UNITED STATES
NUCLEAR REGULATORY COMMISSION
DOCKET NO. 50-324
LICENSE NO. DPR-62

CAROLINA POWER & LIGHT COMPANY

RALEIGH, NORTH CAROLINA

LICENSING SUPPORT INFORMATION
FOR
PROPOSED CHANGES TO TECHNICAL SPECIFICATION
PRESSURE SWITCH TO ANALOG REPLACEMENT

BRUNSWICK STEAM ELECTRIC PLANT

UNIT NO. 2

OCTOBER 12, 1979

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BRUNSWICK STEAM ELECTRIC PLANT

UNIT NO. 2

PREPARED BY:

UNITED ENGINEERS & CONSTRUCTORS INC.

PHILADELPHIA, PA.

OCTOBER 12, 1979

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1. BACKGROUND

1.1 For each device (a) being replaced, this modification consists of removing one existing device and replacing it with one or two channels (b) to perform the same function or functions. Replacing certain devices with two channels (See Section II for tabulation and Section I, 5.3 for discussion) provides additional redundancy and system separation - but does not change the logic or protective functions of the systems.

(a) Device - pressure or differential pressure switch

(b) Channel - a pressure or differential pressure transmitter and one or more trip units

1.2 This document references, and the modifications meet, the requirements outlined in General Electric Licensing Topical Report NEDO 21617-A as applicable. (NEDO 21617-A was accepted for reference in license applications by NRC to G.E. letter dated June 27, 1978.) This document also covers the following areas:

1.2.1 Differences and justifications for differences between this specific plant system and the systems covered by NEDO 21617-A.

1.2.2 Interface information specific to this installation.

2. SYSTEM DESIGN

The system design parameters are essentially the same as the NEDO report with the following exceptions:

2.1 Power Source for the RPS Channels A1, B1, A2 and B2

The change consists of obtaining power from the 125 volts D-C batteries similar to the ECCS systems. The change from 115 volt A-C RPS distribution power to 125 volt D-C battery power was based on the negative effect that an A.C. voltage decay would have on the RPS trip units in the event of a BOP power loss and the subsequent transfer to the diesel generators. Power source availability is assured through power supply redundancy for both the ECCS and RPS systems, (see Figure 5-1 for redundant power supply layout for ECCS and RPS systems).

2.2 Effects of Addition of Trip Calibration Cabinets on DC Load Study

2.2.1 For Unit No. 2 the Trip Calibration Cabinets have been connected to Distribution Panels 4A and 12A which are fed from Battery 2A-1 and to Distribution Panels 4B and 12B which are fed from Battery 2B-2. Review of the expected loads of the Trip Calibration Cabinets by calculation and by observation of ammeters during functional test indicates the following loads for the equipment:

2.2.1.1 ECCS cabinet power supply - 6 amps

2.2.1.2 ECCS cabinet standby power supply - 2 amps

2.2.1.3 RPS cabinet power supply - 4 amps

2.2.1.4 RPS cabinet standby power supply - 2 amps

2.2.2 As there are four (4) power supplies on a battery, the total load would be approximately 14 amps per hour or 112 amp-hours over an eight hour time period. Addition of this load to the loads calculated in the D.C. Load Study of May 9, 1975 causes the following changes:

2.2.2.1 Time to Discharge to 1.75 volt/cell for Normal Operation for Battery 2A-1 is reduced from 38 hours to 27 hours.

2.2.2.2 Time to Discharge to 1.75 volt/cell for Normal Operation for Battery 2B-2 is reduced from 24 hours to 19 hours.

2.2.2.3 Time to Discharge to 1.75 volt/cell for Normal Operation plus UPS and 2A, 2B Lighting Inverter is reduced from 5.5 hours to approximately 5 hours.

2. SYSTEM DESIGN (cont'd)

2.2 Effects of Addition of Trip Calibration Cabinets on DC Load Study (cont'd)

2.2.2.4 Design Basis Accident (DBA) with no DC Failures would require a total of 809 amp-hours on Battery 2A-1 and 687.64 amp-hours on Battery 2B-2. This is below the 960 amp-hours (80% of 1200 amp-hours) rated end of life capacity for batteries.

2.2.2.5 DBA with 2A Battery failure would require a total of 856.35 amp-hours on Battery 2B-2. This is below the 960 amp-hours rated end of life capacity for the battery.

2.2.2.6 DBA with 2B Battery failure would require a total of 1011.92 amp-hours on Battery 2A-1. This is above the 960 amp-hours rated end of life for battery; however, the 1011.92 amp-hours will be reduced to within rating if non-essential loads (for example: Reactor Building Emergency Lighting) are disconnected.

NOTE: The Reactor Building Emergency Lighting (DC) was considered in the DC Load Study as a constant load during the eight hours that the supply to the battery charger would be considered out of service. A recent review has determined the following:

a. The emergency lighting (DC) is controlled by a contactor which is energized by the Reactor Building Standby Lighting system (AC) such that if the Standby Lighting system is in operation the emergency lighting (DC) will be de-energized.

b. The Standby Lighting system (AC) is fed from the Div. II emergency bus which is fed from either the off site power system or a diesel generator.

c. It is highly unlikely that a Div. II battery would be out of service along with the loss of a Div. II emergency bus.

Therefore, under the conditions hypothesized, the Reactor Building Emergency Lighting (DC) would not be required and is automatically disconnected without creating an unsafe condition.

2.2.2.7 DBA with 1A Battery failure would require a total of 814.90 amp-hours on Battery 2A-1 and 687.64 amp-hours on Battery 2B-2. This is below the 960 amp-hours rated end of life capacity for the batteries.

2.2.2.8 DBA with 1B Battery failure would require a total of 809 amp-hours on Battery 2A-1 and 789.86 amp-hours on Battery 2B-2. This is below the 960 amp-hours rated end of life capacity for the batteries.

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3. SYSTEM COMPONENTS

The system components are the same as outlined in NEDO 21617-A report except for the power supplies and transmitters.

3.1 This exception consists of a redundant power supply system using two Lambda LXS-EE-24R regulated power supplies with overvoltage protection and diode isolation instead of an Elma ferroresonant power supply. The Lambda redundant power supply system was selected to assure very high availability and good output voltage stability against input voltage, input frequency, load, and ambient temperature variations.

3.1.1 Subjective comparisons of the failure modes of the two power supply systems - redundant series regulated with overvoltage protection versus ferroresonant (Lambda versus Elma) - indicate that the "Conclusions of System Availability Analysis" (NEDO 21617-A, paragraph 3.4.4) are applicable when the redundant Lambda power supply system is used.

3.1.2 The Lambda overvoltage protectors are specified to operate in a voltage range of 27.3 ± 0.8 volts. When actuated the individual Lambda power supply overvoltage protector will short circuit its current limited power supply output and drive and hold the output voltage to near zero initiating an alarm.

Note: The maximum specified operating voltage of the overvoltage protector, 28.1 volts, exceeds the maximum input voltage of the trip units (28 volts) and the maximum continuous voltage of the trip relays (27 volts). The individual power supply isolating diode forward voltage drop (approximately 0.6 volts) reduces the maximum power supply system bus voltage (after the isolating diodes) to an acceptable value.

3.1.3 Redundant Lambda power supplies, each with a MTBF (mean time between failures) rate of 100,000 hours; annunciated failures; and early replacement of failed supplies with spare supplies provide very high power supply system availability.

3.1.4 Periodic tests of the power supplies can be conducted to detect non-annunciated failures and further improve power system availability. Suggested test and test intervals are listed:

TEST	TEST INTERVAL
Power Supply Output Voltage:	
Before Diode	M (once per 31 days)
After Diode	M (once per 31 days)
Overvoltage Protector	R (once per 18 months)

3. SYSTEM COMPONENTS (cont'd)

3.1.5 The redundant Lambda power supply system discussed above is to be compared to the Elma power supply referenced in NEDO 21617-A, paragraphs 1.3.5, 2.3.1.1, and 3.1.1.

3.2 Transmitters

This installation utilizes Rosemount Model 1152 transmitters instead of the Rosemount Model 1151 transmitters referenced in NEDO 21617-A.

3.2.1 The Model 1152 has been qualified and exceeds the requirements for this installation as noted in Section I, 4 Equipment Qualifications.

3.2.2 Rosemount transmitter Models 1151 and 1152 response times are the same. This makes the Response Time conclusions (NEDO 21617-A, paragraph 3.3.2) applicable to this installation.

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4. EQUIPMENT QUALIFICATIONS

4.1 Qualification Summary

All Class 1E equipment was specified to meet, and does meet or exceed, applicable environmental service conditions. Environmental qualification documentation is on file and is available at the plant.

An "Environmental Interface Comparison Chart" (Figure 4-1 this section) compares the NEDO 21617-A equipment maximum environments to the normal and accident environments for this installation.

4.2 Service Environment

The environmental service conditions were defined in Design Report No. 12 and have been summarized in the "Service Environment Chart - Normal and Accident Conditions - Units No. 1 and No. 2" FSAR FIGURE NO. M7.9-1. A copy of the chart is included in this section of the report.

The environmental parameters applied to the pressure switch to analog replacement safety system transmitters are for "Reactor Building - Other" and "Turbine Building" as applicable. "Reactor Building, -17' Level" parameters are applicable to two non-safety transmitters. The environmental parameters applied to the trip calibration system components; trip units, trip relays, inverters, power supplies and cabinets are for the "Control Building, Control Room".

4.3 Qualification Documentation

Environmental qualification documentation is available at the plant for all equipment except inverters and trip relays which are covered by NEDO 21617-A. (Trip unit documentation supplements coverage by NEDO 21617-A.)

4.3.1 Trip Unit Documentation List

F.P. NO. (BPO/252-55)	REPORT NO.	DESCRIPTION
9527-70271 (2 volumes)	127531	Qualification test report for trip/calibration system - Rosemount Model 510DU
9527-70274	6453C	Qualification test procedure for trip/calibration system - Rosemount Model 510DU
9527-70275	12777D	Qualified life test report for trip/calibration system - Rosemount Model 510DU

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4.3.1 Trip Unit Documentation List (cont'd)

F.P. NO. (BPO/252-55)	REPORT NO.	DESCRIPTION
9527-70295	3768A	Qualification test summary for the trip/calibration system - Rosemount Model 510DU
9527-70296	27723	Qualified life test procedure for the trip/calibration system - Rosemount Model 510DU
9527-70254	510DUA010	Product specification for the trip/calibration system - Rosemount Model 510DU

4.3.2 Transmitter Documentation List

F.P. NO. (BPO/252-51)	REPORT NO.	DESCRIPTION
9527-70298	67710A	Environmental qualification test report for 1151 and 1152 pressure transmitters
9527-70300	117415	Qualification tests summary for 1152 pressure transmitters
9527-70301	127516	Seismic simulation test report for 1151 and 1152 pressure transmitters
9527-70299	10763	Radiation qualification test report for 1152 pressure transmitters
9527-LL-7044 Sheet 174 (Seismic Analyzed and Approved)	UE&C Internal Memo: M. M. Tahara to B. J. Huselton Nov. 17, 1978	New Local Transmitter Mountings - Seismic Evaluation
	UE&C Internal Memo: T. C. Chang to E. R. Forman (Seismic Analyzed and Approved)	New Transmitters Mounted on Existing G.E. Design Racks

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4.3.3 Power Supply Documentation List

F.P. NO.	REPORT NO.	DESCRIPTION
9527-70303	DTB04R75 dated 22 March 1975	Dayton T. Brown Report tested per MIL-STD-810B "Environmental Test Methods" (by similarity to tested equipment) (Lambda LXS-EE-24R is fungus inert Model LXS-EE-24)
N.A.	N.A.	Tested to MIL-I-6181D 25 Nov. 1959 "Interference Control Requirements, Aircraft Equipment"

4.3.4 Trip Calibration Cabinets (Includes Inverters, Power Supplies Trip Units, Trip Relays and Cabinets)

F.P. NO. (BPO/252-56)	REPORT NO.	DESCRIPTION
9527-70292	14660 dated May 7, 1979	Seismic Vibration Testing of One RPS Trip Calibration Cabinet
9527-70293	14660-1 dated May 7, 1979	Seismic Vibration Testing of One RPS Trip Calibration Cabinet

4.4 Electromagnetic Interference (EMI)

All system components are the same as referenced in NEDO 21617-A (equivalent transmitters) except for the 24 volt D-C power supplies.

4.4.1 The susceptibility of this installation to EMI effects is evaluated to be equal to or less than the susceptibility of the NEDO 21617-A reference system.

4.4.2 The Lambda Model LXS-EE-24R power supply meets the requirements of MIL-I-6181D, 25 Nov. 1959, "Interference Control Requirements, Aircraft Equipment".

4.4.3 The NEDO 21617-A instrumentation susceptibility tests were based on worst-case transient and radio frequency tests in and around nuclear control rooms (see NEDO paragraph 4.4) for 24 volt D-C power supplies located in the reactor building (125 volt A-C lines exposed for EMI pickup), and for interpanel 24 volt D.C. buses.

4.4.4 This installation utilizes inverters and 24 volt D-C power supplies located in the same cabinets and in the control room environment for the ECCS and RPS systems - reducing the exposure to EMI pickup in the A-C power lines. The 24 volt D-C buses are not interpanel - again reducing the exposure to EMI pickup.

ENVIRONMENTAL INTERFACE COMPARISON CHART

DEVICE	QUALIFICATION LOCATION	TEMPERATURE (°F)				HUMIDITY				PRESSURE				RADIATION (RADS)				SEISMIC (g)			EMI	
		G.E. SPEC.	G.E. TEST	BSEP NORMAL	BSEP ACCIDENT	G.E. SPEC.	G.E. TEST	BSEP NORMAL	BSEP ACCIDENT	G.E. SPEC.	G.E. TEST	BSEP NORMAL	BSEP ACCIDENT	G.E. SPEC.	G.E. TEST	BSEP NORMAL	BSEP ACCIDENT	G.E. SPEC.	G.E. TEST	BSEP SPEC.*	REMARKS	REMARKS
TRANSMITTERS	EL. 20'-0" & 50'-0" REACTOR BUILDING	212	303	40 to 104	40 to 104	STEAM	STEAM	20% to 90%	20% to 90%	15 PSIG	60 PSIG	14.66 PSIG to 14.70 PSIG	14.66 PSIG to 14.70 PSIG	1.7×10^5	5×10^6	3×10^3	1×10^5	3.0	3.0	0.72	SEE SECTION 4.4	
TRANSMITTERS	EL. -17'-0" REACTOR BUILDING	212	303	40 to 104	148	STEAM	STEAM	20% to 90%	100%	15 PSIG	60 PSIG	14.66 PSIG to 14.70 PSIG	14.95 PSIG	1.7×10^5	5×10^6	3×10^3	1×10^7	3.0	3.0	0.72	SEE SECTION 4.4	These are HPCI & RCIC drain pot level which are not safety related
TRANSMITTERS	TURBINE BUILDING	212	303	40 to 104	40 to 104	STEAM	STEAM	20% to 90%	20% to 90%	15 PSIG	60 PSIG	14.70 PSIG	14.70 PSIG	1.7×10^5	5×10^6	2×10^2 to 3×10^4	1.3×10^2	3.0	3.0	0.72	SEE SECTION 4.4	
TRIP UNITS	EL. 49'-0" CONTROL BUILDING (TRIP CALIBRATION CABINET)	148	171	40 to 120	40 to 120	100%	99%	30% to 60%	30% to 60%	7 IN. W C (14.95)PSIG	ATMOS	14.70 PSIG to 14.74 PSIG	14.70 PSIG to 14.74 PSIG	350	N/A	200	200	10	11	0.72	SEE SECTION 4.4	
POWER SUPPLY	EL. 49'-0" CONTROL BUILDING (TRIP CALIBRATION CABINET)	120	132	40 to 120	40 to 120	90%	90%	30% to 60%	30% to 60%	1 IN. W C (14.74)PSIG	ATMOS	14.70 PSIG to 14.74 PSIG	14.70 PSIG to 14.74 PSIG	350	N/A	200	200	5	5.5	0.72	SEE SECTION 4.4	
INVERTER	EL. 49'-0" CONTROL BUILDING (TRIP CALIBRATION CABINET)	120	135	40 to 120	40 to 120	90%	90%	30% to 60%	30% to 60%	1 IN. W C (14.74)PSIG	ATMOS	14.70 PSIG to 14.74 PSIG	14.70 PSIG to 14.74 PSIG	350	N/A	200	200	5	5.5	0.72	SEE SECTION 4.4	
TRIP RELAY	EL. 49'-0" CONTROL BUILDING (TRIP CALIBRATION CABINET)	120	120	40 to 120	40 to 120	90%	90%	30% to 60%	30% to 60%	1 IN. W C (14.74)PSIG	ATMOS	14.70 PSIG to 14.74 PSIG	14.70 PSIG to 14.74 PSIG	350	N/A	20'	200	6.7	6.7	0.72	SEE SECTION 4.4	

* MAXIMUM DESIGN BASE EVENT (DBE), INPUT ACCELERATION TO CABINET OR RACK ON WHICH THE DEVICE IS MOUNTED

CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT
UNITS NOS. 1 and 2
ENVIRONMENTAL INTERFACE
COMPARISON CHART
FIGURE 4-1

4.4.5 The 24 volt D.C. power supply pass-through of EMI is judged to be equivalent for the Lambda series regulated power supply and the Elma ferroresonant power supply referenced in NEDO 21617-A.

NORMAL AND ACCIDENT SERVICE ENVIRONMENT CHART

CONDITION	PRIMARY CONTAINMENT		REACTOR BUILDING				TURBINE BUILDING		CONTROL BUILDING						DIESEL BUILDING		RADWASTE BUILDING		SERVICE WATER PUMP BUILDING		OUTDOOR	
			EL. -17'-0"		(OTHER)				CONTROL ROOM		BATTERY ROOM		CABLE SPREADING									
	NORMAL	ACCIDENT	NORMAL	ACCIDENT	NORMAL	ACCIDENT	NORMAL	ACCIDENT	NORMAL	ACCIDENT	NORMAL	ACCIDENT	NORMAL	ACCIDENT	NORMAL	ACCIDENT	NORMAL	ACCIDENT	NORMAL	ACCIDENT	NORMAL	ACCIDENT
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23*
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
PRESSURE (PSIG)	2.0	2 DAYS HOURS: 1 -2 % 54	-0.1 GAGE	GAGE	-0.1 GAGE	GAGE	0 GAGE	GAGE	1.0 GAGE	1.0 GAGE	1.0 GAGE	1.0 GAGE	1.0 GAGE	1.0 GAGE	GAGE	GAGE	0 GAGE	0 GAGE	GAGE	GAGE	GAGE	GAGE
DEPTH (FT)	---	NOT 5 HOURS: -2 % 35	---	7	---	*	0	*	---	---	---	---	---	---	*	*	0	0	*	*	*	*
[illegible]	-0.5	NOT 5 HOURS: 0 % 75	-1.0	(1x10^6)	-1.0	(1x10^6)	-0.25		0.1	0.1	0.1	0.1	0.1	0.1			-0.25	-0.25				
TEMPERATURE (°F)	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F *	°F	°F	°F	°F	°F	°F	°F *	°F
MAXIMUM	150	FIRST HOUR: 1 140	104		104		104		170	170	125	125	104	104	104	104	104	104	104	104	55	
AVERAGE	135	NOT 5 HOURS: 560 % 320	70	145	70	*	70	*	75	75	---	---	70	70	70	70	70	70	70	70	55	*
MINIMUM	70	NOT 5 HOURS: 250 %	40	(1x10^6)	40	(1x10^6)	40		40	40	65	65	40	40	40	40	40	40	15 *	15 *	15	
RELATIVE HUMIDITY (%)	% *	%	% *	%	% *	%	% *	%	%	%	% *	% *	% *	% *	% *	%	% *	%	% *	%	% *	%
MAXIMUM	50	FIRST HOUR: 100	50		50		50		60 *	60 *	100	100	100	100	50		100		100		100	
NORMAL	40-55	NOT 5 HOURS: 100	40	100	40	*	40	*	45	45	45	45	45	45	40	*	45	*	45	*	55	*
MINIMUM	---	NOT 15 HOURS: 100	30	(1x10^6)	30	(1x10^6)	20		30	30	10	10	10	10	20		10		10		10	
RADIATION (RADS)	RADS	RADS	RADS	RADS	RADS	RADS	RADS	RADS	RADS	RADS	RADS	RADS	RADS	RADS	RADS	RADS	RADS	RADS	RADS	RADS	RADS	RADS
[illegible]	---	7x10^6	---	1x10^5	---	---	---	1.5x10^7	---	NEGLIGIBLE	---	NEGLIGIBLE	---	NEGLIGIBLE	---	NEGLIGIBLE	---	NEGLIGIBLE	---	NEGLIGIBLE	---	---
30 DAYS	---	5x10^7	---	1x10^7	---	1x10^5	---	---	---	NEGLIGIBLE	---	NEGLIGIBLE	---	NEGLIGIBLE	---	NEGLIGIBLE	---	NEGLIGIBLE	---	NEGLIGIBLE	---	<5x10^7
40 YEARS	4x10^7	--- (1x10^6)	7x10^3	--- (1x10^6)	5x10^3	--- (1x10^6)	7x10^7 % (1x10^6)	--- (1x10^6)	2x10^7	---	2x10^7	---	2x10^7	---	2x10^7	---	NEGLIGIBLE	---	1x10^7	---	NEGLIGIBLE	--- (1x10^6)
[illegible]	---	WATER AT 200°F	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
[illegible]	[illegible]	---	--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
[illegible]	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0 % 40 [illegible]	
[illegible]	NO FIRE PROTECTION		CARBON DIOXIDE (4a) FRESH WATER (8c) POTASSIUM BICARBONATE (4b)		CARBON DIOXIDE (4a) FRESH WATER (8c) POTASSIUM BICARBONATE (4b)		CARBON DIOXIDE (4a) FRESH WATER (8c) POTASSIUM BICARBONATE (4b)		CARBON DIOXIDE (4a)		CARBON DIOXIDE (4a)		CARBON DIOXIDE (4a)		CARBON DIOXIDE (4a)		CARBON DIOXIDE (4a) FRESH WATER (8c)		CARBON DIOXIDE (4a)		CARBON DIOXIDE (4a) FRESH WATER (8a x 4b)	

NOTES:

1. [illegible]
2. [illegible]
3. [illegible]
4. PRESSURE-TEMPERATURE-HUMIDITY
   a. ASTERISK(*) INSIDE A BLOCK OR AGAINST A SPECIFIC VALUE INDICATES THAT THE VALUE (OR VALUES) OF THAT ENVIRONMENTAL PARAMETER IS (ARE) NOT CONTROLLED. VALUES, IF GIVEN, REPRESENT WHAT MIGHT GENERALLY BE EXPECTED
   b. PRESSURE, TEMPERATURE AND HUMIDITY WILL BE CONCURRENT FOR ONE (1) HOUR
   c. TEMPERATURE VALUES DO NOT ACCOUNT FOR DIRECT STEAM DISCHARGE
5. RADIATION
   a. LOSS OF COOLANT ACCIDENT
   b. MAIN STEAM LINE BREAK ACCIDENT
6. FIRE PROTECTION SYSTEM
   a. FROM LOCAL CO_2 FIRE EXTINGUISHER
   b. FROM LOCAL CHEMICAL DRY TYPE FIRE EXTINGUISHER
   c. FROM INTERNAL HOSE CONNECTION
   d. FROM HYDRANTS ON MAIN FIRE SYSTEM
   e. FROM FIXED DELUGE SYSTEM

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POOR ORIGINAL

NOTE

THE INFORMATION CONTAINED ON THIS DRAWING IS GENERAL CONFORMS WITH INFORMATION CONTAINED IN THE FSAR/FSAR AND SHALL BE USED AS A GUIDE IN FIELD PURCHASING OF MATERIAL

AMENDMENT 14
NOVEMBER 1972

CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT
UNITS 1 & 2
Final Safety Analysis Report

SERVICE ENVIRONMENT CHART
NORMAL & ACCIDENT CONDITIONS
UNITS NO. 1 & NO. 2

FIG. NO. M7.9-1

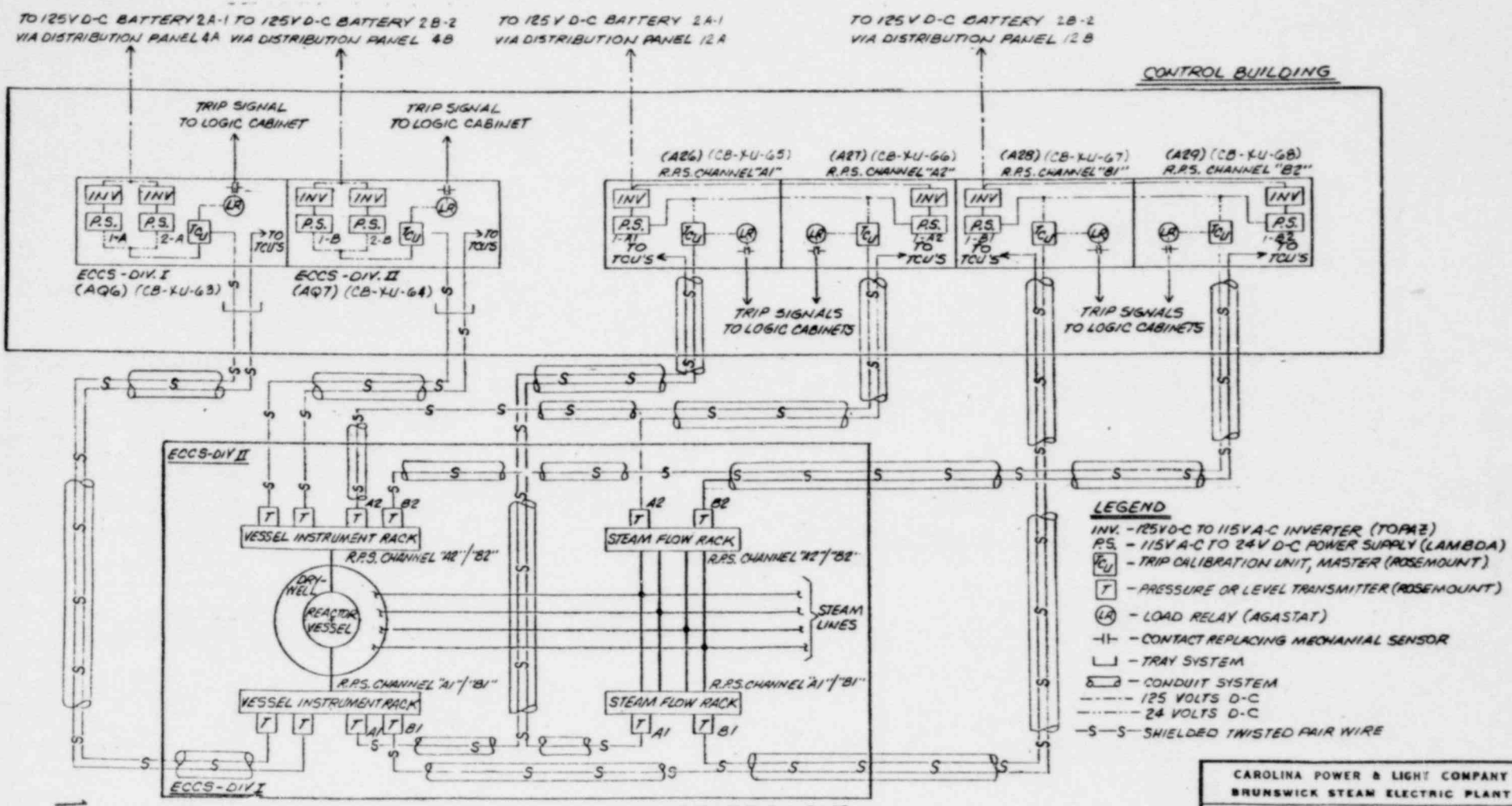
5. INTERCONNECTIONS

5.1 Refer to chart shown in Section II for a complete list of pressure and level switches which were replaced with analog transmitter devices and to Figure 5-1 for conduit and cable routing.

5.2 The original plant separation criteria has been followed in routing of new cables and the location of new equipment. All transmitters, with the exception of ten (10) local transmitters which are mounted on new steel supports, are mounted on existing instrument racks in the same approximate location as the devices which they replaced. (See Section I, 4 for seismic qualification of supports.)

5.3 Separation of ECCS and RPS Circuits

Eight (8) pressure switches (B21-LS-N017A, B, C, D; B21-LS-N024A, B; and B21-LS-N025A, B) were utilized for both ECCS and RPS circuitry. These pressure switches have been replaced by sixteen (16) transmitters. Eight (8) of the transmitters (B21-LT-N017A-2, B-2, C-2, D-2; B21-LT-N024A-2, B-2; and B21-LT-N025A-2, B-2) are utilized in the ECCS system logic and eight (8) of the transmitters (B21-LT-N017A-1, B-1, C-1, D-1; B21-LT-N024A-1, B-1; and B21-LT-N025A-1, B-1) are utilized in the RPS system logic. This increases the separation between systems and assures that a failure of the above transmitters or its respective trip calibration unit in the ECCS system does not affect the RPS system and vice-versa.



CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT

UNIT NO. 2
PRESSURE SWITCH TO ANALOG CHANGEOUT
CONDUIT/TRAY & CABLE ROUTING
INTERCONNECTIONS
TYPICAL FOR "ECCS" & "RPS" SYSTEMS

ATTACHMENT "2" | FIGURE 5-1

1447 270

1444 271

6. SURVEILLANCE TEST INTERVALS

6.1 This modification requires changes to the surveillance requirements as noted below and in the revised Technical Specification pages in Section VI.

6.2 The recommended surveillance intervals listed, either simultaneous or staggered, are based on the following: (NEDO 21617-A paragraphs are referenced)

6.2.1 NEDO 3.4.2, "Mean-Time-Between-Failures (MTBF) Analysis", the MTBF conservatism indicated in paragraph 3.4.2, and on the low trip unit stress level in the control room environment of this installation.

6.2.2 NEDO 3.4.4, "Conclusion of System Availability Analysis".

6.3 Recommended surveillance intervals for all instrument channels which are being changed - and are also covered by Technical Specifications:

	TRANSMITTER	TRIP UNIT
Channel Check	N. A. *	D
Channel Functional Test	N. A. *	M
Channel Calibration	R **	M

N. A. - not applicable
R - at least once per 18 months (550 days)
D - at least once per 24 hours
M - at least once per 31 days

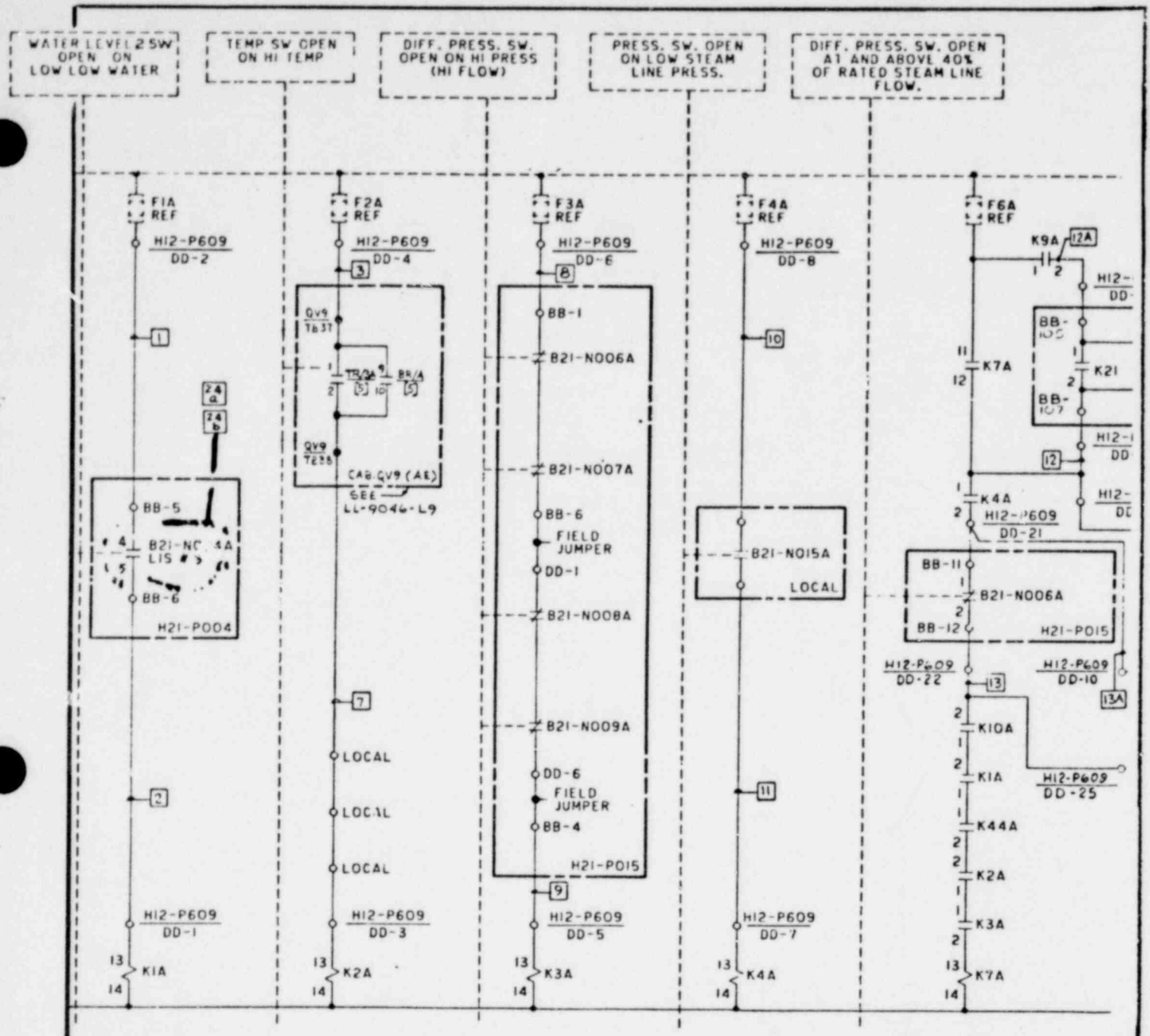
* the transmitter channel is satisfied by the trip unit channel check. A separate transmitter check is not required.

** transmitters are exempted from the monthly channel calibration.

1444 273

7. CONTROL WIRING DIAGRAMS - TYPICAL (BEFORE/AFTER)

Refer to Figures 7-1, 7-2 and 7-3 which show changes introduced to the logic input circuit for specific loops B21-N006A, 7A, 8A and 9A.



T-1246
F.P. 9527-50056

CAROLINA AS BUILT DATED 2-17-78

CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT

GE DRAWING REVISED TO INCORPORATE UE&C WIRE NUMBERS

UNITED ENGINEERS & CONSTRUCTORS INC.

F-DWG NO. 9527-50056

1. All interconnecting wires to be prefixed with "NS4" except as noted.
2. All other wire numbers are shown within this symbol
3. CABLED ON F-9401(U#2) UNLESS NOTED

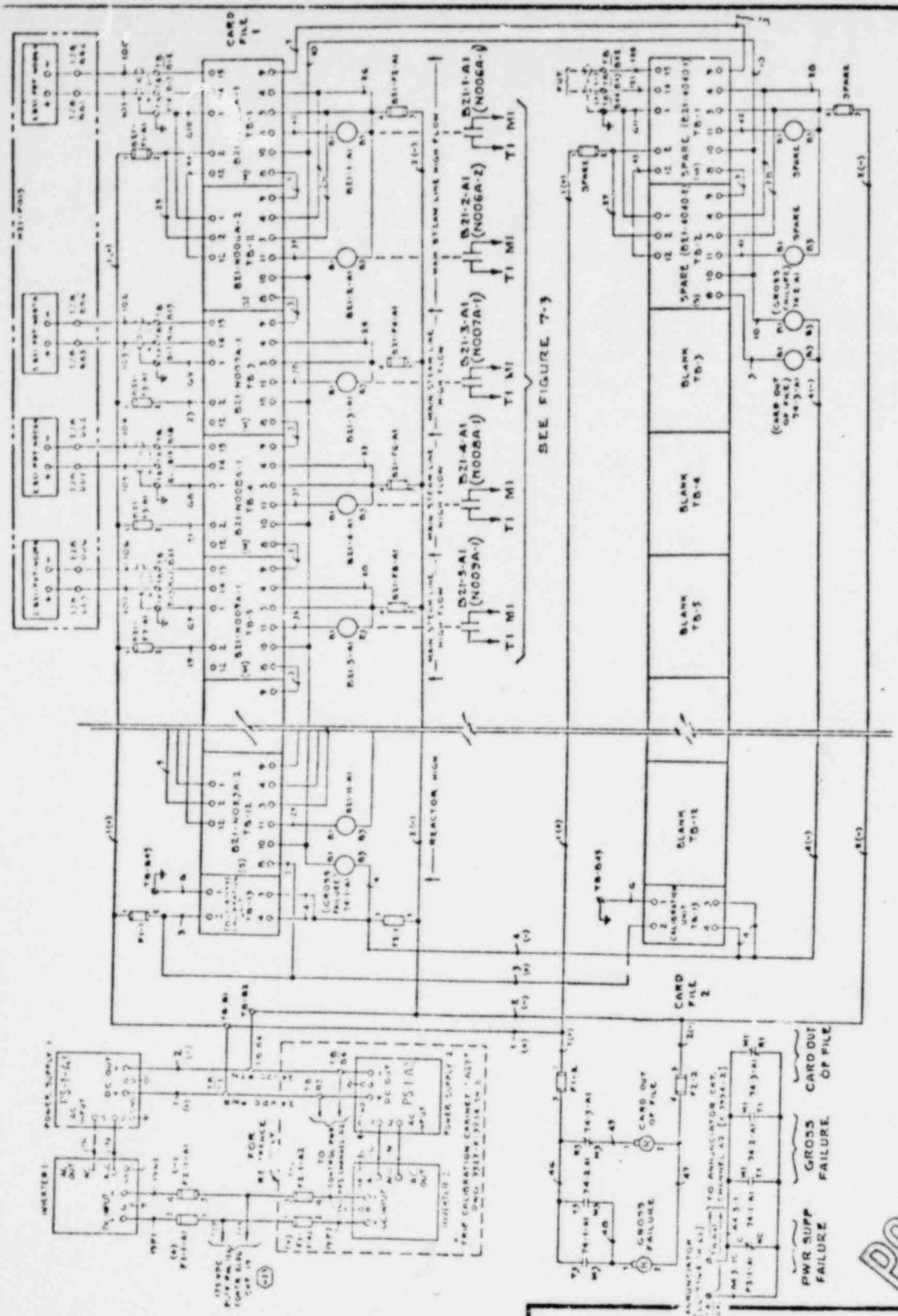
CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT

UNIT NO. 2
CONTROL WIRING DIAGRAM
BEFORE CHANGES
FOR
LOOPS B21-N006A, 7A, 8A AND 9A
TYPICAL

1444 275

ATTACHMENT "B"

FIGURE 7-1



POOR ORIGINAL

CAROLINA POWER & LIGHT COMPANY BRUNSWICK STEAM ELECTRIC PLANT	
TRIP CALIBRATION CABINET "A26" RPS CHANNEL A1 CB-XU-65 CONTROL WIRING DIAGRAM UNIT 2 UNITED ENGINEERS & CONSTRUCTORS INC.	
SCALE:	9527-F-3933 SH. 2

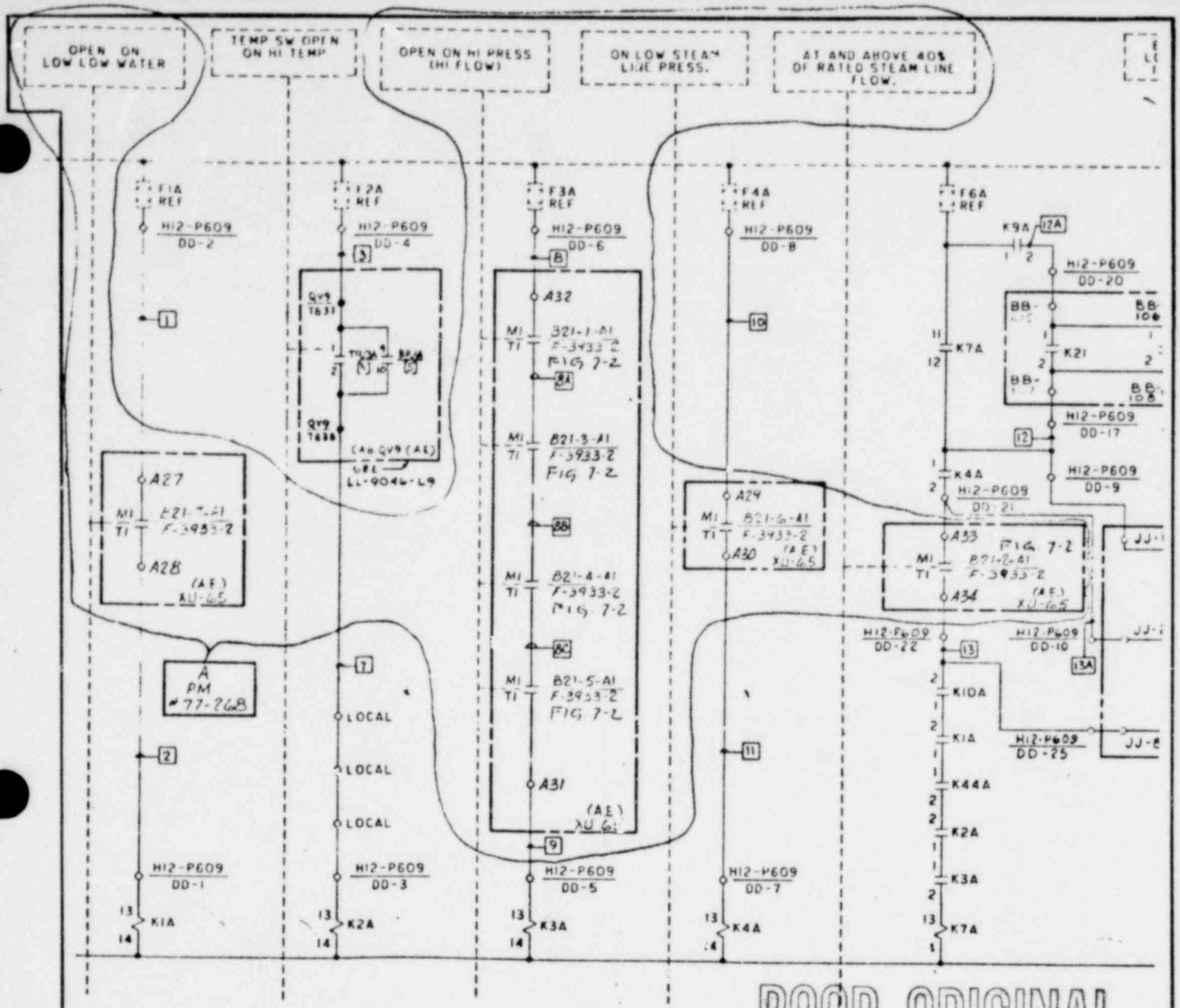
CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT

UNIT NO. 2
TRIP CALIBRATION CABINET
RPS CHANNEL "A1" CB-XU-65
PARTIAL CONTROL WIRING DIAGRAM
TYPICAL

1444 276

ATTACHMENT "B"

FIGURE 7-2



POOR ORIGINAL

PM 77-268

T-1246
F.P. 9527-50056

CAROLINA 2
AS BUILT
DATED 2-17-78

CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT

GE DRAWINGS REVISED TO INCORPORATE UE&C WIRE NUMBERS

2 CABLES ON F-9301(U#2) UNLESS NOTED

CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT

UNIT NO. 2
CONTROL WIRING DIAGRAM
AFTER CHANGES
FOR
LOOPS B21-PTM-N006A, 7A, 8A AND 9A
TYPICAL

ATTACHMENT "B"

FIGURE 7-3

CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT
PRESSURE SWITCH TO ANALOG CHANGEOUT
LICENSING TECHNICAL REPORT INFORMATION

NOTES:

1. For more detailed information on transmitters (*) see Specification No. 9527-01-252-51, page XXA as noted and on trip calibration units (#) see Specification No. 9527-01-252-55, page XXA as noted.

2. Symbol shown thus (**) in column calls attention to (M) = master trip unit and (S) = slave trip unit, both of which are located in card files at the trip calibration cabinets.

3. Under the column heading for schematic data the complete drawing number and cabinet designation consists of the heading and the data listed below the column, e.g.

Drawing No.	Cabinet No.
9527-3933, Sh. 2	CB-XU-65
9527-3934, Sh. 2	CB-XU-66
9527-3935, Sh. 2	CB-XU-67
etc.	etc.

4. Instrument Number Corelation with Technical Specifications

The change from mechanical sensors to analog transmitters requires a re-definition of instrument numbers. The following examples will meet the requirements between transmitters and master/slave trip units:

B21-PT-N023A, pressure transmitter located at instrument rack
B21-PTM-N023A-1, master trip unit, located in card file in trip calibration cabinet
B21-PTS-N023A-2, slave trip unit, located in card file in trip calibration cabinet
B21-LT-N017A-1, level transmitter, located at instrument rack
B21-LT-N017A-2, level transmitter, located at instrument rack
B21-LTM-N017A-1, master trip unit, located in card file in trip calibration cabinet
B21-LTM-N017A-2, master trip unit, located in card file in trip calibration cabinet

1449 279

Unit No. 2
ATTACHMENT "B"
Date: August 15, 1979
Sheet 1 of 5

1447 280

J.O. 9527.018

CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT
PRESSURE SWITCH TO ANALOG CHANGEOUT
LICENSING TECHNICAL REPORT INFORMATION

UNIT NO. 2
ATTACHMENT "B"
DATE: AUGUST 15, 1979
SHEET 2 OF 5

Rev. No.	Item No.	Device Being Replaced: Tag Number	Device Being Replaced: Type	Service	G.E. Rack No. B21-	Differential Pressure Transmitter: Unit No.	Differential Pressure Transmitter: Tag Number	Differential Pressure Transmitter: Rosemount No.	Differential Pressure Transmitter: * - 51 Page No.	Trip Calibration Unit: Unit No.	Trip Calibration Unit: Tag Number	Trip Calibration Unit: Trip ** Set-Point	Trip Calibration Unit: Rosemount No.	Trip Calibration Unit: * - 55 Page No.	Remarks	Schematic Data: Drawing No. 9527-F-39---	Schematic Data: Cabinet CB-VC-	Schematic Data: Relay Number
	1	B21-PDS N006A	BARTON 288	MN. STM. FLOW HIGH	P015	2	B21-PDT-N006A	1152DP7E22T0280PB	24B	2	B21-N006A-1	115PSID (M)	510DU2A010	26B	RPS, "A1"	33, Sh. 2	65	B21-1-A1
										2	B21-N006A-2	9PSID (S)	510DU7A010	26B	RPS, "A1"	33, Sh. 2	65	B21-2-A1
	2	B21-PDS-N006B	BARTON 288	MN. STM. FLOW HIGH	P015	2	B21-PDT-N006B	1152DP7E22T0280PB	24B	2	B21-N006B-1	115PSID (M)	510DU2A010	30B	RPS, "B1"	35, Sh. 2	67	B21-1-B1
	3	B21-PDS-N006C	BARTON 288	MN. STM. FLOW HIGH	P025	2	B21-PDT-N006C	1152DP7E22T0280PB	24B	2	B21-N006C-1	115PSID (M)	510DU2A010	28B	RPS, "A2"	34, Sh. 2	66	B21-1-A2
	4	B21-PDS-N006D	BARTON 288	MN. STM. FLOW HIGH	P025	2	B21-PDT-N006D	1152DP7E22T0280PB	24B	2	B21-N006D-1	115PSID (M)	510DU2A010	32B	RPS, "B2"	36, Sh. 2	68	B21-1-B2
	5	B21-PDS-N007A	BARTON 288	MN. STM. FLOW HIGH	P015	2	B21-PDT-N007A	1152DP7E22T0280PB	24B	2	B21-N007A-1	115PSID (M)	510DU2A010	26B	RPS, "A1"	33, Sh. 2	65	B21-3-A1
	6	B21-PDS-N007B	BARTON 288	MN. STM. FLOW HIGH	P015	2	B21-PDT-N007B	1152DP7E22T0280PB	24B	2	B21-N007B-1	115PSID (M)	510DU2A010	30B	RPS, "B1"	35, Sh. 2	67	B21-2-B1
										2	B21-N007B-2	9PSID (S)	510DU7A010	30B	RPS, "B1"	35, Sh. 2	67	B21-3-B1
	7	B21-PDS-N007C	BARTON 288	MN. STM. FLOW HIGH	P025	2	B21-PDT-N007C	1152DP7E22T0280PB	24B	2	B21-N007C-1	115PSID (M)	510DU2A010	28B	RPS, "A2"	34, Sh. 2	66	B21-2-A2
	8	B21-PDS-N007D	BARTON 288	MN. STM. FLOW HIGH	P025	2	B21-PDT-N007D	1152DP7E22T0280PB	24B	2	B21-N007D-1	115PSID (M)	510DU2A010	32B	RPS, "B2"	36, Sh. 2	68	B21-2-B2
	9	B21-PDS-N008A	BARTON 288	MN. STM. FLOW HIGH	P015	2	B21-PDT-N008A	1152DP7E22T0280PB	24B	2	B21-N008A-1	115PSID (M)	510DU2A010	26B	RPS, "A1"	33, Sh. 2	65	B21-4-A1
	10	B21-PDS-N008B	BARTON 288	MN. STM. FLOW HIGH	P015	2	B21-PDT-N008B	1152DP7E22T0280PB	24B	2	B21-N008B-1	115PSID (M)	510DU2A010	30B	RPS, "B1"	35, Sh. 2	67	B21-4-B1
	11	B21-PDS-N008C	BARTON 288	MN. STM. FLOW HIGH	P025	2	B21-PDT-N008C	1152DP7E22T0280PB	24B	2	B21-N008C-1	115PSID (M)	510DU2A010	28B	RPS, "A2"	34, Sh. 2	66	B21-3-A2
										2	B21-N008C-2	9PSID (S)	510DU7A010	28B	RPS, "A2"	34, Sh. 2	66	B21-4-A2
	12	B21-PDS-N008D	BARTON 288	MN. STM. FLOW HIGH	P025	2	B21-PDT-N008D	1152DP7E22T0280PB	24B	2	B21-N008D-1	115PSID (M)	510DU2A010	32B	RPS, "B2"	36, Sh. 2	68	B21-3-B2
	13	B21-PDS-N009A	BARTON 288	MN. STM. FLOW HIGH	P015	2	B21-PDT-N009A	1152DP7E22T0280PB	25B	2	B21-N009A-1	115PSID (M)	510DU2A010	26B	RPS, "A1"	33, Sh. 2	65	B21-5-A1
	14	B21-PDS-N009B	BARTON 288	MN. STM. FLOW HIGH	P015	2	B21-PDT-N009B	1152DP7E22T0280PB	25B	2	B21-N009B-1	115PSID (M)	510DU2A010	30B	RPS, "B1"	34, Sh. 2	67	B21-5-B1
	15	B21-PDS-N009C	BARTON 288	MN. STM. FLOW HIGH	P025	2	B21-PDT-N009C	1152DP7E22T0280PB	25B	2	B21-N009C-1	115PSID (M)	510DU2A010	28B	RPS, "A2"	34, Sh. 2	66	B21-5-A2
	16	B21-PDS-N009D	BARTON 288	MN. STM. FLOW HIGH	P025	2	B21-PDT-N009D	1152DP7E22T0280PB	25B	2	B21-N009D-1	115PSID (M)	510DU2A010	32B	RPS, "B2"	36, Sh. 2	68	B21-4-B2
										2	B21-N009D-2	9PSID (S)	510DU7A010	32B	RPS, "B2"	36, Sh. 2	68	B21-5-B2
	17	B21-PS-N015A	BARKSDALE B2T-C12SS	MN. STM. PRESS. LOW	LOCAL	2	B21-PT-N015A	1152GP9E22T0280PB	21B	2	B21-N015A-1	825PSIG (M)	510DU2A010	26B	RPS, "A1"	33, Sh. 2	65	B21-6-A1
	18	B21-PS-N015B	BARKSDALE B2T-C12SS	MN. STM. PRESS. LOW	LOCAL	2	B21-PT-N015B	1152GP9E22T0280PB	21B	2	B21-N015B-1	825PSIG (M)	510DU2A010	30B	RPS, "B1"	35, Sh. 2	67	B21-6-B1
	19	B21-PS-N015C	BARKSDALE B2T-C12CC	MN. STM. PRESS. LOW	LOCAL	2	B21-PT-N015C	1152GP9E22T0280PB	21B	2	B21-N015C-1	825PSIG (M)	510DU2A010	28B	RPS, "A2"	34, Sh. 2	66	B21-6-A2
	20	B21-PS-N015D	BARKSDALE B2T-C12CC	MN. STM. PRESS. LOW	LOCAL	2	B21-PT-N015D	1152GP9E22T0280PB	21B	2	B21-N015D-1	825PSIG (M)	510DU2A010	32B	RPS, "B2"	36, Sh. 2	68	B21-6-B2
	21	B21-LS-N017A	YARWAY 4418C-CE	Rx LEVEL LOW	P004-002	2	B21-LT-N017A-1	1152DP4E22T0280PB	24B	2	B21-N017A-1(M)	12.5 in.H_2O	510DU2A010	26B	RPS, "A1"	33, Sh. 2	65	B21-9-A1
				Rx LEVEL HIGH	P004-002		B21-LT-N017A-2	1152DP4E22T0280PB	24B	2	B21-N017A-2(M)	58.0 in.H_2O	510DU2A010	21B	ECCS,DIV.I	31, Sh. 2	63	B21-13-A
	22	B21-LS-N017B	YARWAY 4418C-CE	Rx LEVEL LOW	P004-002	2	B21-LT-N017B-1	1152DP4E22T0280PB	24B	2	B21-N017B-1(M)	12.5 in.H_2O	510DU2A010	30B	RPS, "B1"	35, Sh. 2	67	B21-9-B1
				Rx LEVEL HIGH	P004-002		B21-LT-N017B-2	1152DP4E22T0280PB	24B	2	B21-N017B-2(M)	58.0 in.H_2O	510DU2A010	21B	ECCS,DIV.I	31, Sh. 2	63	B21-14-A
	23	B21-LS-N017C	YARWAY 4418C-CE	Rx LEVEL LOW	P005-002	2	B21-LT-N017C-1	1152DP4E22T0280PB	24B	2	B21-N017C-1(M)	12.5 in.H_2O	510DU2A010	28B	RPS, "A2"	34, Sh. 2	66	B21-9-A2
				Rx LEVEL HIGH	P005-002		B21-LT-N017C-2	1152DP4E22T0280PB	24B	2	B21-N017C-2(M)	58.0 in.H_2O	510DU2A010	24B	ECCS,DIV.II	32, Sh. 2	64	B21-13-B
	24	B21-LS-N017D	YARWAY 4418C-CE	Rx LEVEL LOW	P005-002	2	B21-LT-N017D-1	1152DP4E22T0280PB	24B	2	B21-N017D-1(M)	12.5 in.H_2O	510DU2A010	32B	RPS, "B2"	36, Sh. 2	68	B21-9-B2
				Rx LEVEL HIGH	P005-002		B21-LT-N017D-2	1152DP4E22T0280PB	24B	2	B21-N017D-2(M)	58.0 in.H_2O	510DU2A010	24B	ECCS,DIV.II	32, Sh. 2	64	B21-14-B
	25	B21-PS-N021A	BARKSDALE B2T-C12SS	Rx PRESS. LOW	P004	-	B21-PT-N021A	1152GP8E22T0280PB	21B	2	B21-N021A-1(M)	310PSIG	510DU2A010	20B	ECCS,DIV.I	31, Sh. 2	63	B21-1-A
										2	B21-N021A-2(S)	410PSIG	510DU7A010	20B	ECCS,DIV.I	31, Sh. 2	63	B21-2-A
	26	B21-PS-N021B	BARKSDALE B2T-C12SS	Rx PRESS. LOW	P005	2	B21-PT-N021B	1152GP8E22T0280PB	21B	2	B21-N021B-1(M)	310PSIG	510DU2A010	23B	ECCS,DIV.II	32, Sh. 2	64	B21-1-B
										2	B21-N021B-2(S)	410PSIG	510DU7A010	23B	ECCS,DIV.II	32, Sh. 2	64	B21-2-B
	27	B21-PS-N021C	BARKSDALE B2T-C12SS	Rx PRESS. LOW	P009	2	B21-PT-N021C	1152GP8E22T0280PB	21B	2	B21-N021C-1(M)	310PSIG	510DU2A010	20B	ECCS,DIV.I	31, Sh. 2	63	B21-3-A
										2	B21-N021C-2(S)	410PSIG	510DU7A010	20B	ECCS,DIV.I	31, Sh. 2	63	B21-4-A
	28	B21-PS-N021D	BARKSDALE B2T-C12SS	Rx PRESS. LOW	P010	2	B21-PT-N021D	1152GP8E22T0280PB	21B	2	B21-N021D-1(M)	310PSIG	510DU2A010	23B	ECCS,DIV.II	32, Sh. 2	64	B21-3-B
										2	B21-N021D-2(S)	410PSIG	510DU7A010	23B	ECCS,DIV.II	32, Sh. 2	64	B21-4-B

1444 281

J.O. 9527.018

CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT
PRESSURE SWITCH TO ANALOG CHANGEOUT
LICENSING TECHNICAL REPORT INFORMATION

UNIT NO. 2
ATTACHMENT "B"
DATE: AUGUST 15, 1979
SHEET 3 OF 5

REV. NO.	ITEM NO.	DEVICE BEING REPLACED		SERVICE	G.E. RACK NO. H21-	DIFFERENTIAL PRESSURE TRANSMITTER				TRIP CALIBRATION UNIT					REMARKS	SCHEMATIC DATA		
		TAG NUMBER	TYPE			UNIT NO.	TAG NUMBER	ROSEMOUNT NO.	* PAGE NO. 51	UNIT NO.	TAG NUMBER	TRIP ** SET-POINT	ROSEMOUNT NO.	* - 35 PAGE NO.		DRAWING NO. 9527-F-39--	CABINET CB-VI-	RELAY NUMBER
	29	B21-PS-N023A	BARKSDALE B2T-C12SS	Rx PRESS. HIGH	P004	2	B21-PT-N023A	1152GP9E22T0280PB	21B	2 2	B21-N023A-1(M) B21-N023A-2(S)	1045PSIG 1035PSIG	510DU2A010 510DU7A010	26B 26B	RPS, "A1" RPS, "A1"	33, Sh. 2 33, Sh. 2	65 65	B21-10-A1 B21-11-A1
	30	B21-PS-N023B	BARKSDALE B2T-C12SS	Rx PRESS. HIGH	P004	2	B21-PT-N023B	1152GP9E22T0280PB	21B	2 2	B21-N023B-1(M) B21-N023B-2(S)	1045PSIG 1035PSIG	510DU2A010 510DU7A010	30B 30B	RPS, "B1" RPS, "B1"	35, Sh. 2 35, Sh. 2	67 67	B21-10-B1 B21-11-B1
	31	B21-PS-N023C	BARKSDALE B2T-C12SS	Rx PRESS. HIGH	P005	2	B21-PT-N023C	1152GP9E22T0280PB	21B	2 2	B21-N023C-1(M) B21-N023C-2(S)	1045PSIG 1035PSIG	510DU2A010 510DU7A010	28B 28B	RPS, "A2" RPS, "A2"	34, Sh. 2 34, Sh. 2	66 66	B21-10-A2 B21-11-A2
	32	B21-PS-N023D	BARKSDALE B2T-C12SS	Rx PRESS. HIGH	P005	2	B21-PT-N023D	1152GP9E22T0280PB	21B	2 2	B21-N023D-1(M) B21-N023D-2(S)	1045PSIG 1035PSIG	510DU2A010 510DU7A010	32B 32B	RPS, "B2" RPS, "B2"	36, Sh. 2 36, Sh. 2	68 68	B21-10-B2 B21-11-B2
	33	B21-LS-N024A	YARWAY 4418C-CE	Rx LEVEL LOW	P004	2	B21-LT-N024A-1 B21-LT-N024A-2	1152DP5E22T0280PB 1152DP5E22T0280PB	24B 24B	2 2	B21-N024A-1(M) B21-N024A-2(M)	-38 in. H_2O -38 in. H_2O	510DU2A010 510DU2A010	26B 21B	RPS, "A1" ECCS,DIV.I	33, Sh. 2 31, Sh. 2	65 63	B21-7-A1 B21-15-A
	34	B21-LS-N024B	YARWAY 4418C-CE	Rx LEVEL LOW	P004	2	B21-LT-N024B-1 B21-LT-N024B-2	1152DP5E22T0280PB 1152DP5E22T0280PB	24B 24B	2 2	B21-N024B-1(M) B21-N024B-2(M)	-38 in. H_2O -38 in. H_2O	510DU2A010 510DU2A010	30B 24B	RPS, "B1" ECCS,DIV.II	35, Sh. 2 32, Sh. 2	67 64	B21-7-B1 B21-15-B
	35	B21-LS-N025A	YARWAY 4418C-CE	Rx LEVEL LOW	P005	2	B21-LT-N025A-1 B21-LT-N025A-2	1152DP5E22T0280PB 1152DP5E22T0280PB	24B 24B	2 2	B21-N025A-1(M) B21-N025A-2(M)	-38 in. H_2O -38 in. H_2O	510DU2A010 510DU2A010	28B 21B	RPS, "A2" ECCS,DIV.I	34, Sh. 2 31, Sh. 2	66 63	B21-7-A2 B21-16-A
	36	B21-LS-N025B	YARWAY 4418C-CE	Rx LEVEL LOW	P005	2	B21-LT-N025B-1 B21-LT-N025B-2	1152DP5E22T0280PB 1152DP5E22T0280PB	24B 24B	2 2	B21-N025B-1(M) B21-N025B-2(M)	-38 in. H_2O -38 in. H_2O	510DU2A010 510DU2A010	32B 24B	RPS, "B2" ECCS,DIV.II	35, Sh. 2 32, Sh. 2	68 64	B21-7-B2 B21-16-B
	37	B21-LS-N031A	YARWAY 4418C-CE	Rx LEVEL LOW	P004	2	B21-LT-N031A	1152DP5E22T0280PB	25B	2	B21-N031A-1(M) B21-N031A-2(S) B21-N031A-3(S) B21-N031A-4(S)	-38 in. H_2O -38 in. H_2O -147.5 in. H_2O -147.5 in. H_2O	510DU2A010 510DU7A010 510DU7A010 510DU7A010	20B 20B 20B 20B	ECCS,DIV.I ECCS,DIV.I ECCS,DIV.I ECCS,DIV.I	31, Sh. 2 31, Sh. 2 31, Sh. 2 31, Sh. 2	63 63 63 63	B21-5-A B21-6-A B21-7-A B21-8-A
	38	B21-LS-N031B	YARWAY 4418C-CE	Rx LEVEL LOW	P005	2	B21-LT-N031B	1152DP5E22T0280PB	25B	2	B21-N031B-1(M) B21-N031B-2(S) B21-N031B-3(S) B21-N031B-4(S)	-38 in. H_2O -38 in. H_2O -147.5 in. H_2O -147.5 in. H_2O	510DU2A010 510DU7A010 510DU7A010 510DU7A010	23B 23B 23B 23B	ECCS,DIV.II ECCS,DIV.II ECCS,DIV.II ECCS,DIV.II	32, Sh. 2 32, Sh. 2 32, Sh. 2 32, Sh. 2	64 64 64 64	B21-5-B B21-6-B B21-7-B B21-8-B
	39	B21-LS-N031C	YARWAY 4418C-CE	Rx LEVEL LOW	P004	2	B21-LT-N031C	1152DP5E22T0280PB	25B	2	B21-N031C-1(M) B21-N031C-2(S) B21-N031C-3(S) B21-N031C-4(S)	-38 in. H_2O -38 in. H_2O -147.5 in. H_2O -147.5 in. H_2O	510DU2A010 510DU7A010 510DU7A010 510DU7A010	20B 20B 20B 20B	ECCS,DIV.I ECCS,DIV.I ECCS,DIV.I ECCS,DIV.I	31, Sh. 2 31, Sh. 2 31, Sh. 2 31, Sh. 2	63 63 63 63	B21-9-A B21-10-A B21-11-A B21-12-A
	40	B21-LS-N031D	YARWAY 4418C-CE	Rx LEVEL LOW	P005	2	B21-LT-N031D	1152DP5E22T0280PB	25B	2	B21-N031D-1(M) B21-N031D-2(S) B21-N031D-3(S) B21-N031D-4(S)	-38 in. H_2O -38 in. H_2O -147.5 in. H_2O -147.5 in. H_2O	510DU2A010 510DU7A010 510DU7A010 510DU7A010	23B 23B 23B 23B	ECCS,DIV.II ECCS,DIV.II ECCS,DIV.II ECCS,DIV.II	32, Sh. 2 32, Sh. 2 32, Sh. 2 32, Sh. 2	64 64 64 64	B21-9-B B21-10-B B21-11-B B21-12-B
	41	B21-LS-N036	YARWAY 4418C-CE	Rx LEVEL LOW	P009	2	B21-LT-N036	1152DP5E22T0280PB	25B	2	B21-N036-1(M)	-39 in. H_2O	510DU2A010	25B	ECCS,DIV.I	31, Sh. 2	63	B21-18-A
	42	B21-LS-N037	YARWAY 4418C-CE	Rx LEVEL LOW	P010	2	B21-LT-N037	1152DP5E22T0280PB	25B	2	B21-N037-1(M)	-39 in. H_2O	510DU2A010	25B	ECCS,DIV.II	32, Sh. 2	64	B21-18-B
	43	B21-LS-N042A	YARWAY 4418C-CE	Rx LEVEL LOW	P004	2	B21-LT-N042A	1152DP4E22T0280PB	25B	2	B21-N042A-1(M)	12.5 in. H_2O	510DU2A010	22B	ECCS,DIV.I	31, Sh. 2	63	B21-17-A
	44	B21-LS-N042B	YARWAY 4418C-CE	Rx LEVEL LOW	P005	2	B21-LT-N042B	1152DP4E22T0280PB	25B	2	B21-N042B-1(M)	12.5 in. H_2O	510DU2A010	25B	ECCS,DIV.II	32, Sh. 2	64	B21-17-B

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J.O. 9527.018

CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT
PRESSURE SWITCH TO ANALOG CHANGEOUT
LICENSING TECHNICAL REPORT INFORMATION

[illegible] NO. 2
ATTACHMENT "B"
DATE: AUGUST 15, 1979
SHEET 4 OF 5

Rev. No.	ITEM NO.	DEVICE BEING REPLACED		SERVICE	G.E. RACK NO. B21-	DIFFERENTIAL PRESSURE TRANSMITTER				TRIP CALIBRATION UNIT					REMARKS	SCHEMATIC DATA		
		TAG NUMBER	TYPE			UNIT NO.	TAG NUMBER	ROSEMOUNT NO.	PAGE NO.	UNIT NO.	TAG NUMBER	TRIP SET-POINT	ROSEMOUNT NO.	PAGE NO.		DRAWING NO. 9527-F-39---	CABINET CB-XL-	RELAY NUMBER
	45	B21-PS-N056A	BARKSDALE B2T-M18SS-66	COND. VACUUM LOW	LOCAL	2	B21-PT-N056A	1152GP5E22T0280PB	21B	2	B21-N056A-1(M)	7 in. Hg VAC	510DU2A010	26B	RPS, "A1"	33, Sh. 2	65	B21-8-A1
	46	B21-PS-N056B	BARKSDALE B2T-M18SS-66	COND. VACUUM LOW	LOCAL	2	B21-PT-N056B	1152GP5E22T0280PB	21B	2	B21-N056B-1(M)	7 in. Hg VAC	510DU2A010	30B	RPS, "B1"	35, Sh. 2	67	B21-8-B1
	47	B21-PS-N056C	BARKSDALE B2T-M18SS-66	COND. VACUUM LOW	LOCAL	2	B21-PT-N056C	1152GP5E22T0280PB	21B	2	B21-N056C-1(M)	7 in. Hg VAC	510DU2A010	28B	RPS, "A2"	34, Sh. 2	66	B21-8-A2
	48	B21-PS-N056D	BARKSDALE B2T-M18SS-66	COND. VACUUM LOW	LOCAL	2	B21-PT-N056D	1152GP5E22T0280PB	21B	2	B21-N056D-1(M)	7 in. Hg VAC	510DU2A010	32B	RPS, "B2"	36, Sh. 2	68	B21-8-B2
	49	C72-PS-N002A	STAT-O-RING 12N-AA4	DRYWELL PRESS. HIGH	P004	2	C72-PT-N002A	1152GP4E22T0280PB	22B	2	C72-N002A-1(M)	2PSIG	510DU2A010	26B	RPS, "A1"	33, Sh. 2	65	C72-1-A1
	50	C72-PS-N002B	STAT-O-RING 12N-AA4	DRYWELL PRESS. HIGH	P004	2	C72-PT-N002B	1152GP4E22T0280PB	22B	2	C72-N002B-1(M)	2PSIG	510DU2A010	30B	RPS, "B1"	35, Sh. 2	67	C72-1-B1
	51	C72-PS-N002C	STAT-O-RING 12N-AA4	DRYWELL PRESS. HIGH	P005	2	C72-PT-N002C	1152GP4E22T0280PB	22B	2	C72-N002C-1(M)	2PSIG	510DU2A010	28B	RPS, "A2"	34, Sh. 2	66	C72-1-A2
	52	C72-PS-N002D	STAT-O-RING 12N-AA4	DRYWELL PRESS. HIGH	P005	2	C72-PT-N002D	1152GP4E22T0280PB	22B	2	C72-N002D-1(M)	2PSIG	510DU2A010	32B	RPS, "B2"	36, Sh. 2	68	C72-1-B2
	53	E11-PS-N010A	STAT-O-RING 12N-AA4	DRYWELL PRESS. HIGH	P004	2	E11-PT-N010A	1152GP4E22T0280PB	21B	2	E11-N010A-1(M)	2PSIG	510DU2A010	22B	ECCS, DIV. I	31, Sh. 2	63	E11-5-A
	54	E11-PS-N010B	STAT-O-RING 12N-AA4	DRYWELL PRESS. HIGH	P005	2	E11-PT-N010B	1152GP4E22T0280PB	21B	2	E11-N010B-1(M)	2PSIG	510DU2A010	25B	ECCS, DIV. II	32, Sh. 2	64	E11-5-B
	55	E11-PS-N010C	STAT-O-RING 12N-AA4	DRYWELL PRESS. HIGH	P004	2	E11-PT-N010C	1152GP4E22T0280PB	21B		E11-N010C-1(M)	2PSIG	510DU2A010	22B	ECCS, DIV. I	31, Sh. 2	63	E11-6-A
	56	E11-PS-N010D	STAT-O-RING 12N-AA4	DRYWELL PRESS. HIGH	P005	2	E11-PT-N010D	1152GP4E22T0280PB	21B	2	E11-N010D-1(M)	2PSIG	510DU2A010	25B	ECCS, DIV. II	32, Sh. 2	64	E11-6-B
	57	E11-PS-N011A	STAT-O-RING 12N-AA4	DRYWELL PRESS. HIGH	P004	2	E11-PT-N011A	1152GP4E22T0280PB	22B	2	E11-N011A-1(M) E11-N011A-2(S)	2PSIG 2PSIG	510DU2A010 510DU7A010	21B 21B	ECCS, DIV. I ECCS, DIV. I	31, Sh. 2 31, Sh. 2	63 63	E11-1-A E11-2-A
	58	E11-PS-N011B	STAT-O-RING 12N-AA4	DRYWELL PRESS. HIGH	P005	2	E11-PT-N011B	1152GP4E22T0280PB	22B	2	E11-N011B-1(M) E11-N011B-2(S)	2PSIG 2PSIG	510DU2A010 510DU7A010	24B 24B	ECCS, DIV. II ECCS, DIV. II	32, Sh. 2 32, Sh. 2	64 6	E11-1-B E11-2-B
	59	E11-PS-N011C	STAT-O-RING 12N-AA4	DRYWELL PRESS. HIGH	P004	2	E11-PT-N011C	1152GP4E22T0280PB	22B	2	E11-N011C-1(M) E11-N011C-2(S)	2PSIG 2PSIG	510DU2A010 510DU7A010	21B 21B	ECCS, DIV. I ECCS, DIV. I	31, Sh. 2 31 Sh. 2	63 63	E11-3-A E11-4-A
	60	E11-PS-N011D	STAT-O-RING 12N-AA4	DRYWELL PRESS. HIGH	P005	2	E11-PT-N011D	1152GP4E22T0280PB	22B	2	E11-N011D-1(M) E11-N011D-2(S)	2PSIG 2PSIG	510DU2A010 510DU7A010	24B 24B	ECCS, DIV. II ECCS, DIV. II	32, Sh. 2 32, Sh. 2	64 64	E11-3-B E11-4-B
	61	E11-PS-N019A	STAT-O-RING 12N-AA4	DRYWELL PRESS. HIGH	P004	2	E11-PT-N019A-1	1152GP4E22T0280PB	22B	2	E11-N019A-1(M)	2.5PSIG	510DU2A010	22B	ECCS, DIV. I	31, Sh. 2	63	E11-7-A
	62	E11-PS-N019B	STAT-O-RING 12N-AA4	DRYWELL PRESS. HIGH	P005	2	E11-PT-N019B-1	1152GP4E22T0280PB	22B	2	E11-N019B-1(M)	2.5PSIG	510DU2A010	25B	ECCS, DIV. II	32, Sh. 2	64	E11-7-B
	63	E11-PS-N019C	STAT-O-RING 12N-AA4	DRYWELL PRESS. HIGH	P004	2	E11-PT-N019C-1	1152GP4E22T0280PB	22B	2	E11-N019C-1(M)	2.5PSIG	510DU2A010	22B	ECCS, DIV. I	31, Sh. 2	63	E11-8-A
	64	E11-PS-N019D	STAT-O-RING 12N-AA4	DRYWELL PRESS. HIGH	P005	2	E11-PT-N019D-1	1152GP4E22T0280PB	22B	2	E11-N019D-1(M)	2.5PSIG	510DU2A010	25B	ECCS, DIV. II	32, Sh. 2	64	E11-8-B
	65	E41-PDS-N004	BARTON 288	HPCI STM. LINE △ PRESS. HIGH	P016	2	E41-PDT-N004	1152DP5E22T0280PB	25B	2	E41-N004-1(M) E41-N004-2(S)	-219 in. H_2O +219 in. H_2O	510DU2A010 510DU7A010	21B 21B	ECCS, DIV. I ECCS, DIV. I	31, Sh. 2 31, Sh. 2	63 63	E41-1-A E41-2-A
	66	E41-PDS-N005	BARTON 288	HPCI STM. LINE △ PRESS. HIGH	P036	2	E41-PDT-N005	1152DP5E22T0280PB	25B	2	E41-N005-1(M) E41-N005-2(S)	-292 in. H_2O +292 in. H_2O	510DU2A010 510DU7A010	24B 24B	ECCS, DIV. II ECCS, DIV. II	32, Sh. 2 32, Sh. 2	64 64	E41-1-B E41-2-B
	67	E41-LSH-N014	ROBERT SHAW 83844-B1	HPCI DRAIN POT LEVEL HIGH	LOCAL	2	E41-LT-N014	1152DP3E22T0280PB	26B	2	E41-N014-1(M)	15 in. H_2O	510DU2A010	22B	ECCS, DIV. I	31, Sh. 2	63	E41-3-A
	68	E51-PDS-N017	BARTON 288	RCIC STM. LINE △ PRESS. HIGH	P035	2	E51-PDT-N017	1152DP6E22T0280PB	25B	2	E51-N017-1(M) E51-N017-2(S)	-387 in. H_2O +387 in. H_2O	510DU2A010 510DU7A010	21B 21B	ECCS, DIV. I ECCS, DIV. I	31, Sh. 2 31, Sh. 2	63 63	E51-1-A E51-2-A

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J.O. 9527.018

CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT
PRESSURE SWITCH TO ANALOG CHANGEOUT
LICENSING TECHNICAL REPORT INFORMATION

UNIT NO. 2
ATTACHMENT "B"
DATE: AUGUST 15, 1979
SHEET 5 OF 5

Rev. No.	ITEM NO.	DEVICE BEING REPLACED		SERVICE	G.E. RACK NO. H21-	DIFFERENTIAL PRESSURE TRANSMITTER				TRIP CALIBRATION UNIT					REMARKS	SCHEMATIC DATA		
		TAG NUMBER	TYPE			UNIT NO.	TAG NUMBER	ROSEMOUNT NO.	PAGE NO.	UNIT NO.	TAG NUMBER	TRIP # SET-POINT	ROSEMOUNT NO.	# - 55 PAGE NO.		DRAWING NO. 9527-F-39---	CABINET CB-XT-	RELAY NUMBER
	69	E51-PDS-N018	BARTON 288	RCIC STM. LINE △PRESS. HIGH	P038	2	E51-PDT-N018	1152DP6E22T0280PB	25B	2	E51-N018-1(M) E51-N018-2(S)	-516 in.H_2O +516 in.H_2O	510DU2A010 510DU7A010	24B 24B	ECCS,DIV.II ECCS,DIV.II	32, Sh. 2 32, Sh. 2	64 64	E51-1-8 E51-2-8
	70	E51-LSH-N010	ROBERT SHAW 83844-B1	RCIC DRAIN POT LEVEL HIGH	LOCAL	2	E51-LT-N010	1152DP3E22T0280PB	26B	2	E51-N010-1(M)	8 in. H_2O	510DU2A010	25B	ECCS,DIV.II	32, Sh. 2	64	E51-3-8

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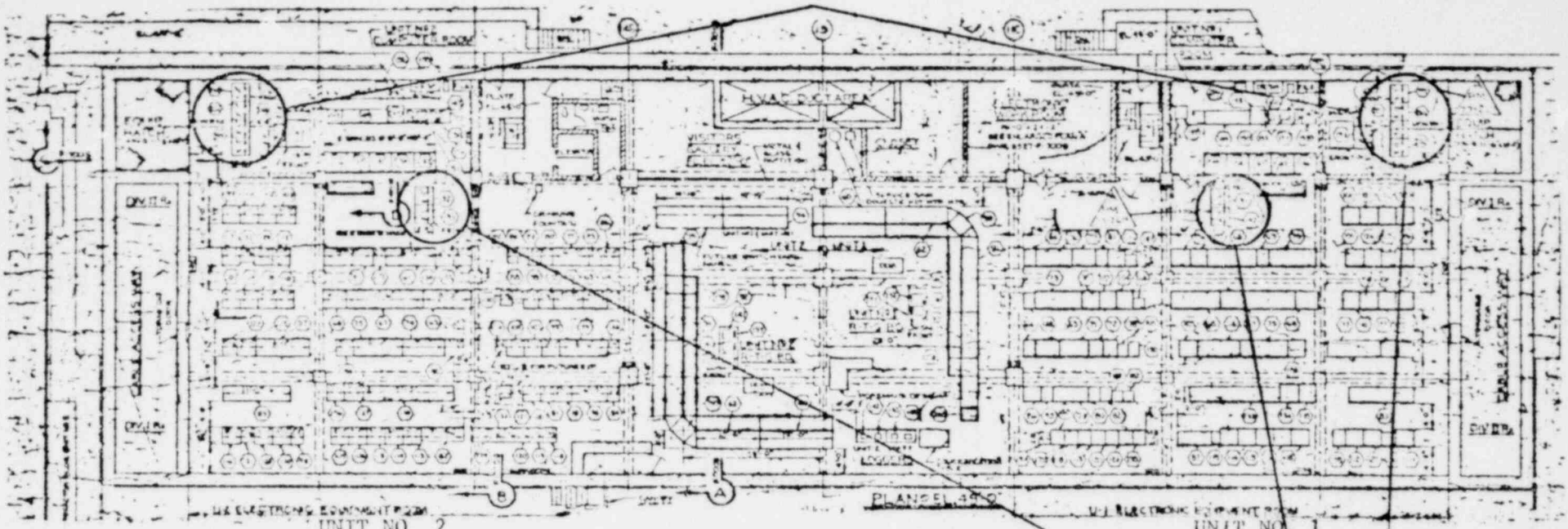

NO.	TITLE	TAG	FUNCTION
199	Trip Calibration Cab.	XU-65	RPS CH. "A1"
200	Trip Calibration Cab.	XU-66	RPS CH. "A2"
201	Trip Calibration Cab.	XU-67	RPS CH. "B1"
202	Trip Calibration Cab.	XU-68	RPS CH. "B2"
191	Trip Calibration Cab.	XU-63	ECCS-DIV. I
192	Trip Calibration Cab.	XU-64	ECCS-DIV. II

REF. DWG. 9527-F-7008

LICENSE NO. DPR-62, DOCKET NO. 50-324

PLANT MODIFICATION 77-268

CAROLINA POWER & LIGHT COMPANY

BRUNSWICK STEAM ELECTRIC PLANT

UNIT NO. 2

CONTROL BUILDING
TRIP CALIBRATION CABINETS
"ECCS" AND "RPS"
GENERAL ARRANGEMENT

ATTACHMENT "B"

SHEET 1 OF 19

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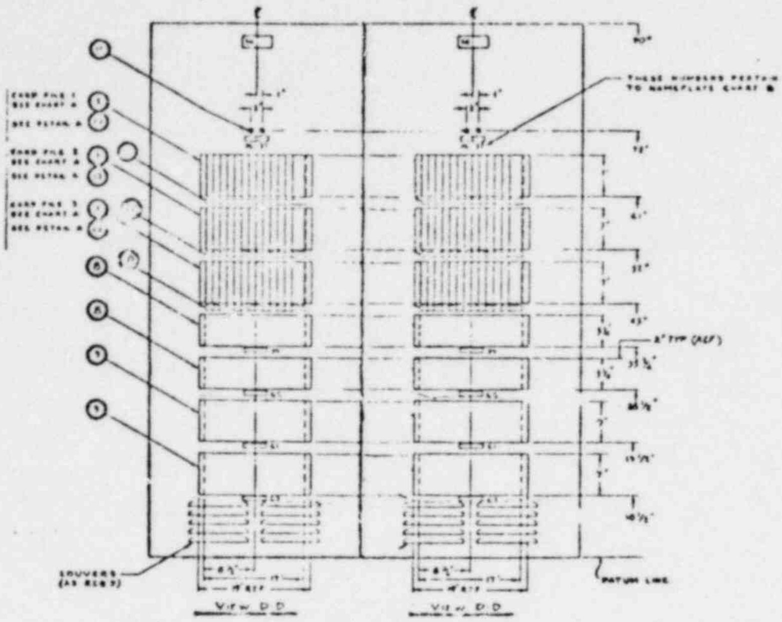

TRIP CALIBRATION CABINET 'AQ6'
ECCS DIV I CB-XU-63
CABINET ARRANGEMENT

TRIP CALIBRATION CABINET 'AQ7'
ECCS DIV II CB-XU-64
CABINET ARRANGEMENT

DETAIL A

CARD FILE SECURITY COVER

MANUFACTURE TO PROVIDE FOR EACH CARD FILE A "SEE THROUGH" TAMPER PROOF COVER W/ PAD LOCK FACILITY TO PROTECT ARE INDICATED.

ITEM	QTY	DESCRIPTION
21	AS REQ'D	NAMEPLATES - IN ACCORDANCE WITH CHART "B"
20	AS REQ'D	NAMEPLATES - IN ACCORDANCE WITH CHART "A"
19	3	SECURITY COVER (SEE DETAIL A)
18	1	INCANDESCENT LIGHT FIXTURE
17	1	BOXES, COVERPLATES, 115VAC DUPLEX OUTLET AND TWO ON-OFF SWITCHES
16	2	FAN, ROTRON MODEL NO. SU-2A1, PART NO. 028267, WITH SUITABLE COVER AND SCREEN
15	13	TERMINAL BOARD, 12 POINT, 30 AMP, G.E. CAT NO EB25A12W
14	2	PULLOUT FUSE BLOCK, DOUBLE POLE, 1-30 AMP, PER SPEC 9527-01-252-56
13	23	CARTRIDGE FUSEHOLDER, DOUBLE POLE, 1-30 AMP PER SPEC 9527-01-252-56
12		UNASSIGNED
11	2	INDICATING LAMP G.E. TYPE ET 5, 24VDC, RED COLOR CAP, G.E. CAT NO 6105700
10	36	RELAY, 24VDC, 4PDT AGASTAT CAT # GPB, WITH SOCKET # P/N CR0002 & LOCKING SPRING # P/N CR0133
9	2	INVERTER TOPAZ ELECTRONICS PER SPEC 9527-01-252-56
8	2	POWER SUPPLY [illegible] LAMBDA ELECTRONICS PER SPEC 9527-01-252-56
7	2	BLANK PANEL (2 5/16 WIDE) ROSEMOUNT INC PER SPEC 9527-01-252-55
6	1	BLANK PANEL (1 7/16 WIDE) ROSEMOUNT INC PER SPEC 9527-01-252-55
5	1	READOUT ASSEMBLY, ROSEMOUNT INC PER SPEC 9527-01-252-55
4	1	CALIBRATION UNIT, ROSEMOUNT INC PER SPEC 9527-01-252-55
3	14	SLAVE TRIP UNIT, ROSEMOUNT INC. PER SPEC 9527-01-252-55
2	21	MASTER TRIP UNIT, ROSEMOUNT INC PER SPEC 9527-01-252-55
1	3	CARD FILE, ROSEMOUNT INC PER SPEC 9527-01-252-55

BILL OF MATERIAL

REF. DWGS. 9527-F-3931, SH. 1
9527-F-3932, SH. 1

REV. NO.	DATE	DESCRIPTION	ENGR.	SUPENG.

LICENSE NO. DPR-62, DOCKET NO. 50-324

PLANT MODIFICATION 77-268

CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT

UNIT NO. 2

EMERGENCY CORE COOLING SYSTEM
TRIP CALIBRATION CABINETS
DIVISIONS I & II
CABINET GENERAL ARRANGEMENT
ELEVATION

ATTACHMENT "B"

SHEET 2 OF 19

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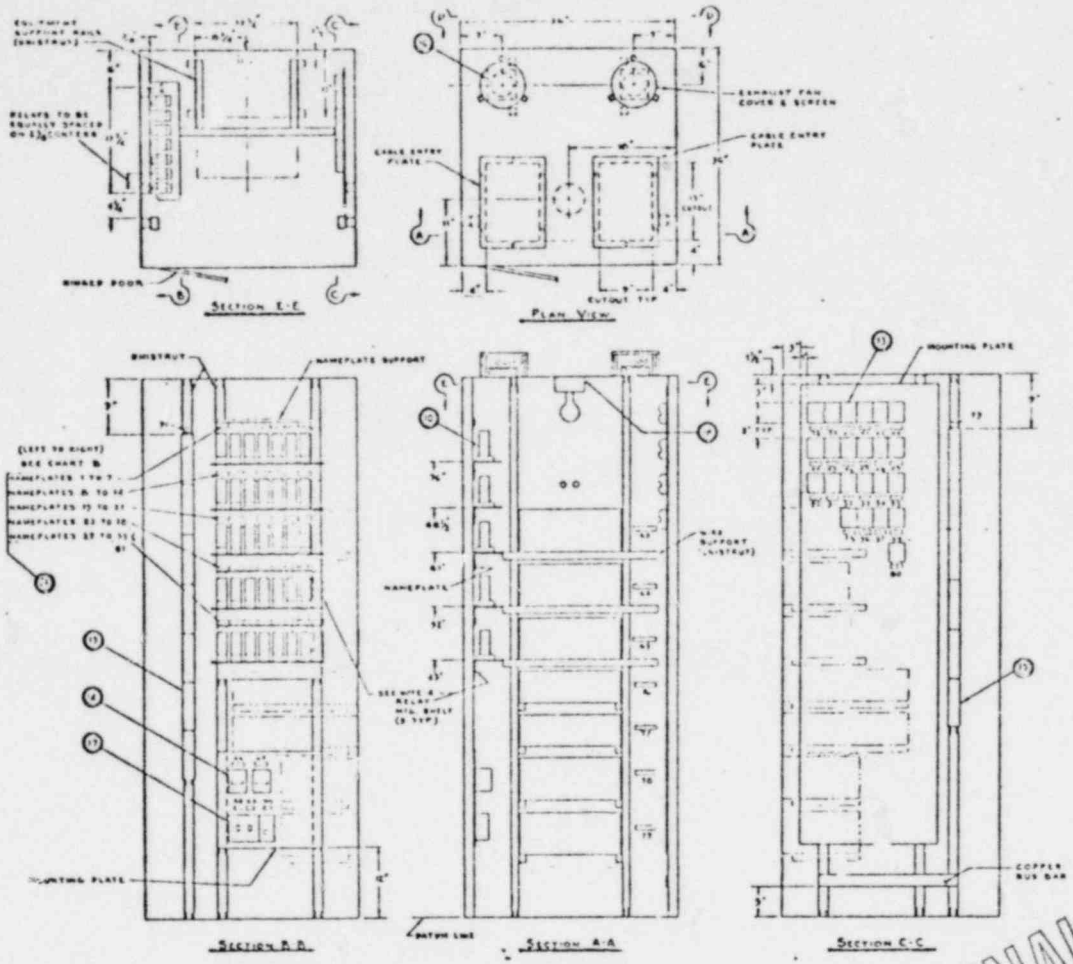

REF. DWG. 9527-F-3931, SH. 1

1444 288

REV. NO.	DATE	DESCRIPTION	ENGR.	SUP.ENG.

LICENSE NO. DPR-62, DOCKET NO. 50-324

PLANT MODIFICATION 77-268

CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT

UNIT NO. 2

EMERGENCY CORE COOLING SYSTEM
TRIP CALIBRATION CABINETS
DIVISIONS I & II
CABINET GENERAL ARRANGEMENT
PLAN & SECTIONS

ATTACHMENT "B"

SHEET 3 OF 19

NAMEPLATE CHART B			
NO.	NAMEPLATE NOMENCLATURE	CHAR. SIZE	
1	SPARE		
2	SPARE		
3	E11-4-A		
4	E11-3-A		
5	E11-2-A		
6	E11-1-A		
7	E51-2-A		
8	B21-8-A		
9	B21-12-A		
10	B21-11-A		
11	B21-10-A		
12	B21-9-A		
13	74-2-A		
14	74-1-A		
15	B21-7-A		
16	B21-6-A		
17	B21-5-A		
18	B21-4-A		
19	B21-3-A		
20	B21-2-A		
21	B21-1-A		
22	E51-1-A		
23	E41-2-A		
24	E41-1-A		
25	B21-16-A		
26	B21-15-A		
27	B21-14-A		
28	B21-13-A		
29	B21-18-A		
30	B21-17-A		
31	E11-8-A		
32	E11-7-A		
33	E11-6-A		
34	E11-5-A		
35	74-3-A		
36	GROSS FAILURE	BY VENDOR	
37	CARD OUT OF FILE		
38	B21-F12-A B21-F11-A		
39	B21-F10-A B21-F9-A		
40	B21-F8-A B21-F7-A		
41	B21-F6-A B21-F5-A		
42	B21-F4-A B21-F3-A		
43	B21-F2-A B21-F1-A		
44	B21-F14-A B21-F13-A		
45	B21-F16-A B21-F15-A		
46	E41-F2-A E41-F1-A		

CHART A						
	CARD FILE 1		CARD FILE 2		CARD FILE 3	
CARD POSITION	B/M ITEM NO.	NAMEPLATE	B/M ITEM NO.	NAMEPLATE	B/M ITEM NO.	NAMEPLATE
1	2	REACTOR PRESSURE LOW B21-N021A-1	2	REACTOR LEVEL HIGH B21-N017A-2	2	DRYWELL PRESSURE HIGH E11-N011A-1
2	3	REACTOR PRESSURE LOW B21-N021A-2	2	REACTOR LEVEL HIGH B21-N017B-2	2	DRYWELL PRESSURE HIGH E11-N011C-1
3	2	REACTOR PRESSURE LOW B21-N021C-1	2	REACTOR LEVEL LOW B21-N046-2	2	DRYWELL PRESSURE HIGH E11-N011A-1
4	3	REACTOR PRESSURE LOW B21-N021C-2	2	REACTOR LEVEL LOW B21-N016A-2	2	DRYWELL PRESSURE HIGH E11-N011C-1
5	2	REACTOR LEVEL LOW B21-N031A-1	2	HPCI STEAMLINE HIGH DP E41-N009C-1	2	REACTOR LEVEL LOW B21-N043A-1
6	3	REACTOR LEVEL LOW B21-N031A-2	3	HPCI STEAMLINE HIGH DP E41-N009C-2	2	REACTOR LEVEL LOW B21-N016C-1
7	3	REACTOR LEVEL LOW B21-N031A-3	2	RCIC STEAMLINE HIGH DP E51-N017-1	2	SPARE
8	3	REACTOR LEVEL LOW B21-N031A-4	3	RCIC STEAMLINE HIGH DP E51-N017-2	3	SPARE
9	2	REACTOR LEVEL LOW B21-N031C-3	2	DRYWELL PRESSURE HIGH E11-N011A-1	2	HPCI DRAIN POT LEVEL HIGH
10	3	REACTOR LEVEL LOW B21-N031C-2	3	DRYWELL PRESSURE HIGH E11-N011A-2	3	SPARE
11	3	REACTOR LEVEL LOW B21-N031C-3	2	DRYWELL PRESSURE HIGH E11-N011C-1	2	SPARE
12	3	REACTOR LEVEL LOW B21-N031C-4	3	DRYWELL PRESSURE HIGH E11-N011C-2	6	
13	4&5	CALIBRATION UNIT	7	CALIBRATION UNIT	7	CALIBRATION UNIT
		(XU-3897)		(XU-3898)		(XU-3899)

47	E51-F2-A E51-F1-A		
48	B21-F20-A B21-F19-A		
49	B21-F18-A B21-F17-A		
50	E11-F12-A E11-F11-A		
51	E11-F10-A E11-F9-A		
52	E -F8-A E11-F7-A		
53	E11-F6-A E11-F5-A		
54	E11-F4-A E11-F3-A		
55	E11-F2-A E11-F1-A		
56	F2-3 F2-4		
57	F2-2 F1-2		
58	F2-1 F1-1		
59	POWER SUPPLY 1		
60	POWER SUPPLY 2		
61	INVERTER 1		
62	INVERTER 2		
63	CARD FILE 1 CB-XU-3897		
64	CARD FILE 2 CB-XU-3898		
65	CARD FILE 3 CB-XU-3899		
66	F1-1-A F2-1-A		

67	F1-2-A F2-2-A		
68	LIGHT SW		
69	FAN SW		
70	115 VAC		
71	TB-A		
72	UNASSIGNED		
73	TB-B		
74	TRIP CALIBRATION CABINET ECCS DIVISION I CB-XU-63	AGG UNIT 2	
75	SPARE		
80	E41-F4-A E41-F3-A		
81	E41-3-A		

REF. DWG. 9527-F-3931, SH. 1

REV. NO.	DATE	DESCRIPTION	ENGR.	SUP.ENG.

LICENSE NO. DPR-62, DOCKET NO. 50-324

PLANT MODIFICATION 77-268

CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT

UNIT NO. 2

EMERGENCY CORE COOLING SYSTEM
TRIP CALIBRATION CABINETS
DIVISION I, CB-XU-63
CARD FILE & NAMEPLATE DATA

ATTACHMENT "B"

SHEET 4 OF 19

POOR ORIGINAL

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NAMEPLATE CHART B			
NO.	NAMEPLATE NOMENCLATURE	CHAR. SIZE	
1	SPARE	1	
2	SPARE		
3	E11-4-B		
4	E11-3-B		
5	E11-2-B		
6	E11-1-B		
7	E51-2-B		
8	B21-8-B		
9	B21-12-B		
10	B21-11-B		
11	B21-10-B		
12	B21-9-B		
13	74-2-B		
14	74-1-B		
15	B21-7-B		
16	B21-6-B		
17	B21-5-B		
18	B21-4-B		
19	B21-3-B		
20	B21-2-B		
21	B21-1-B		
22	E51-1-B		
23	E41-2-B		
24	E41-1-B		
25	B21-16-B		
26	B21-15-B		
27	B21-14-B		
28	B21-13-B		
29	B21-18-B		
30	B21-17-B		
31	E11-8-B		
32	E11-7-B		
33	E11-6-B		
34	E11-5-B		
35	74-3-B	BY VENDOR	
36	GROSS FAILURE		
37	CARD OUT OF FILE		
38	B21-F12-B B21-F11-B		
39	B21-F10-B B21-F9-B		
40	B21-F8-B B21-F7-B		
41	B21-F6-B B21-F5-B		
42	B21-F4-B B21-F3-B		
43	B21-F2-B B21-F1-B		
44	B21-F14-B B21-F13-B		
45	F16-B B21-F15-B		
46	E41-F2-B E41-F1-B		

CHART A						
	CARD FILE 1		CARD FILE 2		CARD FILE 3	
CARD POSITION	B/M ITEM NO.	NAMEPLATE	B/M ITEM NO.	NAMEPLATE	B/M ITEM NO.	NAMEPLATE
1	2	[illegible] PRESSURE [illegible] B21-[illegible]-1	2	REACTOR LEVEL HIGH B21-[illegible]-2	2	PRESSURE [illegible] E11-[illegible]-1
2	3	[illegible] PRESSURE [illegible] B21-[illegible]-2	2	REACTOR LEVEL HIGH B21-[illegible]-2	2	PRESSURE [illegible] E11-[illegible]-1
3	2	[illegible] PRESSURE [illegible] B21-[illegible]-1	2	REACTOR LEVEL HIGH B21-[illegible]-2	2	PRESSURE [illegible] E11-[illegible]-1
4	3	[illegible] PRESSURE LOW B21-[illegible]-2	2	REACTOR LEVEL HIGH B21-[illegible]-2	2	PRESSURE HIGH E11-[illegible]-1
5	2	REACTOR LEVEL LOW B21-[illegible]-1	2	STEAMLINE HIGH DP [illegible]-1	2	REACTOR LEVEL LOW B21-[illegible]-1
6	3	REACTOR LEVEL LOW B21-[illegible]-2	3	STEAMLINE HIGH DP E41-[illegible]-2	2	REACTOR LEVEL LOW B21-[illegible]-1
7	3	REACTOR LEVEL LOW B21-[illegible]-3	2	STEAMLINE HIGH DP E51-[illegible]-1	2	SPARE
8	3	REACTOR LEVEL LOW B21-[illegible]-4	3	STEAMLINE HIGH DP E51-[illegible]-2	3	SPARE
9	2	REACTOR LEVEL LOW B21-[illegible]-1	2	DRYWELL PRESSURE HIGH E11-[illegible]-1	2	RCIC DRAINPOT LEVEL HIGH
10	3	REACTOR LEVEL LOW B21-[illegible]-2	3	PRESSURE HIGH E11-[illegible]-2	3	SPARE
11	3	REACTOR LEVEL LOW B21-[illegible]-3	2	DRYWELL PRESSURE HIGH E11-[illegible]-1	2	SPARE
12	3	REACTOR LEVEL LOW B21-[illegible]-4	3	DRYWELL PRESSURE HIGH E11-[illegible]-2	6	
13	4&5	CALIBRATION UNIT	7	CALIBRATION UNIT	7	CALIBRATION UNIT
		(XU-3900)		(XU-3901)		(XU-3902)

47	E51-F2-B	E51-F1-B		
48	B21-F20-B	B21-F19-B		
49	B21-F18-B	B21-F17-B		
50	E11-F12-B	E11-F11-B		
51	E11-F10-B	E11-F9-B		
52	E11-F8-B	E11-F[illegible]-B		
53	E11-F6-B	E11-F5-B		
54	E11-F4-B	E11-F3-B		
55	E11-F2-B	E11-F1-B		
56	F2-3	F2-4		
57	F2-2	F1-2		
58	F2-1	F1-1		
[illegible]	POWER SUPPLY 1			
[illegible]	POWER SUPPLY 2			
[illegible]	INVERTER 1			
[illegible]	INVERTER 2			
63	CARD FILE 1 CB-XU-3900			
64	CARD FILE 2 CB-XU-3901			
65	CARD FILE 3 CB-XU-3902			
66	F1-1-B	F2-1-B		

67	F1-2-B	F2-2-B		
68	LIGHT SW			
69	FAN SW			
70	115 VAC			
71	TB-A			
72	PHONE JACK			
73	TB-B			
74	TRIP CALIBRATION CABINET AQ? ECCS DIVISION II CB-XU-64 UNIT 2			
75	SPARE			
80	E51-F4-B	E51-F3-B		
81	E51-3-B		1	

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REF. DWG. 9527-F-3932, SH. 1

REV. NO	DATE	DESCRIPTION	ENGR.	SUPENG

LICENSE NO. DPR-62, DOCKET NO. 50-324

PLANT MODIFICATION 77-268

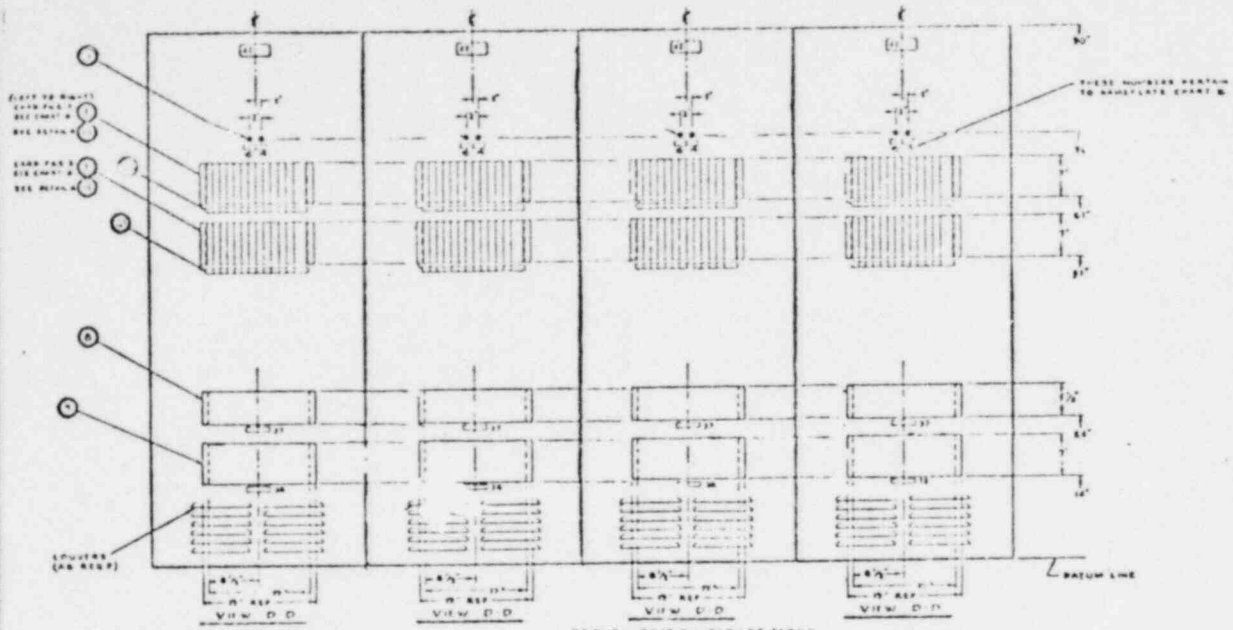
CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT

UNIT NO. 2

EMERGENCY CORE COOLING SYSTEM
TRIP CALIBRATION CABINETS
DIVISION II, CB-XU-64
CARD FILE & NAMEPLATE DATA

ATTACHMENT "B"

SHEET 5 OF 19



TRIP CALIBRATION CABINET "A26"
RPS CHANNEL A1 CB-XU-65
CABINET ARRANGEMENT

TRIP CALIBRATION CABINET "A27"
RPS CHANNEL A2 CB-XU-66
CABINET ARRANGEMENT

TRIP CALIBRATION CABINET "A28"
RPS CHANNEL B1 CB-XU-67
CABINET ARRANGEMENT

TRIP CALIBRATION CABINET "A29"
RPS CHANNEL B2 CB-XU-68
CABINET ARRANGEMENT

Detail A

CARD FILE SECURITY COVER

MANUFACTURER TO PROVIDE FOR EACH CARD FILE A "SEE THROUGH" TAMPER PROOF COVER WITH PADLOCK FACILITY TO PROTECT AREA INDICATED

REF. DWGS. 9527-F-3933, SH. 1
9527-E-3934, SH. 1
9527-F-3935, SH. 1
9527-F-3936, SH. 1

ITEM	QTY	DESCRIPTION
21	AS REQ'D	NAME PLATES - IN ACCORDANCE WITH CHART "B"
20	AS REQ'D	NAMEPLATES - IN ACCORDANCE WITH CHART "A"
19	2	SECURITY COVER (SEE DETAIL A)
18	1	INCANDESCENT LIGHT FIXTURE
17	1	BOXES, COVERPLATES, 115 VAC DUPLEX OUTLET AND TWO ON-OFF SWITCHES
16	2	FAN, ROTRON, MODEL NO. SU-XAY PART NO. 028267 WITH SUITABLE COVER AND SCREEN
15	6	TERMINAL BOARD, 12 POINT, 30 AMP G.E. CAT NO. EB25A12W
14	1	PULLOUT FUSE BLOCK, DOUBLE POLE, 1-30 AMP, PER SPEC 9527-01-252-56
13	13	CARTRIDGE FUSEHOLDER, DOUBLE POLE, 1-30 AMP, PER SPEC 9527-01-252-56
12		UNASSIGNED
11	2	INDICATING LAMP, G.E. TYPE ET-9, 24VDC, RED COLOR CAP, G.E. CAT NO. 6107T00
10	17	RELAY, 24VDC, 4PDT, AGASTAT CAT # GPB, WITH SOCKET P/N CR0002 & LOCKING SPRING # P/N CR0133
9	1	INVERTER TOPAZ ELECTRONICS PER SPEC. 9527-01-252-56
8	1	POWER SUPPLY LAMBDA ELECTRONICS PER SPEC. 9527-01-252-56
7	1	BLANK PANEL (2 5/16 WIDE) ROSEMOUNT INC. PER SPEC. 9527-01-252-55
6	10	BLANK PANEL (1 5/16 WIDE) ROSEMOUNT INC. PER SPEC. 9527-01-252-55
5	1	READOUT ASSEMBLY ROSEMOUNT INC. PER SPEC. 9527-01-252-55
4	1	CALIBRATION UNIT, ROSEMOUNT INC. PER SPEC. 9527-01-252-55
3	3	SLAVE TRIP UNIT, ROSEMOUNT INC. PER SPEC. 9527-01-252-55
2	11	MASTER TRIP UNIT, ROSEMOUNT INC. PER SPEC. 9527-01-252-55
1	2	CARD FILE, ROSEMOUNT INC. PER SPEC. 9527-01-252-55

BILL OF MATERIAL

1444 291

REV. NO	DATE	DESCRIPTION	ENGR.	SUPENG

LICENSE NO. DPR-62, DOCKET NO. 50-324

PLANT MODIFICATION 77-268

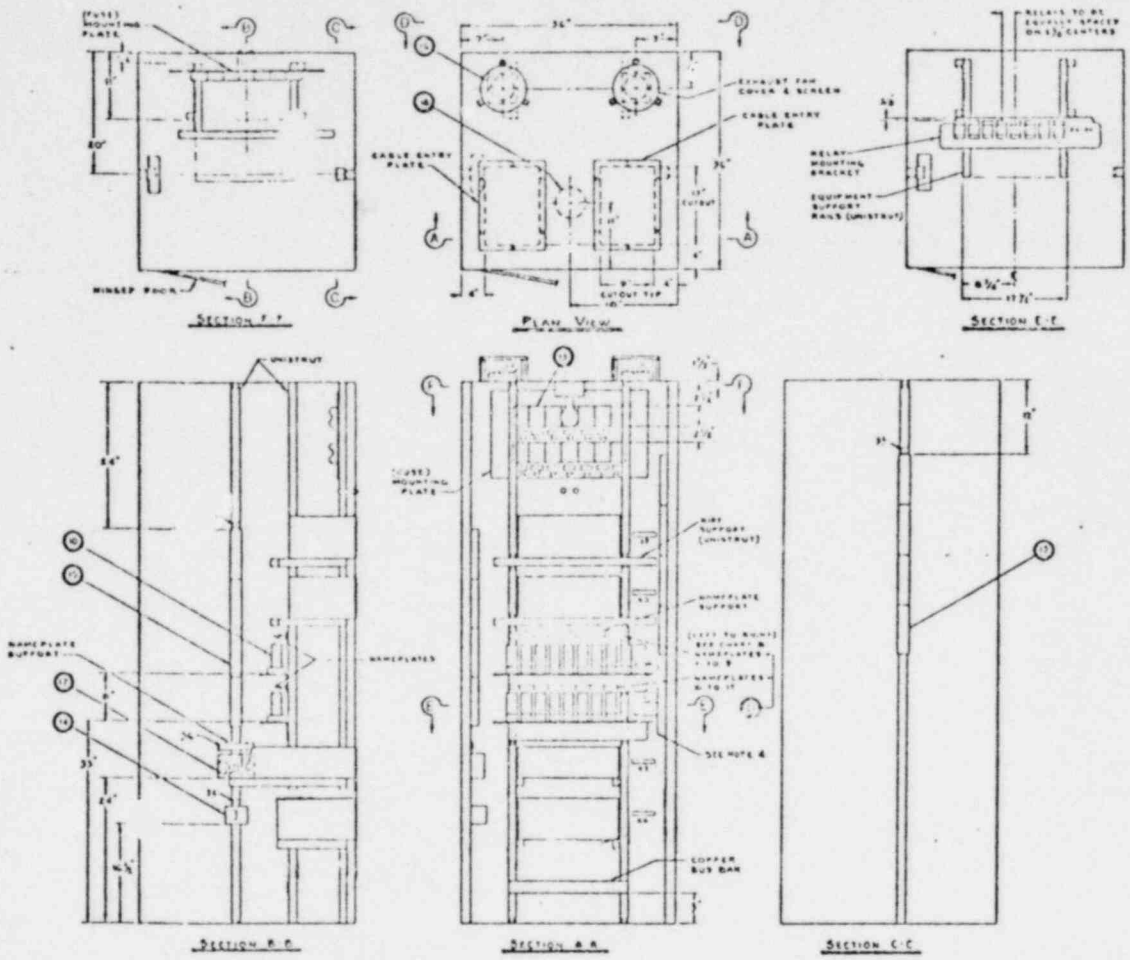
CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT

UNIT NO. 2

REACTOR PROTECTION SYSTEM
TRIP CALIBRATION CABINETS
CHANNELS A1, A2, B1 & B2
CABINET GENERAL ARRANGEMENT

ATTACHMENT "B"

SHEET 6 OF 19



POOR ORIGINAL

REF. DWG. 9527-F-3933, SH. 1

1444 292

REV. NO.	DATE	DESCRIPTION	ENGR.	SUPENG

LICENSE NO. DPR-62, DOCKET NO. 50-324

PLANT MODIFICATION 77-268

CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT

UNIT NO. 2

REACTOR PROTECTION SYSTEM
TRIP CALIBRATION CABINETS
CHANNELS A1, A2, B1 & B2
CABINET GENERAL ARRANGEMENT
PLAN & SECTIONS

ATTACHMENT "B"

SHEET 7 OF 19

NAMEPLATE CHART B			
NO.	NAMEPLATE NOMENCLATURE	CHAR SIZE	
1	C72-1-A1		
2	B21-8-A1		
3	B21-7-A1		
4	B21-6-A1		
5	B21-5-A1		
6	B21-4-A1		
7	B21-3-A1		
8	B21-2-A1		
9	B21-1-A1		
10	B21-9-A1		
11	B21-10-A1		
12	B21-11-A1		
13	SPARE		
14	SPARE		
15	74-1-A1		
16	74-2-A1		
17	74-3-A1		
18	GROSS FAILURE		
19	CARD OUT OF FILE		
20	F2-1 F1-1	MODIFIED AD	
21	B21-F10-A1 B21-F9-A1		
22	B21-F8-A1 B21-F7-A1		
23	B21-F6-A1 B21-F5-A1		
24	B21-F4-A1 B21-F3-A1		
25	B21-F2-A1 B21-F1-A1		
26	SPARE		
27	B21-F18-A1 B21-F17-A1		
28	B21-F16-A1 B21-F15-A1		
29	C72-F2-A1 C72-F1-A1		
30	B21-F14-A1 B21-F13-A1		
31	B21-F12-A1 B21-F11-A1		
32	F2-2 F1-2		
33	TB-A		
34	F1-1-A1 F2-1-A1		
35	TB-B		
36	115 VAC LIGHT SW FAN SW		
43 37	POWER SUPPLY 1		
44 38	INVERTER 1		
39	CARD FILE 1 CB-XU-3903		
40	CARD FILE 2 CB-XU-3904		
41	UNASSIGNED		
42	TRIP CALIBRATION CABINET A26 RPS CHANNEL A1 CB-XU-65 UNIT 2		

CHART A				
CARD POSITION	CARD FILE 1		CARD FILE 2	
	B/M ITEM NO.	NAMEPLATE	B/M ITEM NO	NAMEPLATE
1	2	MAIN STEAMLINE FLOW HIGH B21-N009A-1	2	SPARE
2	3	MAIN STEAMLINE FLOW HIGH B21-N009A-2	3	SPARE
3	2	MAIN STEAMLINE FLOW HIGH B21-N007A-1	6	
4	2	MAIN STEAMLINE FLOW HIGH B21-N008A-1	6	
5	2	MAIN STEAMLINE FLOW HIGH B21-N008A-1	6	
6	2	MAIN STEAMLINE PRESS LOW B21-N015A-1	6	
7	2	REACTOR LEVEL LOW B21-N024A-1	6	
8	2	SJAE CENTER VACUUM LOW B21-N055A-1	6	
9	2	DRYWELL PRESSURE HIGH C72-N007A-1	6	
10	2	REACTOR LEVEL LOW B21-N017A-1	6	
11	2	REACTOR PRESSURE HIGH B21-N023A-1	6	
12	3	REACTOR PRESSURE HIGH B21-N023A-2	6	
13	4&5	CALIBRATION UNIT	7	CALIBRATION UNIT
	(XU-3903)		(XU-3904)	

POOR ORIGINAL

REF. DWG. 9527-F-3933, SH. 1

1444 293

REV. NO.	DATE	DESCRIPTION	ENGR.	SUPENG.

LICENSE NO. DPR-62, DOCKET NO. 50-324

PLANT MODIFICATION 77-268

CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT

UNIT NO. 2

REACTOR PROTECTION SYSTEM
TRIP CALIBRATION CABINETS
CHANNEL A1 - CB-XU-65
CARD FILE & NAMEPLATE DATA

ATTACHMENT B"

SHEET 8 OF 19

NAMEPLATE CHART B			
NO.	NAMEPLATE NOMENCLATURE	CHAR SIZE	
1	C72-1-A2	BY VENDOR	
2	B21-8-A2		
3	B21-7-A2		
4	B21-6-A2		
5	B21-5-A2		
6	B21-4-A2		
7	B21-3-A2		
8	B21-2-A2		
9	B21-1-A2		
10	B21-9-A2		
11	B21-10-A2		
12	B21-11-A2		
13	SPARE		
14	SPARE		
15	74-1-A2		
16	74-2-A2		
17	74-3-A2		
18	GROSS FAILURE		
19	CARD OUT OF FILE		
20	F2-1 F1-1		
21	B21-F10-A2 B21-F9-A2		
22	B21-F8-A2 B21-F7-A2		
23	B21-F6-A2 B21-F5-A2		
24	B21-F4-A2 B21-F3-A2		
25	B21-F2-A2 B21-F1-A2		
26	SPARE		
27	B21-F18-A2 B21-F17-A2		
28	B21-F16-A2 B21-F15-A2		
29	C72-F2-A2 C72-F1-A2		
30	B21-F14-A2 B21-F13-A2		
31	B21-F12-A2 B21-F11-A2		
32	F2-2 F1-2		
33	TB-A		
34	F1-1-A2 F2-1-A2		
35	TB-B		
36	115 VAC LIGHT SW FAN SW		
43 37	POWER SUPPLY 2		
44 38	INVERTER 2		
39	CARD FILE 1 CB-XU-3905		
40	CARD FILE 2 CB-XU-3906		
41	PHONE JACK		
42	TRIP CALIBRATION CABINET A27 RPS CHANNEL A2 CB-XU-66 UNIT 2		

CHART A				
CARD POSITION	CARD FILE 1		CARD FILE 2	
	B/M ITEM NO.	NAMEPLATE	B/M ITEM NO.	NAMEPLATE
1	2	MAIN STEAMLINE FLOW HIGH B21-N006C-1	2	SPARE
2	2	MAIN STEAMLINE FLOW HIGH B21-N007C-1	3	SPARE
3	2	MAIN STEAMLINE FLOW HIGH B21-N008C-1	6	
4	3	MAIN STEAMLINE FLOW HIGH B21-N008C-2	6	
5	2	MAIN STEAMLINE FLOW HIGH B21-N009C-1	6	
6	2	MAIN STEAMLINE PRESS LOW B21-N015C-1	6	
7	2	REACTOR LEVEL LOW B21-N017C-1	6	
8	2	CONDENSER VACUUM LOW B21-N019C-1	6	
9	2	DRYWELL PRESSURE HIGH C72-N002C-1	6	
10	2	REACTOR LEVEL LOW B21-N017C-1	6	
11	2	REACTOR PRESSURE HIGH B21-N023C-1	6	
12	3	REACTOR PRESSURE HIGH B21-N023C-2	6	
13	4&5	CALIBRATION UNIT	7	CALIBRATION UNIT
	(XU-3905)		(XU-3906)	

POOR ORIGINAL

REF. DWG. 9527-F-3934, SH. 1

1444 294

REV. NO.	DATE	DESCRIPTION	ENGR.	SUP.ENG

LICENSE NO. DPR-62, DOCKET NO. 50-324

PLANT MODIFICATION 77-268

CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT

UNIT NO. 2

REACTOR PROTECTION SYSTEM
TRIP CALIBRATION CABINETS
CHANNEL "A2" - CB-XU-66
CARD FILE & NAMEPLATE DATA

ATTACHMENT "B"

SHEET 9 OF 19

NAMEPLATE CHART B			
NO.	NAMEPLATE NOMENCLATURE	CHAR SIZE	
1	C72-1-B1	↓	
2	B21-8-B1		
3	B21-7-B1		
4	B21-6-B1		
5	B21-5-B1		
6	B21-4-B1		
7	B21-3-B1		
8	B21-2-B1		
9	B21-1-B1		
10	B21-9-B1		
11	B21-10-B1		
12	B21-11-B1		
13	SPARE		
14	SPARE		
15	74-1-B1	BY VENDOR	
16	74-2-B1		
17	74-3-B1		
18	GROSS FAILURE		
19	CARD OUT OF FILE		
20	F2-1 F1-1		
21	B21-F10-B1 B21-F9-B1		
22	B21-F8-B1 B21-F7-B1		
23	B21-F6-B1 B21-F5-B1		
24	B21-F4-B1 B21-F3-B1		
25	B21-F2-B1 B21-F1-B1		
26	SPARE		
27	B21-F18-B1 B21-F17-B1		
28	B21-F16-B1 B21-F15-B1		
29	C72-F2-B1 C72-F1-B1		
30	B21-F14-B1 B21-F13-B1		
31	B21-F12-B1 B21-F11-B1		
32	F2-2 F2-1		
33	TB-A		
34	F1-1-B1 F2-1-B1		
35	TB-B		
36	115 VAC LIGHT SW FAN SW		
43 37	POWER SUPPLY 1		
44 38	INVERTER 1		
39	CARD FILE 1 CB-XU-3907		
40	CARD FILE 2 CB-XU-3908		
41	UNASSIGNED	↑	
42	TRIP CALIBRATION CABINET 428 RPS CHANNEL B1 CB-XU-67 UNIT 2.		

CHART A				
CARD POSITION	CARD FILE 1		CARD FILE 2	
	B/M ITEM NO.	NAMEPLATE	B/M ITEM NO.	NAMEPLATE
1	2	MAIN STEAMLINE FLOW HIGH B21-NO07B-1	2	SPARE
2	2	MAIN STEAMLINE FLOW HIGH B21-NO07B-1	3	SPARE
3	3	MAIN STEAMLINE FLOW HIGH B21-NO07B-2	6	
4	2	MAIN STEAMLINE FLOW HIGH B21-NO08B-1	6	
5	2	MAIN STEAMLINE FLOW HIGH B21-NO09B-1	6	
-	2	MAIN STEAMLINE PRESS. LOW B21-NO15B-1	6	
7	2	REACTOR LEVEL LOW B21-NO24B-1	6	
8	2	CONDENSER VACUUM LOW B21-NO56B-1	6	
9	2	DRYWELL PRESSURE HIGH C72-NO02B-1	6	
10	2	REACTOR LEVEL LO B21-NO1[illegible]-1	6	
11	2	REACTOR PRESSURE HIGH B21-NO23B-1	6	
12	3	REACTOR PRESSURE HIGH B21-NO23B-2	6	
13	4&5	CALIBRATION UNIT	7	CALIBRATION UNIT
	(XU-3907)		(XU-3908)	

POOR ORIGINAL

REF. DWG. 9527-F-3935, SH. 1

1444 295

REV. NO.	DATE	DESCRIPTION	ENGR.	SUPENG.

LICENSE NO. DPR-62, DOCKET NO. 50-324

PLANT MODIFICATION 77-268

CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT

UNIT NO. 2

REACTOR PROTECTION SYSTEM
TRIP CALIBRATION CABINETS
CHANNEL "B2" - CB-XU-67
CARD FILE & NAMEPLATE DATA

ATTACHMENT "B"

SHEET 10 OF 19

NAMEPLATE CHART B			
NO.	NAMEPLATE NOMENCLATURE	CHAR SIZE	
1	C72-1-B2	1	
2	B21-8-B2	1	
3	B21-7-B2	1	
4	B21-6-B2	1	
5	B21-5-B2	1	
6	B21-4-B2	1	
7	B21-3-B2	1	
8	B21-2-B2	1	
9	B21-1-B2	1	
10	B21-9-B2	1	
11	B21-10-B2	1	
12	B21-11-B2	1	
13	SPARE	1	
14	SPARE	1	
15	74-1-B2	1	
16	74-2-B2	1	
17	74-3-B2	1	
18	GROSS FAILURE	1	
19	CARD OUT OF FILE	1	
20	F2-1 F1-1	BY VENDOR	
21	B21-F10-B2 B21-F9-B2		
22	B21-F8-B2 B21-F7-B2		
23	B21-F6-B2 B21-F5-B2		
24	B21-F4-B2 B21-F3-B2		
25	B21-F2-B2 B21-F1-B2		
26	SPARE	1	
27	B21-F18-B2 B21-F17-B2	1	
28	B21-F16-B2 B21-F15-B2	1	
29	C72-F2-B2 C72-F1-B2	1	
30	B21-F14-B2 B21-F13-B2	1	
31	B21-F12-B2 B21-F11-B2	1	
32	F2-2 F1-2	1	
33	TB-A	1	
34	F1-1-B2 F2-1-B2	1	
35	TB-B	1	
36	115 VAC LIGHT SW. FAN SA	1	
43 37	POWER SUPPLY 2	1	
44 38	INVERTER 2	1	
39	CARD FILE 1 CB-XU-3909	1	
40	CARD FILE 2 CB-XU-3910	1	
41	UNASSIGNED	1	
42	TRIP CALIBRATION CABINET A29 RPS CHANNEL B2 CB-XU-68 UNIT 2		

CHART A				
CARD POSITION	CARD FILE 1 B/M ITEM NO.	CARD FILE 1 NAMEPLATE	CARD FILE 2 B/M ITEM NO.	CARD FILE 2 NAMEPLATE
1	2	MAIN STEAMLINE FLOW HIGH B21-N004B-1	2	SPARE
2	2	MAIN STEAMLINE FLOW HIGH B21-N004D-1	3	SPARE
3	2	MAIN STEAMLINE FLOW HIGH B21-N004A-1	6	
4	2	MAIN STEAMLINE FLOW HIGH B21-N004C-1	6	
5	3	MAIN STEAMLINE FLOW HIGH B21-N004B-2	6	
6	2	MAIN STEAMLINE PRESS LOW B21-N015D-1	6	
7	2	REACTOR LEVEL LOW B21-N037A-1	6	
8	2	MAIN STEAM FLOW VACUUM LOW B21-N056P-1	6	
9	2	DRYWELL PRESSURE HIGH C72-N002D-1	6	
10	2	REACTOR LEVEL LOW B21-N037D-1	6	
11	2	REACTOR PRESSURE HIGH B21-N023D-1	6	
12	3	REACTOR PRESSURE HIGH B21-N023D-2	6	
13	4&5	CALIBRATION UNIT	7	CALIBRATION UNIT
	(XU-3909)		(XU-3910)	

POOR ORIGINAL

REF. DWG. 9527-F-3935, SH. 1

1444 296

REV. NO.	DATE	DESCRIPTION	ENGR.	SUPENG.

LICENSE NO. DPR-62, DOCKET NO. 50-324

PLANT MODIFICATION 77-268

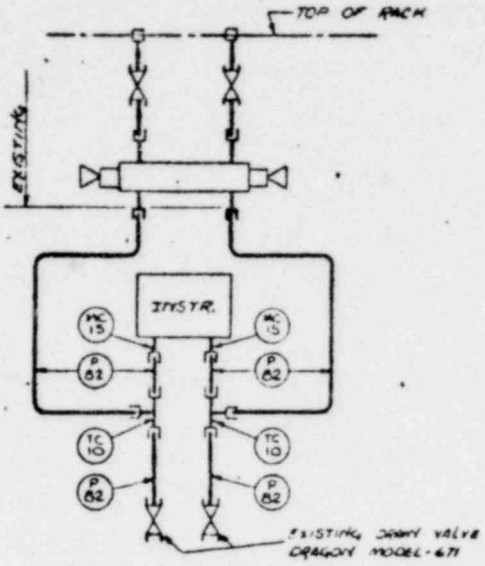
CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT

UNIT NO. 2

REACTOR PROTECTION SYSTEM
TRIP CALIBRATION CABINETS
CHANNEL "B2" - CB-XU-68
CARD FILE & NAMEPLATE DATA

ATTACHMENT "B"

SHEET 11 OF 19



TYPICAL HOOK-UP
PRESS. DIFF. TRANSMITTER
ROSEMOUNT 1152DP REPLACES BARTON 288

INSTR. TAG NO.	REPLACES	G.E. RACK NO.
E41-PDT-N004	E41-PDS-N004	H21-P016
E41-PDT-N005	E41-PDS-N005	H21-P036
B21-PDT-N006A	B21-PDS-N006A	H21-P015
B21-PDT-N006B	B21-PDS-N006B	H21-P015
B21-PDT-N006C	B21-PDS-N006C	H21-P025
B21-PDT-N006D	B21-PDS-N006D	H21-P025
B21-PDT-N007A	B21-PDS-N007A	H21-P015
B21-PDT-N007B	B21-PDS-N007B	H21-P015
B21-PDT-N007C	B21-PDS-N007C	H21-P025
B21-PDT-N007D	B21-PDS-N007D	H21-P025
B21-PDT-N008A	B21-PDS-N008A	H21-P015
B21-PDT-N008B	B21-PDS-N008B	H21-P015
B21-PDT-N008C	B21-PDS-N008C	H21-P025
B21-PDT-N008D	B21-PDS-N008D	H21-P025
B21-PDT-N009A	B21-PDS-N009A	H21-P015
B21-PDT-N009B	B21-PDS-N009B	H21-P015
B21-PDT-N009C	B21-PDS-N009C	H21-P025
B21-PDT-N009D	B21-PDS-N009D	H21-P025
E51-PDT-N017	E51-PDS-N017	H21-P035
E51-PDT-N018	E51-PDS-N018	H21-P038

POOR ORIGINAL

1444 297

REV NO.	DATE	DESCRIPTION	ENGR.	SUPERVS.

LICENSE NO. DPR-62, DOCKET NO. 50-324

PLANT MODIFICATION 77-268

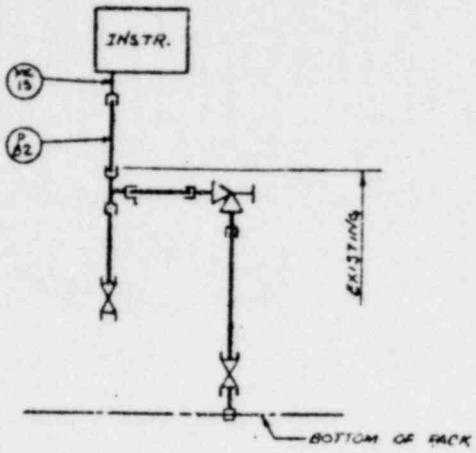
CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT

UNIT NO. 2

PIPING HOOK-UP AT INSTRUMENT RACK
FOR
PRESSURE DIFFERENTIAL TRANSMITTER
ROSEMOUNT 1152DP REPLACES BARTON 288

ATTACHMENT "B"

SHEET 12 OF 19



TYPICAL HOOK-UP
PRESSURE TRANSMITTER

ROSEMOUNT 1152 GP REPLACES STAT-O-RING 12N-AA4
AND BARSDALE 02N-M1BSS

INSTR. TAG. NO	REPLACES	G.P. RACK NO.
E11-PT-N010A	E11-PS-N010A	H21-P004
E11-PT-N010B	E11-PS-N010B	H21-P005
E11-PT-N010C	E11-PS-N010C	H21-P004
E11-PT-N010D	E11-PS-N010D	H21-P005
E11-PT-N011A	E11-PS-N011A	H21-P004
E11-PT-N011B	E11-PS-N011B	H21-P005
E11-PT-N011C	E11-PS-N011C	H21-P004
E11-PT-N011D	E11-PS-N011D	H21-P005
E11-PT-N019A	E11-PS-N019A	H21-P004
E11-PT-N019B	E11-PS-N019B	H21-P005
E11-PT-N019C	E11-PS-N019C	H21-P004
E11-PT-N019D	E11-PS-N019D	H21-P005
C71-PT-N002A	C71-PS-N002A	H21-P004
C71-PT-N002B	C71-PS-N002B	H21-P004
C71-PT-N002C	C71-PS-N002C	H21-P005
C71-PT-N002D	C71-PS-N002D	H21-P005
C72-PT-N002A	C72-PS-N002A	H21-P004
C72-PT-N002B	C72-PS-N002B	H21-P004
C72-PT-N002C	C72-PS-N002C	H21-P005
C72-PT-N002D	C72-PS-N002D	H21-P005

UNIT #1 ONLY

POOR ORIGINAL

1444 298

REV. NO.	DATE	DESCRIPTION	ENGR.	SUP.ENG.

LICENSE NO. DPR-62, DOCKET NO. 50-324

PLANT MODIFICATION 77-268

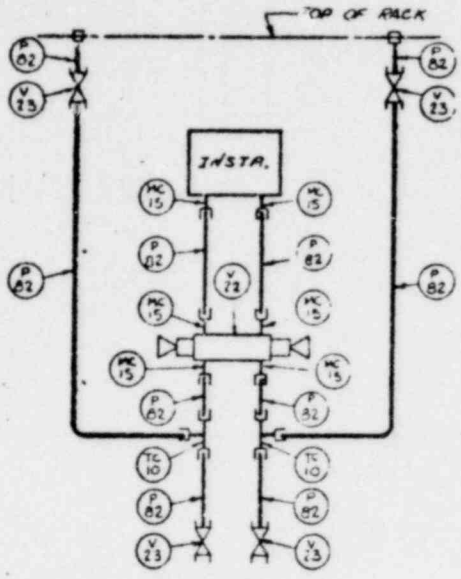
CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT

UNIT NO. 2

PIPING HOOK-UP AT INSTRUMENT RACK
FOR
PRESSURE TRANSMITTERS
ROSEMOUNT 1152DP REPLACES STAT-O-RING 12N-AA4

ATTACHMENT "3"

SHEET 13 OF 19



TYPICAL HOOK-UP
LEVEL TRANSMITTER
ROSEMOUNT 1152 DP REPLACES G.E. INSTR.
AND YARWAY 4418C-CE

INSTR. TAG. NO.	REPLACES	G.E. RACK NO.
B21-LT-N017A-1	B21-LS-N017A	H21-P004-002
B21-LT-N017A-2	———	H21-P004-002
B21-LT-N017B-1	B21-LS-N017B	H21-P004-002
B21-LT-N017B-2	———	H21-P004-002
B21-LT-N017C-1	B21-LS-N017C	H21-P005-002
B21-LT-N017C-2	———	H21-P005-002
B21-LT-N017D-1	G21-LS-N017D	H21-P005-002
B21-LT-N017D-2	———	H21-P005-002
B21-LT-N031A	B21-LS-N031A	H21-P004
B21-LT-N031B	B21-LS-N031B	H21-P005
B21-LT-N031C	B21-LS-N031C	H21-P004
B21-LT-N031D	B21-LS-N031D	H21-P005

1444 299

REV. NO.	DATE	DESCRIPTION	ENGR.	SUP.ENG.

LICENSE NO. DPR-62, DOCKET NO. 50-324

PLANT MODIFICATION 77-268

CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT

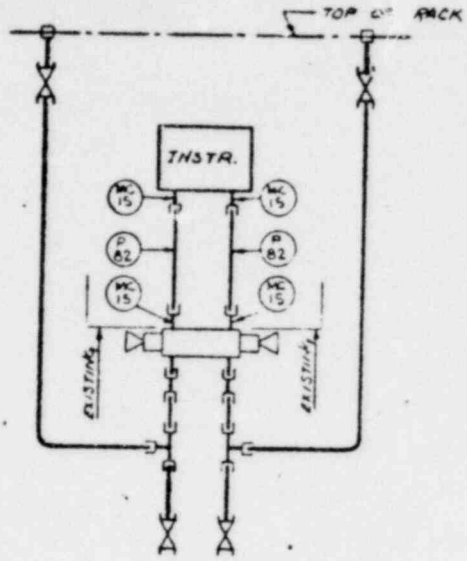
UNIT NO. 2

PIPING HOOK-UP AT INSTRUMENT RACK
FOR
LEVEL TRANSMITTER

ROSEMOUNT 1152DP REPLACES YARWAY 4418C-CE

ATTACHMENT "B"

SHEET 14 OF 19



TYPICAL HOOK-UP
LEVEL TRANSMITTER
ROSEMOUNT 1152DP REPLACES YARWAY 4418C-CE

INSTR. TAG NO.	REPLACES	G.E. RACK NO.
B21-LT-N024A-1	B21-LS-N024A	H21-P004
B21-LT-N024A-2	———	H21-P004
B21-LT-N024B-1	B21-LS-N024B	H21-P004
B21-LT-N024B-2	———	H21-P005
B21-LT-N025A-1	B21-LS-N025A	H21-P005
B21-LT-N025A-2	———	H21-P004
B21-LT-N025B-1	B21-LS-N025B	H21-P005
B21-LT-N025B-2	———	H21-P005
B21-LT-N036	B21-LT-N036	H21-P009
B21-LT-N037	B21-LT-N037	H21-P010
B21-LT-N042A	B21-LS-N042A	H21-P004
B21-LT-N042B	B21-LS-N042B	H21-P005

POOR ORIGINAL

1444 300

REV. NO.	DATE	DESCRIPTION	ENGR.	SUP. ENG

LICENSE NO. DPR-62, DOCKET NO. 50-324

PLANT MODIFICATION 77-268

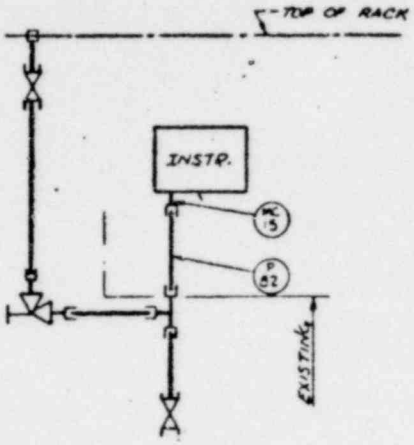
CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT

UNIT NO. 2

PIPING HOOK-UP AT INSTRUMENT RACK
FOR
LEVEL TRANSMITTER
ROSEMOUNT 1152DP REPLACES YARWAY 4418C-CE

ATTACHMENT "B"

SHEET 15 OF 19



TYPICAL HOOK-UP
PRESSURE TRANSMITTER
ROSEMOUNT 1152GP REPLACES BARKSDALE B2T-C12SS

INSTR. TAG NO.	REPLACES	G.E. RACK NO.
B21-PT-N021A	B21-PS-N021A	H21-P004
B21-PT-N021B	B21-PS-N021B	H21-P005
B21-PT-N021C	B21-PS-N021C	H21-P009
B21-PT-N021D	B21-PS-N021D	H21-P010
B21-PT-N023A	B21-PS-N023A	H21-P004
B21-PT-N023B	B21-PS-N023B	H21-P004
B21-PT-N023C	B21-PS-N023C	H21-P005
B21-PT-N023D	B21-PS-N023D	H21-P005

POOR ORIGINAL

1444 301

REV. NO.	DATE	DESCRIPTION	ENGR.	SUP.ENG.

LICENSE NO. DPR-62, DOCKET NO. 50-324

PLANT MODIFICATION 77-268

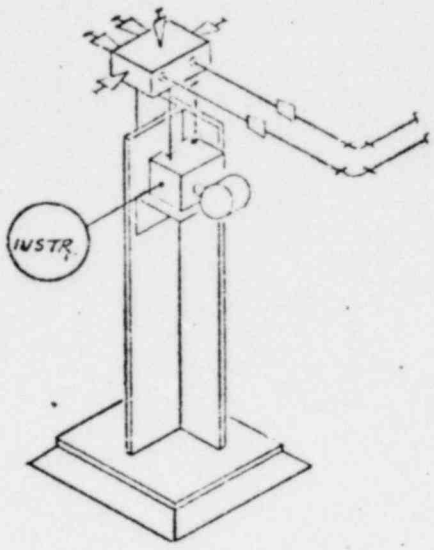
CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT

UNIT NO. 2

PIPING HOOK-UP AT INSTRUMENT RACK
FOR
PRESSURE TRANSMITTER
ROSEMOUNT 1152DP REPLACES BARKSDALE B2T-C12SS

ATTACHMENT "B"

SHEET 16 OF 19



TYPICAL HOOK-UP
ROSEMOUNT 1152 TRANSMITTER REPLACES
ROBERT SHAW 83844-B1

1444 302

INSTR. TAG NO.	REPLACES	LOCATED
E41-LT-N014	E41-LSH-N014	LOCAL
E51-LT-N010	E51-LSH-N010	LOCAL

REV. NO.	DATE	DESCRIPTION	ENGR.	SUPENG

LICENSE NO. DPR-62, DOCKET NO. 50-324

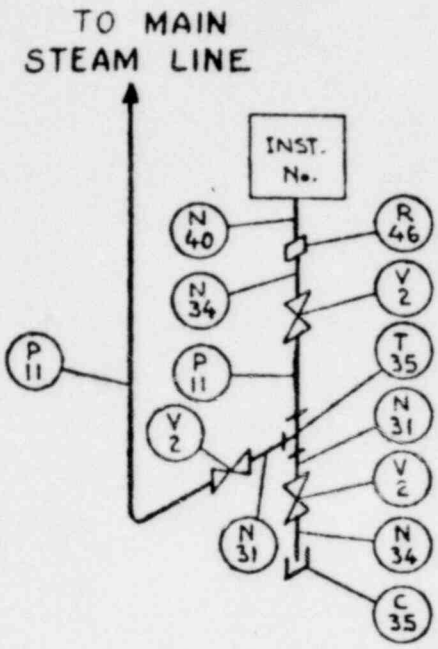
PLANT MODIFICATION 77-268

CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT

UNIT NO. 2

PIPING HOOK-UP AT LOCAL STATIONS
FOR
LEVEL TRANSMITTERS
ROSEMOUNT 1152DP REPLACES
ROBERT SHAW 83844-B1

ATTACHMENT "B"



TYPICAL HOOK-UP
ROSEMOUNT 1152 TRANSMITTER REPLACES
BARKSDALE B2T-C12SS

INSTR. TAG NO.	REPLACES	LOCATED
B21-PT-N015A	B21-PS-N015A	LOCAL
B21-PT-N015B	B21-PS-N015B	LOCAL
B21-PT-N015C	B21-PS-N015C	LOCAL
B21-PT-N015D	B21-PS-N015D	LOCAL

1444 303

POOR ORIGINAL

REV. NO.	DATE	DESCRIPTION	ENGR.	SUP.ENG.

LICENSE NO. DPR-62, DOCKET NO. 50-324

PLANT MODIFICATION 77-268

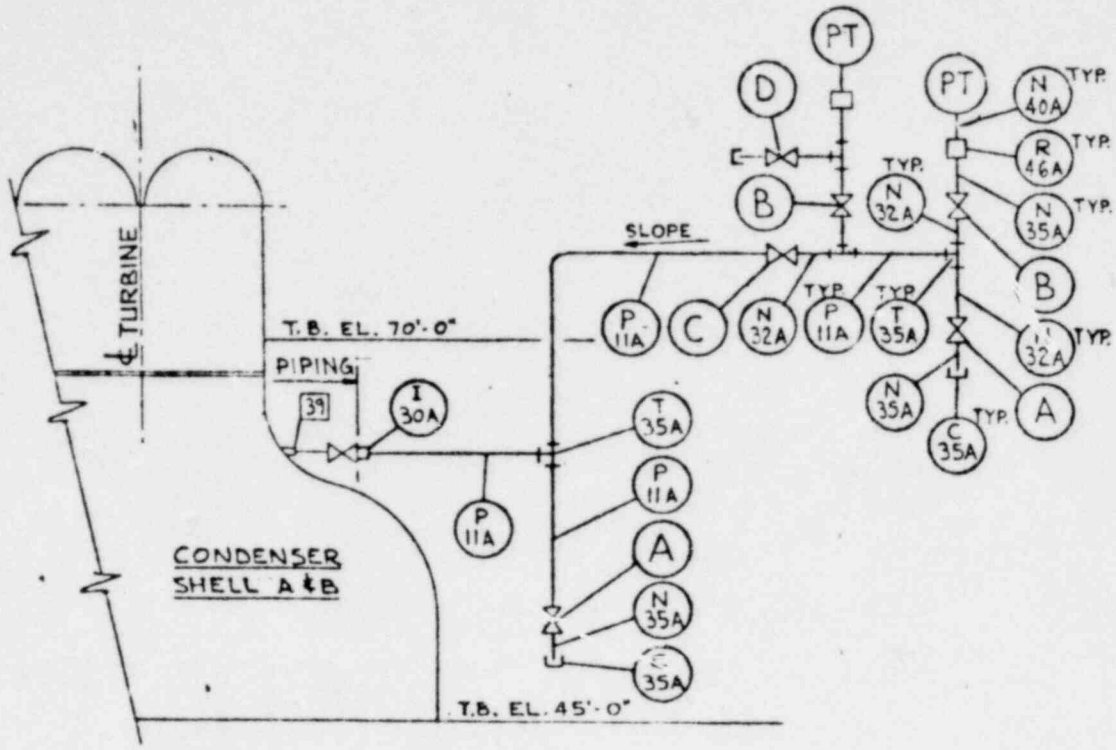
CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT

UNIT NO. 2

PIPING HOOK-UP AT LOCAL STATIONS
FOR
PRESSURE TRANSMITTERS
ROSEMOUNT 1152DP REPLACES
BARKSDALE B2T-C12SS

ATTACHMENT "B"

SHEET 18 OF 19



TYPICAL HOOK-UP
ROSEMOUNT 1152 TRANSMITTER REPLACES
BARKSDALE B2T-M18SS-66

INSTR. TAG NO.	REPLACES	LOCATED
B21-PT-N056A	B21-PS-N056A	LOCAL
B21-PT-N056B	B21-PS-N056B	LOCAL
B21-PT-N056C	B21-PS-N056C	LOCAL
B21-PT-N056D	B21-PS-N056D	LOCAL

1447 '04

REV. NO.	DATE	DESCRIPTION	ENGR.	SUP.ENG.

LICENSE NO. DPR-62, DOCKET NO. 50-324

PLANT MODIFICATION 77-268

CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT

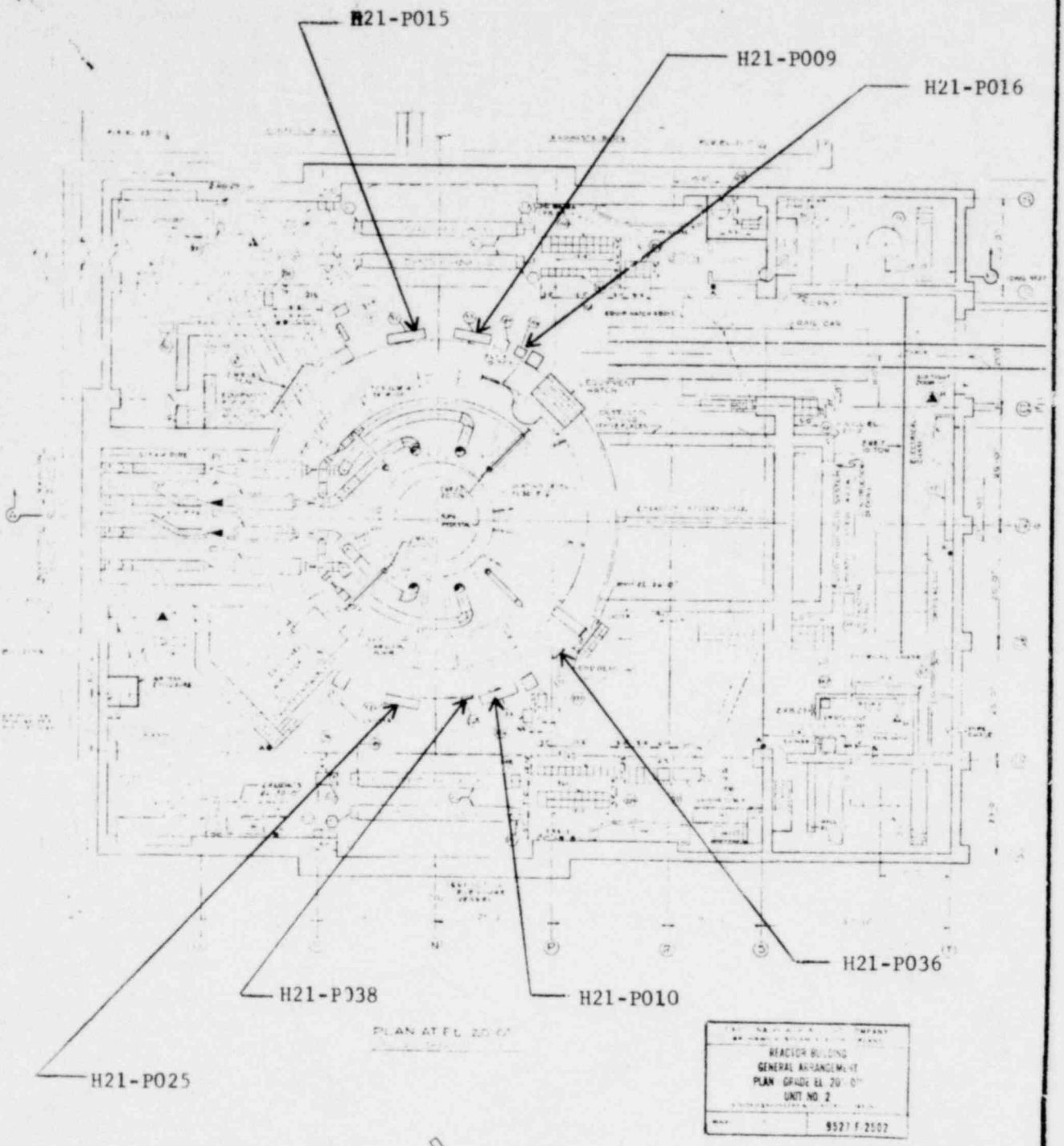
UNIT NO. 2

PIPING HOOK-UP AT LOCAL STATIONS
FOR
PRESSURE TRANSMITTERS
ROSEMOUNT 1152DP REPLACES
BARKSDALE B2T-M18SS-66

ATTACHMENT "B"

SHEET 19 OF 19

1444 305



POOR ORIGINAL

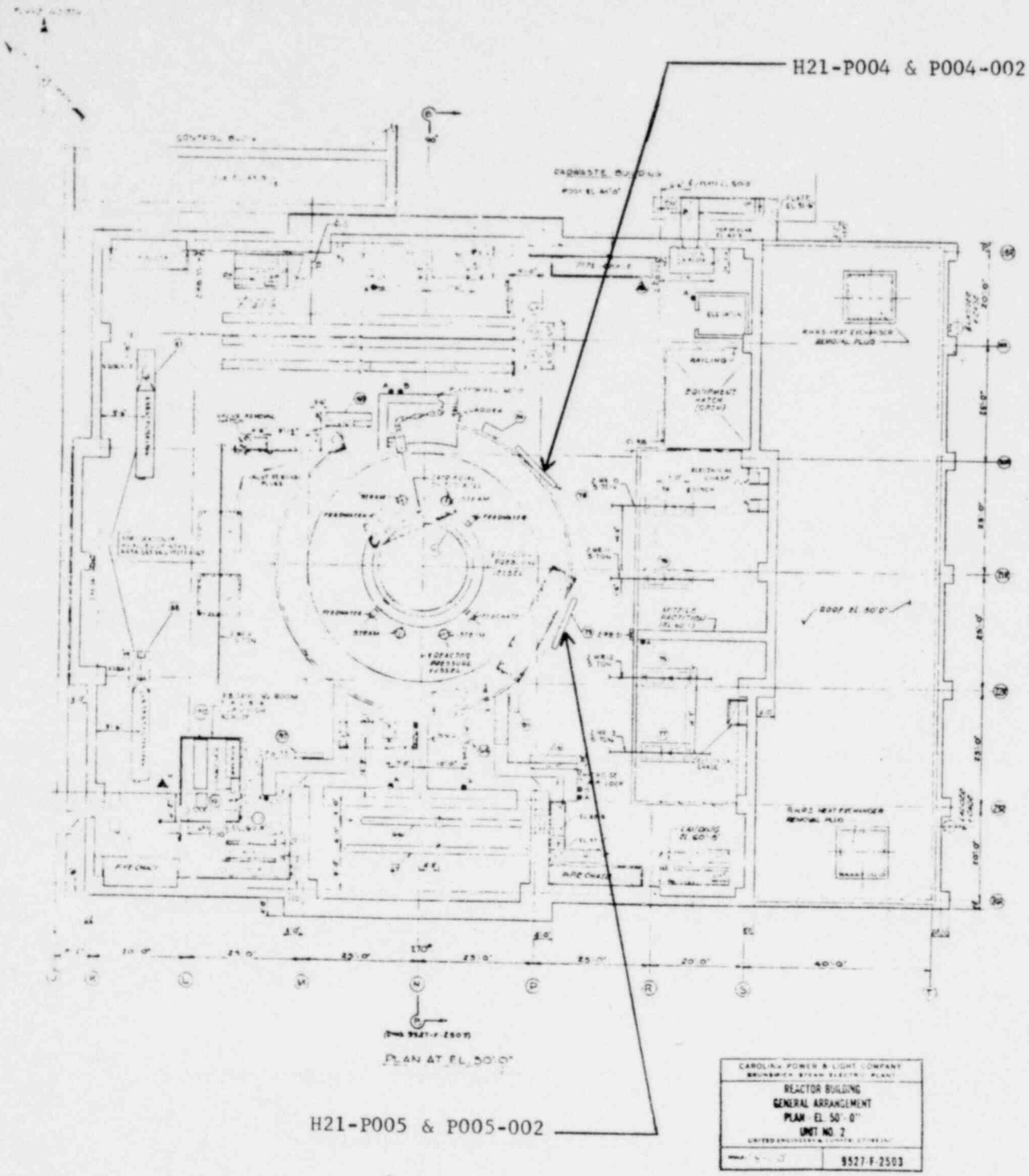
CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT

UNIT NO. 2
REACTOR BUILDING
INSTRUMENT RACKS
ELEVATION 20'-0"
PRESSURE SWITCH TO ANALOG REPLACEMENT

1444 306

ATTACHMENT "B"

SHEET 1 OF 3



POOR ORIGINAL

1449 307

CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT

UNIT NO. 2
REACTOR BUILDING
INSTRUMENT RACKS
ELEVATION 50'-0"
PRESSURE SWITCH TC ANALOG REPLACEMENT

ATTACHMENT "B"

SHEET 2 OF 3

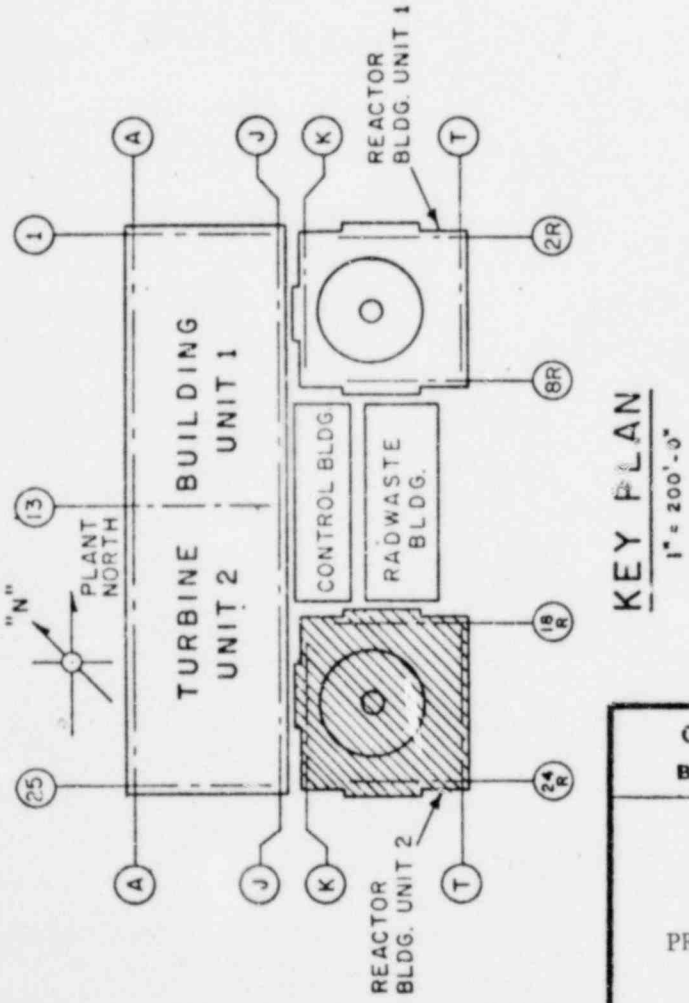
EQUIPMENT LIST

ITEM NO.	DESCRIPTION	C.P.&L. EQUIP. NO.	G.E. M.P.L. NO.
11	HPCI LEAK DETECTOR INST. RACK - B	2B	H21-P036
51	MAIN STEAM FLOW INSTRUMENT RACK	2A	H21-P015
52	MAIN STEAM FLOW INSTRUMENT RACK	2B	H21-P025
53	JET PUMP INSTRUMENT RACK (1 TO 10)	2A	H21-P009
54	JET PUMP INSTRUMENT RACK (1 TO 20)	2B	H21-P010
* 78	R.V. LEVEL & PRESSURE INSTRUMENT RACK	2A	H21-P004 & P004-002
* 79	R.V. LEVEL & PRESSURE INSTRUMENT RACK	2B	H21-P005 & P005-002
168	RCIC LEAK DETECTOR INST. RACKS	2B	H21-P038
186	CS/HPCI LEAK DETECTOR INST. RACK		H21-P016

NOTES:

1. SYMBOL SHOWN WITH AN ASTERISK (*) DENOTES INSTRUMENT RACKS LOCATED AT ELEVATION 50'-0" IN REACTOR BUILDING

2. ALL OTHER INSTRUMENT RACKS ARE LOCATED AT ELEVATION 20'-0"



KEY PLAN
1" = 200'-0"

1444 208

CAROLINA POWER & LIGHT COMPANY
BRUNSWICK STEAM ELECTRIC PLANT

UNIT NO. 2
REACTOR BUILDING
INSTRUMENT RACKS
PRESSURE SWITCH TO ANALOG REPLACEMENT

ATTACHMENT "B"

SHEET 3 OF 3

1444 '09

SECTION VI

PRESSURE AND LEVEL TRANSMITTERS - TAG NUMBER INDEX

Unit No.	Tag Number	Page No.	Unit No.	Tag Number	Page No.
2	B21-PDT-N006A	24 B	2	B21-PT-N056A	21B
2	B21-PDT-N006B	24 B	2	B21-PT-N056B	21B
2	B21-PDT-N006C	24 B	2	B21-PT-N056C	21B
2	B21-PDT-N006D	24 B	2	B21-PT-N056D	21B
2	B21-PDT-N007A	24 B			
2	B21-PDT-N007B	24 B			
2	B21-PDT-N007C	24 B			
2	B21-PDT-N007D	24 B			
2	B21-PDT-N008A	24 B			
2	B21-PDT-N008B	24 B			
2	B21-PDT-N008C	24 B			
2	B21-PDT-N008D	24 B			
2	B21-PDT-N009A	25 B			
2	B21-PDT-N009B	25 B			
2	B21-PDT-N009C	25 B			
2	B21-PDT-N009D	25 B	2	C72-PT-N002A	21B
2	B21-LT-N017A-1	24 B	2	C72-PT-N002B	21B
2	B21-LT-N017A-2	24 B	2	C72-PT-N002C	21B
2	B21-LT-N017B-1	24 B	2	C72-PT-N002D	21B
2	B21-LT-N017B-2	24 B			
2	B21-LT-N017C-1	24 B			
2	B21-LT-N017C-2	24 B	2	E11-PT-N010A	21B
2	B21-LT-N017D-1	24 B	2	E11-PT-N010B	21B
2	B21-LT-N017D-2	24 B	2	E11-PT-N010C	21B
2	B21-LT-N024A-1	24 B	2	E11-PT-N010D	21B
2	B21-LT-N024A-2	24 B	2	E11-PT-N011A	22B
2	B21-LT-N024B-1	24 B	2	E11-PT-N011B	22B
2	B21-LT-N024B-2	24 B	2	E11-PT-N011C	22B
2	B21-LT-N025A-1	24 B	2	E11-PT-N011D	22B
2	B21-LT-N025A-2	24 B	2	E11-PT-N019A	22B
2	B21-LT-N025B-1	24 B	2	E11-PT-N019B	22B
2	B21-LT-N025B-2	24 B	2	E11-PT-N019C	22B
2	B21-LT-N031A	25 B	2	E11-PT-N019D	22B
2	B21-LT-N031B	25 B			
2	B21-LT-N031C	25 B			
2	B21-LT-N031D	25 B	2	E41-PDT-N004	25B
			2	E41-PDT-N005	25B
2	B21-PT-N015A	21 B			
2	B21-PT-N015B	21 B	2	E51-PDT-N017	25B
2	B21-PT-N015C	21 B	2	E51-PDT-N018	25B
2	B21-PT-N015D	21 B			
2	B21-PT-N021A	21 B			
2	B21-PT-N021B	21 B	2	B21-LT-N036	25B
2	B21-PT-N021C	21 B	2	B21-LT-N037	25B
2	B21-PT-N021D	21 B	2	B21-LT-N042A	25B
2	B21-PT-N023A	21 B	2	B21-LT-N042B	25B
2	B21-PT-N023B	21 B			
2	B21-PT-N023C	21 B			
2	B21-PT-N023D	21 B			

PRESSURE AND LEVEL TRANSMITTERS - TAG NUMBER INDEX (Cont'd)

	Unit No.	Tag Number	Page No.
R5	2	B21-PDT-4084 (Spare)	26 B
	2	B21-PDT-4085 (Spare)	26 B
	2	B21-PDT-4086 (Spare)	26 B
	2	B21-PDT-4087 (Spare)	26 B
	2	B21-PDT-4088 (Spare)	26 B
	2	B21-PDT-4089 (Spare)	26 B
	2	B21-PDT-4090 (Spare)	26 B
	2	B21-PDT-4091 (Spare)	26 B
	2	B21-PDT-4092 (Spare)	26 B
	2	B21-PDT-4093 (Spare)	26 B
	2	B21-PT-4094 (Spare)	22 B
	2	B21-PT-4095 (Spare)	22 B
	2	B21-PT-4096 (Spare)	22 B
	2	B21-PT-4097 (Spare)	22 B
	2	B21-PT-4098 (Spare)	22 B
	2	B21-PT-4099 (Spare)	22 B
	2	B21-PT-4100 (Spare)	22 B
	2	B21-PT-4101 (Spare)	22 B
	2	E41-LT-N014	26 B
R6	2	E51-LT-N010	26 B
	2	X-LT-4232 (SPARE)	26 B

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SECTION VII

PRESSURE INSTRUMENT

SPECIFICATION SHEET

TAG NO. SEE PAGES 21B & 22B

CLIENT CAROLINA POWER & LIGHT CO

LOCATION BRNP - UNIT 2

SERVICE SEE PAGES 21B & 22B (CLASS I)

GENERAL

DESCRIPTION: RECORDER ☐ INDICATOR ☐ BLIND ☒ CONTROLLER ☐ TRANSMITTER ☒ (NOTE 1)

CASE: RECTANGULAR ☐ CIRCULAR ☐ MINI ☐ COLOR: BLACK ☐ OTHER MFR STD

MOUNTING: FLUSH ☐ SURFACE ☐ BRACKET ☒ NO. PTS. RECORDING ____ INDICATING ____

CHART TYPE: * STRIP ☐ *CIRCULAR ☐ RANGE ____ CHART NO. ____

SCALE: RANGE ____ CHART SPEED ____

CHART DRIVE: SPRING ☐ ____ DAY WIND ELECTRIC ☐ EXP. PROOF ☐ ____ V ____ CY OTHER ____

CONTROL

TYPE: PNEUMATIC ☐ 3-15 PSIG ☐ ELECTRIC ☐ OUTPUT ____

MTG. LOCATION: INTERNAL ☐ PLUG-IN ☐ REMOTE ☐

PROP. ____ % RESET ☐ RATE ☐ ON-OFF ☐ OTHER ____

ON MEASUREMENT INCREASE, OUTPUT: INCREASES ☐ DECREASES ☐

AUTO. MAN SWITCH: NONE ☐ INTERNAL ☐ EXTERNAL ☐ INTEGRAL ☐ NO POSITIONS ____

SETPOINT ADJUSTMENTS: PNEUMATIC ☐ ELECTRIC ☐ INTERNAL ☐ EXTERNAL ☐

REMOTE SET ☐ MANUAL SET ☐ CASCADE ☐ MASTER ☐ SECONDARY ☐

MANUAL REG: NONE ☐ IN CASE ☐ SUB-PANEL ☐ USED WITH INSTR. NO. ____

TRANSMTR.

TYPE: PNEUMATIC ☐ OUTPUT: 3-15 ☐ OTHER POWER SUPPLY: 24VDC (BY OTHERS)

ELECTRIC ☒ OUTPUT: 4-20 MADC EXP. PROOF ☐ GEN. PURPOSE ☐ WTHR. PROOF NEMA 4 ☐

PRESSURE ELEMENT

TYPE: SPIRAL ☐ BELLOWS ☐ BOURDON ☐ DIAPHRAGM ☒ HELICAL ☐ OTHER ____

MATERIAL: BRONZE ☐ STEEL ☐ 316 SS ☒ OTHER ____

RANGE: SEE PAGES 21B & 22B ____ OVER RANGE PROTECT TO 2000 PSIG

DIAPHRAGM SEAL: CLEANOUT ☐ NON-CLEANOUT ☐ FLUSH CONN. ☐ FLANGED ☐ ____ " ____ LB. ASA; TYPE: ____

MATERIALS: DIAPHRAGM ____ BOTTOM BOWL ____ CAPILLARY TUBING: MAT'L. ____ ARMOR ____

CONNECTION, NPT: BOWL ____ " INSTR. 1/4 " BACK ☐ BOTTOM ☐ CAPILLARY LENGTH ____

OPERATING CONDITIONS

FLUID: SEE PAGES 21B & 22B

PRESSURE: NORMAL ____ PSIG MAX. ____ PSIG TEMP: ____ NORMAL ____ MAX. ____

ACCESSORIES

FILTER-REGULATOR ☐ SUPPLY G ☐ MTG. BRACKET ☒ SYPHON ☐ OUTPUT GAGE ☐

CHARTS ____ INI ☐ CONTROLLER MANIFOLD ☐

ELECT. CONTACTS: ____

OTHER: ____

NOTES

(1) ROSEMOUNT MODEL 1152GP

(2) SEISMIC QUALIFICATION REQUIRED; INSTALLED INDOORS

(3) 5-POINT CALIBRATION FOR EACH INSTRUMENT.

(4) FOR PLANT MOD. 77-268 & 269

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POOR ORIGINAL

BASED ON I.S.A. RP 20

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SECTION VII

SPECIFICATION SHEET

TAG NO. SEE BELOW

CLIENT CAROLINA POWER & LIGHT CO

LOCATION BSEP - UNIT 2

SERVICE SEE BELOW (CLASS I)

TAG NO.	PROCESS RANGE (PSIG)	CALIBRATION RANGE (PSIG) 4 mA	20 mA	PROCESS PRESS (PSIG) NORM	MAX	PROCESS TEMP @ INST. (°F) NORM	MAX	PROCESS FLUID	SERVICE	NOTE
2-B21-PT-N015A	0-1200	0	1200	965	1352	100	150	STEAM	MAIN STEAMLINE PRESS LOW	1
2-B21-PT-N015B	0-1200	0	1200							1
2-B21-PT-N015C	0-1200	0	1200							1
2-B21-PT-N015D	0-1200	0	1200							1
2-B21-PT-N023A	600 TO 1200	600	1200	1005	1337			WATER	Rx PRESS HIGH	1
2-B21-PT-N023B	600 TO 1200	600	1200							1
2-B21-PT-N023C	600 TO 1200	600	1200							1
2-B21-PT-N023D	600 TO 1200	600	1200							1
2-B21-PT-N021A	0-500	0	500		1325				Rx PRESS LOW	3
2-B21-PT-N021B	0-500	0	500							3
2-B21-PT-N021C	0-500	0	500							3
2-B21-PT-N021D	0-500	0	500							3
2-B21-PT-N056A	0 TO 30"Hg VAC	0" Hg VAC	30" Hg VAC	7" Hg VAC	0" Hg VAC			STEAM	COND. VACUUM LOW	2
2-B21-PT-N056E	0 TO 30"Hg VAC	0" Hg VAC	30" Hg VAC							2
2-B21-PT-N056C	0 TO 30"Hg VAC	0" Hg VAC	30" Hg VAC							2
2-B21-PT-N056D	0 TO 30"Hg VAC	0" Hg VAC	30" Hg VAC							2
2-C72-PT-N002A	0-5	0	5	.85	72	70	150	AIR/N_2	DRYWELL PRESS HI	4
2-C72-PT-N002B	0-5	0	5							4
2-C72-PT-N002C	0-5	0	5							4
2-C72-PT-N002D	0-5	0	5							4
2-E11-PT-N010A	0-5	0	5							4
2-E11-PT-N010B	0-5	0	5							4
2-E11-PT-N010C	0-5	0	5							4
2-E11-PT-N010D	0-5	0	5							4

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BASED ON I.S.A. RP 20

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SECTION VII

SPECIFICATION SHEET

TAG NO. SEE BELOW

CLIENT CAROLINA POWER & LIGHT CO

LOCATION BSEP - UNIT 2

SERVICE SEE BELOW (CLASS I)

TAG NO.	PROCESS RANGE (PSIG)	CALIBRATION RANGE (PSIG)		PROCESS PRESS (PSIG)		PROCESS TEMP @ INST (°F)		PROCESS FLUID	SERVICE	NOTE
		4 mA	20 mA	NORM	MAX	NORM	MAX			
2-E11-PT-N011A	0-5	0	5	.85	72	70	150	AIR/N2	DRYWELL PRESS HI	4
2-E11-PT-N011B	0-5	0	5	.85	72	70	150	AIR/N2		4
2-E11-PT-N011C	0-5	0	5	.85	72	70	150	AIR/N2		4
2-E11-PT-N011D	0-5	0	5	.85	72	70	150	AIR/N2		4
2-E11-PT-N019A	0-5	0	5	.85	72	70	150	AIR/N2		4
2-E11-PT-N019B	0-5	0	5	.85	72	70	150	AIR/N2		4
2-E11-PT-N019C	0-5	0	5	.85	72	70	150	AIR/N2		4
2-E11-PT-N019D	0-5	0	5	.85	72	70	150	AIR/N2		4
2-B21-PT-4094		0	5						SPARE	4
2-B21-PT-4095		0	5							4
2-B21-PT-4096		0	5							4
2-B21-PT-4097		0" Hg VAC	30" Hg VAC							2
2-B21-PT-4098		0	75							5
2-B21-PT-4099		0	500							3
2-B21-PT-4100		0	1200							1
2-B21-PT-4101		600	1200							1

NOTES

(1) ROSEMOUNT MODEL 1152GP1E22T0280PB
(2) ROSEMOUNT MODEL 1152GP5E22T0280PB
(3) ROSEMOUNT MODEL 1152GP8E22T0280PB
(4) ROSEMOUNT MODEL 1152GP4E22T0280PB
(5) ROSEMOUNT MODEL 1152GP6E22T0280PB

POOR ORIGINAL

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BASED ON I.S.A. RP 20

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SECTION VII

DIFFERENTIAL PRESSURE INSTRUMENT

SPECIFICATION SHEET

TAG NO. SEE PAGES 24B, 25B & 26B

CLIENT CAROLINA POWER & LIGHT CO
LOCATION SSEP - UNIT 2
SERVICE SEE PAGES 24B, 25B & 26B (CLASS I)

GENERAL

DESCRIPTION: RECORDER ☐ INDICATOR ☐ BLIND ☒ CONTROLLER ☐ TRANSMITTER ☒ (NOTE 1) INTEG. ☐
CASE: RECTANGULAR ☐ CIRCULAR ☐ COLOR: BLACK ☐ OTHER MFR STD
MOUNTING: FLUSH ☐ SURFACE ☐ BRACKET ☒ NO. PTS. RECORDING ____ INDICATING ____
CHART TYPES: ____" CIRC. ☐ RANGE: ____ SQ. ROOT ☐ UNIFORM ☐ ____ REV /DAY
SCALE: TYPE ____ RANGE: ____ SQ. ROOT ☐ UNIFORM ☐
CHART DRIVE: SPRING ☐ ____ DAY WIND ELECTRIC ☐ EXP. PROOF ☐ ____ V ____ CY OTHER ____

CONTROL

TYPE: PNEUMATIC ☐ 3-15 PSIG ☐ ELECTRIC ☐ OUTPUT ____
MTG. LOCATION: INTERNAL ☐ PLUG-IN ☐ REMOTE ☐
PROP. ____ ____ % RESET ☐ RATE ☐ ON-OFF ☐ OTHER ____
ON MEASUREMENT INCREASE, OUTPUT: INCREASES ☐ DECREASES ☐
AUTO-MAN SWITCH: NONE ☐ INTERNAL ☐ EXTERNAL ☐ INTEGRAL ☐ NO POSITIONS ____
SETPOINT ADJUSTMENTS: PNEUMATIC ☐ ELECTRIC ☐ INTERNAL ☐ EXTERNAL ☐
REMOTE SET ☐ MANUAL SET ☐ CASCADE ☐ MASTER ☐ SECONDARY ☐
MANUAL REG: NONE ☐ IN CASE ☐ SUB-PANEL ☐ USED WITH INSTR. NO. ____

TRANSMTR.

TYPE: PNEUMATIC ☐ OUTPUT: 3-15 ☐ OTHER POWER SUPPLY: 24VDC (BY OTHERS)
ELECTRIC ☒ OUTPUT: 4-20 mA dc EXP. PROOF ☐ GEN. PURPOSE ☐ WTHR. PROOF ☐ NEMA

DIFFERENTIAL UNIT

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SERVICE: FLOW ☐ LEVEL ☒ OR DIFF. PRESS. ☒ DIFF. RANGE SEE PAGES 24B, 25B & 26B
TYPE: FORCE BAL. ☐ BELLOWS ☐ MERC. MANO. ☐ OTHER DIFF. CAPACITANCE
BODY MATL: STEEL ☐ 316 STNL. STL. ☒ OTHER ____ RATING 2000 PSIG AT 100 °F
ELEMENT MATL: 316 STNL. STL. ☒ OTHER ____
PROCESS CONNECTION SIZE: NPT 1/4" ☒ 1/2" ☐ OTHER ____

PRIMARY ELEMENT

TYPE: ORIFICE ☐ FLOW NOZ. ☐ VENTURI ☐ OTHER ____
TYPE TAPS: FLANGE ☐ VENA CONTRACTA ☐ PIPE ☐ OTHER ____
PIPE I.D.: ____" FLANGE SIZE: ____" ____ LB. ASA; TYPE: ____
ELEMENT MATL: ____ BORE: ____" BETA RATIO ____

OPERATING CONDITIONS

FLUID: SEE PAGES 24B, 25B & 26B FLOW: NORMAL ____ FULL SCALE ____ UNITS ____
PRESSURE: NORMAL ____ PSIG. MAX. ____ PSIG. TEMPERATURE: NORMAL ____ °F MAX. ____ °F
SPECIFIC GRAVITY: ____ AT ____ °F MOL. WT. ____ VISCOSITY ____ CP AT ____ °F
BASE CONDITIONS: ____ PSIA. ____ °F STEAM: QUALITY ____ % SUPERHEAT: ____ °F

ACCESSORIES

FILTER-REGULATOR ☐ SUPPLY GAUGE ☐ MTG. BRACKET ☒ COND. POTS ☐ OUTPUT-GAUGE ☐
CHARTS: ____ INKSET ☐ METER MANIFOLD ☐ CONTROLLER MANIFOLD ☐
ELECT. CONTACTS: ____
OTHER: ____

NOTES

(1) ROSEMOUNT MODEL 1152L
(2) SEISMIC QUALIFICATION REQUIRED; INSTALLED INDOORS.
(3) FIVE (5) POINT CALIBRATION FOR EACH INSTRUMENT.
(4) FOR PLANT MOD. 77-258 & 269

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POOR ORIGINAL

BASED ON I.S.A. RP 20

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SECTION VII

SPECIFICATION SHEET

TAG NO. SEE BELOW

CLIENT CAROLINA POWER & LIGHT CO

LOCATION ASSP - UNIT 2

SERVICE SEE BELOW (CLASS I)

TAG NOS.	PROCESS RANGE	CALIB. RANGE		PROCESS PRESS (PSIG)		PROCESS TEMP @ INSTR. (°F)		FLUID	SERVICE	NOTE
		4 mA	20 mA	NORM	MAX	NORM	MAX			
2-B21-LT-N017A-1	0-60"WC	67.58"WC	25.1"WC	1005	1337	100	150	WATER	Rx LEVEL LOW	3,5
2-B21-LT-N017A-2	0-60"WC	67.58"WC	25.1"WC						Rx LEVEL HIGH	3,5
2-B21-LT-N017B-1	0-60"WC	67.58"WC	25.1"WC						Rx LEVEL LOW	3,5
2-B21-LT-N017B-2	0-60"WC	67.58"WC	25.1"WC						Rx LEVEL HIGH	3,5
2-B21-LT-N017C-1	0-60"WC	67.58"WC	25.1"WC						Rx LEVEL LOW	3,5
2-B21-LT-N017C-2	0-60"WC	67.58"WC	25.1"WC						Rx LEVEL HIGH	3,5
2-B21-LT-N017D-1	0-60"WC	67.58"WC	25.1"WC						Rx LEVEL LOW	3,5
2-B21-LT-N017D-2	0-60"WC	67.58"WC	25.1"WC						Rx LEVEL HIGH	3,5
2-B21-LT-N024A-1	-150 TO 60" WC	196.4"WC	47.4"WC						Rx LEVEL LOW	1,5
2-B21-LT N024A-2	-150 TO 60" WC	196.4"WC	47.4"WC							1,5
2-B21-LT-N024B-1	-150 TO 60" WC	196.4"WC	47.4"WC							1,5
2-B21-LT-N024B-2	-150 TO 60" WC	196.4"WC	47.4"WC							1,5
2-B21-LT-N025A-1	-150 TO 60" WC	196.4"WC	47.4"WC							1,5
2-B21-LT-N025A-2	-150 TO 60" WC	196.4"WC	47.4"WC							1,5
2-B21-LT-N025B-1	-150 TO 60" WC	196.4"WC	47.4"WC							1,5
2-B21-LT-N025B-2	-150 TO 60" WC	196.4"WC	47.4"WC							1,5
2-B21-PDT-N006A	0-150PSID	0 PSID	150 PSID	1000				STEAM	MAIN STEAMLINE FLOW HIGH	2
2-B21-PDT-N006B	0-150PSID	0 PSID	150 PSID							2
2-B21-PDT-N006C	0-150PSID	0 PSID	150 PSID							2
2-B21-PDT-N006D	0-150PSID	0 PSID	150 PSID							2
2-B21-PDT-N007A	0-150PSID	0 PSID	150 PSID							2
2-B21-PDT-N007B	0-150PSID	0 PSID	150 PSID							2
2-B21-PDT-N007C	0-150PSID	0 PSID	150 PSID							2
2-B21-PDT-N007D	0-150PSID	0 PSID	150 PSID							2
2-B21-PDT-N008A	0-150PSID	0 PSID	150 PSID							2
2-B21-PDT-N008B	0-150PSID	0 PSID	150 PSID							2
2-B21-PDT-N008C	0-150PSID	0 PSID	150 PSID							2
2-B21-PDT-N008D	0-150PSID	0 PSID	150 PSID							2

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BASED ON I.S.A. RP 20
N2502A, 2502B, 2502C, 2502D, 2502E, 2502F
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SECTION VII

SPECIFICATION SHEET

TAG NO. SEE BELOW

CLIENT CAROLINA POWER & LIGHT CO

LOCATION BSEP - UNIT 2

SERVICE SEE BELOW (CLASS I)

TAG NOS.	PROCESS RANGE	CALIB. RANGE 4 mA	CALIB. RANGE 20 mA	PROCESS PRESS (PSIG) NORM	PROCESS PRESS (PSIG) MAX	PROCESS TEMP @ INSTR. (°F) NORM	PROCESS TEMP @ INSTR. (°F) MAX	FLUID	SERVICE	NOTES
2-B21-PDT-N009A	0-150 PSID	0 PSID	150 PSID	1000	1337	100	150	STEAM	MAIN STEAMLINE FLOW HIGH	2
2-B21-PDT-N009B	0-150 PSID	0 PSID	150 PSID							2
2-B21-PDT-N009C	0-150 PSID	0 PSID	150 PSID							2
2-B21-PDT-N009D	0-150 PSID	0 PSID	150 PSID							2
2-B21-LT-N031A	-150 TO 60" WC	196.4" WC	47.4" WC	1005				WATER	RX LEVEL LOW	1,5
2-B21-LT-N031B	-150 TO 60" WC	196.4" WC	47.4" WC							1,5
2-B21-LT-N031C	-150 TO 60" WC	196.4" WC	47.4" WC							1,5
2-B21-LT-N031D	-150 TO 60" WC	196.4" WC	47.4" WC							1,5
2-E41-PDT-N004	-300 TO 300" WC	-300" WC	300" WC					STEAM	HPCI STMLINE ΔP HI	1
2-E41-PDT-N005	-300 TO 300" WC	-300" WC	300" WC							1
2-E51-PDT-N017	-550 TO 550" WC	-550" WC	550" WC	1135					RCIC STMLINE ΔP HI	4
2-E51-PDT-N018	-550 TO 550" WC	-550" WC	550" WC							4
2-B21-LT-N036	-100 TO 200" WC	321.44" WC	33.74" WC	1005				WATER	RX LEVEL LOW	1
2-B21-LT-N037	-100 TO 200" WC	321.44" WC	33.74" WC							1
2-B21-LT-N042A	0-60" WC	67.58" WC	25.1" WC							3
2-B21-LT-N042B	0-60" WC	67.58" WC	25.1" WC							3

NOTES

(1) ROSEMOUNT MODEL 1152DP5E22T0280PB

(2) ROSEMOUNT MODEL 1152DP7E22T0280PB

(3) ROSEMOUNT MODEL 1152DP4E22T0280PB

(4) ROSEMOUNT MODEL 1152DP6E22T0280PB

(5) FIELD TO INSURE THAT INSTRUMENT "ZERO" AGREES WITH VESSEL "ZERO" REF. LEVEL WHICH IS 517" ABOVE VESSEL BASE. RANGE TO MATCH THAT OF REPLACED DIFFERENTIAL PRESS SWITCH.

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POOR ORIGINAL

BASED ON I S A RP 20

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SECTION VII

SPECIFICATION SHEET

TAG NO. SEE BELOW

CLIENT CAROLINA POWER & LIGHT CO
LOCATION BSEP -- UNIT 2
SERVICE SPARES (CLASS I)

TAG NOS.	PROCESS RANGE	CALIB. RANGE 4 mA	CALIB. RANGE 20 mA	PROCESS PRESS (PSIG) NORM	PROCESS PRESS (PSIG) MAX	PROCESS TEMP @ INST (°F) NORM	PROCESS TEMP @ INST (°F) MAX	FLUID	SERVICE	NOTE
2-B21-PDT-4084		67.58" WC	25.1" WC						SPARE	1
2-B21-PDT-4085		67.58" WC	25.1" WC							1
2-B21-PDT-4086		196.4" WC	47.4" WC							2
2-B21-PDT-4087		196.4" WC	47.4" WC							2
2-B21-PDT-4088		196.4" WC	47.4" WC							2
2-B21-PDT-4089		321.44" WC	33.74" WC							2
2-B21-PDT-4090		550" WC	550" WC							3
2-B21-PDT-4091		0 PSID	150 PSID							4
2-B21-PDT-4092		0 PSID	150 PSID							4
2-B21-PDT-4093		0 PSID	150 PSID							4
2-E41-LT-N014	0-30" H_2O	0" H_2O	30" H_2O	1120	1500	560	575	STM	HPCI DRAIN POT LEVEL HIGH	5
R6 2-E51-LT-N010	0-30" H_2O	0" H_2O	30" H_2O	1120	1500	560	575	STM	RCIC DRAIN POT LEVEL HIGH	5
2-X-LT-4232	0-30" H_2O	0" H_2O	30" H_2O						SPARE	5

NOTES

(1) ROSEMOUNT MODEL 1152DP4E22T0280PB
(2) " " 1152DP5E22T0280PB
(3) " " 1152DP6E22T0280PB
(4) " " 1152DP7E22T0280PB
(5) " " 1152DP3E22T0280PB

POOR ORIGINAL

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BASED ON I.S.A. RP 20
R5 FOR EM. 71-268, 269 & 370

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SECTION V

TRIP CALIBRATION SYSTEM - TAG NUMBER INDEX

UNIT NO.	TAG NO.	PAGE NO.	UNIT NO.	TAG NO.	PAGE NO.
2	B21-N006A-1	26 B	2	B21-N024B-1	30 B
2	B21-N006A-2	26 B	2	B21-N024B-2	24 B
2	B21-N006B-1	30 B	2	B21-N025A-1	28 B
2	B21-N006C-1	28 B	2	B21-N025A-2	21 B
2	B21-N006D-1	32 B	2	B21-N025B-1	32 B
2	B21-N007A-1	26 B	2	B21-N025B-2	24 B
2	B21-N007B-1	30 B	2	B21-N031A-1	20 B
2	B21-N007B-2	30 B	2	B21-N031A-2	20 B
2	B21-N007C-1	28 B	2	B21-N031A-3	20 B
2	B21-N007D-1	32 B	2	B21-N031A-4	20 B
2	B21-N008A-1	26 B	2	B21-N031B-1	23 B
2	B21-N008B-1	30 B	2	B21-N031B-2	23 B
2	B21-N008C-1	28 B	2	B21-N031B-3	23 B
2	B21-N008C-2	28 B	2	B21-N031B-4	23 B
2	B21-N008D-1	32 B	2	B21-N031C-1	20 B
2	B21-N009A-1	26 B	2	B21-N031C-2	20 B
2	B21-N009B-1	30 B	2	B21-N031C-3	20 B
2	B21-N009C-1	28 B	2	B21-N031C-4	20 B
2	B21-N009D-1	32 B	2	B21-N031D-1	23 B
2	B21-N009D-2	32 B	2	B21-N031D-2	23 B
2	B21-N015A-1	26 B	2	B21-N031D-3	23 B
2	B21-N015B-1	30 B	2	B21-N031D-4	23 B
2	B21-N015C-1	28 B	2	B21-N036-1	22 B
2	B21-N015D-1	32 B	2	B21-N037-1	25 B
2	B21-N017A-1	26 B	2	B21-N042A-1	22 B
2	B21-N017A-2	21 B	2	B21-N042B-1	25 B
2	B21-N017B-1	30 B	2	B21-N056A-1	26 B
2	B21-N017B-2	21 B	2	B21-N056B-1	30 B
2	B21-N017C-1	28 B	2	B21-N056C-1	28 B
2	B21-N017C-2	24 B	2	B21-N056D-1	32 B
2	B21-N017D-1	32 B	2	B21-4033	20 B
2	B21-N017D-2	24 B	2	B21-4036	23 B
2	B21-N021A-1	20 B	2	B21-4039	26 B
2	B21-N021A-2	20 B	2	B21-4040-1 (Spare)	27 B
2	B21-N021B-1	23 B	2	B21-4040-2 (Spare)	27 B
2	B21-N021B-2	23 B	2	B21-4041	28 B
2	B21-N021C-1	20 B	2	B21-4042-1 (Spare)	29 B
2	B21-N021C-2	20 B	2	B21-4042-2 (Spare)	29 B
2	B21-N021D-1	23 B	2	B21-4043	30 B
2	B21-N021D-2	23 B	2	B21-4044-1 (Spare)	31 B
2	B21-N023A-1	26 B	2	B21-4044-2 (Spare)	31 B
2	B21-N023A-2	26 B	2	B21-4045	32 B
2	B21-N023B-1	30 B	2	B21-4046-1 (Spare)	33 B
2	B21-N023B-2	30 B	2	B21-4046-2 (Spare)	33 B
2	B21-N023C-1	28 B			
2	B21-N023C-2	28 B			
2	B21-N023D-1	32 B			
2	B21-N023D-2	32 B			
2	B21-N024A-1	26 B			
2	B21-N024A-2	21 B	2	B21-4053	19 B

TRIP CALIBRATION SYSTEM - TAG NUMBER INDEX (Cont'd)

UNIT NO.	TAG NO.	PAGE NO.
2	C72-N002A-1	26 B
2	C72-N002B-1	30 B
2	C72-N002C-1	28 B
2	C72-N002D-1	32 B
2	E11-N010A-1	22 B
2	E11-N010B-1	25 B
2	E11-N010C-1	22 B
2	E11-N010D-1	25 B
2	E11-N011A-1	21 B
2	E11-N011A-2	21 B
2	E11-N011B-1	24 B
2	E11-N011B-2	24 B
2	E11-N011C-1	21 B
2	E11-N011C-2	21 B
2	E11-N011D-1	24 B
2	E11-N011D-2	24 B
2	E11-N019A-1	22 B
2	E11-N019B-1	25 B
2	E11-N019C-1	22 B
2	E11-N019D-1	25 B
2	E11-4034-1 (Spare)	22 B
2	E11-4034-2 (Spare)	22 B
2	E11-4035-1 (Spare)	22 B
2	E11-4035-2 (Spare)	22 B
2	E11-4037-1 (Spare)	25 B
2	E11-4037-2 (Spare)	25 B
2	E11-4038-1 (Spare)	25 B
2	E11-4038-2 (Spare)	25 B
2	E41-N004-1	21 B
2	E41-N004-2	21 B
2	E41-N005-1	24 B
2	E41-N005-2	24 B
2	E41-N014-1	22 B
2	E51-N017-1	21B
2	E51-N017-2	21B
2	E51-N018-1	24B
2	E51-N018-2	24B
2	E51-N010-1	25B

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SECTION V

TRIP CALIBRATION SYSTEM - TAG NUMBER INDEX (Cont'd)

NOTES:

1. The tag number index, as shown on Specification No. 9527-01-252-55, Sheet Nos. 17B and 18B, is recorded on the following data sheets and on the plant modification drawings, whereas the instrument tag numbers noted on the technical specification sheets reflects the distinction between master and slave trip units in accordance with the following examples:

	TRANSMITTERS	DATA SHEETS & DRAWINGS MASTER/SLAVE TRIP UNITS	TECHNICAL SPECIFICATIONS
(Ex.)	B21-PT-N023A	B21-N023A-1 (Master) B21-N023A-2 (Slave)	B21-PTM-N023A-1 B21-PTS-N023A-2
(Ex.)	B21-LT-N017A-1 B21-LT-N017A-2	B21-N017A-1 (Master) B21-N017A-2 (Master)	B21-LTM-N017A-1 B21-LTM-N017A-2

etc.

2. The sumbol (c) shown in trip setpoint column on the following specification data sheets reflect nominal trip setpoints. Actual trip setpoints will be determined and set in the Field to be consistent with the technical specifications.

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SECTION VI

SPECIFICATION SHEET

TRIP CALIBRATION SYSTEM

Rosemount Model 510DU Trip Calibration System consisting of one hundred seventy-two (172) Master Trip Units, eighty (80) Slave Trip Units, twelve (12) Calibration Units and twenty-eight (28) unwired card files complete with accessories as listed below.

Refer to specification sheets, pages 20B thru 33B for tag numbers, scales, trip setpoints and card file locations. The master, slave and calibration units shall be furnished completely assembled in their respective card file positions as shown in the specification sheets.

ACCESSORIES:

Three (3) Trip Unit Card Extenders
Two (2) Spare Parts Kits
One (1) Readout Assembly Card Extender
One (1) Calibration Card Extender
One (1) Bench Test Facility
Eighty-Eight (88) Blanks for Trip Units
Sixteen (16) Blanks for Calibration Units
Two (2) Readout Assembly tagged as follows:

2-B21-4053

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SECTION VI

SPECIFICATION SHEET (CONT'D)

CABINET TAG NO.: 2-CB-XU-63 (ECCS DIV. I)						
CARD FILE TAG NO.	CARD FILE POSITION	INSTRUMENT TAG NO.	TYPE	SCALE (RANGE)	TRIP SETPOINT	SERVICE
2-CB-XU-3897	1	2-B21-N021A-1	M	0-500 PSIG	310 PSIG	Rx Press. Low
	2	2-B21-N021A-2	S	(0-500 PSIG)	410 PSIG	Rx Press. Low
	3	2-B21-N021C-1	M	0-500 PSIG	310 PSIG	Rx Press. Low
	4	2-B21-N021C-2	S	(0-500 PSIG)	410 PSIG	Rx Press. Low
	5	2-B21-N031A-1	M	-150 to 60 IN H_2O	-38 IN H_2O	Rx Level Low
	6	2-B21-N031A-2	S	(-150 to 60 IN H_2O)	-38 IN H_2O	Rx Level Low
	7	2-B21-N031A-3	S	(-150 to 60 IN H_2O)	-147.5 IN H_2O	Rx Level Low
	8	2-B21-N031A-4	S	(-150 to 60 IN H_2O)	-147.5 IN H_2O	Rx Level Low
	9	2-B21-N031C-1	M	-150 to 60 IN H_2O	-38 IN H_2O	Rx Level Low
	10	2-B21-N031C-2	S	(-150 to 60 IN H_2O	-38 IN H_2O	Rx Level Low
	11	2-B21-N031C-3	S	(-150 to 60 IN H_2O)	-147.5 IN H_2O	Rx Level Low
	12	2-B21-N031C-4	S	(-150 to 60 IN H_2O)	-147.5 IN H_2O	Rx Level Low
	13	2-B21-4033	C	Digital	-	Calibration

NOTES

(1) M = Master Trip Unit; S = Slave Trip Unit; C = Calibration Unit.

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SECTION VI

SPECIFICATION SHEET (CONT'D)

CABINET NO.: 2-CB-XU-63 (ECCS DIV. I)						
CARD FILE TAG NO.	CARD FILE POSITION	INSTRUMENT TAG NO.	TYPE	SCALE (RANGE)	TRIP ¢ SETPOINT	SERVICE
2-CB-XU-3898	1	2-B21-N017A-2	M	0-60 IN H_2O	58 IN H_2O	Rx Level High
	2	2-B21-N017B-2	M	0-60 IN H_2O	58 IN H_2O	Rx Level High
	3	2-B21-N024A-2	M	-150 TO 60 IN H_2O	-38 IN H_2O	Rx Level Low
	4	2-B21-N025A-2	M	-150 TO 60 IN H_2O	-38 IN H_2O	Rx Level Low
	5	2-E41-N004-1	M	-300 TO 300" H_2O	-219 IN H_2O	HPCI Stmline ΔP Hi
	6	2-E41-N004-2	S	(-300 TO 300 IN H_2O)	+219 IN H_2O	HPCI Stmline ΔP Hi
	7	2-E51-N017-1	M	-550 TO 550" H_2O	-387 IN H_2O	RCIC Stmline ΔP Hi
	8	2-E51-N017-2	S	(-550 TO 550" H_2O)	+387 IN H_2O	RCIC Stmline ΔP Hi
	9	2-E11-N011A-1	M	0-5 PSIG	2 PSIG	Drywell Press Hi
	10	2-E11-N011A-2	S	(0-5 PSIG)	2 PSIG	Drywell Press Hi
	11	2-E11-N011C-1	M	0-5 PSIG	2 PSIG	Drywell Press Hi
	12	2-E11-N011C-2	S	(0-5 PSIG)	2 PSIG	Drywell Press Hi
	13	Blank for Calib. Unit	-	-	-	-

NOTES

(1) M = Master Trip Unit; S = Slave Trip Unit; C = Calibration Unit.

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SECTION VI

SPECIFICATION SHEET (CONT'D)

CABINET NO.: 2-CB-XU-63 (ECCS DIV. I)						
CARD FILE TAG NO.	CARD FILE POSITION	INSTRUMENT TAG NO.	TYPE	SCALE (RANGE)	TRIP ¢ SETPOINT	SERVICE
2-CB-XU-3899	1	2-E11-N010A-1	M	0-5 PSIG	2 PSIG	Drywell Press Hi
	2	2-E11-N010C-1	M	0-5 PSIG	2 PSIG	Drywell Press Hi
	3	2-E11-N019A-1	M	0-5 PSIG	2.5 PSIG	Drywell Press Hi
	4	2-E11-N019C-1	M	0-5 PSIG	2.5 PSIG	Drywell Press Hi
	5	2-B21-N042A-1	M	0-60 IN H_2O	12.5 IN H_2O	Rx Level Low
	6	2-B21-N036-1	M	-100 TO 200 IN H_2O	-39 IN H_2O	Rx Level Low
	7	2-E11-4034-1	M	-	-	Spare
R5	8	2-E11-4034-2	S	-	-	Spare
	9	2-E41-N014-1	M	0-30 IN H_2O	15 IN H_2O	HPCI Drain Pot Level High
	10	2-E11-4035-1	M	-	-	Spare
	11	2-E11-4035-2	S	-	-	Spare
	12	Blank	-	-	-	-
	13	Blank For Calib. Unit	-	-	-	-

NOTE:
(1) M = Master Trip Unit; S = Slave Trip Unit; C = Calibration Unit

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SECTION VI

SPECIFICATION SHEET (CONT'D)

CABINET TAG NO.: 2-CB-XU-64 (ECCS DIV. II)						
CARD FILE TAG NO.	CARD FILE POSITION	INSTRUMENT TAC NO.	TYPE	SCALE (RANGE)	TRIP ¢ SETPOINT	SERVICE
2-CB-XU-3900	1	2-B21-N021E-1	M	0-500 PSIG	310 PSIG	Rx Press Low
	2	2-B21-N021B-2	S	(0-500 PSIG)	410 PSIG	Rx Press Low
	3	2-B21-N021D-1	M	0-500 PSIG	310 PSIG	Rx Press Low
	4	2-B21-N021D-2	S	(0-500 PSIG)	410 PSIG	Rx Press Low
	5	2-B21-N031B-1	M	-150 TO 60 IN H_2O	-38 IN H_2O	Rx Level Low
	6	2-B21-N031B-2	S	(-150 TO 60 IN H_2O)	-38 IN H_2O	Rx Level Low
	7	2-B21-N031B-3	S	(-150 TO 60 IN H_2O)	-147.5 IN H_2O	Rx Level Low
	8	2-B21-N031B-4	S	(-150 TO 60 IN H_2O)	-147.5 IN H_2O	Rx Level Low
	9	2-B21-N031D-1	M	-150 TO 60 IN H_2O)	-38 IN H_2O	Rx Level Low
	10	2-B21-N031D-2	S	(-150 TO 60 IN H_2O)	-38 IN H_2O	Rx Level Low
	11	2-B21-N031D-3	S	(-150 TO 60 IN H_2O)	-147.5 IN H_2O	Rx Level Low
	12	2-B21-N031D-4	S	(-150 TO 60 IN H_2O)	-147.5 IN H_2O	Rx Level Low
	13	2-B21-4036	C	Digital	-	Calibration

NOTE:
(1) M = Master Trip Unit; S = Slave Trip Unit; C = Calibration Unit

SECTION VI

SPECIFICATION SHEET (CONT'D)

CABINET TAG NO.: 2-CB-XU-64 (ECCS DIV. II)						
CARD FILE TAG NO.	CARD FILE POSITION	INSTRUMENT TAG NO.	TYPE	SCALE (RANGE)	TRIP ¢ SETPOINT	SERVICE
2-CB-XU-3901	1	2-B21-N017C-2	M	0-60 IN H_2O	58 IN H_2O	Rx Level High
	2	2-B21-N017D-2	M	0-60 IN H_2O	58 IN H_2O	Rx Level High
	3	2-B21-N024B-2	M	-150 TO 60 IN H_2O	-38 IN H_2O	Rx Level Low
	4	2-B21-N025B-2	M	-150 TO 60 IN H_2O	-38 IN H_2O	Rx Level Low
	5	2-E41-N005-1	M	-300 TO 300 IN H_2O	-292 IN H_2O	HPCI Stmline ΔP Hi
	6	2-E41-N005-2	S	(-300 TO 300 IN H_2O)	+ 292 IN H_2O	HPCI Stmline ΔP Hi
	7	2-E51-N018-1	M	-550 TO 550 IN H_2O	-516 IN H_2O	RCIC Stmline ΔP Hi
	8	2-E51-N018-2	S	(-550 TO 550 IN H_2O)	+ 516 IN H_2O	RCIC Stmline ΔP Hi
	9	2-E11-N011B-1	M	0-5 PSIG	2 PSIG	Drywell Press Hi
	10	2-E11-N011B-2	S	(0-5 PSIG)	2 PSIG	Drywell Press Hi
	11	2-E11-N011D-1	M	0-5 PSIG	2 PSIG	Drywell Press Hi
	12	2-E11-N011D-2	S	(0-5 PSIG)	2 PSIG	Drywell Press Hi
	13	Blank for Calib. Unit	-	-	-	-

NOTE:
(1) M = Master Trip Unit; S = Slave Trip Unit; C = Calibration Unit

SECTION VI

SPECIFICATION SHEET (CONT'D)

CABINET TAG NO.: 2-CB-XU-64 (ECCS DIV. II)						
CARD FILE TAG NO.	CARD FILE POSITION	INSTRUMENT TAG NO.	TYPE	SCALE (RANGE)	TRIP & SETPOINT	SERVICE
2-CB-XU-3902	1	2-E11-N010B-1	M	0-5 PSIG	2 PSIG	Drywell Press Hi
	2	2-E11-N010D-1	M	0-5 PSIG	2 PSIG	Drywell Press Hi
	3	2-E11-N019B-1	M	0-5 PSIG	2.5 PSIG	Drywell Press Hi
	4	2-E11-N019D-1	M	0-5 PSIG	2.5 PSIG	Drywell Press Hi
	5	2-B21-N042B-1	M	0-60 IN H_2O	12.5 IN H_2O	Rx Level Low
	6	2-B21-N037-1	M	-100 TO 200 IN H_2O	-39 IN H_2O	Rx Level Low
	7	2-E11-4037-1	M	-	-	Spare
R5	8	2-E11-4037-2	S	-	-	Spare
	9	2-E51-N010-1	M	0-30 IN H_2O	8 IN H_2O	RCIC Drain Pot Level High
	10	2-E11-4038-1	M	-	-	Spare
	11	2-E11-4038-2	S	-	-	Spare
	12	Blank	-	-	-	-
	13	Blank For Calib. Unit	-	-	-	-

NOTE:

(1) M = Master Trip Unit; S = Slave Trip Unit; C = Calibration Unit

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SECTION VI

SPECIFICATION SHEET (CONT'D)

CABINET TAG NO.: 2-CB-XU-65 (RPS CHANNEL A1)						
CARD FILE TAG NO.	CARD FILE POSITION	INSTRUMENT TAG NO.	TYPE	SCALE (RANGE)	TRIP & SETPOINT	SERVICE
2-CB-XU-3903	1	2-B21-N006A-1	M	0-150 PSID	9 PSID	Main Stm. Flo High
	2	2-B21-N006A-2	S	(0-150 PSID)	115 PSID	Main Stm. Flo High
	3	2-B21-N007A-1	M	0-150 PSID	115 PSID	Main Stm. Flo High
	4	2-B21-N008A-1	M	0-150 PSID	115 PSID	Main Stm. Flo High
	5	2-B21-N009A-1	M	0-150 PSID	115 PSID	Main Stm. Flo High
	6	2-B21-N015A-1	M	0-1200 PSIG	825 PSIG	Main Stm. Press Lo
	7	2-B21-N024A-1	M	-150 to 60IN H_2O	-38IN H_2O	Rx Level Low
	8	2-B21-N056A-1	M	0-30 IN HgVAC	7 IN HgVAC	Cond. Vacuum Low
	9	2-C72-N002A-1	M	0-5 PSIG	2 PSIG	Drywell Press High
	10	2-B21-N017A-1	M	0-60IN H_2O	12.5IN H_2O	Rx Level Low
	11	2-B21-N023A-1	M	600-1200 PSIG	1045 PSIG	Rx Press High
	12	2-B21-N023A-2	S	(600-1200PSIG)	1035 PSIG	Rx Press High
	13	2-B21-4039	C	Digital	-	Calibration

NOTE:
(1) M = Master Trip Unit; S = Slave Trip Unit; C = Calibration Unit

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SECTION VI

SPECIFICATION SHEET (CONT'D)

CABINET TAG NO.: 2-CB-XU-65 (RPS CHANNEL A1)						
CARD FILE TAG NO.	CARD FILE POSITION	INSTRUMENT TAG NO.	TYPE	SCALE (RANGE)	TRIP ¢ SETPOINT	SERVICE
2-CB-XU-3904	1	2-B21-4040-1	M	-	-	Spare
	2	2-B21-4040-2	S	-	-	Spare
	3	Blank	-	-	-	-
	4	Blank	-	-	-	-
	5	Blank	-	-	-	-
	6	Blank	-	-	-	-
	7	Blank	-	-	-	-
	8	Blank	-	-	-	-
	9	Blank	-	-	-	-
	10	Blank	-	-	-	-
	11	Blank	-	-	-	-
	12	Blank	-	-	-	-
	13	Blank for Calib. Unit	-	-	-	-

NOTE:
(1) M = Master Trip Unit; S - Slave Trip Unit; C = Calibration Unit

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SECTION VI

SPECIFICATION SHEET (CONT'D)

CABINET TAG NO.: 2-CB-XU-65 (RPS CHANNEL A2)						
CARD FILE TAG NO.	CARD FILE POSITION	INSTRUMENT TAG NO.	TYPE	SCALE (RANGE)	TRIP SETPOINT	SERVICE
2-CB-XU-3905	1	2-B21-N006C-1	M	0-150 PSID	115 PSID	Main Stm Flo High
	2	2-B21-N007C-1	M	0-150 PSID	115 PSID	Main Stm Flo High
	3	2-B21-N008C-1	M	0-150 PSID	9 PSID	Main Stm Flo High
	4	2-B21-N008C-2	S	(0-150 PSID)	115 PSID	Main Stm Flo High
	5	2-B21-N009C-1	M	0-150 PSID	115 PSID	Main Stm Flo High
	6	2-B21-N015C-1	M	0-1200 PSIG	825 PSIG	Main Stm Press Lo
	7	2-B21-N025A-1	M	-150 to 60 IN H_2O	-38 IN H_2O	Rx Level Low
	8	2-B21-N056C-1	M	0-30 IN Hg VAC	7 IN HgVAC	Cond. Vacuum Low
	9	2-C72-N002C-1	M	0-5 PSIG	2 PSIG	Drywell Press Hi
	10	2-B21-N017C-1	M	0-60 IN H_2O	12.5IN H_2O	Rx Level Low
	11	2-B21-N023C-1	M	600-1200 PSIG	1045 PSIG	Rx Press High
	12	2-B21-N023C-2	S	(600-1200 PSIG)	1035 PSIG	Rx Press High
	13	2-B21-4041	C	Digital	-	Calibration

NOTE:
(1) M - Master Trip Unit; S = Slave Trip Unit; C = Calibration Unit

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SECTION VI

SPECIFICATION SHEET (CONT'D)

CABINET TAG NO.: 2-CB-XU-66 (RPS CHANNEL A2)						
CARD FILE TAG NO.	CARD FILE POSITION	INSTRUMENT TAG NO.	TYPE	SCALE (RANGE)	TRIP ¢ SETPOINT	SERVICE
2-CB-XU-3906	1	2-B21-4042-1	M	-	-	Spare
	2	2-B21-4042-2	S	-	-	Spare
	3	Blank	-	-	-	-
	4	Blank	-	-	-	-
	5	Blank	-	-	-	-
	6	Blank	-	-	-	-
	7	Blank	-	-	-	-
	8	Blank	-	-	-	-
	9	Blank	-	-	-	-
	10	Blank	-	-	-	-
	11	Blank	-	-	-	-
	12	Blank	-	-	-	-
	13	Blank For Calib. Unit	-	-	-	-

NOTE:
(1) M = Master Trip Unit; S = Slave Trip Unit; C = Calibration Unit

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SECTION VI

SPECIFICATION SHEET (CONT'D)

CABINET TAG NO.: 2-CB-XU-67 (RPS CHANNEL B1)						
CARD FILE TAG NO.	CARD FILE POSITION	INSTRUMENT TAG NO.	TYPE	SCALE (RANGE)	TRIP & SETPOINT	SERVICE
2-CB-XU-3907	1	2-B21-N006B-1	M	0-150 PSID	115 PSID	Main Stm Flo High
	2	2-B21-N007B-1	M	0-150 PSID	9 PSID	Main Stm Flo High
	3	2-B21-N007B-2	S	(0-150 PSID)	115 PSID	Main Stm Flo High
	4	2-B21-N008B-1	M	0-150 PSID	115 PSID	Main Stm Flo High
	5	2-B21-N009B-1	M	0-150 PSID	115 PSID	Main Stm Flo High
	6	2-B21-N015B-1	M	0-1200 PSIG	825 PSIG	Main Stm Press Lo
	7	2-B21-N024B-1	M	-150 To 60 IN H_2O	-38 IN H_2O	Rx Level Lo
	8	2-B21-N056B-1	M	0-30 IN HgVAC	7 IN HgVAC	Cond. Vacuum Lo
	9	2-C72-N002B-1	M	0-5 PSIG	2 PSIG	Drywell Press Hi
	10	2-B21-N017B-1	M	0-60 IN H_2O	12.5IN H_2O	Rx Level Lo
	11	2-B21-N023B-1	M	600-1200 PSIG	1045 PSIG	Rx Press High
	12	2-B21-N023B-2	S	(600-1200PSIG)	1035 PSIG	Rx Press High
	13	2-B21-4043	C	Digital	-	Calibration

NOTE:

(1) M = Master Trip Unit; S = Slave Trip Unit; C = Calibration Unit

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SECTION VI

SPECIFICATION SHEET (CONT'D)

CABINET TAG NO.: 2-CB-XU-67 (RPS CHANNEL B1)						
CARD FILE TAG NO.	CARD FILE POSITION	INSTRUMENT TAG NO.	TYPE	SCALE (RANGE)	TRIP ¢ SETPOINT	SERVICE
2-CB-XU-3908	1	2-B21-4044-1	M	-	-	Spare
	2	2-B21-4044-2	S	-	-	Spare
	3	Blank	-	-	-	-
	4	Blank	-	-	-	-
	5	Blank	-	-	-	-
	6	Blank	-	-	-	-
	7	Blank	-	-	-	-
	8	Blank	-	-	-	-
	9	Blank	-	-	-	-
	10	Blank	-	-	-	-
	11	Blank	-	-	-	-
	12	Blank	-	-	-	-
		Blank for Calib. Unit	-	-	-	-

NOTE:
(1) M = Master Trip Unit; S = Slave Trip Unit; C = Calibration Unit

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SECTION VI

SPECIFICATION SHEET (CONT'D)

CABINET TAG NO.: 2-CB-XU-68 (RPS CHANNEL B2)						
CARD FILE TAG NO.	CARD FILE POSITION	INSTRUMENT TAG NO.	TYPE	SCALE (RANGE)	TRIP SETPOINT	SERVICE
2-CB-XU-3909	1	2-B21-N006D-1	M	0-150 PSIG	115 PSID	Main Stm Flo High
	2	2-B21-N007D-1	M	0-150 PSID	115 PSID	Main Stm Flo High
	3	2-B21-N008D-1	M	0-150 PSID	115 PSID	Main Stm Flo High
	4	2-B21-N009D-1	M	0-150 PSID	9 PSID	Main Stm Flo High
	5	2-B21-N009D-2	S	(0-150 PSID)	115 PSID	Main Stm Flo High
	6	2-B21-N015D-1	M	0-1200 PSIG	825 PSIG	Main Stm Press Low
	7	2-B21-N025B-1	M	-150 To 60 IN H_2O	-38 IN H_2O	Rx Level Low
	8	2-B21-N056D-1	M	0-30IN HgVAC	7 IN HgVAC	Cond. Vacuum Low
	9	2-C72-N002D-1	M	0-5 PSIG	2 PSIG	Drywell Press Hi
	10	2-B21-N017D-1	M	0-60 IN H_2O	12.5IN H_2O	Rx Level Low
	11	2-B21-N023D-1	M	600-1200 PSIG	1045 PSIG	Rx Press High
	12	2-B21-N023D-2	S	(600-1200PSIG)	1035 PSIG	Rx Press High
	13	2-B21-4045	C	Digital	-	Calibration

NOTE:
(1) M = Master Trip Unit; S = Slave Trip Unit; C = Calibration Unit

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SECTION VI

SPECIFICATION SHEET (CONT'D)

CABINET TAG NO.: 2-CB-XU-68 (RPS CHANNEL B2)						
CARD FILE TAG NO.	CARD FILE POSITION	INSTRUMENT TAG NO.	TYPE	SCALE (RANGE)	TRIP & SETPOINT	SERVICE
2-CB-XU-3910	1	2-B21-4046-1	M	-	-	Spare
	2	2-B21-4046-2	S	-	-	Spare
	3	Blank	-	-	-	-
	4	Blank	-	-	-	-
	5	Blank	-	-	-	-
	6	Blank	-	-	-	-
	7	Blank	-	-	-	-
	8	Blank	-	-	-	-
	9	Blank	-	-	-	-
	10	Blank	-	-	-	-
	11	Blank	-	-	-	-
	12	Blank	-	-	-	-
	13	Blank for Calib. Unit	-	-	-	-

NOTE:
(1) M = Master Trip Unit; S = Slave Trip Unit; C = Calibration Unit

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TABLE 2.2.1-1

REACTOR PROTECTION SYSTEM INSTRUMENTATION SETPOINTS

FUNCTIONAL UNIT AND INSTRUMENT NUMBER	TRIP SETPOINT	ALLOWABLE VALUES
1. Intermediate Range Monitor, Neutron Flux - High[1] (C51-IRM-K601 A,B,C,D,E,F,G,H)	≤120 divisions of full scale	≤120 divisions of full scale
2. Average Power Range Monitor (C51-APRM-CH.A,B,C,D,E,F)		
a. Neutron Flux - High, 15%[2]	≤15% of RATED THERMAL POWER	≤15% of RATED THERMAL POWER
b. Flow Biased Neutron Flux - High[3][4]	≤(0.66 W + 54%)	≤(0.66 W + 54%)
c. Fixed Neutron Flux - High[4]	≤120% of RATED THERMAL POWER	≤120% of RATED THERMAL POWER
3. Reactor Vessel Steam Dome Pressure - High (B21-PTM-N023A-1,B-1,C-1,D-1)	≤1045 psig	≤1045 psig
4. Reactor Vessel Water Level - Low, Level #1 (B21-LTM-N017A-1,B-1,C-1,D-1)	≥12.5 inches above instrument zero	≥12.5 inches above instrument zero
5. Main Steam Line Isolation Valve - Closure[5] (B21-F022 A,B,C,D; B21-F028 A,B,C,D)	≤10% closed	≤10% closed
6. Main Steam Line Radiation - High (D12-RM-K603 A,B,C,D)	≤3 x full power background	≤3.5 x full power background

TABLE 2.2.1-1 (continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION SETPOINTS

FUNCTIONAL UNIT AND INSTRUMENT NUMBER	TRIP SETPOINT	ALLOWABLE VALUES
7. Drywell Pressure - High (C72-PTM-N002A-1,B-1,C-1,D-1)	≤2 psig	≤2psig
8. Scram Discharge Volume Water Level - High (C11-LSH-N013 A,B,C,D)	≤109 gallons	≤109 gallons

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TABLE 3.3.1-1

REACTOR PROTECTION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT AND INSTRUMENT NUMBER	APPLICABLE OPERATIONAL CONDITIONS	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM(a)(b)	ACTION
1. Intermediate Range Monitors: (C51-IRM-K601A,B,C,D,E,F,G,H)			
a. Neutron Flux - High	2, 5	3	1
	3, 4	2	2
b. Inoperative	2, 5	3	1
	3, 4	2	2
2. Average Power Range Monitor: (C51-APRM-CH.A,B,C,D,E,F,)			
a. Neutron Flux - High, 15%	2, 5	2	3
b. Flow Biased Neutron Flux - High	1	2	4
c. Fixed Neutron Flux-High, 120%	1	2	4
d. Inoperative	1, 2, 5	2	5
e. Downscale	1	2	4
f. LPRM	1, 2, 5	(c)	NA
3. Reactor Vessel Steam Dome Pressure - High (B21-PT-N023A,B,C,D) (B21-PTM-N023A-1,B-1,C-1,D-1)	1, 2[d]	2	6
4. Reactor Vessel Water Level Low, Level #1 (B21-LT-N017A-1,B-1,C-1,D-1) (B21-LTM-N017A-1,B-1,C-1,D-1)	1, 2	2	6
5. Main Steam Line Isolation Valve - Closure (B21-F022A,B,C,D, and B21-F028A,B,C,D)	1	4	4

TABLE 3.3.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION

FUNCTION UNIT AND INSTRUMENT NUMBER	APPLICABLE OPERATIONAL CONDITIONS	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM(a)(b)	ACTION
6. Main Steam Line Radiation - High (D12-RM-K603A,B,C,D)	1, 2[d]	2	7
7. Drywell Pressure - High (C72-PT-N002A,B,C,D) (C72-PTM-N002A-1,B-1,C-1,D-1)	1, 2[e]	2	6
8. Scram Discharge Volume Water Level - High (C12-LSH-N013A,B,C,D)	1, 2, 5[f]	2	5
9. Turbine Stop Valve - Closure (EHC-SVOS-1X,2X,3X,4X)	1[g]	4	8
10. Turbine Control Valve Fast Closure Control Oil Pressure - Low (EHC-PSL-1756,1757,1758,1759	1[g]	2	8
11. Reactor Mode Switch in Shutdown Position (C72A-SI)	1, 2, 3, 4, 5	1	9
12. Manual Scram (C72A-S3A,B)	1, 2, 3, 4, 5	1	10

TABLE 3.3.1-2

REACTOR PROTECTION SYSTEM RESPONSE TIMES

FUNCTIONAL UNIT AND INSTRUMENT NUMBER	RESPONSE TIME (Seconds)
1. Intermediate Range Monitors (C51-IRM-K601A,B,C,D,E,F,G,H):	
a. Neutron Flux - High*	NA
b. Inoperative	NA
2. Average Power Range Monitor* (C51-APRM-CH.A,B,C,D,E,F):	
a. Neutron Flux - High, 15%	≤0.09
b. Flow Biased Neutron Flux - High	NA
c. Neutron Flux - High, 120%	≤0.09
d. Inoperative	NA
e. Downscale	NA
f. LPRM	NA
3. Reactor Vessel Steam Dome Pressure - High (B21-PT-N023A,B,C,D) (B21-PTM-N023A-1,B-1,C-1,D-1)	≤0.55
4. Reactor Vessel Water Level - Level #1 (B21-LT-N017A-1,B-1,C-1,D-1) (B21-LTM-N017A-1,B-1,C-1,D-1)	≤1.05
5. Main Steam Line Isolation Valve-Closure (B21-F022A,B,C,D and B21-F028A,B,C,D)	≤0.06
6. Main Steam Line Radiation - High (D12-RM-K603A,B,C,D)	NA
7. Drywell Pressure - High (C72-PT-N002A,B,C,D) (C72-PTM-N002A-1,B-1,C-1,D-1)	NA
8. Scram Discharge Volume Water Level - High (C12-LSH-N013A,B,C,D)	NA
9. Turbine Stop Valve - Closure (EHC-SVOS-1X,2X,3X,4X)	≤0.06

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TABLE 3.3.1-2 (Continued)

REACTOR PROTECTION SYSTEM RESPONSE TIMES

FUNCTIONAL UNIT AND INSTRUMENT NUMBER	RESPONSE TIME (Seconds)
10. Turbine Control Valve Fast Closure, Control Oil Pressure - Low (EHC-PSL-1756,1757,1758,1759)	$\leq$0.08
11. Reactor Mode Switch in Shutdown Position (C72A-S1)	NA
12. Manual Scram (C72A-S3A,B)	NA

* Neutron detectors are exempt from response time testing. Response time shall be measured from detector output or input of first electronic component in channel.

TABLE 4.3.1-1

REACTOR PROTECTION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT AND INSTRUMENT NUMBER	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION[a]	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
1. Intermediate Range Monitors: (C51-IRM-K601 A,B,C,D,E,F,G,H)				
a. Neutron Flux - High	D	S/U[b][c]	R	2
	D	W	R	3, 4, 5
b. Inoperative	NA	W	NA	2, 3, 4, 5
2. Average Power Range Monitor: (C51-APRM-CH.A,B,C,D,E,F)				
a. Neutron Flux - High 15%	S	S/U[b], W[d]	Q	2
	S	W	Q	5
b. Flow Biased Neutron Flux-High	S	S/U[b], W	W[e][f], Q	1
c. Fixed Neutron Flux - High, 120%	S	S/U[b], W	W[e], Q	1
d. Inoperative	NA	W	NA	1, 2, 5
e. Downscale	NA	W	NA	1
f. LPRM	D	NA	(g)	1, 2, 5
3. Reactor Vessel Steam Dome Pressure - High				
(B21-PT-N023A, B, C, D)	NA[k]	NA	R[l]	
(B21-PTM-N023A-1, B-1, C-1, D-1)	D	M	M	1, 2
4. Reactor Vessel Water Level - Low Level #1				
(B21-LT-N017A-1, B-1, C-1, D-1)	NA[k]	NA	R[l]	
(B21-LTM-N017A-1, B-1, C-1, D-1)	D	M	M	1, 2
5. Main Steam Line Isolation Valve - Closure (B21-F022 A,B,C,D and B21-F028 A,B,C,D)	NA	M	R[h]	1

TABLE 4.3.1-1 (continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT AND INSTRUMENT NUMBER	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION[a]	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
6. Main Steam Line Radiation-High (D12-RM-K603 A,B,C,D)	S	M[i]	R[j]	1, 2
7. Drywell Pressure - High				
(C72-PT-N002A, B, C, D)	NA[k]	NA	R[l]	
(C72-PTM-N002A-1,B-1,C-1,D-1)	D	M	M	1, 2
8. Scram Discharge Volume Water Level - High (C12-LSH-N013 A, B, C, D)	NA	Q	R	1, 2, 5
9. Turbine Stop Valve - Closure (EHC-SVOS-1X, 2X, 3X, 4X)	NA	M	R[h]	1
10. Turbine Control Valve Fast Closure, Control Oil Pressure-Low (EHC-PSL-1756,1757,1758, 1759)	NA	M	R	1
11. Reactor Mode Switch in Shutdown Position (C72A-S1)	NA	R	NA	1, 2, 3, 4, 5
12. Manual Scram (C72A-S3A,B)	NA	Q	NA	1, 2, 3, 4, 5

a. Neutron detectors may be excluded from CHANNEL CALIBRATION.
b. Within 24 hours prior to startup, if not performed within the previous 7 days.
c. The IRM channels shall be compared to the APRM channels and the SRM instruments for overlap during each startup, if not performed within the previous 7 days.
d. When changing from CONDITION 1 to CONDITION 2, perform the required surveillance within 12 hours after entering CONDITION 2.
e. This calibration shall consist of the adjustment of the APRM readout to conform to the power values calculated by a heat balance during CONDITION 1 when THERMAL POWER $\geq$ 25% of RATED THERMAL POWER.

TABLE 4.3.1-1 (continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

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f. This calibration shall consist of the adjustment of the APRM flow biased setpoint to conform to a calibrated flow signal.

g. The LPRM's shall be calibrated at least once per effective full power month (EFPM) using the TIP system.

h. This calibration shall consist of a physical inspection and actuation of these position switches.

i. Instrument alignment using a standard current source.

j. Calibration using a standard radiation source.

k. The transmitter channel check is satisfied by the trip unit channel check. A separate transmitter check is not required.

l. Transmitters are exempted from the monthly channel calibration.

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TABLE 3.3.2-1

ISOLATION ACTUATION INSTRUMENTATION

TRIP FUNCTION AND INSTRUMENT NUMBER	VALVE GROUPS OPERATED BY SIGNAL(a)	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM(b)(c)	APPLICABLE OPERATIONAL CONDITION	ACTION
1. PRIMARY CONTAINMENT ISOLATION				
a. Reactor Vessel Water Level - Low				
1. Level #1 (B21-LT-N017A-1,B-1,C-1,D-1) (B21-LTM-N017A-1,B-1,C-1,D-1)	2, 6, 7, 8	2	1, 2, 3	20
2. Level #2 (B21-LT-N024A-1,B-1,and B21-LT-N025A-1,B-1				
(B21-LTM-N024A-1,B-1 and B21-LTM-N025A-1,B-1)	1, 3	2	1, 2, 3	20
b. Drywell Pressure - High (C72-PT-N002A,B,C,D) (C72-PTM-N002A-1,B-1,C-1,D-1)	2, 6, 7	2	1, 2, 3	20
c. Main Steam Line				
1. Radiation - High (d) (D12-RM-K603A,B,C,D)	1	2	1, 2, 3	21
2. Pressure - Low (B21-PT-N015A,B,C,D) (B21-PTM-N015A-1,B-1,C-1,D-1)	1	2	1	22

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TABLE 3.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION

TRIP FUNCTION AND INSTRUMENT NUMBER	VALVE GROUPS OPERATED BY SIGNAL(a)	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM(b)(c)	APPLICABLE OPERATIONAL CONDITION	ACTION
1. PRIMARY CONTAINMENT ISOLATION (Continued)				
c. Main Steam Line (Continued)				
3. Flow - High (B21-PDT-N006A,B,C,D; B21-PDT-N007A,B,C,D; B21-PDT-N008A,B,C,D; B21-PDT-N009A,B,C,D) (B21-PDTM-N006A-1,B-1,C-1,D-1; B21-PDTM-N007A-1,B-1,C-1,D-1; B21-PDTM-N008A-1,B-1,C-1,D-1; b21-PDTM-N009A-1,B-1,C-1,D-1)	1	2/line	1	22
4. Flow - High (B21-PDTS-N006A-2: B21-PDTS-N007B-2; B21-PDTS-N008C-2; B21-PDTS-N009D-2)	1	2	2, 3	21
d. Main Steam Line Tunnel Temperature - High (B21-TS-N010A,B,C,D; B21-TS-N011A,B,C,D; B21-TS-N012A,B,C,D and B21-TS-N013A,B,C,D)	1	2(e)	1, 2, 3	21
e. Condenser Vacuum - Low (B21-PT-N056A,B,C,D) (B21-PTM-N056A-1,B-1,C-1,D-1)	1	2	1, 2(f)	21
f. Turbine Building Area Temperature - High (B21-TS-3225A,B,C,D; B21-TS-3226A,B,C,D; B21-TS-3227A,B,C,D; B21-TS-3228A,B,C,D; B21-TS-3229A,B,C,D; B21-TS-3230A,B,C,D; B21-TS-3231A,B,C,D; and B21-TS-3232A,B,C,D)	1	4(e)	1, 2, 3	21

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TABLE 3.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION

TRIP FUNCTION AND INSTRUMENT NUMBER	VALVE GROUPS OPERATED BY SIGNAL(a)	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM(b)(c)	APPLICABLE OPERATIONAL CONDITION	ACTION
2. SECONDARY CONTAINMENT ISOLATION				
a. Reactor Building Exhaust Radiation - High (D12-RM-N010A,B)	6	1	1, 2, 3, 5 and *	23
b. Drywell Pressure - High (C72-PT-N002A,B,C,D) (C72-PTM-N002A-1,B-1,C-1,D-1)	2, 6, 7	2	1, 2, 3	23
c. Reactor Vessel Water Level - Low, Level #2 (B21-LT-N024A-1,B-1 and B21-LT-N025A-1,B-1)				
(B21-LTM-N024A-1,B-1 and B21-LTM-N025A-1,B-1)	1, 3	2	1, 2, 3	23
3. REACTOR WATER CLEANUP SYSTEM ISOLATION				
a. Δ Flow - High (G31-dFS-N603-1A,1B)	3	1	1, 2, 3	24
b. Area Temperature - High (G31-TS-N600A,B,C,D,E,F)	3	2	1, 2, 3	24
c. Area Ventilation Δ Temp. - High (G31-TS-N602A,B,C,D,E,F)	3	2	1, 2, 3	24
d. SLCS Initiation (C41A [illegible]1)	3(g)	NA	1, 2, 3	24
e. Reactor Vessel Water Level - Low, Level #2 (B21-LT-N024A-1,B-1 and B21-LT-N025A-1,B-1)				
(B21-LTM-N024A-1,B-1 and B21-LTM-N025A-1,B-1)	1, 3	2	1, 2, 3	24

TABLE 3.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION

TRIP FUNCTION AND INSTRUMENT NUMBER	VALVE GROUPS OPERATED BY SIGNAL(a)	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM(b)(c)	APPLICABLE OPERATIONAL CONDITION	ACTION
4. CORE STANDBY COOLING SYSTEMS ISOLATION				
a. High Pressure Coolant Injection Isolation				
1. HPCI Steam Line Flow - High (E41-PDT-N004 and E41-PDT-N005) (E41-PDTM-N004-1 and E41-PDTM-N005-1) (E41-PDTS-N004-2 and E41-PDTS-N005-2)	4	2	1, 2, 3	25
2. HPCI Steam Supply Pressure - Low (E41-PSL-N001A,B,C,D)	4	2	1, 2, 3	25
3. HPCI Steam Line Tunnel Temperature - High (E41-TS-3314; E41-TS-3315; E41-TS-3316; E41-TS-3317; E41-TS-3318; E41-TS-3354; E41-TS-3488 and E41-TS-3489)	4	2	1, 2, 3	25
4. Bus Power Monitor (E41-K55 and E41-K56)	NA(h)	1/bus	1, 2, 3	26
5. HPCI Turbine Exhaust Diaphragm Pressure - High (E41-PSH-N012A,B,C,D)	4	2	1, 2, 3	25
6. HPCI Steam Line Ambient Temperature - High (E51-TS-N603C,D)	4	2	1, 2, 3	25

TABLE 3.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION

TRIP FUNCTION AND INSTRUMENT NUMBER	VALVE GROUPS OPERATED BY SIGNAL(a)	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM(b)(c)	APPLICABLE OPERATIONAL CONDITION	ACTION
4. CORE STANDBY COOLING SYSTEMS ISOLATION (Continued)				
a. High Pressure Coolant Injection Isolation (Continued)				
7. HPCI Steam Line Area Δ Temp. - High (E51-dTS-N604C,D)	4	2	1, 2, 3	25
8. Emergency Area Cooler Temperature - High (E41-TS-N002A,B)	4	2	1, 2, 3	25

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TABLE 3.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION

TRIP FUNCTION AND INSTRUMENT NUMBER	VALVE GROUPS OPERATED BY SIGNAL(a)	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM(b)(c)	APPLICABLE OPERATIONAL CONDITION	ACTION
b. Reactor Core Isolation Cooling System Isolation				
1. RCIC Steam Line Flow - High (E51-PDT-N017 and E51-PDT-N018) (E51-PDTM-N017-1 and E51-PDTM-N018-1) (E51-PDTS-N017-2 and E51-PDTS-N018-2)	5	2	1, 2, 3	25
2. RCIC Steam Supply Pressure - Low (E51-PS-N019A,B,C,D)		2	1, 2, 3	25
3. RCIC Steam Line Tunnel Temperature - High (E51-TS-3319; E51-TS-3320; E51-TS-3321; E51-TS-3322; E51-TS-3323; E51-TS-3355 and E51-TS-3487)	5	2	1, 2, 3	25
4. Bus Power Monitor (E51-K42 and E51-K43)	NA(h)	1/bus	1, 2, 3	26
5. RCIC Turbine Exhaust Diaphragm Pressure - High (E51-PS-N012A,B,C,D)	5	2	1, 2, 3	25
6. RCIC Steam Line Ambient Temp - High (E51-TS-N603A,B)	5	2	1, 2, 3	25
7. RCIC Steam Line Area Δ Temp - High (E51-dTS-N604A,B)	5	2	1, 2, 3	25
8. RCIC Equipment Room Ambient Temp - High (E51-TS-N602A,B)	5	2	1, 2, 3	25
9. RCIC Equipment Room Δ Temp - High (E51-dTS-N601A,B)	5	2	1, 2, 3	25

TABLE 3.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION

TRIP FUNCTION AND INSTRUMENT NUMBER	VALVE GROUPS OPERATED BY SIGNAL(a)	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM(b)(c)	APPLICABLE OPERATIONAL CONDITION	ACTION
5. SHUTDOWN COOLING SYSTEM ISOLATION				
a. Reactor Vessel Water - Low, Level #1 (B21-LT-N017A-1,B-1,C-1,D-1) (B21-LTM-N017A-1,B-1,C-1,D-1)	2, 6, 7, 8	2	3, 4, 5	25
b. Reactor Steam Dome Pressure - High (B32-PS-N018A,B)	7, 8	1	1, 2, 3	27

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TABLE 3.3.2-2

ISOLATION ACTUATION INSTRUMENTATION SETPOINTS

TRIP FUNCTION AND INSTRUMENT NUMBER	TRIP SETPOINT	ALLOWABLE VALUE
1. PRIMARY CONTAINMENT ISOLATION		
a. Reactor Vessel Water Level - Low		
1. Level #1 (B21-LTM-N017A-1,B-1,C-1,D-1)	≥ +12.5 inch	≥ +12.5 inches
2. Level #2 (B21-LTM-N024A-1,B-1 and B21-LTM-N025A-1,B-1)	≥ -38 inches	≥ -38 inches
b. Drywell Pressure - High (C72-PTM-N002A-1,B-1,C-1,D-1)	≤ 2 psig	≤ 2 psig
c. Main Steam Line		
1. Radiation - High (D12-RM-K603A,B,C,D)	≤ 3 x full power background	≤ 3.5 x full power background
2. Pressure - Low (B21-PTM-N015A-1,B-1,C-1,D-1)	≥ 825 psig	≥ 825 psig
3. Flow - High (B21-PDTM-N006A-1,B-1,C-1,D-1; B21-PDTM-N007A-1,B-1,C-1,D-1; B21-PDTM-N008A-1,B-1,C-1,D-1; B21-PDTM-N009A-1,B-1,C-1,D-1)	≤ 140% of rated flow	≤ 140% of rated flow
4. Flow - High (B21-PDTS-N006A-2, B21-PDTS-N007B-2 B21-PDTS-N008C-2, B21-PDTS-N009D-2)	≤ 40% of rated flow	≤ 40% of rated flow
d. Main Steam Line Tunnel Temperature - High (B21-TS-N010A,B,C,D; B21-TS-N011A,B,C,D; B21-TS-N012A,B,C,D; B21-TS-N013A,B,C,D)	≤ 200°F	≤ 200°F
e. Condenser Vacuum - Low (B21-PTM-N056A-1,B-1,C-1,D-1)	≥ 7 inches Hg Vacuum	≥ 7 inches Hg Vacuum
f. Turbine Building Area Temp. - High (B21-TS-3225A,B,C,D; B21-TS-3226A,B,C,D; B21-TS-3227A,B,C,D; B21-TS-3228A,B,C,D; B21-TS-3229A,B,C,D; B21-TS-3230A,B,C,D; B21-TS-3231A,B,C,D and B21-TS-3232A,B,C,D)	≤ 200°F	≤ 200°F

TABLE 3.3.2-2 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SETPOINTS

TRIP FUNCTION AND INSTRUMENT NUMBER	TRIP SETPOINT	ALLOWABLE VALUE
2. SECONDARY CONTAINMENT ISOLATION		
a. Reactor Building Exhaust Radiation - High (D12-RM-N010 A, B)	≤ 11 mr/hr	≤ 11 mr/hr
b. Drywell Pressure - High (C72-PTM-N002A-1, B-1, C-1, D-1)	≤ 2 psig	≤ 2 psig
c. Reactor Vessel Water Level - Low, Level #2 (B21-LTM-N024A-1, B-1 and B21-LTM-N025A-1, B-1)	≥ -38 inches	≥ -38 inches
3. REACTOR WATER CLEANUP SYSTEM ISOLATION		
a. △ Flow - High (G31-dFS-N603-1A, 1B)	≤ 53 gal/min	≤ 53 gal/min
b. Area Temperature - High (G31-TS-N600A, B, C, D, E, F)	≤ 150° F	≤ 150° F
c. Area Ventilation Temperature △ Temp - High (G31-TS-N602A, B, C, D, E, F)	≤ 50° F	≤ 50° F
d. SLCS Initiation (C41A-S1)	NA	NA
e. Reactor Vessel Water - Low, Level #2 (B21-LTM-N024A-1, B-1 and B21-LTM-N025A-1, B-1)	≥ -38 inches	≥ -38 inches

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TABLE 3.3.2-2 (continued)

ISOLATION ACTUATION INSTRUMENTATION SETPOINTS

TRIP FUNCTION AND INSTRUMENT NUMBER	TRIP SETPOINT	ALLOWABLE VALUE
4. CORE STANDBY COOLING SYSTEMS ISOLATION		
a. High Pressure Coolant Injection Isolation		
1. HPCI Steam Line Flow - High (E41-PDTM-N004-1 and E41-PDTM-N005-1) (E41-PDTS-N004-2 and E41-PDTS-N005-2)	≤ 300% of rated flow	≤ 300% of rated flow
2. HPCI Steam Supply Pressure - Low (E41-PSL-N001A, B, C, D)	≥ 100 psig	≥ 100 psig
3. HPCI Steam Line Tunnel Temperature - High (E41-TS-3314; E41-TS-3315; E41-TS-3316; E41-TS-3317; E41-TS-3318; E41-TS-3354; E41-TS-3488 and E41-TS-3489)	≤ 200° F	≤ 200° F
4. Bus Power Monitor (E41-K55 and E41-K56)	NA	NA
5. HPCI Turbine Exhaust Diaphragm Pressure-High (E41-PSH-N012A, B, C, D)	≤ 10 psig	≤ 10 psig
6. HPCI Steam Line Ambient Temp. - High (E51-TS-N603C, D)	≤ 200° F	≤ 200° F
7. HPCI Steam Line Area △Temp. - High (E51dTS-N604C, D) (E51-dTS-N604C, D)	≤ 50° F	≤ 50° F
8. Emergency Area Cooler Temp. - High (E41-TS-N602A, B)	≤ 175° F	≤ 175° F

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TABLE 3.3.2-2 (continued)

ISOLATION ACTUATION INSTRUMENTATION SETPOINTS

TRIP FUNCTION AND INSTRUMENT NUMBER	TRIP SETPOINT	ALLOWABLE VALUE
b. Reactor Core Isolation Cooling System Isolation		
1. RCIC Steam Line Flow - High (E51-PDTM-N017-1 and E51-PDTM-N018-1) (E51-PDTS-N017-2 and E51-PDTS-N018-2)	≤ 300% of rated flow	≤ 300% of rated flow
2. RCIC Steam Supply Pressure - Low (E51-PS-N019A, B, C, D)	≥ 50 psig	≥ 50 psig
3. RCIC Steam Line Tunnel Temp. - High (E51-TS-3319; E51-TS-3320; E51-TS-3321; E51-TS-3322; E51-TS-3323; E51-TS-3355 and E51-TS-3487)	≤ 175° F	≤ 175° F
4. Bus Power Monitor (E51-K42 and E51-K43)	NA	NA
5. RCIC Turbine Exhaust Diaphragm Pressure - High (E51-PS-N012A, B, C, D)	≤ 10 psig	≤ 10 psig
6. RCIC Steam Line Ambient Temp. - High (E51-TS-N603A, B)	≤ 200° F	≤ 200° F
7. RCIC Steam Line Area △ Temp. - High (E51-dTS-N604A, B)	≤ 50° F	≤ 50° F
8. RCIC Equipment Room Ambient Temp. - High (E51-TS-N602A, B)	≤ 175° F	≤ 175° F
9. RCIC Equipment Room △ Temp. - High (E51-dTS-N601A, B)	≤ 50° F	≤ 50° F

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TABLE 3.3.2-2 (continued)

ISOLATION ACTUATION INSTRUMENTATION SETPOINTS

TRIP FUNCTION AND INSTRUMENT NUMBER	TRIP SETPOINT	ALLOWABLE VALUE
5. SHUTDOWN COOLING SYSTEM ISOLATION		
a. Reactor Vessel Water - Low, Level #1 (B21-LTM-N017A-1, B-1, C-1, D-1)	≥ +12.5 inches	≥ +12.5 inches
b. Reactor Steam Dome Pressure - High (B32-PS-N018A, B)	≤ 140 psig	≤ 140 psig

1444 359

TABLE 3.3.2-3

ISOLATION SYSTEM RESPONSE TIME

TRIP FUNCTION AND INSTRUMENT NUMBER	RESPONSE TIME (Seconds)
1. PRIMARY CONTAINMENT ISOLATION	
a. Reactor Vessel Water Level - Low	
1. Level #1	
(B21-LT-N017A-1,B-1,C-1,D-1) B21-LTM-N017A-1,B-1,C-1,D-1)	≤13
2. Level #2	
(B21-LT-N024A-1,B-1 and B21-LT-N025A-1,B-1) (B21-LTM-N024A-1,B-1 and B21-LTM-N025A-1,B-1)	≤1.0**
b. Drywell Pressure - High	
(C72-PT-N002A,B,C,D) C72-PTM-N002A-1,B-1,C-1,D-1)	≤13
c. Main Steam Line	
1. Radiation - High*	
(D12-RM-K603A,B,C,D)	≤1.0**
2. Pressure - Low	
(B21-PT-N015A,B,C,D) (B21-PTM-N015A-1,B-1,C-1,D-1)	≤13
3. Flow - High	
(B21-PDT-N006A,B,C,D; B21-PDT-N007A,B,C,D; B21-PDT-N008A,B,C,D; B21-PDT-N009A,B,C,D)	
(B21-PDTM-N006A-1,B-1,C-1,D-1; B21-PDTM-N007A-1,B-1,C-1,D-1; B21-PDTM-N008A-1,B-1,C-1,D-1; B21-PDTM-N009A-1,B-1,C-1,D-1)	≤0.5**
4. Flow - High	
(B21-PDTS-N006A-2; B21-PDTS-N007B-2; B21-PDTS-N008C-2; B21-PDTS-N009D-2)	≤.5**

1444 360

IMAGE EVALUATION
TEST TARGET (MT-3)

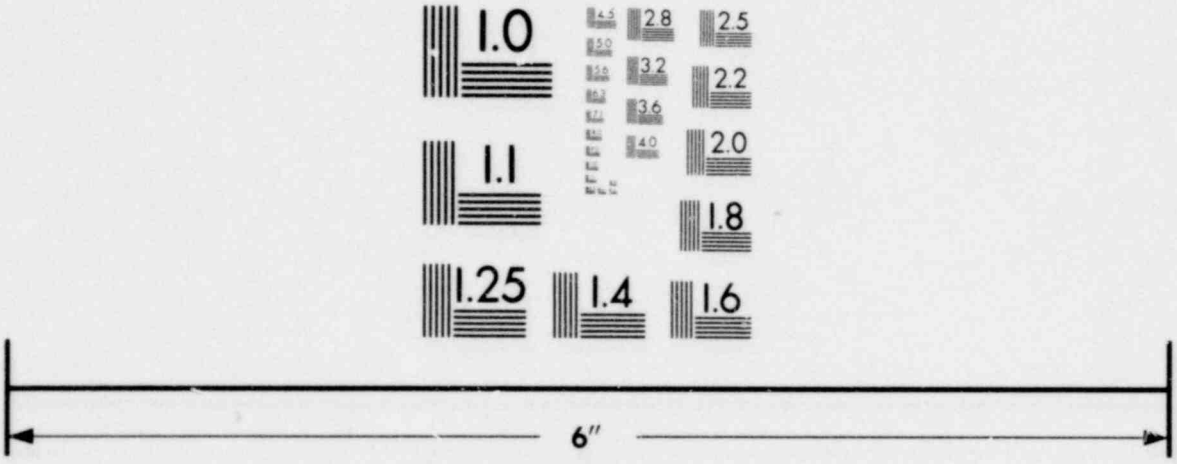

IMAGE EVALUATION
TEST TARGET (MT-3)

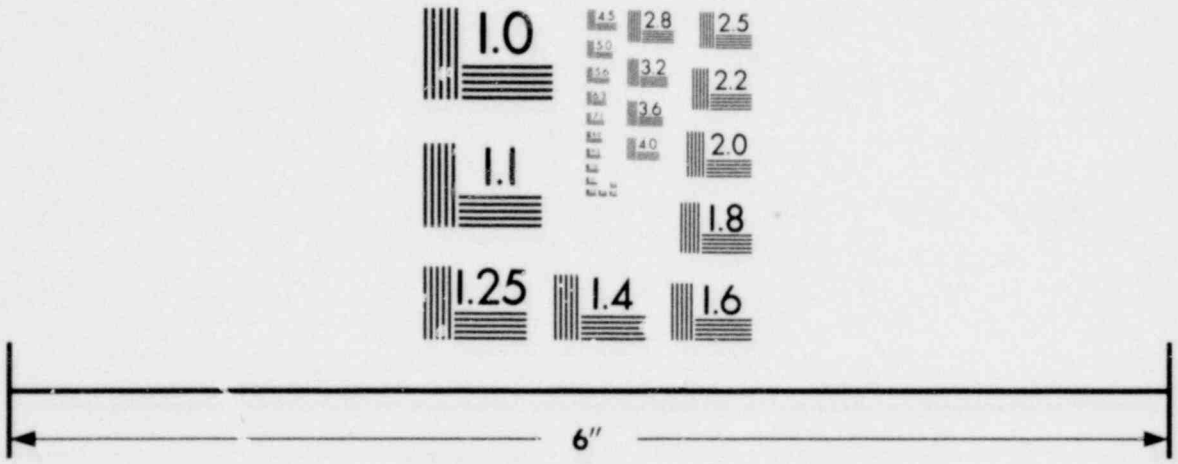

IMAGE EVALUATION
TEST TARGET (MT-3)

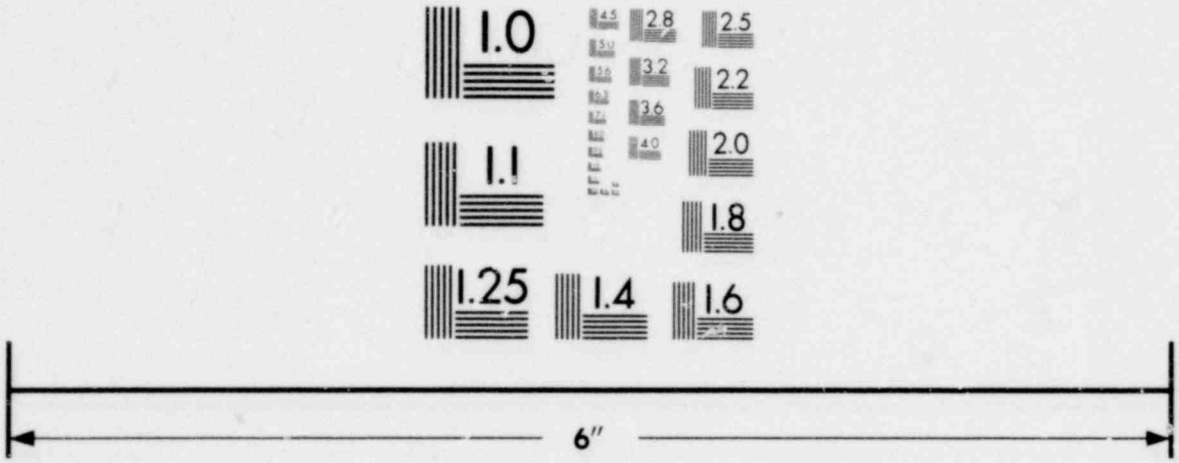

TABLE 3.3.2-3 (Continued)

ISOLATION SYSTEM RESPONSE TIME

TRIP FUNCTION AND INSTRUMENT NUMBER	RESPONSE TIME (Seconds)
1. PRIMARY CONTAINMENT ISOLATION (Continued)	
d. Main Steam Line Tunnel Temperature - High (B21-TS-N010A,B,C,D; B21-TS-N011A,B,C,D; B21-TS-N012A,B,C,D and B21-TS-N013A,B,C,D)	≤13
e. Condenser Vacuum - Low (B21-PT-N056A,B,C,D) (B21-PTM-N056A-1,B-1,C-1,D-1)	≤13
f. Turbine Building Area Temperature - High (B21-TS-3225A,B,C,D; B21-TS-3226A,B,C,D; B21-TS-3227A,B,C,D; B21-TS-3228A,B,C,D; B21-TS-3229A,B,C,D; B21-TS-3230A,B,C,D; B21-TS-3231A,B,C,D; B21-TS-3232A,B,C,D)	NA
2. SECONDARY CONTAINMENT ISOLATION	
a. Reactor Building Exhaust Radiation - High * (D12-RM-N010A,B)	≤13
b. Drywell Pressure - High (C72-PT-N002A,B,C,D) (C72-PTM-N002A-1,B-1,C-1,D-1)	≤13
c. Reactor Vessel Water Level - Low, Level #2 (B21-LT-N024A-1,B-1 and B21-LT-N025A-1,B-1) (B21-LTM-N024A-1,B-1 and B21-LTM-N025A-1,B-1)	≤1.0**

1445 001

[redacted]

TABLE 3.3.2-3 (Continued)

ISOLATION SYSTEM RESPONSE TIME

TRIP FUNCTION AND INSTRUMENT NUMBER	RESPONSE TIME (Seconds)
3. REACTOR WATER CLEANUP SYSTEM ISOLATION	
a. △ Flow - High G31-dFS-N603-1A,1B)	≤13
b. Area Temperature - High (G31-TS-N600A,B,C,D,E,F)	≤13
c. Area Ventilation Temperature △ T - High (G31-TS-N602A,B,C,D,E,F)	≤13
d. SLCS Initiation (C41A-S1)	NA
e. Reactor Vessel Water - Low, Level #2 (B21-LT-N024A-1,B-1 and B21-LT-N025A-1,B-1) B21-LTM-N024A-1,B-1 and B21-LTM-N025A-1,B-1)	≤1.0**
4. CORE STANDBY COOLING SYSTEMS ISOLATION	
a. High Pressure Coolant Injection Isolation	
1. HPCI Steam Line Flow - High (E41-PDT-N004 and E41-PDT-N005) (E41-PDTM-N004-1 and E41-PDTM-N005-1) (E41-PDTS-N004-2 and E41-PDTS-N005-2)	≤13
2. HPCI Steam Supply Pressure - Low (E41-PSL-N001A,B,C,D)	≤13
3. HPCI Steam Line Tunnel Temperature - High (E41-TS-3314; E41-TS-3315; E41-TS-3316; E41-TS-3317; E41-TS-3318; E41-TS-3354; E41-TS-3488 and E41-TS-3489)	≤13
4. Bus Power Monitor (E41-K55 and E41-K56)	NA
5. HPCI Turbine Exhaust Diaphragm Pressure - High (E41-PSH-N012A,B,C,D)	NA
6. HPCI Steam Line Ambient Temperature - High (E51-TS-N603C,D)	NA
7. HPCI Steam Line Area △ Temp - High (E51-dTS-N604C,D)	NA
8. Emergency Area Cooler Temperature - High (E41-TS-602A,B)	NA

1445 002

TABLE 3.3.2-3 (Continued)

ISOLATION SYSTEM RESPONSE TIME

TRIP FUNCTION AND INSTRUMENT NUMBER	RESPONSE TIME (Seconds)
b. Reactor Core Isolation Cooling System Isolation	
1. RCIC Steam Line Flow - High (E51-PDT-N017 and E51-PDT-N018) (E51-PDTM-N017A-1 and E51-PDTM-N018A-1) (E51-PDTS-N017A-2 and E51-PDTS-N018A-2)	NA
2. RCIC Steam Supply Pressure - Low (E51-PS-N019A,B,C,D)	NA
3. RCIC Steam Line Tunnel Temp - High (E51-TS-3319; E51-TS-3320; E51-TS-3321; E51-TS-3322; E51-TS-3323; E51-TS-3355 and E51-TS-3487)	NA
4. Bus Power Monitor (E51-K42 and E51-K43)	NA
5. RCIC Turbine Exhaust Diaphram Pressure - High (E51-PS-N012A,B,C,D)	NA
6. RCIC Steam Line Ambient Temperature - High (E51-TS-N603A,B)	NA
7. RCIC Steam Line Area Δ Temp - High (E51-dTS-N604A,B)	NA
8. Emergency Area Cooler Temperature - High (E51-TS-N602A,B)	NA
9. RCIC Equipment Room Δ Temp - High (E51-dTS-N601A,B)	NA
5. SHUTDOWN COOLING SYSTEM ISOLATION	
a. Reactor Vessel Water Level - Low, Level #1 (B21-LT-N017A-1,B-1,C-1,D-1) (B21-LTM-N017A-1,B-1,C-1,D-1)	NA
b. Reactor Steam Dome Pressure - High (B32-PS-N018A,B)	NA

* Radiation monitors are exempt from response time testing. Response time shall be measured from detector output or the input of the first electronic component in the channel.

** Isolation actuation instrumentation response time only.

1445 003

TABLE 4.3.2-1

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION AND INSTRUMENT NUMBER	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
1. PRIMARY CONTAINMENT ISOLATION				
a. Reactor Vessel Water Level - Low				
1. Level #1				
(B21-LT-N017A-1,B-1,C-1,D-1)	NA[a]	NA	R[b]	
(B21-LTM-N017A-1,B-1,C-1,D-1)	D	M	M	1, 2, 3
2. Level #2				
(B21-LT-N024A-1,B-1 and B21-LT-N025A-1,B-1)	NA[a]	NA	R[b]	
(B21-LTM-N024A-1,B-1 and B21-LTM-N025A-1,B-1)	D	M	M	1, 2, 3
b. Drywell Pressure - High				
(C72-PT-N002A,B,C,D)	NA[a]	NA	R[b]	
(C72-PTM-N002A-1,B-1,C-1,D-1)	D	M	M	1, 2, 3
c. Main Steam Line				
1. Radiation - High				
(D12-RM-K603A,B,C,D)	D	W	R	1, 2, 3
2. Pressure - Low				
(B21-PT-N015A,B,C,D)	NA[a]	NA	R[b]	
(B21-PTM-N015A-1,B-1,C-1,D-1)	D	M	M	1
3. Flow - High				
(B21-PDT-N006A,B,C,D; B21-PDT-N007A,B,C,D; B21-PDT-N008A,B,C,D; B21-PDT-N009A,B,C,D)	NA[a]	NA	R[b]	
(B21-PDTM-N006A-1,B-1,C-1,D-1; B21-PDTM-N007A-1,B-1,C-1,D-1; B21-PDTM-N008A-1,B-1,C-1,D-1; B21-PDTM-N009A-1,B-1,C-1,D-1)	D	M	M	1

1445 004

TABLE 4.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION AND INSTRUMENT NUMBER	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
1. PRIMARY CONTAINMENT ISOLATION (Continued)				
c. Main Steam Line (Continued)				
4. Flow - High (B21-PDTS-N006A-2; B21-PDTS-N007B-2; B21-PDTS-N008C-2; B21-PDTS-N009D-2)	D	M	M	2, 3
d. Main Steam Line Tunnel Temperature - High (B21-TS-N010A,B,C,D; B21-TS-N011A,B,C,D; B21-TS-N012A,B,C,D and B21-TS-N013A,B,C,D)	NA	M	R	1, 2, 3
e. Condenser Vacuum - Low				
(B21-PT-N056A,B,C,D)	NA[a]	NA	R[b]	
(B21-PTM-N056A-1,B-1,C-1,D-1)	D	M	M	1, 2#
f. Turbine Building Area Temp - High (B21-TS-3225A,B,C,D; B21-TS-3226A,B,C,D; B21-TS-3227A,B,C,D; B21-TS-3228A,B,C,D; B21-TS-3229A,B,C,D; B21-TS-3230A,B,C,D; B21-TS-3231A,B,C,D and B21-TS-3232A,B,C,D)	NA	M	R	1, 2, 3

When reactor steam pressure ≥500 psig.

1445 005

TABLE 4.3.2.-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION AND INSTRUMENT NUMBER	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
2. SECONDARY CONTAINMENT ISOLATION				
a. Reactor Building Exhaust Radiation - High (D12-RM-N010A,B)	D	M	R	1, 2, 3, 5 and *
b. Drywell Pressure - High (C72-PT-N002A,B,C,D)	NA[a]	NA	R[b]	
(C72-PTM-N002A-1,B-1,C-1,D-1)	D	M	M	1, 2, 3
c. Reactor Vessel Water Level - Low, Level #2 (B21-LT-N024A-1,B-1 and B21-LT-N025A-1,B-1)	NA[a]	NA	R[b]	
(B21-LTM-N024A-1,B-1 and B21-LTM-N025A-1,B-1)	D	M	M	1, 2, 3
3. REACTOR WATER CLEANUP SYSTEM ISOLATION				
a. Δ Flow - High (G31-dFS-N603-1A,1B)	D	M	R	1, 2, 3
b. Area Temperature - High (G31-TS-N604A,B,C,D,E,F)	NA	M	R	1, 2, 3
c. Area Ventilation Δ Temp - High (G31-TS-N602A,B,C,D,E,F)	NA	M	R	1, 2, 3

*When handling irradiated fuel in the secondary containment.

1445 006

TABLE 4.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION AND INSTRUMENT NUMBER	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
3. REACTOR WATER CLEANUP SYSTEM ISOLATION (continued)				
d. SLCS Initiation (C41A-S1)	NA	R	NA	1, 2, 3
e. Reactor Vessel Water Level - Low, Level #2				
(B21-LT-N024A-1,B-1 and B21-LT-N025A-1,B-1)	NA[a]	NA	R[b]	
(B21-LTM-N024A-1,B-1 and B21-LTM-N025A-1,B-1)	D	M	M	1, 2, 3

TABLE 4.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION AND INSTRUMENT NUMBER	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CCONDITIONS IN WHICH SURVEILLANCE REQUIRED
4. CORE STANDBY COOLING SYSTEMS ISOLATION				
a. High Pressure Coolant Injection Isolation				
1. HPCI Steamline Flow - High (E41-PDT-N004 and E41-PDT-N005)	NA[a]	NA	R[b]	
(E41-PDTM-N004-1 and E41-PDTM-N005-1) (E41-PDTS-N004-2 and E41-PDTS-N005-2)	D	M	M	1, 2, 3
2. HPCI Steam Supply Pressure - Low (E41-PSL-N001A,B,C,D)	NA	M	R	1, 2, 3
3. HPCI Steamline Tunnel Temperature - High (E41-TS-3314; E41-TS-3315; E41-TS-3316; E41-TS-3317; E41-TS-3318; E41-TS-3354; E41-TS-3488 and E41-TS-3489)	NA	M	Q	1, 2, 3
4. Bus Power Monitor (E41-K55 and E41-K56)	NA	R	NA	1, 2, 3
5. HPCI Turbine Exhaust Diaphragm Pressure - High (E41-PSH-N012A,B,C,D)	NA	M	Q	1, 2, 3
6. HPCI Steam Line Ambient Temp - High (E51-TS-N603C,D)	NA	M	R	1, 2, 3
7. HPCI Steam Line Area Δ Temp - High (E51-dTS-N604C,D)	NA	M	R	1, 2, 3
8. Emergency Area Cooler Temp - High (E41-TS-N602A,B)	NA	M	Q	1, 2, 3

TABLE 4.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION AND INSTRUMENT NUMBER	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
b. Reactor Core Isolation Cooling System Isolation				
1. RCIC Steamline Flow - High (E51-PDT-N017 and E51-PDT-N018)	NA[a]	NA	R[b]	
(E51-PDTM-N017A-1 and E51-PDTM-N018A-1) (E51-PDTS-N017A-2 and E51-PDTS-N018A-2)	D	M	M	1, 2, 3
2. RCIC Steam Supply Pressure - Low (E51-PS-N019A,B,C,D)	NA	M	Q	1, 2, 3
3. RCIC Steamline Tunnel High Temperature (E51-TS-3319; E51-TS-3320; E51-TS-3321; E51-TS-3322; E51-TS-3323; E51-TS-3355 and E51-TS-3487)	NA	M	R	1, 2, 3
4. Bus Power Monitor (E51-K42 and E51-K43)	NA	R	NA	1, 2, 3
5. RCIC Turbine Exhaust Diaphragm Pressure - High (E51-PS-N012A,B,C,D)	NA	M	R	1, 2, 3
6. RCIC Steam Line Ambient Temp - High (E51-TS-N603A,B)	NA	M	R	1, 2, 3
7. RCIC Steam Line Area Δ Temp - High (E51-dTS-N604A,B)	NA	M	R	1, 2, 3
8. RCIC Equipment Room Ambient Temp - High (E51-TS-N602A,B)	NA	M	Q	1, 2, 3
9. RCIC Equipment Room Δ Temp - High (E51-dTS-N601A,B)	NA	M	Q	1, 2, 3

1445 009

TABLE 4.3.2-1 (Continued)

ISOLATION ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION AND INSTRUMENT NUMBER	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
5. SHUTDOWN COOLING SYSTEM ISOLATION				
a. Reactor Vessel Water - Low, Level #1				
(B21-LT-N017A-1,B-1,C-1,D-1)	NA[a]	NA	R[b]	
(B21-LTM-N017A-1,B-1,C-1,D-1)	D	M	M	3, 4, 5
b. Reactor Steam Dome Pressure High (B32-PS-N018A,B)	NA	S/U*, M	R	1, 2, 3

* If not performed within the previous 31 days.

(a) The transmitter channel check is satisfied by the trip unit channel check. A separate transmitter check is not required.

(b) Transmitters are exempted from the monthly channel calibration.

1445 010

TABLE 3.3.3-1

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

TRIP FUNCTION AND INSTRUMENT NUMBER	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM	APPLICABLE OPERATIONAL CONDITIONS
1. CORE SPRAY SYSTEM		
a. Reactor Vessel Water Level - Low, Level #3 (B21-LT-N031A, B, C, D) (B21-LTS-N031A-3, B-3, C-3, D-3; B21-LTS-N031A-4, B-4, C-4, D-4)	2	1, 2, 3, 4, 5
b. Reactor Steam Dome Pressure - Low (Injection Permissive) (B21-PT-N021A, B, C, D) (B21-PTM-N021A-1, B-1, C-1, D-1) (B21-PTS-N021A-2, B-2, C-2, D-2)	2	1, 2, 3, 4, 5
c. Drywell Pressure - High (E11-PT-N011A, B, C, D) (E11-PTM-N011A-1, B-1, C-1, D-1) (E11-PTS-N011A-2, B-2, C-2, D-2)	2	1, 2, 3
d. Time Delay Relay	1	1, 2, 3, 4, 5
e. Bus Power Monitor #(E21-K1A, B)	1/bus	1, 2, 3, 4, 5
2. LPCI MODE OF RHR SYSTEM		
a. Drywell Pressure - High (E11-PT-N011A, B, C, D) (E11-PTM-N011A-1, B-1, C-1, D-1)	2	1, 2, 3
b. Reactor Vessel Water Level - Low, Level #3 (B21-LT-N031A, B, C, D) (B21-LTS-N031A-3, B-3, C-3, D-3) (B21-LTS-N031A-4, B-3, C-3, D-3)	2	1, 2, 3, 4*, 5*

*Not applicable when two core spray system subsystems are OPERABLE per Specification 3.5.3.1.
#Alarm Only. When inoperable, verify power availability to the bus at least once per 12 hours.

1445 011

TABLE 3.3.3-1 (continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

TRIP FUNCTION AND INSTRUMENT NUMBER	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM	APPLICABLE OPERATIONAL CONDITIONS
2. LPCI MODE OF RHR SYSTEM (continued)		
c. Reactor Vessel Shroud Level (Drywell Spray Permissive) (B21-LT-N036 and B21-LT-N037) (B21-LTM-N036-1 and B21-LTM-N037-1)	1	1, 2, 3, 4*, 5*
d. Reactor Steam Dome Pressure - Low (Injection Permissive) (B21-PT-N021A, B, C, D) (B21-PTM-N021A-1, B-1, C-1, D-1) (B21-PTS-N021A-2, B-2, C-2, D-2)		
1. RHR Pump Start and LPCI Injection Valve Actuation	2	1, 2, 3, 4*, 5*
2. Recirculation Loop Pump Discharge Valve Actuation	2	1, 2, 3, 4*, 5*
e. RHR Pump Start - Time Delay Relay	1	1, 2, 3, 4*, 5*
f. Bus Power Monitor# (E11-K106A, B)	1/bus	1, 2, 3, 4*, 5*

*Not applicable when two core spray system subsystems are OPERABLE per Specification 3.5.3.1.
#Alarm only. When inoperable, verify power availability to the bus at least once per 12 hours.

TABLE 3.3.3-1 (continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

TRIP FUNCTION AND INSTRUMENT NUMBER	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM	APPLICABLE OPERATIONAL CONDITIONS
3. HPCI SYSTEM		
a. Reactor Vessel Water Level - Low, Level #2 (B21-LT-N031A, B, C, D) (B21-LTM-N031A-1, B-1, C-1, D-1; B21-LTS-N031A-2, B-2, C-2, D-2)	2	1, 2, 3
b. Drywell Pressure - High (E11-PT-N011A, B, C, D) (E11-PTM-N011A-1, B-1, C-1, D-1, E11-PTS-N011A-2, B-2, C-2, D-2)	2	1, 2, 3
c. Condensate Storage Tank Level-Low** (E41-LS-N002, E41-LS-N003)	NA*	1, 2, 3
d. Suppression Chamber Water Level-High** (E41-LS-N015A, B)	NA*	1, 2, 3
e. Bus Power Monitor # (E41-K55 and E41-K56)	1/bus	1, 2, 3
4. ADS		
a. Drywell Pressure - High, coincident with (E11-PT-N010A, B, C, D) (E11-PTM-N010A-1, B-1, C-1, D-1)	2	1, 2, 3
b. Reactor Vessel Water Level - Low, Level #3 (B21-LT-N031A, B, C, D) (B21-LTS-N031A-3, B-3, C-3, D-3; B21-LTS-N031A-4, B-4, C-4, D-4)	2	1, 2, 3

445 013

Alarm only. When inoperable, verify power availability to the bus at least once per 12 hours.
* When either channel of the automatic transfer logic is inoperable, align HPCI pump suction to the suppression pool.
**Provides signal to HPCI pump suction valves only.

TABLE 3.3.3-1 (continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION

TRIP FUNCTION AND INSTRUMENT NUMBER	MINIMUM NUMBER OPERABLE CHANNELS PER TRIP SYSTEM	APPLICABLE OPERATIONAL CONDITIONS
4. ADS (continued)		
c. ADS Timer (B21-TDPU-K5A, B)	1	1, 2, 3
d. Core Spray Pump Discharge Pressure - High (Permissive) (E21-PS-N008A, B and E21-PS-N009A, B)	2	1, 2, 3
e. RHR (LPCI Mode) Pump Discharge Pressure - High (Permissive) (E11-PS-N016A, B, C, D and E11-PS-N020A, B, C, D)	2/pump	1, 2, 3
f. Bus Power Monitor # (B21-K1A, B)	1/bus	1, 2, 3

Alarm only. When inoperable, verify power availability to the bus at least once per 12 hours.

1445 014

TABLE 3.3.3-2

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SETPOINTS

TRIP FUNCTION AND INSTRUMENT NUMBER	TRIP SETPOINT	ALLOWABLE VALUE
1. CORE SPRAY SYSTEM		
a. Reactor Vessel Water Level - Low, Level #3 (B21-LTS-N031A-3, B-3, C-3, D-3; B21-LTS-N031A-4, B-4, C-4, D-4)	≥ -147.5 inches	≥ -147.5 inches
b. Reactor Steam Dome Pressure - Low (B21-PTS-N021A-2, B-2, C-2, D-2)	410 ± 15 psig	410 ± 15 psig
c. Drywell Pressure - High (E11-PTS-N011A-2, B-2, C-2, D-2)	≤ 2 psig	≤ 2 psig
d. Time Delay Relay	14 ≤ t ≤ 16 secs	14 ≤ t ≤ 16 secs
e. Bus Power Monitor (E21-K1A, B)	NA	NA
2. LPCI MODE OF RHR SYSTEM		
a. Drywell Pressure - High (E11-PTM-N011A-1, B-1, C-1, D-1)	≤ 2 psig	≤ 2 psig
b. Reactor Vessel Water Level - Low, Level #3 (B21-LTS-N031A-3, B-3, C-3, D-3; B21-LTS-N031A-4, B-4, C-4, D-4)	≥ -147.5 inches	≥ -147.5 inches
c. Reactor Vessel Shroud Level (B21-LTM-N036-1 and B21-LTM-N037-1)	≥ 39" below TAF*	≥ 39" below TAF*

*Top of the active fuel.

TABLE 3.3.3-2 (continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SETPOINTS

TRIP FUNCTION AND INSTRUMENT NUMBER	TRIP SETPOINT	ALLOWABLE VALUE
d. Reactor Steam Dome Pressure - Low		
1. RHR Pump Start and LCPI Injection Valve Actuation (B21-PTS-N021A-2, B-2, C-2, D-2)	410 ± 15 psig	410 ± 15 psig
2. Recirculation Pump Discharge Valve Actuation (B21-PTM-N021A-1, B-1, C-1, D-1)	310 ± 15 psig	310 ± 15 psig
e. RHR Pump Start - Time Delay Relay	9 ≤ t ≤ 11 seconds	9 ≤ t ≤ 11 seconds
f. Bus Power Monitor (E11-K106A, B)	NA	NA

1445 016

TABLE 3.3.3-2 (continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SETPOINTS

TRIP FUNCTION AND INSTRUMENT NUMBER	TRIP SETPOINT	ALLOWABLE VALUE
3. HPCI SYSTEM		
a. Reactor Vessel Water Level - Low, Level #2 (B21-LTM-N031A-1, B-1, C-1, D-1 and B21-LTS-N031A-2, B-2, C-2, D-2)	≥ -38 inches	≥ -38 inches
b. Drywell Pressure - High (E11-PTM-N011A-1, B-1, C-1, D-1 and E11-PTS-N011A-2, B-2, C-2, D-2)	≤ 2 psig	≤ 2 psig
c. Condensate Storage Tank Level - Low (E41-LS-N002, E41-LS-N003)	≥ 23'4"	≥ 23'4"
d. Suppression Chamber Water Level - High* (E41-LSH-N015A, B)	≤ -2 feet	≤ -2 feet
e. Bus Power Monitor (E41-K55 and E41-K56)	NA	NA
4. ADS		
a. Drywell Pressure - High (E11-PTM-N010A-1, B-1, C-1, D-1)	≤ 2 psig	≤ 2 psig
b. Reactor Vessel Water Level - Low, Level #3 (B21-LTS-N031A-3, B-3, C-3, D-3 and B21-LTS-N031-A-4, B-4, C-4, D-4)	≥ -147.5 inches	≥ -147.5 inches
c. ADS Timer (B21-TDPU-K5A, B)	≤ 120 seconds	≤ 120 seconds
d. Core Spray Pump Discharge Pressure - High (E21-PS-N008A, B and E21-PS-N009A, B)	≥ 100 psig	≥ 100 psig
e. RHR (LPCI Mode) Pump Discharge Pressure - High (E11-PS-N016A, B, C, D and E11-PS-N020A, B, C, D)	≥ 100 psig	≥ 100 psig

*Suppression chamber water level zero is the torus centerline minus 1 inch.

1445 017

TABLE 3.3.3-2 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SETPOINTS

TRIP FUNCTION AND INSTRUMENT NUMBER	TRIP SETPOINT	ALLOWABLE VALUE
4. ADS (continued)		
f. Bus Power Monitor (B21-K1A, B)	NA	NA

1445 018

TABLE 4.3.3-1

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION AND INSTRUMENT NUMBER	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
1. CORE SPRAY SYSTEM				
a. Reactor Vessel Water Level - Low, Level #3				
(B21-LT-N031A,B,C,D)	NA[a]	NA	R[b]	
(B21-LTS-N031A-3,B-3,C-3,D-3)	D	M	M	1, 2, 3, 4, 5
(B21-LTS-N031A-4,B-4,C-4,D-4)	D	M	M	
b. Reactor Steam Dome Pressure - Low				
(B21-PT-N021A,B,C,D)	NA[a]	NA	R[b]	
(B21-PTM-N021A-1,B-1,C-1,D-1)	D	M	M	1, 2, 3, 4, 5
(B21-PTS-N021A-2,B-2,C-2,D-2)	D	M	M	
c. Drywell Pressure - High				
(E11-PT-N011A,B,C,D)	NA[a]	NA	R[b]	
(E11-PTM-N011A-1,B-1,C-1,D-1)	D	M	M	1, 2, 3
(E11-PTS-N011A-2,B-2,C-2,D-2)	D	M	M	
d. Time Delay Relay	NA	R	R	1, 2, 3, 4, 5
e. Bus Power Monitor (E21-K1A,B)	NA	R	NA	1, 2, 3, 4, 5
2. LPCI MODE OF RHR SYSTEM				
a. Drywell Pressure - High				
(E11-PT-N011A,B,C,D)	NA[a]	NA	R[b]	
(E11-PTM-N011A-1,B-1,C-1,D-1)	D	M	M	1, 2, 3

(a) The transmitter channel check is satisfied by the trip unit channel check. A separate transmitter check is not required.

(b) Transmitters are exempted from the monthly channel calibration.

TABLE 4.3.3.-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION AND INSTRUMENT NUMBER	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
2. LPCI MODE OF RHR SYSTEM (Continued)				
b. Reactor Vessel Water Level - Low, Level #3				
(B21-LT-N031A,B,C,D)	NA[a]	NA	R[b]	
(B21-LTS-N031A-3,B-3,C-3,D-3)	D	M	M	1, 2, 3, 4*, 5*
(B21-LTS-N031A-4,B-4,C-4,D-4)	D	M	M	
c. Reactor Vessel Shroud Level				
(B21-LT-N036; B21-LT-N037)	NA[a]	NA	R[b]	
(B21-LTM-N036-1 and B21-LTM-N037-1)	D	M	M	1, 2, 3, 4*, 5*
d. Reactor Steam Dome Pressure - Low (B21-PT-N021A,B,C,D)	NA[a]	NA	R[b]	
1. RHR Pump Start and LPCI Injection Valve Actuation (B21-PTS-N021A-2,B-2,C-2,D-2)	D	M	M	1, 2, 3, 4*, 5*
2. Recirculation Loop Pump Discharge Valve Actuation (B21-PTM-N021A-1,B-1,C-1,D-1)	D	M	M	1, 2, 3, 4*, 5*
e. RHR Pump Start-Time Delay Relay	NA	R	R	1, 2, 3, 4*, 5*
f. Bus Power Monitor (E11-K106A,B)	NA	R	N	1, 2, 3, 4*, 5*

* Not applicable when two core spray system subsystems are OPERABLE per Specification 3.5.3.1.

(a) The transmitter channel check is satisfied by the trip unit channel check. A separate transmitter check is not required.

(b) Transmitters are exempted from the monthly channel calibration.

TABLE 4.3.3.-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION AND INSTRUMENT NUMBER	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
3. HPCI SYSTEM				
a. Reactor Vessel Water Level - Low Level #2				
(B21-LT-N031A,B,C,D)	NA[a]	NA	R[b]	
(B21-LTM-N031A-1,B-1,C-1,D-1)	D	M	M	1, 2, 3
(B21-LTS-N031A-2,B-2,C-2,D-2)	D	M	M	
b. Drywell Pressure - High				
(E11-PT-N011A,B,C,D)	NA[a]	NA	R[b]	
(E11-PTM-N011A-1,B-1,C-1,D-1)	D	M	M	1, 2, 3
(E11-PTS-N011A-2,B-2,C-2,D-2)	D	M	M	
c. Condensate Storage Tank Level Low (E41-LS-N002, E41-LS-N003)	NA	M	Q	1, 2, 3
d. Suppression Chamber Water Level - High (E41-LSH-N015A,B)	NA	M	Q	1, 2, 3
e. Bus Power Monitor (E41-K55 and E41-K56)	NA	R	NA	1, 2, 3
4. ADS				
a. Drywell Pressure - High				
(E11-PT-N010A,B,C,D)	NA[a]	NA	R[b]	
(E11-PTM-N010A-1,B-1,C-1,D-1)	D	M	M	1, 2, 3

(a) The transmitter channel check is satisfied by the trip unit channel check. A separate transmitter check is not required.

(b) Transmitters are exempted from the monthly channel calibration.

TABLE 4.3.3-1 (Continued)

EMERGENCY CORE COOLING SYSTEM ACTUATION INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION AND INSTRUMENT NUMBER	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION	OPERATIONAL CONDITIONS IN WHICH SURVEILLANCE REQUIRED
4. ADS (Continued)				
b. Reactor Vessel Water Level - Low, Level #3				
(B21-LT-N031A,B,C,D)	NA[a]	NA	R[b]	
(B21-LTS-N031A-3,B-3,C-3,D-3)	D	M	M	1, 2, 3
(B21-LTS-N031A-4,B-4,C-4,D-4	D	M	M	
c. ADS Timer (B21-TDPU-K5A,B)	NA	R	R	1, 2, 3
d. Core Spray Pump Discharge Pressure - High (E21-PS-N008A,B and E21-PS-N009A,B)	NA	M	Q	1, 2, 3
e. RHR (LPCI MODE) Pump Discharge Pressure - High (E11-PS-N016A,B,C,D and E11-PS-N020A,B,C,D)	NA	M	Q	1, 2, 3
f. Bus Power Monitor (B21-K1A,B)	NA	R	NA	1, 2, 3

(a) The transmitter channel check is satisfied by the trip unit channel check. A separate transmitter check is not required.

(b) Transmitters are exempted from the monthly channel calibration.

1445 022

TABLE 3.3.5.3-1

POST-ACCIDENT MONITORING INSTRUMENTATION

INSTRUMENT AND INSTRUMENT NUMBER	MINIMUM NO. OF OPERABLE INSTRUMENT CHANNELS
1. Reactor Vessel Water Level (B21-LITS-N026A,B; B21-LR-615; B21-LI-R604A,B; B21-LT-N037 and B21-LTM-N037-1)	2
2. Reactor Vessel Pressure (B21-PI-R004A,B; C32-LPR-R608 and C32-PT-N005A,B)	2
3. Containment Pressure (CAC-PI-2599; CAC-PT-2599; CAC-PR-1257-1 and CAC-PT-1257-1)	2
4. Containment Pressure (CAC-TR-1258-1 thru 13,22,23,24 and C91-P602)	2
5. Suppression Chamber Atmosphere Temperature (CAC-TR-1258-17 thru 20 and C91-P602)	2
6. Suppression Chamber Water Level (CAC-LI-2601-3; CAC-LR-2602; CAC-LT-2601; CAC-LT-2602 and CAC-LY-2601-1)	2
7. Suppression Chamber Water Temperature (CAC-TR-1258-14, 21 and C91-P602)	2
8. Containment Radiation (CAC-AR-1260; CAC-AQH-1260-1,2,3; CAC-AR-1261; CAC-AQH-1261-1,2,3; CAC-AR-1262 and CAC-AQH-1262-1,2,3)	2
9. Containment Oxygen (CAC-AT-1259-2; CAC-AR-1259; CAC-AT-1263-2 and CAC-AR-1263)	2
10. Containment Hydrogen (CAC-AT-1959-1; CAC-AR-1259; CAC-AT-1263-1 and CAC-AR-1263)	2

TABLE 4.3.5.3-1

POST-ACCIDENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT AND INSTRUMENT NUMBER	CHANNEL CHECK	CHANNEL CALIBRATION
1. Reactor Vessel Water Level (B21-LITS-N026A,B; B21-LR-R615; B21-LI-R604A,B; B21-LT-N037 and B21-LTM-N037-1)	M	R
2. Reactor Vessel Pressure (B21-PI-R004A,B; C32-LPR-R608 and C32-PT-N005A,B)	M	R
3. Containment Pressure (CAC-PI-2599; CAC-PT-2599; CAC-PR-1257-1 and CAC-PT-1257-1)	M	R
4. Containment Temperature (CAC-TR-1258-1 thru 13,22,23,24 and C91-P602)	M	R
5. Suppression Chamber Atmosphere Temperature (CAC-TR-1258-17 thru 20 and C91-P602)	M	R
6. Suppression Chamber Water Level (CAC-LI-2601-3; CAC-LR-2602; CAC-LT-2601; CAC-LT-2602 and CAC-LY-2601-1)	M	R
7. Suppression Chamber Water Temperature (CAC-TR-1258-14, 21 and C91-P602)	M	R
8. Containment Radiation (CAC-AR-1260; CAC-AQH-1260-1,2,3; CAC-AR-1261; CAC-AQH-1261-1,2,3; CAC-AR-1262 and CAC-AQH-1262-1,2,3)	M	R
9. Containment Oxygen Concentration (CAC-AT-1259-2; CAC-AR-1259; CAC-AT-1263-2 and CAC-AR-1263)	M	R
10. Containment Hydrogen Concentration (CAC-AT-1259-1; CAC-AR-1259; CAC-AT-1263-1 and CAC-AR-1263)	M	R

TABLE 3.3.6.1-1

ATWS RECIRCULATION PUMP TRIP SYSTEM INSTRUMENTATION

TRIP FUNCTION AND INSTRUMENT NUMBER	MINIMUM NUMBER OPERABLE TRIP SYSTEMS PER OPERATING PUMP
1. Reactor Vessel Water Level - Low Low, Level 2 (B21-LT-N024A-1,B-1 and B21-LT-N025A-1,B-1) B21-LTM-N024A-1,B-1 and B21-LTM-N025A-1,B-1)	1
2. Reactor Vessel Pressure - Low (B21-PS-N045A,B,C,D)	1

1445 025

TABLE 3.3.6.1-2

ATWS RECIRCULATION PUMP TRIP SYSTEM INSTRUMENTATION SETPOINTS

TRIP FUNCTION AND INSTRUMENT NUMBER	TRIP SETPOINT	ALLOWABLE VALUE
1. Reactor Vessel, Water Level - Low low, Level 2 (B21-LTM-N024A-1,B-1 and B21-LTM-N025A-1,B-1)	≥ -38 inches	≥ -38 inches
2. Reactor Vessel Pressure - Low (B21-PS-N045A,B,C,D)	≥1120 psig	≥1120. psig

1445 026

TABLE 4.3.6.1-1

ATWS RECIRCULATION PUMP TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

TRIP FUNCTION AND INSTRUMENT NUMBER	CHANNEL CHECK	CHANNEL FUNCTIONAL TEST	CHANNEL CALIBRATION
1. Reactor Vessel Water Level - Low Low, Level 2			
(B21-LT-N024A-1,B-1; B21-LT-N025A-1,B-1)	NA[a]	NA	R[b]
B21-LTM-N024A-1,B-1; B21-LTM-N025A-1,B-1)	D	M	M
2. Reactor Vessel Pressure - Low (B21-PS-N045A,B,C,D)	NA	M	R

(a) The transmitter channel check is satisfied by the trip unit channel check. A separate transmitter check is not required.

(b) Transmitters are exempted from the monthly channel calibration.

1445 027

SURVEILLANCE REQUIREMENTS (Continued)

d. At least once per 18 months, during shutdown, by verifying that either:

1. The battery capacity is adequate to supply and maintain in OPERABLE status all of the actual emergency loads for 8 hours when the battery is subjected to a battery service test, or

2. The battery capacity is adequate to supply a dummy load of the following profile while maintaining the battery terminal voltage ≥ 105 volts.

a) During the initial 60 seconds of the test;

1) Battery 2A-1 ≥ 1056.42 amperes,
2) Battery 2A-2 ≥ 1211.90 amperes,
3) Battery 2B-1 ≥ 1089.06 amperes, and
4) Battery 2B-2 ≥ 1042.67 amperes.

b) During the remainder of the first 30 minutes of the test;

1) Battery 2A-1 ≥ 243.19 amperes,
2) Battery 2A-2 ≥ 159.10 amperes,
3) Battery 2B-1 ≥ 176.79 amperes, and
4) Battery 2B-2 ≥ 216.67 amperes.

c) During the remainder of the 8 hour test;

1) Battery 2A-1 ≥ 89.52 amperes,
2) Battery 2A-2 ≥ 50.34 amperes,
3) Battery 2B-1 ≥ 53.39 amperes, and
4) Battery 2B-2 ≥ 75.09 amperes.

3. At the completion of either of the above tests, the battery charger shall be demonstrated capable of recharging its battery at a rate of at least 200 amperes while supplying normal D.C. loads. The battery shall be charged to at least 95% capacity in ≤ 24 hours.

e. At least once per 60 months during shutdown by verifying that the battery capacity is at least 80% of the manufacturer's rating when subjected to a performance discharge test. This performance discharge test shall be performed subsequent to the satisfactory completion of the required battery service test and after normal equalizer charge.