CB COMPUTER RM	X	X	X	X

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OPERATING DURATION	POWER SUPPLY	RELATED EMERGENCY PROCEDURES	COMPONENT ID
3	RED	EOP 0, 0.1, 0.2 FO, 1, 1 FO, 1.2	1(2) PT-429
3	WHITE	EOP 0, 0.1, 0.2 FO, 1, 1 FO, 1.2	1(2) PT-430
3	BLUE	EOP 0, 0.1, 0.2 FO, 1, 1 FO, 1.2	1(2) PT-431
4	YELLOW	EOP 0.1, 1.2	1(2) TE-424
4	YELLOW	EOP 0.1, 1.2	1(2) TE-425
4	RED	EOP 0, 0 ATT A, 0.0, 0.1, 0.2, 1, 1 FO, 1.2, 1.2 FO, ECA 1.2 FO	1(2) LT-461
4	BLUE	EOP 0, 0 ATT A, 0.0, 0.1, 0.2, 1, 1 FO, 1.2, 1.2 FO, ECA 1.2 FO	1(2) LT-462
4	YELLOW	EOP 0, 0 ATT A, 0.0, 0.1, 0.2, 1, 1 FO, 1.2, 1.2 FO, ECA 1.2 FO	1(2) LT-463
4	YELLOW	EOP 0, 0 ATT A, 0.0, 0.1, 0.2, 1, 1 FO, 1.2, 1.2 FO, ECA 1.2 FO	1(2) LT-471
4	RED	EOP 0, 0 ATT A, 0.0, 0.1, 0.2, 1, 1 FO, 1.2, 1.2 FO, ECA 1.2 FO	1(2) LT-472
4	WHITE	EOP 0, 0 ATT A, 0.0, 0.1, 0.2, 1, 1 FO, 1.2, 1.2 FO, ECA 1.2 FO	1(2) LT-473
4	RED & WHITE	NA — Not Required to go to Hot Shutdown	1(2) LT-460A & 460B
4	RED & YELLOW	NA — Not Required to go to Hot Shutdown	1(2) LT-470A & 470B
4	RED	EOP 0, 0 FO, 0.0, 0.1, 1, 1 FO, 1.2, 1.2 FO, 2, ECA 1.2 FO	1(2) PT-468
4	WHITE	EOP 0, 0 FO, 0.0, 0.1, 1, 1 FO, 1.2, 1.2 FO, 2, ECA 1.2 FO	1(2) PT-469
4	BLUE	EOP 0, 0 FO, 0.0, 0.1, 1, 1 FO, 1.2, 1.2 FO, 2, ECA 1.2 FO	1(2) PT-482
4	BLUE	EOP 0, 0 FO, 0.0, 0.1, 1, 1 FO, 1.2, 1.2 FO, 2, ECA 1.2 FO	1(2) PT-478
4	YELLOW	EOP 0, 0 FO, 0.0, 0.1, 1, 1 FO, 1.2, 1.2 FO, 2, ECA 1.2 FO	1(2) PT-479
4	RED	EOP 0, 0 FO, 0.0, 0.1, 1, 1 FO, 1.2, 1.2 FO, 2, ECA 1.2 FO	1(2) PT-483
1	RED	In Support of Other Required Equipment	1(2) FT-464 & 465
1	BLUE	In Support of Other Required Equipment	1(2) FT-474 & 475
1	RED	In Support of Other Required Equipment	1(2) FT-466 & 467
1	BLUE	In Support of Other Required Equipment	1(2) FT-476 & 477
4	RED	EOP 0, 0 FO, 0.1, 0.1 FO, 1, 1 FO, 1.2, 1.2 FO, ECA 1.2 FO	1(2) FT-4002
4	BLUE	EOP 0, 0 FO, 0.1, 0.1 FO, 1, 1 FO, 1.2, 1.2 FO, ECA 1.2 FO	COMMON FT-4007 & 4014
4	WHITE & YELLOW	EOP 0, 0 FO, 0.1, 0.1 FO, 1, 1 FO, 1.2, 1.2 FO, ECA 1.2 FO	1(2) FT-4036 & 4037
4	1RE-231, DAM-03-09, 1Y114/Yellow & 2RE-231, DAM-04-09, 2Y-114/Yellow	EOP 0 FO, 0.0, 1, 2, ECA 1.2 FO	1(2) RE-231
NA	NA—Place Holder	In Support of 1RE-231 & 2RE-231	"
4	1RE-232, DAM-05-02, 1Y113/White & 2RE-232, DAM-06-02, 2Y-113/White	EOP 0 FO, 0.0, 1, 2, ECA 1.2 FO	1(2) RE-232
NA	NA—Place Holder	In Support of 1RE-232 & 2RE-232	"
3	1(2)C03 ANNUNCIATOR POWER	EOP 0, 0.1, 0.2, 1, 1.2, ECA 1.2	1(2) FIC-609
3	1(2)C03 ANNUNCIATOR POWER	EOP 0, 0.1, 0.2, 1, 1.2, ECA 1.2	1(2) FIC-613
3	MOB-124/1Y06 & MOB-179/2Y06	In Support of Other Required Equipment	1(2) FIS-650
1	YELLOW 1C125 from 1Y04	In Support of Other Required Equipment	1FT-134
1	YELLOW 2C125 from 2Y04	In Support of Other Required Equipment	2FT-134
4	WHITE 1C-171B-F/1Y103 & 2C-171B-F/2Y103	EOP 0, 1 FO, 2 FO, 1.2 FO	1(2) LT-972
4	YELLOW 1C-173B-F/1Y104 & 2C-173B-F/2Y104	EOP 0, 1 FO, 2 FO, 1.2 FO	1(2) LT-973
3	WHITE 1C-171B-F/1Y103 & 2C-171B-F/2Y103	EOP 0 ATT A, 0.0	1(2) FT-925
3	YELLOW 1C-173B-F/1Y104 & 2C-173B-F/2Y104	EOP 0 ATT A, 0.0	1(2) FT-924
4	WHITE 1C-171B-F/1Y103	EOP 0 FO, 0.1 FO, 0.2 FO, 1 FO, 1.2 FO, 2, 2 FO, ECA 1.2 FO	COMMON LT-4038
4	YELLOW 1C-173B-F/1Y104	EOP 0 FO, 0.1 FO, 0.2 FO, 1 FO, 1.2 FO, 2, 2 FO, ECA 1.2 FO	COMMON LT-4040
4	WHITE 2C-171B-F/2Y103	EOP 0 FO, 0.1 FO, 0.2 FO, 1 FO, 1.2 FO, 2, 2 FO, ECA 1.2 FO	COMMON LT-4039
4	YELLOW 2C-173B-F/2Y104	EOP 0 FO, 0.1 FO, 0.2 FO, 1 FO, 1.2 FO, 2, 2 FO, ECA 1.2 FO	COMMON LT-4041
4	RED 1C105/1Y01-16 & BLUE 2C105/1Y02-14	In Support of Other Required Equipment	COMMON PT-2844 & 2845
4	WHITE 1C-171B & 2C-171B	EOP 0, 0.1, 1	COMMON PT-3084 & 3083
			INCORE THERMOCOUPLES
4	WHITE MOB-407/1Y103-08 & MOB-474/2Y103-08	EOP 0.1, 0.2, 1.2	1(2) TR-00001A
4	YELLOW MOB-416/1Y104-08 & MOB-466/2Y104-08	EOP 0.1, 0.2, 1.2	1(2) TR-00001B
4	WHITE 1Y103-03 & 2Y103-03	In Support of Other Required Equipment	COMMON C-177
4	YELLOW 1Y104-03 & 2Y104-03	In Support of Other Required Equipment	COMMON C-179

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COMPONENT ID	COMPONENT DESCRIPTION	GOTHIC ROOM	COMPONENT LOCATION	MS	FD	CV	SB
SUBCOOLING							
1(2) TSS-970	RTD/TC Input to 1(2) TI-970 White	326	44' CB, 1C20 & 2C20	X	X	X	X
1(2) TSS-971	RTD/TC Input to 1(2) TI-971 Yellow	326	44' CB, 1C20 & 2C20	X	X	X	X
1(2) TI-970	ASIP Subcooling Digital Indicator White	326	44' CB, 1C20 & 2C20	X	X	X	X
1(2) TI-971	ASIP Subcooling Digital Indicator Yellow	326	44' CB, 1C20 & 2C20	X	X	X	X
PPCS-009	UNIT 1 Yellow RTP Data Link Server	333	60' CB/Comp Rm C-179	X	X	X	X
PPCS-004	UNIT 2 White RTP Data Link Server	333	60' CB/Comp Rm C-177	X	X	X	X
RVLIS TRAIN "A"							
1(2) TE-499	RV LT Head Vent Sensing T/C	511 & 611	21' CONT @ Seal Table	X	X	X	X
1(2) TE-500	RV LT Head Vent Sensing T/C	505 & 611	8' U1C/21' U2C Seal Tab	X	X	X	X
1TE-501	RV LT Thimble Sensing T/C	520	66' U1 CONT	X	X	X	X
2TE-501	RV LT Thimble Sensing T/C	NA	Minus 1' RV Key Way	X	X	X	X
1(2) TE-502	RV LT Thimble Sensing T/C	505 & 608	U1C/ 8' U2C	X	X	X	X
1TE-503 (U1 Only)	RV LT Thimble Sensing T/C	505	8' U1 CONT	X	X	X	X
1(2) LT-494 & 496	RV Narrow Range Level Transmitter	505 & 608	U1C NE/8/U2C HR-53	X	X	X	X
1(2) LI-494 & 496	RV Narrow Range Level Indicators	326	44' CB 1C20 & 2C20	X	X	X	X
RVLIS TRAIN "B"							
1(2) TE-506	RV LT Head Vent Sensing T/C	511 & 611	21' CONT @ Seal Table	X	X	X	X
1(2) TE-507	RV LT Head Vent Sensing T/C	505 & 608	8' CONT	X	X	X	X
1TE-508	RV LT Thimble Sensing T/C	520	66' U1 CONT	X	X	X	X
2TE-508	RV LT Thimble Sensing T/C	NA	Minus 1' RV Key Way	X	X	X	X
1(2) TE-509	RV LT Thimble Sensing T/C	NA	Minus 1' RV Key Way	X	X	X	X
1TE-510 (U1 Only)	RV LT Thimble Sensing T/C	505	8' U1 CONT	X	X	X	X
1(2) LT-495 & 497	RV Narrow Range Level Transmitter	505 & 611	U1C NE/8/U2C HR-53	X	X	X	X
1(2) LI-495 & 497	RV Narrow Range Level Indicators	326	44' CB 1C20 & 2C20	X	X	X	X
F. MANUAL ELECTRICAL ACTUATIONS AND ELECTRICAL DISTRIBUTION SYSTEMS							
1(2) Manual SI Push Buttons	Manual SI Actuation PB's (All 4 Train "A" + "B")	326	44' CB C01 S & N	X	X	X	X
1(2) Train "A" Block SI CS	SI-A Block/Auto Unblock Control Switch	326	44' CB C01 S & N	X	X	X	X
1(2) Train "B" Block SI CS	SI-B Block/Auto Unblock Control Switch	326	44' CB C01 S & N	X	X	X	X
1(2) SI RESET Train A	SI-A Reset Push Buttons	326	44' CB C01 Center	X	X	X	X
1(2) SI RESET Train B	SI-B Reset Push Buttons	326	44' CB C01 Center	X	X	X	X
1(2) CI RESET Train A	CI-A Reset Push Buttons	326	44' CB C01 Center	X	X	X	X
1(2) CI RESET Train B	CI-B Reset Push Buttons	326	44' CB C01 Center	X	X	X	X
1(2) 86-B03 NSG LO Relays	B03 Non-Safeguards Equipment Lockout Relays	326	44' CB Rear of C01	X	X	X	X
1(2) 86-B04 NSG LO Relays	B04 Non-Safeguards Equipment Lockout Relays	326	44' CB Rear of C01	X	X	X	X
1(2) MS-2018-CS	MSIV 2018 Control Switch (Both Train "A" + "B")	326	44' CB 1C03 & 2C03	X	X	X	X
1(2) MS-2017-CS	MSIV 2017 Control Switch (Both Train "A" + "B")	326	44' CB 1C03 & 2C03	X	X	X	X
U1(2) Trn "A" Rx Trip PB's	Reactor Trn Breaker Push Button for [RTA & BYB]	326	1C04/C01 & C02/2C04	X	X	X	X
U1(2) Trn "B" Rx Trip PB's	Reactor Trn Breaker Push Button for [RTB & BYA]	326	1C04/C01 & C02/2C04	X	X	X	X
1(2) 52-RTA & BYA	Reactor Trn Bkrs RTA & BYA [Both on 1(2)C-41]	245 & 246	46' Elect Equip Rm	X	X	X	X
1(2) 52-RTB & BYB	Reactor Trn Bkrs RTB & BYB [Both on 1(2)C-41]	245 & 246	46' Elect Equip Rm	X	X	X	X

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OPERATING DURATION	POWER SUPPLY	RELATED EMERGENCY PROCEDURES	COMPONENT ID
			SUBCOOLING
4	WHITE MOB-401/1Y103-08 & MOB-471/2Y103-08	EOP 0, 0 FO, 0.1, 0.1 FO, 0.2, 0.2 FO, 1, 1 FO, 1.2, 1.2 FO	1(2) TSS-970
4	YELLOW MOB-411/1Y104-08 & MOB-461/2Y104-08	EOP 0, 0 FO, 0.1, 0.1 FO, 0.2, 0.2 FO, 1, 1 FO, 1.2, 1.2 FO	1(2) TSS-971
4	WHITE MOB-408/1Y103-08 & MOB-478/2Y103-08	EOP 0, 0 FO, 0.1, 0.1 FO, 0.2, 0.2 FO, 1, 1 FO, 1.2, 1.2 FO	1(2) TI-970
4	YELLOW MOB-418/1Y104-08 & MOB-468/2Y104-08	EOP 0, 0 FO, 0.1, 0.1 FO, 0.2, 0.2 FO, 1, 1 FO, 1.2, 1.2 FO	1(2) TI-971
4	(1Y104-03 Norm, 2Y104-03 Alt)	EOP 0, 0 FO, 0.1, 0.1 FO, 0.2, 0.2 FO, 1, 1 FO, 1.2, 1.2 FO	PPCS-009
4	(2Y103-03 Norm, 1Y103-03 Alt)	EOP 0, 0 FO, 0.1, 0.1 FO, 0.2, 0.2 FO, 1, 1 FO, 1.2, 1.2 FO	PPCS-004
			RVLIS TRAIN "A"
4	WHITE 1C171B-R & 2C171B-R	In Support of Other Required Equipment	1(2) TE-499
4	WHITE 1C171B-R & 2C171B-R	In Support of Other Required Equipment	1(2) TE-500
4	WHITE 1C171B-R	In Support of Other Required Equipment	1TE-501
4	WHITE 2C171B-R	In Support of Other Required Equipment	2TE-501
4	WHITE 1C171B-R & 2C171B-R	In Support of Other Required Equipment	1(2) TE-502
4	WHITE 1C171B-R (Unit 1 only)	In Support of Other Required Equipment	1TE-503 (U1 Only)
4	WHITE 1C171A-F	EOP 0.2, 1.2	1(2) LT-494 & 496
4	WHITE 1C171A-F	EOP 0.2, 1.2	1(2) LI-494 & 496
			RVLIS TRAIN "B"
4	YELLOW 1C173B-R & 2C173B-R	In Support of Other Required Equipment	1(2) TE-506
4	YELLOW 1C173B-R & 2C173B-R	In Support of Other Required Equipment	1(2) TE-507
4	YELLOW 1C173B-R	In Support of Other Required Equipment	1TE-508
4	YELLOW 2C173B-R	In Support of Other Required Equipment	2TE-508
4	YELLOW 1C173B-R & 2C173B-R	In Support of Other Required Equipment	1(2) TE-509
4	YELLOW 1C173B-R (Unit 1 only)	In Support of Other Required Equipment	1TE-510 (U1 Only)
4	YELLOW 1C173A-F & 2C173A-F	EOP 0.2, 1.2	1(2) LT-495 & 497
4	YELLOW 1C173A-F & 2C173A-F	EOP 0.2, 1.2	1(2) LI-495 & 497
			F. Man Elect. Actuation & Distribution
1	D16-10 & D21-10 for U1 & D22-10 & D18-10 for U2	EOP 0, 0.1, 0.2 FO	1(2) Manual SI Push Buttons
2	D16-10 & D22-10	EOP 0.2	1(2) Train "A" Block SI CS
2	D21-10 & D18-10	EOP 0.2	1(2) Train "B" Block SI CS
1	(D16-10 & D22-10)	EOP 0, 1, 1.2	1(2) SI-A MANUAL RESET PB's
1	(D21-10 & D18-10)	EOP 0, 1, 1.2	1(2) SI-B MANUAL RESET PB's
1	(D16-10 & D22-10)	EOP 0, 1	1(2) CI RESET Train A
1	(D21-10 & D18-10)	EOP 0, 1	1(2) CI RESET Train B
1	MOB-102/D17-03 & MOB-158/D17-08	EOP 0, 1	1(2) 86-B03 NSG LO Relays
1	MOB-152/D19-03 & MOB-208/D19-08	EOP 0, 1	1(2) 86-B04 NSG LO Relays
1	D22-10 + D21-10 for U1 & D22-10 + D18-10 for U2	EOP 0, 2	1(2) MS-2018-CS
1	D22-10 + D21-10 for U1 & D22-10 + D18-10 for U2	EOP 0, 2	1(2) MS-2017-CS
1	D18-09 & D22-09	EOP 0	U1(2) Trn "A" Rx Trip PB's
1	D21-09 & D18-09	EOP 0	U1(2) Trn "B" Rx Trip PB's
1	D16-05 & D22-05, also 1(2) G-06 and/or G-07	EOP 0	1(2) 52-RTA & BYA
1	D22-05 & D18-05, also 1(2) G-06 and/or G-07	EOP 0	1(2) 52-RTB & BYB

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DC SYSTEM STATUS	VOLTS & AMPS for 5 Safety Related Batteries and Charger Status	326	44' CB ASIP 2C-20	X	X	X	X
COMMON D05	Battery D05 - Train "A" RED	307	CB-8', 4.16 KV Swgr Rm	X	X	X	X
COMMON D06	Battery D06 - Train "B" BLUE	306	CB-8', 4.16 KV Swgr Rm	X	X	X	X
COMMON D305	Swing Battery D305	301 NE	26' TB East Above CB	X	X	X	X
COMMON D105	Battery D105, WHITE	228	35' PAB NE	X	X	X	X
COMMON D106	Battery D106, YELLOW	225	26' PAB NE	X	X	X	X
COMMON D109	Swing Charger D109 - White or Yellow.	227	26' PAB NE	X	X	X	X
DIESEL GENERATOR STATUS	G01, G02, G03, & G04 KILOWATTS & FREQUENCY	326	44' CB PANEL C02	X	X	X	X
1(2) A05	4160 Volt Train A Switchgear	305	CB-8' ele 4 KV Swgr Rm	X	X	X	X
1(2) A06	4160 Volt Train B Switchgear	773 & 777	DG BLDG 28'	X	X	X	X
1(2) B03	480 Volt Train A Switchgear	318 S & N	CB-26'-Cable Sprd Rm	X	X	X	X
1(2) B04	480 Volt Train B Switchgear	318 S & N	CB-26'-Cable Sprd Rm	X	X	X	X
VITAL AC SYSTEM STATUS	SAFEGUARDS VOLTS 1(2)A05/A06/B03/B04 and Supply Bkr. Status	326	44' CB PANEL C02	X	X	X	X
1(2) T-001C	200 KW Pressurizer Backup Heater Group C	516 & 615	CONT @ PZR 48'	X	X	X	X
1(2) T-001D	200 KW Pressurizer Backup Heater Group D	516 & 615	CONT @ PZR 48'	X	X	X	X
1(2) T-001E	200 KW Pressurizer Proportional Heater Group E	516 & 615	CONT @ PZR 48'	X	X	X	X
1(2) T-001C Control Switch	Bench of U1(2)C04 Reactor Plant Control Panel	326	44' CB 1C04 & 2C04	X	X	X	X
1(2) T-001D Control Switch	Bench of U1(2)C04 Reactor Plant Control Panel	326	44' CB 1C04 & 2C04	X	X	X	X
1(2) T-001E Control Switch	Bench of U1(2)C04 Reactor Plant Control Panel	326	44' CB 1C04 & 2C04	X	X	X	X

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4	NA (All DC System Control Room Indications on ASIP 2C20)	EOP 0, 0.1, 1, 1.2	DC SYSTEM STATUS
4	CHARGER D07 fed from 1B42 (D07 is in Room 305)	In Support of Other Required Equipment	COMMON D05
4	CHARGER D08 fed from 2B42 (D08 is in Room 305)	In Support of Other Required Equipment	COMMON D06
4	Red or Blue SWING CHARGER D09 fed from 2B03 or 1B04 (D09 in Rm 305)	In Support of Other Required Equipment	COMMON D305
4	CHARGER D107 fed from 2B42 (D107 is in Room 227)	In Support of Other Required Equipment	COMMON D105
4	CHARGER D108 fed from 1B42 (D108 is in Room 227)	In Support of Other Required Equipment	COMMON D106
4	White or Yellow SWING CHARGER D109 fed from 1B32 or 2B42 (D109 in Rm 227)	In Support of Other Required Equipment	COMMON D109
4	NA (All Diesel Generator Control Room Indications are on Shared PANEL C02)	EOP 0, 0.1, 1, 1.2 (All Reference AOP-22 for KW & Frequency)	DIESEL GENERATOR STATUS
4	1A03 NORM OR G-01 EMERG & 2A03 NORM OR G-02 EMERG	In Support of Other Required Equipment	1(2) A05
4	1A04 NORM OR G-03 EMERG & 2A04 NORM OR G-04 EMERG	In Support of Other Required Equipment	1(2) A06
4	1A05 & 2A05	In Support of Other Required Equipment	1(2) B03
4	1A06 & 2A06	In Support of Other Required Equipment	1(2) B04
4	NA (All AC System Control Room Indications on Shared Electrical Panel C02)	EOP 0, 0.0, 1, 1.2	VITAL AC SYSTEM STATUS
3	1B03 via PP14 & 2B03 via PP19	EOP 0.1, 1.2	1(2) T-001C
3	1B04 via PP13 & 2B04 via PP18	EOP 0.1, 1.2	1(2) T-001D
1	1B04 via PP12 & 2B04 via PP17	EOP 0.1, 1.2	1(2) T-001E
3	1B52-12B (2B52-36B) Supply Breaker 125 VDC Control Power	EOP 0.1, 1.2	1(2) T-001C Control Switch
3	1B52-21B (2B52-29B) Supply Breaker 125 VDC Control Power	EOP 0.1, 1.2	1(2) T-001D Control Switch
1	1B52-22C (2B52-30C) Supply Breaker 125 VDC Control Power	EOP 0.1, 1.2	1(2) T-001E Control Switch