FINAL

SYSTEM DESCRIPTION
(Index No. 45B)

REACTOR BUILDING EMERGENCY COOLING WATER SYSTEM
(B&R Dwg. No. 2033, Rev. 15)

JERSEY CENTRAL POWER & LIGHT COMPANY

THREE MILE ISLAND NUCLEAR STATION

UNIT NO. 2

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REACTOR BUILDING EMERGENCY COOLING WATER SYSTEM

1.0 INTRODUCTION

1.1 System Functions

The function of the Reactor Building Emergency Cooling Water System is to provide cooling to the Reactor Building Cooling Units in the event of a loss of coolant accident.

This system has an interface with the following systems. (Dwg. Nos. refer to B&R Flow Diagrams.)

1. Nuclear Services River Water (2033)
2. Reactor Building Normal Cooling (2046)
3. Reactor Building Ventilation and Purge (2041)

1.2 Summary Description of the System (Ref. B&R Dwg. No. 2033, Rev. 15)

The Reactor Building Emergency Cooling Water System consists of four R.B. emergency cooling booster pumps, and five R.B. cooling units containing cooling coils and fans, (see Reactor Building Ventilating and Purge, Index No. 35A). Water is supplied to the booster pumps suction from both of the Nuclear Services River Water System headers. The pumps are divided into pairs, each pair feeding a separate emergency cooling water header. Each header supplies three cooling coils, one coil being fed by both headers. The cooling unit fans circulate air over the coils. Return water is discharged through the Mechanical Draft Cooling Tower. Connections are provided for circulation of normal cooling water through the coils (see Reactor Building Normal Cooling Water System, Index No. 45A). The water supply to the coils is automatically switched from normal cooling water to emergency cooling water during a LOCA.

1.3 System Design Requirements

The system is designed to supply sufficient river water to the Reactor Building cooling units to adequately cool the Reactor Building atmosphere after a LOCA. The Reactor Building emergency cooling booster pumps supply water at 3000 GPM from the two independent Nuclear Services River Water headers to the five cooling units. The five coils are designed to remove 240 x 10^6 BTU/hr with a river water temperature of 85°F and a Reactor Building ambient temperature of 286°F.

The system is designed to preclude a single failure during a LOCA. Two independent headers are fed by two pairs of R.B. emergency cooling pumps. Each pair of pumps receives power from either the red or green bus. The pump suctions are cross-connected so either pair can be lined up to receive water from either NSRW header. In the event of a loss of a diesel, one R.B. emergency cooling pump, feeding two cooling units and one-half of the Reactor Building Spray System can supply adequate cooling for the Reactor Building after a LOCA.

The system is designed to minimize the possibility of radioactive contamination of the river water during a LOCA. Pressure control valve maintains the pressure of cooling water in the Reactor Building above 60 psig. This pressure is above the expected Reactor Building pressure during a LOCA and therefore any system leakage will be into the Reactor Building rather than into the R.B. Emergency Cooling System.

The Reactor Building Emergency Cooling Water System is conventional piping of Quality Control Level 4 except at the penetrations through the wall of the Reactor Building where it changes to Nuclear Class 2 piping with a Quality Control Level 1. The entire system is classified Seismic I and Cleanliness - D. The piping inside the containment is designed, fabricated, and inspected in accordance with ANSI Nuclear Power Piping Code B31.7; piping outside containment in accordance with ANSI B31.1.

2.0 DETAILED DESCRIPTION OF THE SYSTEM

2.1 Components

2.1.1 R.B. Emergency Cooling Booster Pumps, RR-P-1A, 1B, 1C, 1D

The Reactor Building emergency cooling booster pumps (see Table 1) are located in the south east corner of the Auxiliary Building at elevation 280'-6". These four (4) pumps are horizontal, double suction, single stage centrifugal pumps with a rated capacity of 3000 GPM at 210 ft. TDH. The pump casings are split horizontally with flanged side suction and discharge connections. The impeller is a closed type. Each pump is driven by a 200 HP motor with split sleeve bearings and oil lubrication.

The pumps are provided with ball type thrust and radial bearings. Lubrication of the bearings is carried out by a self contained constant level oiler and indicator. The recommended oil level is marked on the bearing housing.

The stuffing boxes have close clearance shaft sleeves and lantern rings with internal piping and valves for recirculation of water from the pump case to the stuffing box.

The pump motors are cooled by Nuclear Services Closed Cooling Water. During testing, the pump will not start without cooling water flow. Pump indication is provided locally and on Panel No. 3 and Panel No. 13. The pump is normally controlled from Panel 3 by a TEST-OFF-AUTO-BACKUP switch. Additionally, the pump may be controlled locally by a JOG-NORMAL-STOP. Pumps RR-P-1A and 1B are powered from MCC 2-11E. Pumps RR-P-1C and 1D are powered from MCC 2-21E.

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2.1.2 Major System Valves

Reactor Building Emergency Booster Pump Discharge Valve, RR-V2A through 2D

One 12", 150 lb. ANSI, 85° F, CS, electric motor operated, gate valve is located in the discharge of each Reactor Building emergency booster pump. The valves may be controlled locally or from Panel No. 3. Indication is available locally and on Panel No. 3 and No. 13. The valves open on an ES signal. Valves RR-V2A & 2B receive power from MCC 2-11EA and valves RR-V2C & 2D receive power from MCC 2-21EA.

Reactor Building Cooling Fan Unit Inlet Valves RR-V5A, 5B, 5C, 6C, 6D and 6E

One 8", 225 lb. ANSI, 85° F, CS, electric motor operated, gate valve is located in the inlet to Reactor Building fan cooling units AH-C-13A/14A, 13B/14B, 13D/14D and 13E/14E. RR-V5C and RR-V6C are in the inlet to cooling unit AH-C-13C/14C. The valves are controlled by local and remote (Panel No. 15) pushbutton stations. Valve indication is available locally and on Panels No. 13 and 15. Those valves shut are opened by an ES signal. Valves RR-V5A, 5B and 5C are powered from MCC 2-11E and valves RR-V6A, 6B and 6C are powered from MCC 2-21E.

Reactor Building Cooling Unit Back-Pressure Regulator RR-V11A through 11E

One 6", 225 lb. ANSI, 200° F, CS, diaphragm operated globe valve is located in each Reactor Building cooling unit emergency discharge. The valves are controlled by a

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pressure controller upstream of the valve. During operation of the RB Emergency Cooling System, the control valve maintains 60 psig in the coils so that Reactor Building atmosphere will not leak into river water discharge. During normal operation with the RB Normal Cooling flow through the coils, the valves are a boundary between the RB Normal and Nuclear River Water System . The valves fail open on loss of air.

Reactor Building Cooling Unit Normal Discharge Valves, RR-V25A through 25F

One 6", 225 lb. ANSI, 200° F, CS, air cylinder operated gate valve is located in each Reactor Building cooling unit normal discharge. The valves are shut by an ES signal to isolate the cooling units from the Reactor Building Normal Cooling Water System. Indication and control is available on Panel No. 15 and No. 13. The valves fail closed with a loss of instrument air.

Reactor Building Cooling Unit Outlet Valve, RR-V26A through 26E and RR-V79

One 8", 225 lb. ANSI, 200° F, CS, electric motor operated gate valve is located in the outlet from Reactor Building cooling units A, B, D and E. Unit C has two valves RR-V26C and RR-V79 in its outlet. Control and indication is available locally and from Panel 15. The valves are not repositioned by an ES signal. RR-V26A, 26B and 26C are powered from MCC 2-11EA. Valves RR-V79, PR-V26D and 26E are powered from MCC 2-21EA.

2.2 Instruments, Controls, Alarms and Protective Devices

The following instrumentation and controls (See Table 2) are provided to control and monitor the system operation.

Pressure transmitters and remote indicators are provided for each of the Emergency Booster Pumps. Pushbutton controls are provided for the valves on the discharge of each of the Emergency Booster Pumps and the inlet lines to each of the cooling coil units. Orifice plates and flow transmitters are installed in each line downstream of the cooling coils for monitoring both Normal and Emergency flow

Temperature elements are installed in the lines from each of the cooling units. The output of these elements are interconnected to the computer.

An orifice plate and differential pressure indicator is located in the 10" discharge branch line for testing the discharge of the Emergency Cooling Booster Pumps.

Flow indication is provided on Panel No. 25. Pressure Control Valves and Pressure Controllers are provided in the discharge lines of each cooling coil to regulate the pressure in the cooling units to 60 psig. This back-

pressure will help prevent contamination of the river water during a LOCA, i.e. if there is a leak in the system, river water will flow out instead of Reactor Building atmosphere leaking in.

Pushbutton controls are provided on Panel 15 to operate block valves for each of the cooling units. Each pump has JOG-NORMAL-STOP local control switch and a TEST-OFF-AUTO-BACKUP control switch on Panel No. 3. One pump switch in each pair is placed in AUTO and the other pump switch is placed in BACKUP. During testing (without ES signal) the pumps will not run without Nuclear Services Closed Cooling water flow. Pressure switches are provided in the discharge of each of the Emergency Cooling Booster pumps to stop the pump, if its discharge pressure falls below 50 psig. The backup pump of this pair will automatically start if the running pump stops. Each pump has a low Nuclear River Water Suction Pressure alarm on Panel No. 8.

On an SFAS signal, all discharge valves on the Emergency Cooler Booster pump open. One booster pump of each pair starts. [illegible], all cooling inlet valves open, and RB Normal Cooling coil outlet valves close. With a loss of normal power and an ES signal, the RB

Emergency Booster Pumps are sequentially powered in accordance with the diesel loading sequence.

3.0 PRINCIPAL MODES OF OPERATION

3.1 Startup

The Reactor Building Emergency cooling is not used in normal power operation. The system is in standby startup status. The control switch of one pump of each pair is put in AUTO, and the remaining two are placed in BACKUP. With an ES signal, the RB Normal Cooling System will be automatically shutdown, and the RB Emergency System started up.

3.2 Normal Operation

Three of the five Reactor Building air cooling units are normally operated, using the normal cooling water system, refer to System Description Index No. 45A, Reactor Building Normal Cooling Water System.

During normal operation, the inlet valves of two fan coil units are shut, and all Booster Pumps are idle.

On a SFAS Signal the RB Normal Cooling System Pump and Evaporator are shutdown and isolated. The six inlet

to the five cooling units open and the RB Normal outlet valves close.

Pump suction is taken from the Nuclear River Water Header through a check valve. After passing through the pump discharge check valve and isolation valve, the four 12" lines from each pump combine into two 16" headers. The header from RR-P-1A/B supplies cooling units AH-C-13A/14A, 13B/14B and 13C/14C. The header from RR-P-1C/D supplies AH-C-13C/14C, 13D/14D and 13E/14E. Each cooling unit inlet has a remote controlled ES actuated valve, a check valve and manual isolation valve. The two unit C supply lines combine before entering the Reactor Building. Inside the building are second check valves RR-V27A through E and isolation valves RR-V9A through E. At the cooling units each line divides into six 3" lines for the cooling coils, recombining on the cooler discharge.

The discharge lines contain isolation valves RR-V10A through E, and remotely operated isolation valves RR-V26A through E and RR-V79. After leaving the Reactor Building, the discharge lines divide into 6" lines and 8" lines. The 6" lines have remotely operated isolation valves RR-V25A

through E, which isolate the Normal Cooling Water System on an SFAS signal. The emergency cooling water flows through the 8" lines, through pressure regulating valves RR-V11A through E, and isolation valves RR-V12A through E. The five cooling unit discharge lines are combined into one 14" return line. This line is increased to 30", and is cross connected to both Nuclear Services River Water return headers before continuing to the Mechanical Draft Cooling Tower.

3.3 Shutdown

After clearing the ES signal, the RB Normal Pumps may be stopped and the system isolated. However, before resuming operation with the RB Normal System, the coils and its associated piping must be completely flushed of river water and normal chemistry conditions restored.

3.4 Special or Infrequent Operation

Because river water should not be pumped through the fan coils, except under abnormal conditions, a test line and an associated flow element are provided to verify pump capacity. During pump testing ~~and~~ the normal discharge, valves RR-V2A, 2B, 2C and 2D remain shut.

Flow is directed through the pump's normally shut gate valves, RR-V3A, 3B, 3C or 3D, and the header isolation valve RR-V29. Flow indication is available in the path to the Mechanical Draft Cooling Towers.

3.5 Emergency

During a LOCA only two Reactor Building cooling units are required. If a LOCA, loss of normal power and loss of a diesel occur simultaneously only one pump will run and supply water to three cooling units. Cooling unit C acts as a backup for either the red or green cooling units.

The pressure in the cooling piping in the Reactor Building is maintained above the maximum expected pressure of the Reactor Building. If a leak in the piping occurs during a LOCA, water will flow out of the pipe preventing radioactive contamination of the river. A leak can be isolated by shutting the cooling unit inlet and outlet valves RR-V5A, B or C or RR-V6C, D or E and RR-V26A, B, C, D, E or RR-V79. The pressure regulating valve RR-V11A, B, C, D or E will shut automatically when the pressure is reduced below 60 psig. To ensure cooling unit isolation the manual valve downstream of the pressure regulating valve should also be shut.

A discussion of the operation of RB Cooling with a loss of instrument air is discussed in System Description No. 45A.

4.0 HAZARDS AND PRECAUTIONS

During pump capacity testing, ensure that the discharge valve to the fan coil units, (RR-V2A, 2B, 2C and 2D) remain shut, and that there is a flow path to the river.

If the running RB Emergency trips on low discharge pressure, the pump trip should be reset by opening pump breaker.

TABLE 1

Reactor Building Emergency Cooling Booster Pumps

Pump Details	
Identification	RR-P-1A, RR-P-1B, RR-P-1C, RR-P-1D
Number Installed	4
Manufacturer	Ingersoll-Rand
Model No.	6x18 SE
Type	Horizontal, double suction, single stage, centrifugal
Rated Speed, rpm	1750
Rated Capacity, gpm	3000
Rated Total Dynamic Head, ft.	160
NPSH required at rated flow, ft.	15
Design Pressure, casing, ft.	170
Design Temperature, ^{o}F	85
Lubricant/Coolant	oil/air
Min. Flow Requirements, gpm	150
Motor Details	
Manufacturer	General Electric
Type	Squirrel cage
Enclosure	TEWC
Rated Horsepower	200
Speed, rpm	1750
Lubricant/Coolant	Oil/Water
Power Requirements	460V, 3Ø, 60 Hz, 230 amps full load
Power Source	RR-P-1A and B, 480V Bus 2-11E RR-P-1C and D, 480V Bus 2-21E
Classification	**Level**
Code	C
Quality Control	4
Seismic	I
Cleanliness	D

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TABLE 3

INSTRUMENTATION AND CONTROLS

Identification	Description	Function	Location	Type	Input Range	Output Range	Set Point
RR-PT-346	Press. XMTR.	Transmit Disch. press. of pump RR-P-1A to press. Indicator RR-PI-346.	Rack 443	Gage Press.	0-150 psig	10-50 MA DC	N/A
RR-PI-346	Press. Indicator	Indicates disch. press. of pump RR-P-1A	Panel 3	Milliammeter	10-50 MA DC	0-150 psig	N/A
RR-PT-347	Press. XMTR.	Transmit disch. press. of pump RR-P-1B to press. Indicator RR-PI-347	Rack 443	Gage Press.	0-150 psig	10-50 MA DC	N/A
RR-PI-347	Press. Indicator	Indicates disch. press. of pump RR-P-1B	Panel 3	Milliammeter	10-50 MA DC	0-150 psig	N/A
RR-PT-348	Press. XMTR.	Transmit disch. press. of pump RR-P-1C to press. Indicator RR-PI-348	Rack 444	Gage Press.	0-150 psig	10-50 MA DC	N/A
RR-PI-348	Press. Indicator	Indicates disch. press. of pump RR-P-1C	Panel 3	Milliammeter	10-50 MA DC	0-150 psig	N/A
RR-PT-349	Press. XMTR.	Transmit disch. press. of pump RR-P-1D to press. Indicator RR-PI-349	Rack 444	Gage Press.	0-150 psig	10-50 MA DC	N/A
RR-PI-349	Press. Indicator	Indicates disch. press. of pump RR-P-1D	Panel 3	Milliammeter	10-50 MA DC	0-150 psig	N/A
RR-PHS-388	Pushbutton	Operates block valve RR-V-2A for pump RR-P-1A	Panel 3	C-H Type E-30	N/A	N/A	N/A
RR-PHS-389	Pushbutton	Operates block valve RR-V-2B for pump RR-P-1B	Panel 3	C-H Type E-30	N/A	N/A	N/A
RR-PHS-390	Pushbutton	Operates block valve RR-V-2C for pump RR-P-1C	Panel 3	C-H Type E-30	N/A	N/A	N/A
RR-PHS-391	Pushbutton	Operates block valve RR-V-2D for pump RR-P-1C	Panel 3	C-H Type E-30	N/A	N/A	N/A
RR-PHS-1015	Pushbutton	Operates block valve RR-V5A for Cooling Coils AH-C-13A & AH-C-14A	Panel 15	C-H Type E-30	N/A	N/A	N/A
RR-PHS-1017	Pushbutton	Operates block valve RR-V5B for Cooling Coils AH-C-13B & AH-C-14B	Panel 15	C-H Type E-30	N/A	N/A	N/A
RR-PHS-1019	Pushbutton	Operates block valve RR-V5C for Cooling Coils AH-C-13C & AH-C-14C	Panel 15	C-H Type E-30	N/A	N/A	N/A
RR-PHS-1020	Pushbutton	Operates block valve RR-V6C for Cooling Coils AH-C-13C & AH-C-14C	Panel 15	C-H Type E-30	N/A	N/A	N/A
RR-PHS-1022	Pushbutton	Operates block valve RR-V6D for Cooling Coils AH-C-13D & AH-C-14D	Panel 15	C-H Type E-30	N/A	N/A	N/A
RR-PHS-1024	Pushbutton	Operates block valve RR-V6E for Cooling Coils AH-C-13E & AH-C-14E	Panel 15	C-H Type E-30	N/A	N/A	N/A

TABLE 2 (Continued)

INSTRUMENTATION AND CONTROLS

Identification	Description	Function	Location	Type	Input Range	Output Range	Set Point
RR-FE-1025, 1026 1027, 1028 & 1029	Orifice	Detect flow for flow transmitter RR-FT-1025, 1026, 1027 1028 and 1029 respectively	Piping	Orifice	0-1800 GPM	0-100 H_2O	N/A
RR-FT-1025, 1026 1027, 1028, 1029	Flow Transmitter	Transmit differential pressure signal to square root converted RR-FY-1025, 1026, 1027, 1028 and 1029 respectively	Rack 428 for 1025, 1026 1027, MTG #1 for 1028, 1029	D/P Cell	0-100"	10-50 MA DC	N/A
RR-FY-1025, 1026 1027, 1028 & 1029	Square Root Converter	Convert differential pressure signal to flow signal for indicators AH-FI-5620, 5621, 5622, 5623 and 5624	Cable Room	Sq. Rt. Converter	10-50 MA DC	10-50 MA DC	N/A
AH-FI-5620, 5621, 5622, 5623,& 5624	Flow Indicator	Indicates water flow through Reactor Building cooling coils A, B, C, D and E respectively	Panel 25	Vertical Dial Milliammeter	10-50 MA DC	0-1500 GPM	N/A
RR-TE-1040	Dual RTD	Temp. Detect. - R.B. Air Cooling Coils A outlet, signal for computer	Piping	Dual RTD	0-225°F	92.92-141.94	N/A
RR-TE-1041	Dual RTD	Temp. Detect. - R. B. Air Cooling Coils B outlet, signal for computer.	Piping	Dual RTD	0-225°F	92.92-141.94	N/A
RR-TE-1042	Dual RTD	Temp. Detect. R.B. Air Cooling Coils C outlet, signal for computer	Piping	Dual RTD	0-225°F	92.92-141.94	N/A
RR-TE-1043	Dual RTD	Temp. Detect. - R.B. Air Cooling Coils D outlet, signal for computer	Piping	Dual RTD	0-225°F	92.92-141.94	N/A
RR-TE-1044	Dual RTD	Temp. Detect. - R.B. Air Cooling Coils E outlet. signal for computer.	Piping	Dual RTD	0-225°F	92.92-141.94	N/A
RR-HIS-1560	Hand Switch	Operates block valve RR-V25A R.B. Normal cooling	Panel 15	Pushbutton	N/A	N/A	N/A
RR-HIS-1561	Hand Switch	Operates block valve RR-V25B R.B. normal cooling.	Panel 15	Pushbutton	N/A	N/A	N/A

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TABLE 3 (Continued)

INSTRUMENTATION AND CONTROL

IDENTIFICATION	DESCRIPTION	FUNCTION	LOCATION	TYPE	INPUT RANGE	OUTPUT RANGE	SET POINT
AR-FIS-1562	Hand Switch	Operates block valve AR-V25C R.B. normal cooling.	Panel 15	Pushbutton	N/A	N/A1	N/A
AR-FIS-1563	Hand Switch	Operates block valve AR-V25D R.B. normal cooling.	Panel 15	Pushbutton	N/A	N/A	N/A
AR-FIS-1564	Hand Switch	Operates block valve AR-V25E R.B. normal cooling.	Panel 14	Pushbutton	N/A	N/A	N/A
AR-FE-1755	Orifice	Orifice plate for AR-DPI-1755	Piping	Orifice	0-3000 GPM	0-180" H_2O	N/A
AR-DPI-1755	Diff. Press. Indicator	Flow indicator for local test	Mtg. A61	Bourdon Tube	0-180" H_2O	0-250" H_2O	N/A
AR-PC-3541	Press. Controller	Regulates AR-V11A (AR-PCV-3541)	Piping	Bourdon/ Bellows	0-150 psig	3-15 psig	60 psig
AR-PCV-3541	Press. Control	Controls AH-C-13A/14A outlet Press	Piping	Diaphgram/ Globe	3-15 psig	N/A	60 psig
AR-PC-3542	Press. Control	Regulates AR-V11B (AR-PCV-3542)	Piping	Bourdon/ Bellows	0-150 psig	3-15 psig	60 psig
AR-PCV-3542	Press. Cont. Valve	Controls AH-C-13B/14B outlet Press.	Piping	Diaphgram/ Globe	3-15 psig	N/A	60 psig
AR-PC-3543	Press. Contr.	Regulates AR-V11C (AR-PCV-3543)	Piping	Bourdon/ Bellows	0-150 psig	3-15 psig	60 psig
AR-PCV-3543	Press. Contr.	Controls AH-C-13C/14C outlet Press.	Piping	Diaphgram/ Globe	3-15 psig	N/A	60 psig
AR-PC-3544	Press. Contr.	Regulates AR-V11D (AR-PCV-3544)	Piping	Bourdon/ Bellows	0-150 psig	3-15 psig	60 psig
AR-PCV-3544	Press. Contr.	Controls AH-C-13D/14D outlet Pressure	Piping	Diaphgram/ Glove	3-15 psig	N/A	60 psig
AR-PC-3545	Press. Controller	Regulates AR-V11E (AR-PCV-3545)	Piping	Bourdon/ Bellows	0-150 psig	3-15 psig	60 psig
AR-PCV-3545	Press. Control	Pressure Control Valve	Piping	Diphgram/ Globe	3-15 psig	N/A	60 psig
AAR-FIS-3546	Hand Switch	Operates block valve AR-V26A Coil "A" Outlet	Panel 15	Pushbutton	N/A	N/A	N/A
AR-FIS-3547	Hand Switch	Operates block valve AR-V26B Coil "B" Outlet	Panel 15	Pushbutton	N/A	N/A	N/A

TABLE 2 (Continued)

INSTRUMENTATION AND CONTROL

Identification	Description	Function	Location	Type	Input Range	Output Range	Set Point
RR-PCS-3548	Hand Switch	Operates block valve RR-V26C Coil "C" Outlet.	Panel 15	Pushbutton	N/A	N/A	N/A
RR-PCS-3549	Hand Switch	Operates block valve RR-V26D Coil "D" Outlet.	Panel 15	Pushbutton	N/A	N/A	N/A
RR-PCS-3550	Hand Switch	Operates block valve RR-V26E Coil "E" Outlet.	Panel 15	Pushbutton	N/A	N/A	N/A
RR-PS-3561	Press. Switch	Releases drop out circuit RR-P-1A, starts RR-P-1B	Rack 443	Diaphragm	4-100 psig	N/A	50 psig
RR-PS-3562	Press. Switch	Releases drop out circuit RR-P-1B, starts RR-P-1A	Rack 443	Diaphragm	4-100 psig	N/A	50 psig
RR-PS-3563	Press. Switch	Releases drop out circuit RR-P-1C, starts RR-P-1D	Rack 444	Diaphragm	4-100 psig	N/A	50 psig
RR-PS-3564	Press. Switch	Releases drop out circuit RR-P-1D, starts RR-P-1C	Rack 444	Diaphragm	4-100 psig	N/A	50 psig
RR-PHS-3822	Hand Switch	Operates block valve RR-V79	Panel 15	Pushbutton	N/A	N/A	N/A
RR-P1A-MLS	Hand Switch	Operat RR-P-1A	Panel 3	SBM	N/A	N/A	N/A
RR-P1B-MLS	Hadd Switch	Operate RR-P-1B	Panel 3	SBM	N/A	N/A	N/A
RR-P1C-MLS	Hand Switch	Operate RR-P-1C	Panel 3	SBM	N/A	N/A	N/A
RR-P1D-MLS	Hand Switch	Operate RR-P-1D	Panel 3	SBM	N/A	N/A	N/A

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TABLE 3

PANEL MOUNTED ANNUNCIATORS

Identification No.	Measured Variable, Units	Alarm Hi	Alarm Low	Input Source	Var. Range	Panel No.
RR-EA-4539	R.B. Emergency Cooling Booster Pump, Trip.	N/A	N/A	Pump OLX's	N/A	8

COMPUTER INPUTS

1020	R.B. Cooling Coil Unit, A, Outlet Temperature, °F	N/A	N/A	RR-TE-1040	0-60# °
1021	R.B. Cooling Coil Unit, B, Outlet Temperature, °F	N/A	N/A	RR-TE-1041	0-[illegible] °
1022	R.B. Cooling Coil Unit, C, Outlet Temperature, °F	N/A	N/A	RR-TE-1042	0-200
1023	R.B. Cooling Coil Unit, D, Outlet Temperature, °F	N/A	N/A	RR-TE-1043	0-200
1024	R.B. Cooling Coil Unit, E, Outlet Temperature, °F	N/A	N/A	RR-TE-1044	0-200
3639	R.B. Emergency Cooling Booster Pump, RR-P-1A, overload	N/A	N/A	OLX	N/A
3540	R.B. Emergency Cooling Booster Pump, RR-P-1B, overload	N/A	N/A	OLX	N/A
3641	R.B. Emergency Cooling Booster Pump, RR-P-1C, overload	N/A	N/A	OLX	N/A
3642	R.B. Emergency Cooling Booster Pump, RR-P-1D, overload	N/A	N/A	OLX	N/A
0170	R.B. Emergency Cooling Booster Pump, RR-P-1A, Discharge Press.	N/A	N/A	RR-PT-346	0-150 psig
0171	R.B. Emergency Cooling Booster Pump, RR-P-1B, Discharge Press.	N/A	N/A	RR-PT-347	0-150 psig
0172	R.B. Emergency Cooling Booster Pump, RR-P-1C, Discharge Press.	N/A	N/A	RR-PT-348	0-150 psig
0173	R.B. Emergency Cooling Booster Pump, RR-P-1D, Discharge Press.	N/A	N/A	RR-PT-349	0-150 psig

TMI DOCUMENTS

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