FINAL

SYSTEM DESCRIPTION
(Index No. 28A)

REACTOR BUILDING EMERGENCY SPRAY SYSTEM

(B&R Dwg. No. 2034, Rev. 16)

JERSEY CENTRAL POWER & LIGHT COMPANY
THREE MILE ISLAND NUCLEAR STATION
UNIT NO. 2

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REACTOR BUILDING EMERGENCY SPRAY SYSTEM

1.0 INTRODUCTION

1.1 System Functions

The reactor building emergency spray system serves an engineered safety features function, along with the building emergency cooling system, to cool the reactor building atmosphere following a reactor coolant system piping rupture, thereby effecting a pressure reduction within the building, and consequently, minimizing the potential leakage of radioactivity from the building to the site and surrounding areas. The spray system also functions to remove radioiodine from the reactor building atmosphere by chemical reaction and to wash suspended particulate radioactivity out of the reactor building atmosphere. The cooling action is accomplished by spraying water into the reactor building atmosphere, in order to remove heat from the steam released by the piping rupture. The fluid for the spray system is supplied from the borated water, sodium hydroxide ~~and sodium thiosulfate~~ storage tanks and is discharged into the reactor building by a pump in each of the two system circuits. ~~The sodium thiosulfate reacts with radioiodine and removes it from the building atmosphere. In order that the sodium thiosulfate remains stable in th borated water,~~ sodium hydroxide is added to raise the pH of the borated water and maintain it in the alkaline range. The chemical solutions are gravity fed from their respective storage tanks to the line leading to each system pump. The chemical storage tanks and their outlet lines are sized to drain at a rate proportional to the drainage rate of the borated water storage tank.

When the borated water storage tank supply has been exhausted, the reactor building emergency spray system functions in a recirculation mode by taking suction from the reactor building sump and returning the water to the reactor building by way of the spray system. The post-accident building spray is used in the recirculation mode to continue removal of heat and iodine from the reactor building atmosphere.

The reactor building emergency spray system has an interface with the decay heat removal system in that the spray system pumps take suction from the supply headers for the decay heat removal pumps, and during system testing, discharge into the decay heat removal system return line to the borated water storage tank. The system has no normal operating interface with any other plant system with the exception that each pump motor is cooled by water from the nuclear services closed cooling water system.

1.2 Summary Description of System (Refer to B&R Dwg. No. 2034, Rev. 16)

The reactor building emergency spray system discharges borated water into the reactor building atmosphere after a loss of coolant accident (LOCA) to cool the steam released due to the casualty and thereby prevent overpressurization by effecting building cooldown. System operation is automatically initiated upon receipt of signals from the safety features actuation system (SFAS). Alkaline sodium thiosulfate and sodium hydroxide are introduced with the spray for radioiodine removal and pH control. The system also functions to provide long term, post-accident building cooling by recirculating the water from the reactor building sump through the spray system.

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The system consists of two circuits each containing a 50% capacity pump for heat removal (100% capacity for iodine removal by sodium thiosulfate injection) which takes suction independently from a decay heat removal system supply header. Each of the two Reactor Building Spray Pump Suction headers is connected to the borated water, ~~sodium thiosulfate~~ and sodium hydroxide storage tanks and to the reactor building sump and can therefore provide the building spray pumps with suction initially from the borated water storage tank and also from the reactor building sump, while at the same time, the decay heat removal system is performing its emergency function. Each of the suction lines to the building spray pumps contains a remotely actuated, electric motor operated stop valve and a check valve in series. The electric motor operated stop valves are normally maintained in the open position and are closed only during normal operation of the decay heat removal system or when isolation of a circuit is required as during maintenance work. The pumps are cross-connected at the suction but are normally isolated from each other by two stop valves in the interconnecting line. ~~A~~ separate ~~line fitted with a normally closed, remotely~~ actuated, electric motor-operated-stop valve connects ~~to each pump suction~~ line from ~~the sodium~~ thiosulfate ~~storage tank outlet~~. ~~These valves are automatically opened upon receipt of a signal from the SFAS.~~ The discharge of each pump is routed through an individual reactor building penetration and connects to separate spray headers in the upper portion of the reactor building. Each discharge line is provided with a normally closed, remotely actuated, electric motor operated throttle valve at the pump discharge which opens automatically upon a signal from the SFAS, and a check valve inside the reactor building.

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Provisions have been incorporated into the system to allow testing of the pumps and the spray nozzles. A test connection is provided from each of the pump discharge lines, upstream of the electric motor operated throttle valve, which returns the pump discharge to the borated water storage tank via the decay heat removal system return line to that tank. During in-service testing, the pumps take suction from the borated water storage tank and recirculate back to the tank. Another test connection is provided downstream of each discharge throttle valve to introduce low pressure air or smoke to the spray headers to check for nozzle flow.

The system is automatically activated upon receipt of signals from the safety features actuation system. The electric motor operated valves, necessary for system operation, are opened at a building pressure of 4 psig, and the pumps are started at a building pressure of 30 psig. Remote manual activation by operator action is also provided.

1.3 System Design Requirements

The reactor building emergency spray system is designed to provide sufficient heat removal capability to limit the pressure rise in the reactor building, following a design basis accident, to a point below the 60 psig design pressure of the building, without credit for heat dissipation to the building structure. This capability is predicated upon each of the two 50% capacity circuits delivering 1500 gpm of spray to the reactor building after the accident. However, to provide redundancy, this heat removal requirement is also fulfilled by each of the following: all five of the reactor building emergency cooling system fan-cooler units in operation; or, three fan-cooler units and one circuit of the building spray system in operation.

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Therefore, with either the reactor building emergency spray system, the reactor building emergency cooling system or a combination of the two systems being capable of providing adequate cooling of the reactor building atmosphere, the building integrity will be maintained following an accident and the building pressure will be decreased at a rate which satisfies the site criteria.

The water is introduced into the reactor building atmosphere through two spray headers each containing 96 spray nozzles. Each spray nozzle delivers approximately 15.5 gpm upon system actuation immediately following the accident. This flow rate increases slightly with time as the building pressure decreases as a result of cooldown. The water is supplied from the borated water, sodium hydroxide ~~and sodium thiosulfate~~ storage tanks until the tanks are empty. Thereafter water collected in the building sump is recirculated through the spray nozzles. The sump water, in all cases, meets the NPSH requirements of the spray pumps with the building spray system in the recirculation mode.

Major system components consist of two pumps, ~~the sodium thiosulfate storage tank,~~ two spray headers with fixed spray nozzles, interconnecting piping and electric motor operated valves capable of automatic opening. The borated water storage tank and the sodium hydroxide storage tank, although not expressly designated as part of the reactor building emergency spray system, serve an integral function with respect to system operation (see Decay Heat Removal System Description, Index No. 20 for further information). The suction line from the borated water storage tank which provides, in part the initial supply of spray water for approximately the first 40 minutes is sized to deliver the expected flows of two decay

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heat removal pumps (3000 gpm each), two high pressure makeup pumps (500 gpm each), and two building spray pumps (1500 gpm each) plus some margin of runout for each pump. The tank will deliver approximately 403,000 gals. of water at a minimum concentration of 2270 ppm boron. The design pressure and temperature of the spray system are 350 psig and 300F, respectively. Major system piping is classified as Nuclear, Symbol N, designed, fabricated, inspected and erected in accordance with ANSI B31.7, Nuclear Piping. The seismic requirements of Class I apply to the entire system including all components.

Monitoring of system performance and control of system operation is provided in the control room.

2.0 DETAILED DESCRIPTION OF SYSTEM

2.1 Components

The components in each circuit are identical and each circuit provides a 50% capacity for building cooling and a 100% capacity for iodine removal. Used in conjunction with the reactor building emergency cooling system, it provides sufficient heat removal to prevent over-pressurization of the reactor building in the event of a loss of coolant accident. Since the system is an engineered safety features system, neither circuit can be out of service except for brief periods during which maintenance is being performed on system components.

2.1.1 Reactor Building Spray Pumps, BS-P-1A/BS-P-1B

The reactor building spray pumps (see Table 1) are single-stage, horizontal-shaft, single suction, centrifugal pumps rated at 1500 gpm each with a total discharge head of 450 ft. The pumps discharge water into the reactor building from the borated water, the sodium hydroxide ~~and the sodium thiosulfate~~ storage tanks until the supply in the tanks is nearly exhausted and then recirculate the accumulated water from the reactor building sump back to the reactor building through the spray nozzles. Cooling water for the pumps' motors is supplied by the nuclear services closed cooling water system. The pumps are automatically started by a signal from the safety features actuation system, or can be remotely activated from the control room on the Auxiliary Systems Control Panel Number 3 by operator action. Testing of the pumps' auto-start feature is possible from the Safety Features Actuation Monitoring and Test Panel No. 13. Electric Power supply to the pump's motor is provided from the 4160V engineered safety features busses 2-1E for BS-P-1A and 2-2E for BS-P-1B.

2.1.2 Sodium Thiosulfate Storage Tank BS-T-1

The sodium thiosulfate storage tank (see Table 2) is a vertical cylinder, with a 94" OD and an overall height of 52'-0". The dry capacity of the tank is approximately 17,853 gals. and the tank will deliver 13,000 gals. of 30,000 ppm sodium thiosulfate solution for approximately 40 min. after the LOCA. The sodium thiosulfate solution is discharged into the reactor building with sprayed water and reacts with the iodine to remove it from the building atmosphere. The tank is physically located outside of the auxiliary building. Thermal insulation and redundant electrical heat tracing is provided to maintain the tank temperature above 40F. Heater control is automatic. The tank is designed to withstand an internal pressure equal to a column of

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water 10 ft. above the high liquid level in the tank and a temperature of 150F. A slight nitrogen over-pressure is maintained in the tank to provide an inert atmosphere. The sodium thiosulfate solution is gravity fed to the suction line of each building spray pump through a 4 inch line provided with remotely controlled, electric motor operated valves. The valves open automatically upon receipt of a signal from the safety features actuation system. A relief valve set a 2½ psig and a vacuum breaker set at 3 oz/sq.in. are fitted to the tank. A double valved blanked drain and a local sampling connection are provided.

2.1.3 Reactor Building Spray Nozzles

The Reactor Building spray nozzles are manufactured by Spray Co. (model #1713) and are designed to deliver approximately 15.5 gpm at a building pressure of 60 psig with a 40 psi pressure drop through the nozzle. The nozzles are capable of passing particales up to 0.25" in diameter without plugging. Filtering screens in each reactor building sump outlet line are also sized to pass particles up to this dimension. Ninety-six spray nozzles are fixed in each of the two headers. The spray headers follow the contour of the reactor building dome at an elevation of between 449'-09" and 468'-05" within the building.

2.1.4 Borated Water Storage Tank DH-T-1

Although not expressly designated as a component of the reactor building emergency spray system, the borated water storage tank serves an integral function with respect to initial system operation following the loss-of-coolant accident. The tank

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(see Decay Heat Removal System description, Index No. 20, Table 3) is a vertical cylinder, 37'-06" outside diameter, with a vertical straight section of 50 ft. and a self supporting domed roof. The overall height of the tank is 60'/04-3/4" and the dry volume ~~if~~ is 472,964 gals. The tank is physically located outside of the auxiliary building. Thermal insulation and redundant electrical heat tracing is provided to automatically maintain the liquid at a minimum temperature of 40F. The tank will deliver approximately 403,008 gals. (Normal level to Lo/Lo Level) of water at a minimum concentration of 2270 ppm boron and provides a source of borated water for the building spray pumps, as well as the decay heat removal pumps (for low pressure injection) and the high pressure makeup pumps, for approximately 40 minutes after a LOCA.

2.1.5. Sodium Hydroxide Storage Tank DH-T-2

The sodium hydroxide storage tank is also not expressly designated as a component of this system but serves an integral function following a LOCA. The tank (see Decay Heat Removal System description, Index No. 20 Table 4) is a vertical cylinder, 84" in outside diameter with an overall height of 52 ft. and a dry volume of approximately 14,285 gal. of water at a concentration of 20,000 ppm NaOH. The delivered volume following the LOCA is approximately 11,600 gals. The sodium hydroxide establishes an alkaline pH in the borated water which is injected into the reactor building after the accident ~~to maintain the stability of the sodium thiosulfate which is added for iodine removal~~. The tank is physically located outside of the auxiliary building and thermal insulation is provided. Redundant electrical

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heat tracing is installed around the tank to automatically maintain the liquid temperature at approximately 40F. A slight nitrogen overpressure is maintained in the tank to provide an inert atmosphere.

2.1.6 Major System Valves

Reactor Building Spray Pump Discharge Valves-BS-V1A, BS-V1B

One 350 psig, 300F, 8 inch, SS, electric motor operated globe valve is provided in the discharge line from each reactor building spray pump. The valves are opened automatically within 10 secs. by a signal from the safety features actuation system. Remote manual operation of each valve is provided from the coolant Systems Monitoring Panel No. 8 in the control room. Cycling of the valves for periodic test purposes is controlled from the Safety Features Actuation Monitoring and Test Panel No. 13. During system operation, as the reactor building pressure decreases, the valves are remote manually throttled to prevent pump runout. Power supply to the electric motor valve operators is provided from the 480V motor control centers 2-11EA for BS-V1A and 2-21EA for BS-V1B.

Reactor Building Spray Pump Suction Valve from Decay Heat Removal Suction Headers - BS-V3A, BS-V3B

One 200 psig, 300F, 10 inch, SS, electric motor operated gate valve is provided in the suction line from the decay heat removal system suction headers to each building spray pump. These valves are normally maintained in the open position except during operation of the decay heat removal system when the removal system is serving its normal functions. In these cases, BS-V3A and BS-V3B must be closed by operator action to isolate the

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building spray system. The valves are remotely controlled from the control room by switches located on the Auxiliary Systems Control Panel Number 3. Power to the electric motor valve operators is supplied from the 480V motor control centers 2-11EA for BS-V3A and 2-21EA for BS-V3B.

Sodium Thiosulfate Storage Tank to Reactor Building Spray Pump Suction Lines, BS-V4A and BS-V4B

One 350 psig, 300F, 4 inch, SS, electric motor operated gate valve is provided in the gravity feed line to each building spray pump suction line from the sodium thiosulfate storage tank. The valves are opened automatically within 20 seconds by a signal from the safety features actuation system, to admit the sodium thiosulfate to the pumps for discharge into the building atmosphere. Remote manual operation of each valve is also provided from the control room on Coolant Systems Monitoring Panel Number 8. Cycling of the valves for periodic test purposes is controlled from the Safety Features Actuation Monitoring and Test Panel No. 13. Power to the electric motor valve operators is provided from the 480V motor control centers 2-11EA for BS-V4A and 2-21EA for BS-V4B.

2.2 Instruments, Controls, Alarms and Protective Devices

Instrumentation is provided in the control room on the Auxiliary Systems Control Panel Number 3 for the reactor building emergency spray system to monitor system performance during testing, standby and during actual operation. (See Table 3). A listing of panel mounted annunciator, relief valve and vacuum

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breaker setpoints is given in Table 4. Alarm conditions are annunciated in the control room on the Coolant Systems Monitoring Panel No. 8.

The reactor building spray flow in each circuit is monitored and indicated in the control room. High and low flow alarm contacts are provided for annunciation. The low flow alarm is interlocked with the reactor building high-high pressure monitors to annunciate only during an emergency condition, i.e., when the building high-high pressure monitor has been tripped. This arrangement permits the Low-Flow Alarm to function as a monitor to verify that the Building Spray pumps--have started. Local instrumentation is also provided to indicate the suction and discharge pressure of each pump with low suction pressure alarmed in the control room.

The temperature and level in the sodium thiosulfate storage tank is monitored and indicated in the control room with high and low condition for each parameter, annunciated. A gauge glass is fitted to the tank for local level indication. The temperature of the solution in the tank is automatically maintained by redundant electrical heat tracing. A tabulation of the instrumentation to the borated water and sodium hydroxide storage tanks can be found in the Decay Heat Removal System Description, Index No. 20.

A relief valve set at 350 psig is provided at the suction of each building spray pump to preclude overpressurization from inadvertent reactor coolant system leakage through closed valves when the spray system is idle during normal reactor power operations. A vacuum breaker and pressure relief valve are fitted on the sodium thiosulfate storage tank to prevent damage to the tank.

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For details concerning actuation of the reactor building emergency spray system, refer to the Safety Features Actuation System description, Index No. 50.

3.0 PRINCIPAL MODES OF OPERATION

3.1 Startup

Startup of the reactor building emergency spray system consists of testing the operation and performance of the system and preparing it for normal stand-by service. The borated water storage tank is filled with demineralized water and boric acid to establish a 2270 ppm minimum boron concentration if this has not already been accomplished. With the circuit electric motor operated discharge valve closed and suction lined up from the borated water storage tank, each pump is started individually and flow is recirculated to the storage tank. Flow rates and pump suction and discharge pressures are noted and recorded for future reference in determining system performance. System piping up to the circuits' discharge valve BS-V1A/BS-V1B are maintained filled with borated water. The automatic actuation feature of all related equipment, including all electric motor operated valves must also be tested to ensure proper operation. An air or smoke supply is introduced into the nozzle air test connection for each circuit to check for free flow through the nozzles. Visual observation of the ribbon indicators attached to each nozzle or of the smoke is required to verify proper nozzle operation.

The sodium thiosulfate storage tank is filled with demineralized water and sodium thiosulfate to produce a 30,000 ppm concentration in the tank. The tank outlet line and each branch to the building spray pump suction line, up to the motor operated valve is filled

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and vented. ~~A nitrogen overpressure at approximately 2 psig~~ is introduced ~~into~~ the tank to maintain an inert ~~atmosphere. The~~ system is then lined-up-and-~~maintained in a standby condition,~~ ready for emergency ~~operation.~~ It must be ensured that the sodium hydroxide storage tank is also filled and at the prescribed concentration of 20,000 ppm NaOH.

A low point drain line is provided in each circuit inside the reactor building and fitted with manual stop valves BS-V106A/BS-V106B. The purpose of the drain lines is to prevent water from reaching the spray headers by leakage through the building spray pumps' discharge valve during system testing. These drain lines are sized to pass approximately 16 gpm (flow through one spray nozzle) and must be opened prior to reactor startup and remain open during reactor operation.

3.2 Normal Operation

The reactor building emergency spray system serves no function during normal plant power operation. The system provides an engineered safety features function and is actuated by signals from the safety features actuation system following a reactor coolant system piping casualty which increases the reactor building pressure above pre-set points. The system can also be manually placed in service by operator action, if required.

Upon receipt of an actuation signal, the circuits' discharge valve BS-V1A/BS-V1B, ~~the sodium thiosulfate supply valves, BS-V4A/BS-V4B,~~ and the valves in the lines from the borated water storage tank (DH-V5A/DH-V5B) and sodium hydroxide storage tank (DH-V8A/DH-V8B) are automatically opened followed by automatic starting of the spray pump, BS-P-1A and BS-P-1B. The pumps take suction independently through 10 in. lines, fitted with electric motor operated valves BS-V3A/BS-V3B (normally open), from each decay heat removal pump suction header. The suction headers are supplied with water from the borated water and sodium hydroxide storage tanks through independent lines fitted with safety features actuated, electric motor operated valves DH-V5A/DH-V5B and DH-V8A/DH-V8B. The suction lines to the pumps can be cross-connected but are normally maintained isolated by manual stop valves, BS-V101A and BS-V101B. ~~A 4 in. branch line from the common outlet of the sodium thiosulfate storage tank connects to the suction line of each building spray pump. Each branch line is provided with a safety features actuated, electric motor operated valve, BS-V4A/BS-V4B.~~ The pumps discharge to independent 8 in. lines fitted with electric motor operated throttle valve BS-V1A/BS-V1B. These valves are opened fully upon a SFAS Signal but are remote manually throttled in order to prevent pump runout as the reactor building pressure decreases due to cooling of the atmosphere after the accident. Downstream of the throttle valve, each pump discharge line enters the reactor building through a separate penetration, R-586 for circuit A, and R-583 for circuit B. Downstream of the building penetration, the piping size is reduced to 6 in. and each line is provided with a check valve for building isolation. Each circuit is then routed to one of the two spray headers in the upper part of the reactor building. Physical space limitations within the building required that the 6 in. supply line to each spray header be reduced into 4-4in. risers, ascending along the reactor building wall and reconnecting at the header.

Before the supply of water in the borated water storage tank is exhausted, (approximately 40 min.), the control room operator is alerted by annunciation of the low-low storage tank level alarm. At this time, the suction supply to the pumps must be transferred from the storage tank to the reactor building sump. The operation is performed by action of the control room operator. The electric motor operated valves, DH-V6A/DH-V6B, in each of the reactor building sump lines to the decay heat removal pump suction headers are opend, and the supply valves DH-V5A/DH-V5B from the borated water storage tank, ~~BS-V4A/BS-V4B from the sodium thiosulfate storage tank~~ and DH-V8A/DH-V8B from the sodium hydroxide storage tank to the headers are closed. Hand switches on the Safety Features Actuation Monitoring and Test Panel No. 3 provide for negating the safety features actuation signal (once the signal has been tripped) so that these valves may be closed. Once the safety features actuation signal has been negated, these valves are closed by depressing their respective actuation switches from the control room. The reactor building emergency spray system, in this mode, recirculates the water from the reactor building sump through the spray system, and discharges the water into the reactor building atmosphere to continue iodine removal as well as building cooldown and depressurization.

3.3 Shutdown

When the building spray system is shutdown, as is the case during normal reactor power or shutdown conditions, it is maintained in a standby status with all valving except the safety features actuated, electric motor operated valves positioned for system operation, and the pumps available for automatic start. If

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maintenance to equipment in one circuit of the system is required, it must be ensured that the other circuit is fully operable and available in the event of an emergency. To shutdown a circuit for maintenance, it is only necessary to de-energize the pump and the safety features actuated valves, close and de-energize the electric motor operated pump suction valve (either BS-V3A or BS-V3B), and close the associated manual valves to isolate the circuit and/or component requiring maintenance.

Following a system test, the building spray pump(s) must be manually stopped and the valves, opened for the test, must be closed and the system control switch positioned for automatic operation.

3.4 Special or Infrequent Operation

Provisions have been incorporated into the system to allow testing of each circuit pump and for testing spray nozzle flow during reactor operation. Pump performance can be determined by operating the pump taking suction from the borated water storage tank through electric motor operated valve DH-V5A or DH-V5B and discharging through manual test valve BS-V103A or BS-V103B and BS-V104 back to the storage tank via the decay heat removal system test line. The suction and discharge pressures of the pump and the circuit flow is noted and recorded for comparison with initial and prior test results to determine system performance.

The nozzle flow test is performed by introducing air or smoke through the nozzle test connection, for each circuit, fitted with manual stop valve BS-V130A or BS-V130B. The air flows through the circuit piping to the spray header in the reactor building and free flow is confirmed by visual observation of the smoke or the ribbon indicators affixed to each nozzle.

Sampling of the water contained within the sodium thiosulfate storage tanks is periodically performed to ensure an adequate concentration of the required chemicals and to determine water quality. Sample taps are fitted to each tank for this purpose.

3.5 Emergency Operation

Reactor building emergency spray is initiated upon an abnormally high reactor building pressure sensed by redundant pressure monitors within the building. System activation is a function of the safety features actuation system (see System Description, Index Number 50).

Operation of the system in the emergency mode is identical to that which has been described under "Normal Operation", Section 3.2 of this system description.

Additional sodium hydroxide ~~and sodium thiosulfate~~ may be added to the recirculating water during post-accident operation, if deemed necessary. The solution is added to the respective storage tank from the caustic mixing tank, via the addition pump, in the chemical addition system and then introduced into the recirculating water by opening the appropriate storage tank outlet valve (s), once a water level in the storage tank has been established.

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4.0 HAZARDS AND PRECAUTIONS

The principal hazard associated with this system is inadvertent actuation when no emergency condition exists. Such an occurrence with the reactor in operation or in a shutdown condition could cause damage to equipment and electrical wiring within the reactor building. Since manual activation of the system is possible from the safety features actuation panel, extreme care must be exercised to prevent this occurrence. Also, prior to routine periodic test of the system pumps, a visual observation of the electric motor operated throttle valves BS-V1A and BS-V1B should be made to ensure that the valves are fully closed.

TABLE 1

REACTOR BUILDING SPRAY PUMP

Pump Details	
Identification	BS-P-1A, BS-P-1B
Number Installed	Two
Manufacturer	Babcock & Wilcox, Ltd,, Canada
Model No.	SMK 6 x 8 x 13
Type	Single Stage, Horizontal Shaft, Single Suction, Centrifugal
Rated Sp_ed, rpm	3600
Rated Capacity, gpm (U.S.)	1500
Rated Total Dynamic Head, ft.	450
Submergency required at rated flow, ft.	14
Design Pressure, casing,psig	350
Design Temperature, ^{o}F	300
Lubricant/Coolant	Oil/Water
Min. Flow Requirements, gpm	None
Motor Details	
Manufacturer	Westinghouse Electric Corp.
Type	LLD Horizontal
Enclosure	Totally enclosed
Rated Horsepower	250
Speed, rpm	3600
Lubricant/Coolant	Oil/Water
Power requirements	4160V, _____ Amps (Full Load) 60 Hz, 3-Ø

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TABLE 1 (Continued)

Power Source (for each pump motor).	BS-P-1A:-4160V. Engineered Safety Features Bus 2-1E BS-P-1B:-4160V. Engineered Safety Features Bus 2-2E

Classification	Level
Code	N-2
Quality Control	2
Seisimic	I
Cleanliness	C

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TABLE 2

Sodium Thisolphate Storage TANK

Identification	BS-T-1
Manufacturer	Buffalo Tank Div.
Capacity-gallons	17,853
Installation	Vertical
Outside diameter and length	94" O.D. x 52' High
Skill Material	304 S.S
Shell Thickness	9/16"-3/16"
Design temperature, ^oF	150
Design pressure,	High Liquid Level Plus 10 ft. Water
Corrosion allowance, in.	None
Design Code	ASME-1968 Sec. VIII Div. 1
Code stamp required	No
Minimum Temperature F.	40
Electric heating/Source	Redundant Heat tracing

Classification	Level
Code	N-3
Quality Control	3
Seismic	I
Cleanliness	C

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TABLE 3

INSTRUMENTATION AND CONTROLS

IDENTIFICATION	DESCRIPTION	FUNCTION	LOCATION	TYPE	INPUT RANGE	OUTPUT RANGE	SETPOINT
BS-1-FE1	Differential Pressure	Indicates flow from BS-P-1A Pmp	Discharge of BS-P-1A	Orifice	0-1800 GPM	0-200" H_2O	N/A
BS-1-FE2	Differential Pressure	Indicates flow from BS-P-1B Pmp	Discharge of BS-P-1B	Orifice	0-1800 GPM	0-200" H_2O	N/A
BS-1-DPT1	Differential Pressure	Transmit Diff. Press. signal.	Discharge of BS-P-1A	Δ P	0-200" H_2O	± 10 V.-D.C.	N/A
BS-1-DPT2	Differential Pressure	Transmit Diff. Press. signal.	Discharge of BS-P-1B	Δ P	0-200" H_2O	± 10V.-D.C.	N/A
BS-1-FI1	Indicator	Indicates flow from BS-P-1A	Panel No. 3	Vert. Gauge	± 10 V DC	0-1800 GPM	N/A
BS-1-FI2	Indicator	Indicates flow from BS-P-1B	Panel No. 3	Vert. Gauge	± 10 V DC	0-1800 GPM	N/A
BS-1-FS1	Flow Alarm	Hi-Low flow Alarm BS-P-1A	Panel No. 3	Hi-Lo Switch	± 10 V DC	0-1800 GPM	Hi-1700 GPM; Lo-1400 GPM
BS-1-FS2	Flow Alarm	Hi-Low flow Alarm BS-P-1B	Panel No. 3	Hi-Lo Switch	± 10 V DC	0-1800 GPM	Hi-1700 GPM; Lo-1400 GPM
BS-2-PI-1	Press. Indicator	Indicates Disch. Press. BS-P-1A	LOCAL	DIAL	0-400 PSIG	N/A	N/A
BS-2-PI2	Press. Indicator	Indicates Disch. Press BS-P-1B	LOCAL	DIAL	0-400 PSIG	N/A	N/A
BS-3-LT	Level Transmitter	Transmit Level of Tank BS-T-1	Storage Tank BS-T-1	Δ P	0-50 Ft.	± 10 V DC	N/A
BS-3-LI	Level Indicator	Indicate Level of Tank BS-T-1	Panel 3	Bailey Type RY	± 10 V DC	0-50 Ft.	N/A
BS-3-LS	Level Alarm	Hi-Lo Signal for Tank BS-T-1	Panel 3	Hi-Lo Switch	± 10 V DC from BS-3-LT	N/A	Hi-44.5'; Lo-42.5'
BS-4-PI	Pressure Gauge	Indicate cover gas press. on BS-T-1	On Tank	Bourdon	0-5 PSIG	N/A	N/A
BS-7-TE	Temperature Element	Sense and indicate temp of BS-T-1	On Tank	Plat. RTD	0-200°F	100 ohms @ 0°F	N/A
BS-7-TT	Temp. Transmitter	Convert Resist. sign. to voltage DC		D.C. Convert.	0-200°F	± 10 V DC	N/A
BS-7-TI	Temp. Indicator	Temp. Readout of BS-T-1	Panel 3	Bailey-RY	± 10 V DC	0-200°F	N/A

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TABLE 3 (Continued)

INSTRUMENTATION AND CONTROLS

IDENTIFICATION	DESCRIPTION	FUNCTION	LOCATION	TYPE	INPUT RANGE	OUTPUT RANGE	SETPOINT
BS-T-TS1	Temp. Switch	Bistable Contact for Temp. Cont. (BS-T-1)	Panel 8	Hi-Lo Signal Monitor	± 10 V DC from BS-T-TT	N/A	Hi-110 F
BS-T-TS2	Temp. Switch	Bistable Contact for Temp. Alarms (BS-T-1)	Panel 8	Hi-Lo Signal Monitor	± V DC from BS-T-TT	N/A	Lo-50 F.
BS-V1A-HS	Manual Switch	Hand Switch Control for BS-V1A	Panel 3	Switch & Position Lght.	N/A	N/A	N/A
BS-V1B-HS	Manual Switch	Hand Switch Control for BS-V1B	Panel 3	Switch & Position Ligt.	N/A	N/A	N/A
BS-FHS-1400 (BS-V4A)	Flow Hand Actuated Switch	Actuates BS-V4A Sodium Thiosulphate into Reactor Building Spray	Panel 8	Pushbutton	N/A	N/A	N/A
BS-FHS-1401 (BS-V4B)	Flow Hand Actuated Switch	Actuates BS-V4B Sodium Thiosulphate into Reactor Building Spray	Panel 8	Pushbutton	N/A	N/A	N/A
BS-LI-1402	Level Indicator	Indicates level of BS-T-1 Sodium Thiosulphate Storage Tank	On Tank	Diff. Press.	0-49'6"	0-50'	N/A
BS-DPI-1403	Diff. Pressure Indicator	Indicate DP across BS-U2 to suction of BS-P-1B	Line at Valves BS-V120B & BS-V121B	DPI	0-100" Water	0-125" Water	N/A
BS-PS-1404	Press. Switch	Actuates BS-PAL-1404 low suction press. to BS-P-1B	Suction line to BS-P-1B at valve BS-V122B	Diaphragm	0.25-16 PSIG	N/A	6.5 PSIG
BS-DPI-1405 (across BS-U1)	Diff. Pressure Indicator	Indicates DP-across BS-U1	Line at Valves BS-V120A - BS-V121A	DPI	0-100" Water	0-125" Water	N/A
BS-PS-1406	Press. Switch	Actuates BS-PAL-1406	Suction line to BS-P-1A at Valves BS-V122A	Diaphragm	0.25-16 PSIG	N/A	6.5 PSIG
BS-FHS-1407 (BS-V1B)	Flow Hand actuated switch	Actuates Valve BS-V1B flow to React. Bldg. Spray Nozzles.	Panel 8	Pushbutton	N/A	N/A	N/A
BS-XL-1407	Position Lights	Indicates Open-Close on BS-V-1B	Panel 15	E-30-R,G	N/A	N/A	N/A
BS-FHS-1408 (BS-V-1A)	Flow Hand actuated switch	Actuates Valves BS-V1A flow to React. Bldg. Spray Nozzles.	Panel 8	Pushbutton	N/A	N/A	N/A

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IDENTIFICATION	DESCRIPTION	FUNCTION	LOCATION	TYPE	INPUT RANGE	OUTPUT RANGE	SETPOINT
BS-KL-1408	Position Lights	Indicate Open-Close on BS-V-1A	Panel 15	R-30-R,G	N/A	N/A	N/A
BS-PT-1412-1	Pressure Transmitter	Transmits press. in React. Bldg.	Rack 472	Gage Press.	-5-10 PSIG	10-50 MA DC	N/A
BS-PT-1412-2	Pressure Transmitter	Transmits press. in React. Bldg.	Rack 472	Gage Press.	0-100 PSIG	10-50 MA DC	N/A
BS-PR-1412	Recorder	Records press. in React. Bldg.	Panel 3	Min. Recorder	10-50 MA DC	0-100 PSIG 0-100 PSIG	N/A
BS-PS-1412-1	Press. Alarm Switch	Actuates React. Bldg. High Press. alarm.	Cable Room	Solid State	10-50 MA DC	N/A	4 PSIG
BS-TI-2001	Bi-Met.Coil-5" Dia.	Local indication of BS-T-1 Temp.	Tank	Bi-Met	0-250°F	N/A	N/A
ND-PS-3253	Pressure Switch	Actuates from High Pressure in React. Bldg. (Red Channel) BS-P-1A	Rack 472	Bellows	0-100 PSIG	N/A	30 PSIG
BS-PS-3254	Pressure Switch	Actuates from High Pressure in React.Bluiding (Green Channel) BS-P-1A	Rack 455	Bellows	0-100 PSIG	N/A	30 PSIG
BS-PS-3255	Pressure Switch	Actuates from High Pressure in React. Bldg. (Yellow Channel) BS-P-1A	Rack 467	Bellows	0-100 PSIG	N/A	30 PSIG
BS-PS-3256	Pressure Switch	Actuates from High Pressure in React. Bldg. (Red Channel) BS-P-1B	Rack 472	Bellows	0-100 PSIG	N/A	30 PSIG
BS-PS-3257	Pressure Switch	Actuates from High Pressure in React. Bldg. (Green Channel) BS-P-1B	Rack 455	Bellows	0-100 PSIG	N/A	30 PSIG
BS-PS-3258	Pressure Switch	Actuates from High Pressure in React.Bldg. (Yellow Channel) BS-P-1B	Rack 467	Bellows	0-100 PSIG	N/A	30 PSIG
BS-PS-3259	Pressure Switch	Actuates from High Pressure in Reactor Bldg. (Red Channel) BS-V1A, B	Rack 472	Bellows	0-10 PSIG	N/A	4 PSIG

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TABLE 3 (Continued

INSTRUMENTATION AND CONTROLS

IDENTIFICATION	DESCRIPTION	FUNCTION	LOCATION	TYPE	INPUT RANGE	OUTPUT RANGE	SETPOINT
BS-PS-3260	Pressure Switch	Actuates from High Pressure in Reactor Bldg. (Green Channel) BS-V1A, B	Rack 455	Bellows	0-10 PSIG	N/A	4 PSIG
BS-PS-3261	Pressure Switch	Actuates from High Pressure in Reactor Bldg. (Yellow Channel) BS-V1A, B	Rack 467	Bellows	0-10 PSIG	N/A	4 PSIG
BS-PS-3570	Pressure Switch	Actuates from High Pressure In Reactor Bldg. (Red Channel) RPS	Rack 472	Bellows	0-10 PSIG	N/A	4 PSIG
BS-PS-3571	Pressure Switch	Actuates from High Pressure in Reactor Bldg. (Green Channel) R.P.S	Rack 455	Bellows	0-10 PSIG	N/A	4 PSIG
BS-PS-3572	Pressure Switch	Actuates from High Pressure in React. Bldg. (Yellow Channel) R.P.S.	Rack 467	Bellows	0-10 PSIG	N/A	4 PSIG
BS-PS-3573	Pressure Switch	Actuated from High Pressure in React. Bldg. (Blue Channel) R.P.S.	Rack 453	Bellows	0-10 PSIG	N/A	4 PSIG
BS-PTV-3253	Routing Valve	Press. Test for BS-PS-3253	Rack 472	Solenoid	0-100 PSIG	N/A	N/A
BS-PTV-3254	Routing Valve	Press. Test for BS-PS-3259	Rack 455	Solenoid	0-100 PSIG	N/A	N/A
BS-PTV-3255	Routing Valve	Press. Test for BS-PS-3255	Rack 467	Solenoid	0-100 PSIG	N/A	N/A
BS-PTV-3256	Routing Valve	Press. Test for BS-PS-3256	Rack 472	Solenoid	0-100 PSIG	N/A	N/A
BS-PTV-3257	Routing Valee	Press. Test for BS-PS-3257	Rack 455	Solenoid	0-100 PSIG	N/A	N/A
BS-PTV-3258	Routing Valve	Press. Test for BS-PS-3258	Rack 467	Solenoid	0-100 PSIG	N/A	N/A
BS-PTV-3259	Routing Valve	Press. Test for BS-PS-3259	Rack 472	Solenoid	0-100 PSIG	N/A	N/A
BS-PTV-3260	Routing Valve	Press. Test for BS-PS-3260	Rack 455	Solenoid	0-100 PSIG	N/A	N/A
BS-PTV-3261	Routing Valve	Press. Test for BS-PS-3261	Rack 467	Solenoid	0-100 PSIG	N/A	N/A
BS-PTV-3270	Routing Valve	Press. Test for BS-PS-3570	Rack 472	Solenoid	0-100 PSIG	N/A	N/A
BS-PTV-3271	Routing Valve	Press. Test for BS-PS-3571	Rack 455	Solenoid	0-100 PSIG	N/A	N/A
BS-PTV-3272	Routing Valve	Press. Test for BS-PS-3572	Rack 4671	Solenoid	0-100 PSIG	N/A1	N/A

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INSTRUMENTATION AND CONTROLS

IDENTIFICATION	DESCRIPTION	FUNCTION	LOCATION	TYPE	INPUT RANGE	OUTPUT RANGE	SETPOINT
BS-PTV-3573	Routing Valve	Press. Test for BS-PS-3573	Rack 452	Solenoid	0-100 PSIG	N/A	N/A
BS-XL-3839	Position Lights	Indicate Open-Close on BS-V146	Panel 15	B-30 Dual	N/A	N/A	N/A
BS-XL-3840	Position Lights	Indicate Open-Close on BS-V147	Panel 15	B-30 Dual	N/A	N/A	N/A
BS-XL-3841	Position Lights	Indicate Open-Close on BS-V148	Panel 15	B-30 Dual	N/A	N/A	N/A
BS-XL-3842	Position Lights	Indicat Open-Close on BS-V149	Panel 15	B-30 Dual	N/A	N/A	N/A
BS-PS-3987	Pressure Switch	Actuated from High Pressure in React. Bldg. (Red Channel)	Rack 472	Bellows	0-10 PSIG	N/A	4 PSIG
BS-PTV-3987	Routing Valve	Press. Test for BS-PS-3987	Rack 472	Solenoid	0-100 PSIG	N/A	N/A
BS-PS-3988	Pressure Switch	Actuated from High Pressure in React. Bldg. (Green Channel)	Rack 455	Bellows	0-10 PSIG	N/A	4 PSIG
BS-PTV-3988	Routing Valve	Press. Test for BS-PS-3988	Rack 455	Solenoid	0-100 PSIG	N/A	N/A
BS-PS-3989	Pressure Switch	Actuated from High Pressure in React. Bldg. (Yellow Channel)	Rack 467	Bellows	0-10 PSIG	N/A	4 PSIG
BS-PTV-3989	Routing Valve	Press. Test for BS-PS-3989	Rack 467	Solenoid	0-100 PSIG	N/A	N/A
BS-PR-4388	Recorder	Records press. in React. Bldg.	Panel 3	Mini Recorder	10-50 MA DC 10-50 MA DC	-5-10 PSIG 0-100 PSIG	N/A
BS-PT-4388-1	Press. Transmitter	Transmits press. in React. Bldg.	Rack 455	Bellows	-5-10 PSIG	10-50 MA DC	N/A
BS-PS-4388-2	Press Switch	Actuated from High Pressure in React. Bldg. (Alarm)	Cable Room	Solid State	10-50 MA DC	N/A	30 PSIG
BS-PT-4388-3	Press. Transmitter	Transmits press. in React. Bldg.	Rack 455	Bellows	0-100 PSIG	10-50 MA DC	N/A

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TABLE 4

PANEL-MOUNTED ANNUNCIATORS AND PROTECTIVE DEVICES SET POINTS

PANEL MOUNTED ANNUNCIATORS

MARK NO.	WINDOW LEGEND, UNITS	ALARM SETPOINTS HIGH	ALARM SETPOINTS LOW	INPUT SOURCE	VAR. RANGE	PANEL IDENTIFICATION
BS-PAL-1404	2B Reactor Building Spray Pump Suction Press. Lo.	NA	6.5 PSIG	BS-PS-1404	.25-16 PSIG	Coolant Systems Monitoring Panel No. 8-C1
BS-PAL-1406	2A Reactor Building Spray Pump Suction Press. Lo.	NA	6.5 PSIG	BS-PS-1406	.25-16 PSIG	Coolant Systems Monitoring Panel No. 8-B1
BS-PAH-1412	Reactor Building Press. Hi.	30 PSIG	NA	BS-PS-1417-1	0-100 PSIG	Coolant System Monitoring Panel No. 8-A1
BS-KA-3039	BS-V146 Not Open	NA	NA	BS-V146 (SL-7)	NA	Engineered Safety Features Pnl. No. 13-A5
BS-KA-3040	BS-V147 Not Open	NA	NA	BS-V147 (SL-7)	NA	Engineered Safety Features Pnl. No. 13-A11
BS-KA-3041	BS-V148 Not Open	NA	NA	BS-V148 (SL-7)	NA	Engineered Safety Features Pnl. No. 13-A6
BS-KA-3042	BS-V149 Not Open	NA	NA	BS-V149 (SL-7)	NA	Engineered Safety Features Pnl. No. 13-A12
BS-KA-4455	RB Spray Pump Suction Header Valve closed.	NA	NA	BS-V3A & B (20-0)		Coolant Systems Monitoring Panel No. 8-C2
BS-FA-4456	2A Reactor Building Spray Pump Flow Hi/Lo	1700 GPM	1400 GPM	BS-1-FS-1	0-1800 GPM	Coolant Systems Monitoring Panel No. 8-D1
BS-FA-4457	2B Reactor Building Spray Pump Flow Hi/Lo	1700 GPM	1400 GPM	BS-2-FS-2	0-1800 GPM	Coolant Systems Monitoring Panel No. 8-E1
BS-LA-4458	Sod. Thiosulfate Storage Tank Level Hi/Lo	44.5%	43.5%	BS3-LS	0-50'	Coolant Systems Monitoring Panel No. 8-B2
BS-TA-4459	Sod. Thiosulfate Storage Tank Temp. Hi/Lo	110 F	50 F	BS7-TS2	0-200 F	Coolant Systems Monitoring Panel No. 8-A2
BS-KA-4558	Reactor Building Spray Pump Overload	NA	NA	74/BS-P-1A & 1B	NA	Coolant Systems Monitoring Panel No. 8-F1
BS-KA-4577	Reactor Bldg. Spray Pump Trip	NA	NA	30T/BS-P-1A & 1B	NA	Coolant Systems Monitoring Panel No. 8-F8

PROTECTIVE DEVICES SET POINTS

IDENT.	PROTECTED COMPONENT	TYPE OF DEVICE	SETPOINT
BS-R1A	Circuit piping to pump	Relief Valve	350 psig
BS-R1B	SHO discharge valve	Relief Valve	350 psig
BS-R2	Sodium thiosulfate storage tank	Relief Valve	3½ psig
BS-V113	Sodium thiosulfate storage tank	Vacuum Breaker	3 oz/sq.in.

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TABLE 5

COMPUTER LIST (DIGITAL)

INPUT NO.	DESCRIPTION	INSTRUMENT TAG NO.	INPUT CONDITION FOR OUTPUT STATUS CHANGE	USES
2824	ES ACT A BLDG ISLN MNL TEST GP1	1X1E/RBA	MANUAL TEST	ALARM
2825	ES ACT A BLDG ISLN MNL TEST GP2	1X2C/RBA	MANUAL TEST	ALARM
2826	ES ACT A BLDG ISLN MNL TEST GP3	1X3E/RBA	MANUAL TEST	ALARM
2827	ES ACT A 2/3 LOGIC BLDG ISLN GP1	63Z1E/RB1A, RB2A, RB3A	4 PSIG	ALARM
2828	ES ACT A 2/3 LOGIC BLDG ISLN GP2	63Z2C/RB1A, RB2A, RB3A	4 PSIG	ALARM
2829	ES ACT A 2/3 LOGIC BLDG ISLN GP3	63Z3E/RB1A, RB2A, RB3A	4 PSIG	ALARM
2830	ES ACT A BLDG ISLN CH1 DEFEATED	43X/RB1A & 43Y/RB1A	4 PSIG	ALARM
2831	ES ACT A BLDG ISLN CH2 DEFEATED	43X/RB2A & 43Y/RB2A	4 PSIG	ALARM
2832	ES ACT A BLDG ISLN CH3 DEFEATED	43X/RB3A & 43Y/RB3A	4 PSIG	ALARM
2833	ES BLDG ISLN SW ACT A CH1 TRIP	63X2/RB1A	4 PSIG	ALARM
2834	ES BLDG ISLN SW ACT A CH2 TRIP	63X2/RB2A	4 PSIG	ALARM
2835	ES BLDG ISLN SW ACT A CH3 TRIP	63X2/RB3A	4 PSIG	ALARM
2836	ES BLDG SPRAY SW ACT A CH1 TRIP	63X/RB4A	30 PSIG	ALARM
2837	ES BLDG SPRAY SW ACT A CH2 TRIP	63X/RB5A	30 PSIG	ALARM
2838	ES BLDG SPRAY SW ACT A CH3 TRIP	63X/RB6A	30 PSIG	ALARM

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TABLE 5 (Continued)

COMPUTER LIST (DIGITAL)

INPUT NO.	DESCRIPTION	INSTRUMENT TAG NO.	INPUT CONDITION FOR OUTPUT STATUS CHANGE	USES
2839	ES BLDG 2/3 LOGIC RB SPRAY	63X/RB4A, RB5A, RB6A	30 PSIG	ALARM
2849	ES ACT B BLDG ISLN MNL TEST GP1	1X1E/RBB	MANUAL TEST	ALARM
2850	ES ACT B BLDG ISLN MNL TEST GP2	1X2C/RBB	MANUAL TEST	ALARM
2851	ES ACT B BLDG ISLN MNL TEST GP3	1X3E/RBB	MANUAL TEST	ALARM
2852	ES ACT B 2/3 LOGIC BLDG ISLN GP1	63Z1E/RB1B, RB2B, RB3B	4 PSIG	ALARM
2853	ES ACT B 2/3 LOGIC BLDG ISLN GP2	63Z2C/RB1B, RB2B, RB3B	4 PSIG	ALARM
2854	ES ACT B 2/3 LOGIC BLDG ISLN GP3	63Z3E/RB1B, RB2B, RB3B	4 PSIG	ALARM
3047	ES ACT B BLDG ISLN CH1 DEFEATED	43X, 43Y/ RB1B	4 PSIG	ALARM
3048	ES ACT B BLDG ISLN CH2 DEFEATED	43X, 43Y/ RB2B	4 PSIG	ALARM
3049	ES ACT B BLDG ISLN CH3 DEFEATED	43X,43Y/ RB3B	4 PSIG	ALARM
3278	ES BLDG ISLN SW ACT B CH1 TRIP	63X2/RB1B	4 PSIG	ALARM
3279	ES BLDG ISLN SW ACT B CH2 TRIP	63X2/RB2B	4 PSIG	ALARM
3280	ES BLDG ISLN SW ACT B CH3 TRIP	63X2/RB3B	4 PSIG	ALARM
3281	ES BLDG SPRAY SW ACT B CH1 TRIP	63X/RB4B	30 PSIG	ALARM

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TABLE 5 (Continued)

COMPUTER LIST (DIGITAL)

INPUT NO.	DESCRIPTION	INSTRUMENT TAG NO.	INPUT CONDITION FOR OUTPUT STATUS CHANGE	USES
3264	ES BLDG SPRAY SW ACT B CH2 TRIP	63X/RB5B	30 PSIG	ALARM
3265	ES BLDG SPRAY SW ACT B CH3 TRIP	63X/RB6B	30 PSIG	ALARM
3050	ES BLDG 2/3 LOGIC RB SPRAY	63X/RB4B, RB5B, RB6B	30 PSIG	ALARM
3167	4 PSI RB PRESS RED CH TRIP	BS-PS-3570	CH TRIP	ALARM SEQ. MON.
3168	4 PSI RB PRESS GRN CH TRIP	BS-PS-3571	CH TRIP	ALARM SEQ. MON.
3169	4 PSI RB PRESS YEL CH TRIP	BS-PS-3572	CH TRIP	ALARM SEQ. MON.
3170	4 PSI RB PRESS BLUE CH TRIP	BS-PS-3573	CH TRIP	ALARM SEQ. MON.

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TABLE 5 (Continued)

COMPUTER LIST (ANALOG)

INPUT NO.	DESCRIPTION	INSTRUMENT TAG NO.	ALARM LIMITS LO	ALARM LIMITS HI	USES
0097	RB WIDE RANGE PRESS.	BS-PS-1412-2		30 PSIG	ALARM
1668	BLDG SPRAY PMP A MOT STATOR	BSP-52-TE6		266F	ALARM
1669	BLDG SPRAY PUMP B MOT STATOR	BSP-52-TE12		266F	ALARM

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