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ZIMMERMANN,S.R. Carolina Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION
EISENHUT,D.G. Division of Licensing

SUBJECT: Forwards supplemental info re util 831107 response to Generic Ltr 83-28 concerning shunt trip automatic actuation mod,per util 831107 commitment & NRC 840810 request.

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CP&L
Carolina Power & Light Company
DEC 27 1984

SERIAL: NLS-84-511
NRC TAC# 53191

Mr. Darrell G. Eisenhut, Director
Division of Licensing
United States Nuclear Regulatory Commission
Washington, DC 20555

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/LICENSE NO. DPR-23
ADDITIONAL INFORMATION CONCERNING GENERIC LETTER 83-28

Dear Mr. Eisenhut:

SUMMARY

Carolina Power & Light Company (CP&L) provided our response to Generic Letter 83-28, "Required Actions Based on Generic Implications of Salem ATWS Events," on November 7, 1983. The Company committed to perform a shunt trip automatic actuation modification based on the Westinghouse Owners' Group (WOG) generic design.

DISCUSSION

The NRC issued a Safety Evaluation Report (SER) on the WOG generic design on August 10, 1983. The SER endorsed the proposed design but required further information on a plant specific basis. The Company's November 7, 1983 letter committed to provide the required information upon the completion of the shunt trip modification during our Steam Generator Replacement Outage.

CONCLUSION

The Enclosure to this letter provides the required information. Questions regarding this matter may be referred to Mr. Stephen D. Floyd at (919) 836-6901.

Yours very truly,

S. D. Floyd for

S. R. Zimmerman
Manager
Nuclear Licensing Section

JSK/crs (946JSK)
Enclosure

cc: Mr. J. P. O'Reilly (NRC-RII)
Mr. G. Requa (NRC)
Mr. H. Krug (NRC Resident Inspector - RNP)

A055
1/1

411 Fayetteville Street • P. O. Box 1551 • Raleigh, N. C. 27602

ENCLOSURE

Item 1

"Provide the electrical schematic/elementary diagrams for the reactor trip and bypass breakers showing the undervoltage and shunt coil actuation circuits as well as the breaker control (e.g., closing) circuits, and circuits providing breaker status information/alarms to the control room."

CP&L Response

The following drawings are provided: (1) Reactor Protection System, Sheet 6 of 14, Drawing Number CP-380-5379-3244, revision 8; (2) Control Wiring Diagram, Sheet 45, Drawing Number B-190628, revision 8; (3) Control Wiring Diagram, Sheet 46, Drawing Number B-190628, revision 7; (4) Design to Achieve Isolation Between Channels, FSAR Figure 7.2.1-3; (5) Trip Logic Channels, FSAR Figure 7.2.1-4. The FSAR will be revised in the next FSAR update to include the information on the latter two figures.

Item 2

"Identify the power sources for the shunt trip coils. Verify that they are Class 1E and that all components providing power to the shunt trip circuitry are Class 1E and that any faults within non-Class 1E circuitry will not degrade the shunt trip function. Describe the annunciation/indication provided in the control room upon loss of power to the shunt trip circuits. Also describe the overvoltage protection and/or alarms provided to prevent or alert the operator(s) to an overvoltage condition that could affect both the UV coil and the parallel shunt trip actuation relay."

CP&L Response

The power sources for the H. B. Robinson Unit No. 2 Train "A" and Train "B" reactor trip breaker shunt trip coil are from safety-related 125V DC Panels and its corresponding safety-related batteries. The power sources to both the Train "A" and "B" reactor trip breaker shunt trip coils are Class 1E.

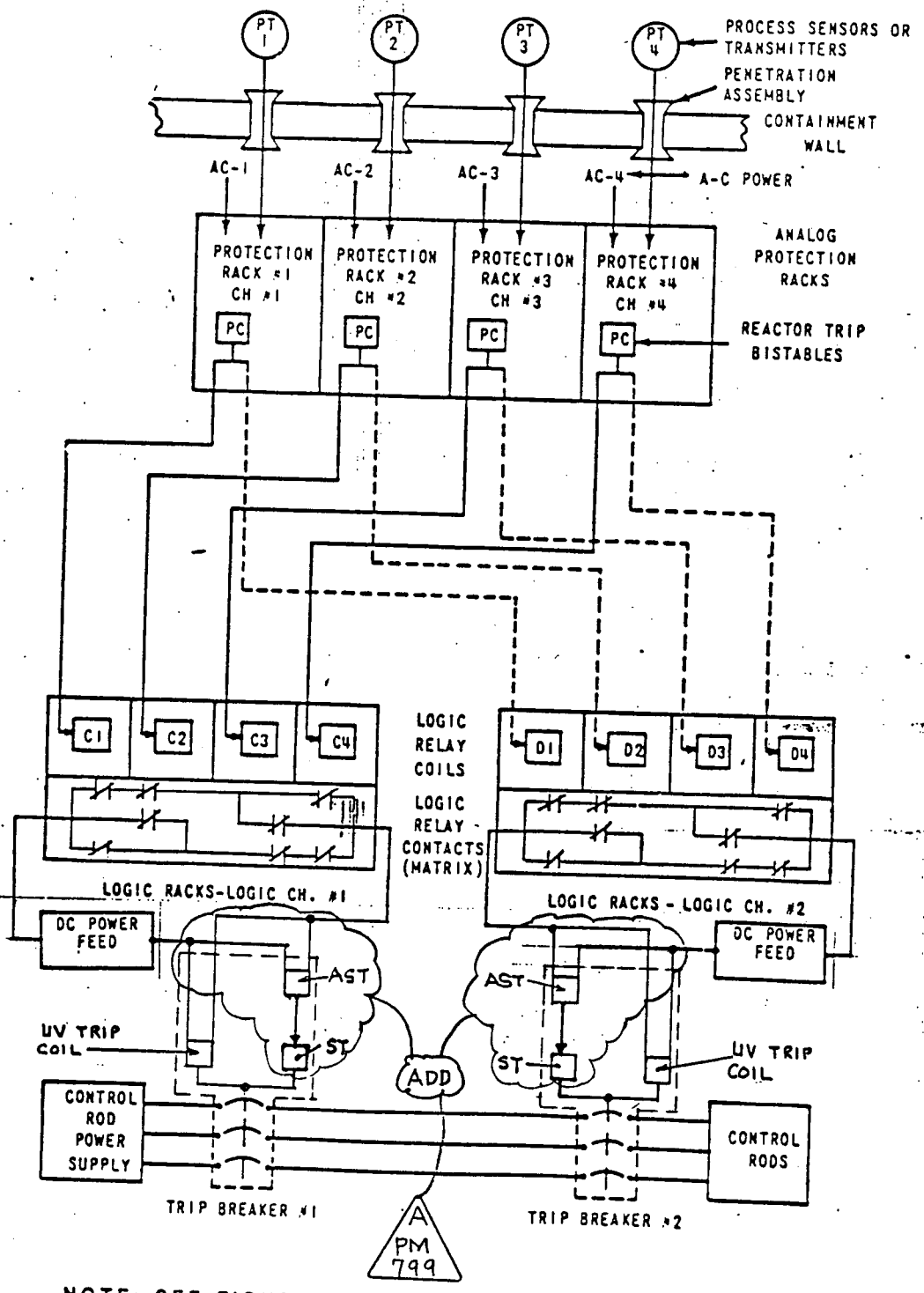
The existing components in the shunt trip circuits are either Class 1E or will not effect the operation of the shunt trip mechanism should they fail. The shunt trip coils are currently being upgraded to Class 1E through the Westinghouse qualification program.

It is not necessary to add new control room indication/annunciation as a result of incorporating the shunt trip modification. Existing indications on the main control board for breaker operation are the red and green position lights.

These lights are powered from the same fused 125V DC supply used for closing the shunt which trips the circuit breakers. A green light indicates that the breaker is open and power is available for closing and tripping the breaker. The red light is connected in series with the shunt trip coil and an "a" auxiliary contact; the red light also indicates that power is available to the shunt trip device and that there is circuit continuity in the shunt trip

NEW

M-799-17
PAGE 11, REV. 0

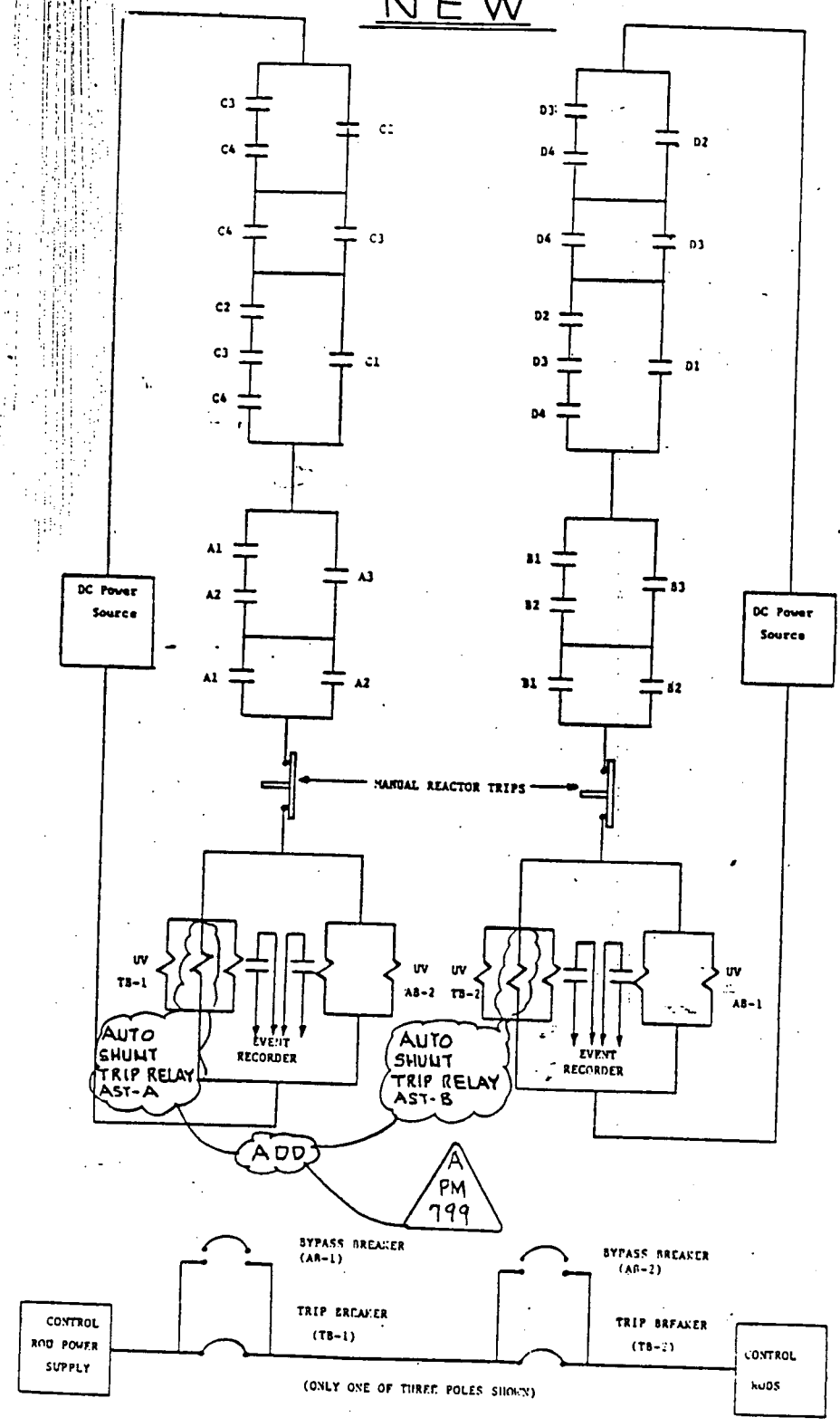


NOTE: SEE FIGURE 7.2.1-12 FOR DEFINITION OF SYMBOLS

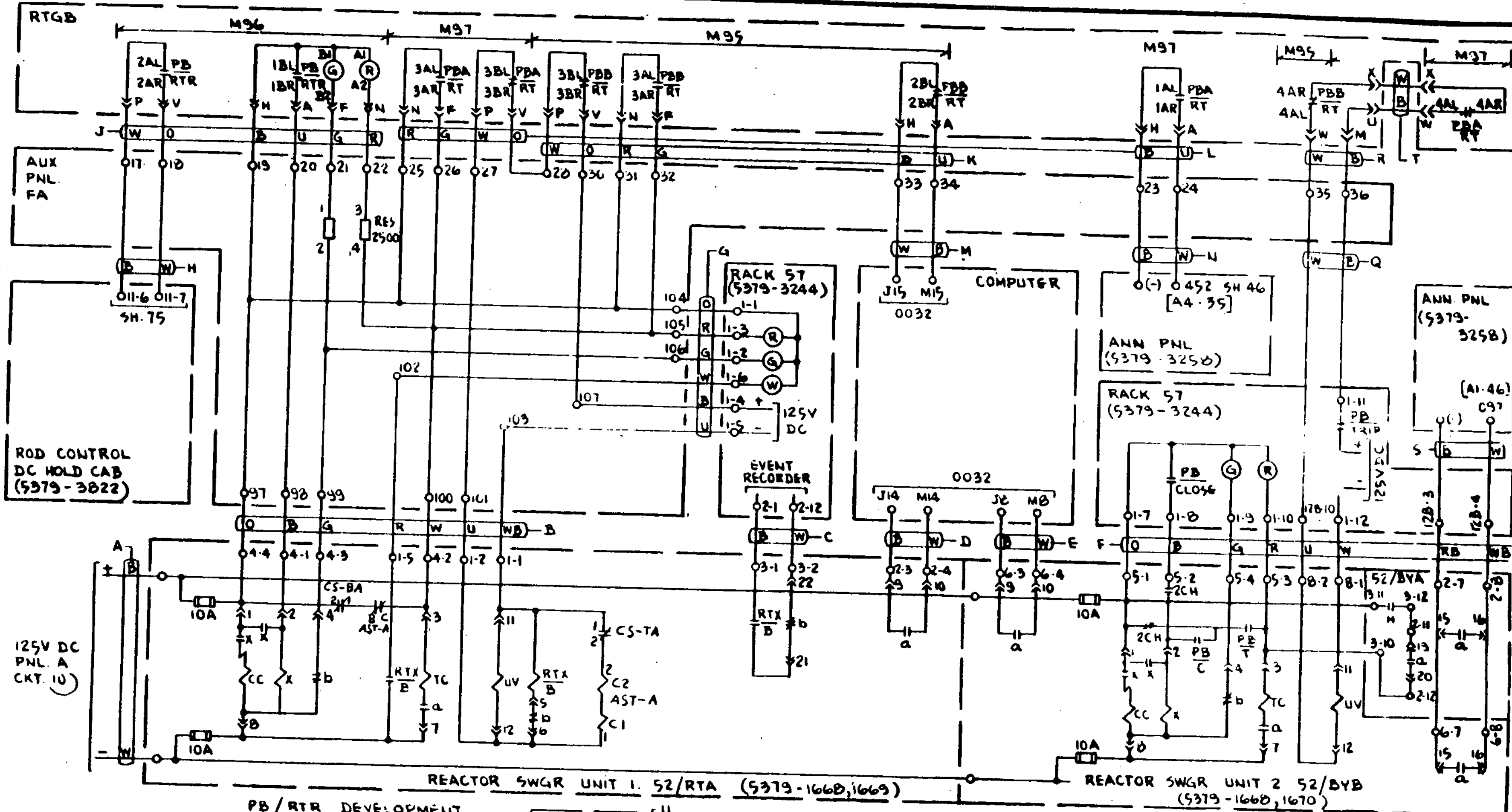
H. B. ROBINSON UNIT 2 Carolina Power & Light Company UPDATED FINAL SAFETY ANALYSIS REPORT	DESIGN TO ACHIEVE ISOLATION BETWEEN CHANNELS	FIGURE 7.2.1 - 3

NEW

M-799-17
PAGE 13, REV. 0



H. B. ROBINSON UNIT 2 Carolina Power & Light Company UPDATED FINAL SAFETY ANALYSIS REPORT	TRIP LOGIC CHANNELS	FIGURE 7.2.1 - 4



CABLE ROUTE I

PB/RTR DEVELOPMENT
DEV. 5 SH 38

PBA/RT & PBB/RT DEV
DEV 6 SH 38

RSS 3325-9 U 6F1 R52
3325-10 6F2 S1HX

	TEST	NORM →
	↖	↗
A	O	X
CS-BA	CS-TA	

KEY OPERATED SWITCHES

REACTOR TRIP BREAKERS
52/RTA & 52/BYB

REV	DATE	BY	APPROVED	REV	DATE	BY	APPROVED
6	[illegible]	GC	RSM	JJF			
5	[illegible]	[illegible]	R.M.	J.C.			
4	[illegible]	GC	F.D.	L.S.			
3	[illegible]	GC	F.D.	L.S.			
2	7-16-79	GC	F.D.	L.S.	8	[illegible]	RSM
1	[illegible]	GC	F.D.	L.S.	7	5-6-84	DH	RSM

No	NOTES	No	NOTES
6			
5			
4			
3			
2			
1		8	Revised per D.R. 84-1063 (Mod. 794)
		7	PER DCR 84-733
		No	REV

VENDOR DRAWING NO
5008452

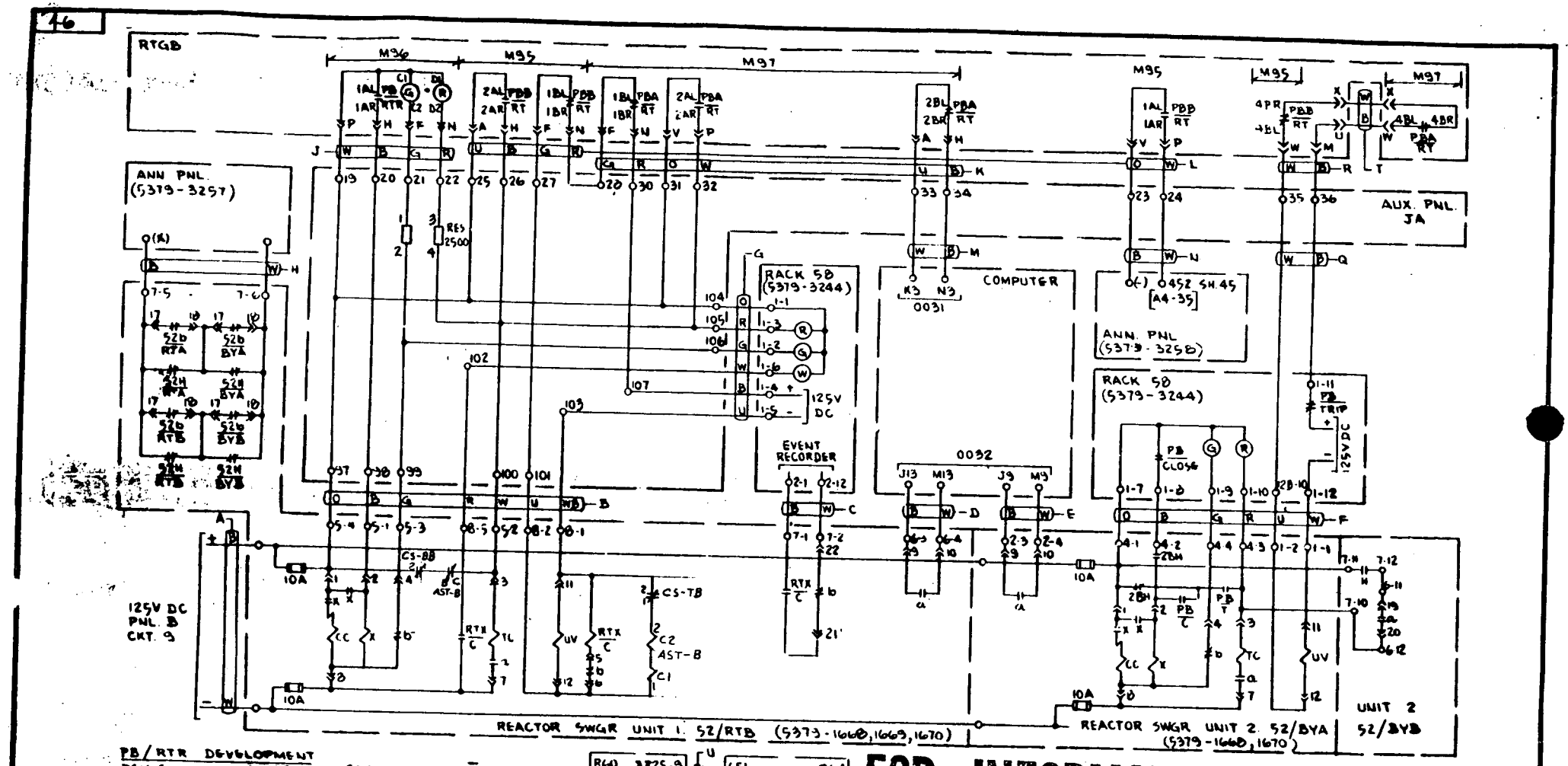
CP&L
Carolina Power & Light Co.
H B ROBINSON S E PLANT
UNIT- NO. 2
Hartsville, South Carolina

Dsgn	W	Scale NONE
Drn	G.C.	Date: 3/31/82
Ck	V.B.	
Appr	[illegible]	

DRAWING TITLE Control Wiring Diagram

DRAWING NO B-190628

SHEET NO 45 Rev. 8



NOTES	
6	PER DCR 84-734
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No.	REV.

NOTES	
7	Revise per DCR 84-1003 & mod 799
No.	REV.

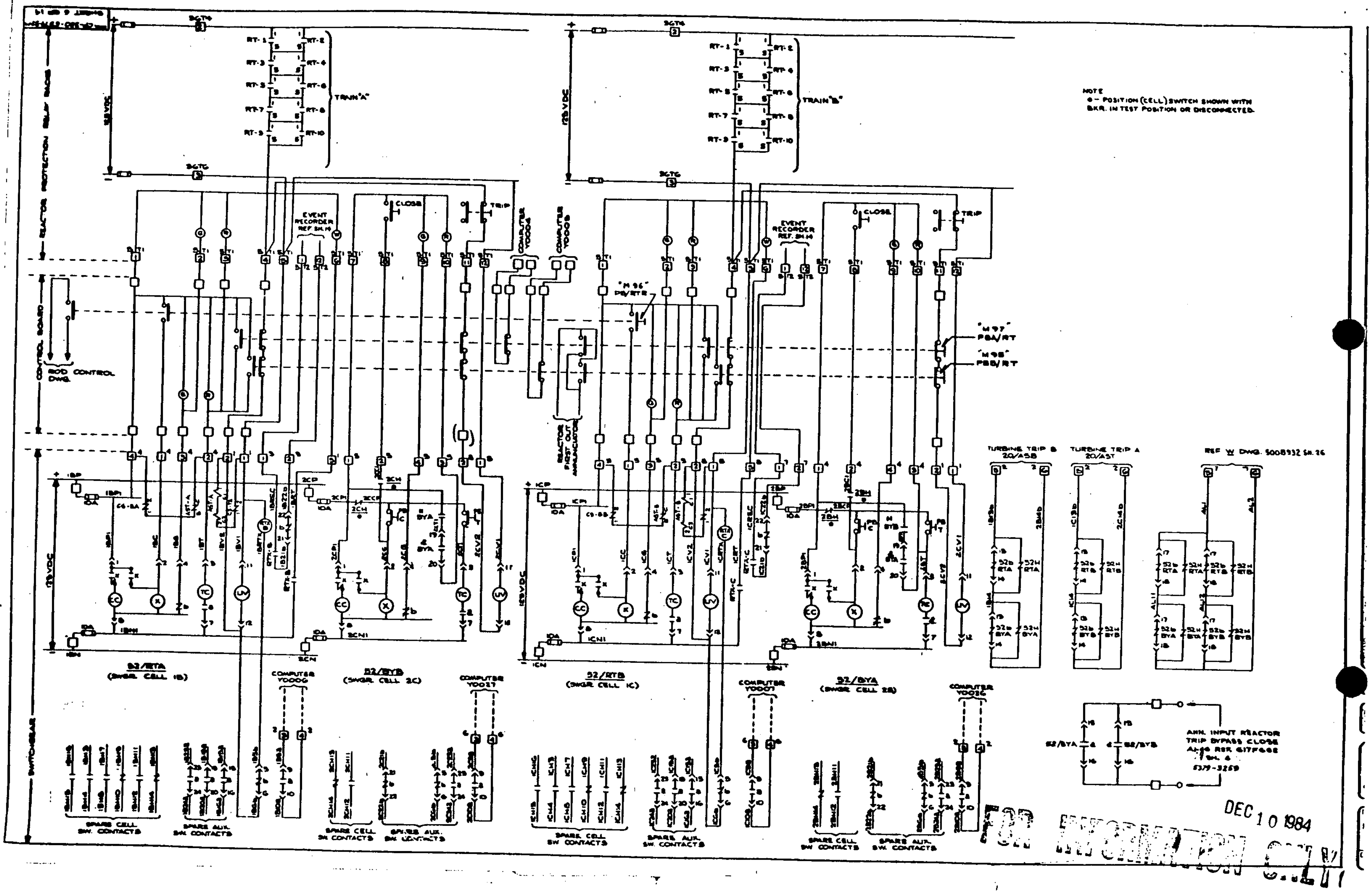
DEV	DATE	BY	APPROVED	REV	DATE	BY	APPROVED
6	[illegible]			7	[illegible]	RSA	[illegible]
5	[illegible]						
4	[illegible]						
3	[illegible]						
2	[illegible]						
1	[illegible]						

VENDOR DRAWING NO. 5008452

Dsgn	Scale NONE
Drn G.C.	Date 3/31/82
Ck RSM	
Appv	

CP&L
Carolina Power & Light Co.
H.B. ROBINSON S.E. PLANT
UNIT- NO. 2
Hartsville, South Carolina

DRAWING TITLE Control Wiring Diagram
DRAWING NO B-190828
SHEET NO 46 Rev 7


NOTE
⊗ – POSITION (CELL) SWITCH SHOWN WITH BKR. IN TEST POSITION OR DISCONNECTED.
TRAIN "A"
TRAIN "B"
125 VDC
EVENT RECORDER REF. SH. 14
CLOSE
TRIP
COMPUTER Y0004
COMPUTER Y0005
"M 96" PB/RTB
"M 97" PBA/RT
"M 98" PBB/RT
REACTOR FIRST OUT ANNUNCIATOR
ROD CONTROL DWG.
CONTROL BOARD
REACTOR PROTECTION RELAY RACKS
SWITCHGEAR
TURBINE TRIP B 20/ASB
TURBINE TRIP A 20/AST
REF W DWG. 5008932 SH. 26
52/RTA (SWGR. CELL 1B)
52/BYB (SWGR. CELL 2C)
52/RTB (SWGR. CELL 1C)
52/BYA (SWGR. CELL 2B)
COMPUTER Y0006
COMPUTER Y0037
COMPUTER Y0007
COMPUTER Y0036
SPARE CELL SW. CONTACTS
SPARE AUX. SW. CONTACTS
ANN. INPUT REACTOR TRIP BYPASS CLOSE
52/BYA
52/BYB
DEC 10 1984
SHEET 6 OF 14

coil. This provides an indication that the shunt trip coil is ready to perform its function when required.

The added shunt trip circuitry is powered from the reactor protection logic voltage supply. Components in the added shunt trip circuitry have been selected based on their ability to perform their intended function up to a voltage as high as approximately 115% of nominal voltage.

The shunt trip coils and associated circuitry in the reactor trip breakers are powered from 125V DC via the station batteries. Since the 125V DC voltage is supplied from the battery system, it may temporarily rise to the battery equalizing voltage (not to exceed 115% of nominal voltage). The overvoltage relay is set at approximately 115% of 125V DC to shut the charger down if the voltage on the battery exceeds the 140V DC level used for equalizing.

Should the overvoltage relay (internal to the battery charger) fail and the voltage exceed the 115% level, the undervoltage trip coil will fail in the safe position (as the coil will open, thus tripping the breaker). The shunt trip coil does not normally see the full 125V DC because it is in series with the red indicating light until called upon to trip. If the shunt trip is energized during an overvoltage condition, the coil will still cause the breaker to open, since it is energized to operate. Should the parallel shunt trip actuation relay fail because of excessive voltage, it will fail to the deenergized state, which will again cause the shunt trip coil to trip the breaker.

Item 3

"Verify that the relays added for the automatic shunt trip function are within the capacity of their associated power supplies and that the relay contacts are adequately sized to accomplish the shunt trip function. If the added relays are other than the Potter & Brumfield MDR series relays recommended by Westinghouse, provide a description of the relays and their design specifications."

CP&L Response

The added relays are Potter & Brumfield MDR series relays. The relay contacts which are rated 0.8 amp at 125V DC are adequately sized for the shunt trip function, and the coil draws 0.082 amp at 125V DC, which is within the capacity of the associated power supplies.

Item 4

"State whether the test procedure/sequence used to independently verify operability of the undervoltage and shunt trip devices in response to an automatic reactor trip signal is identical to the test procedure proposed by the Westinghouse Owners' group (WOG). Identify any differences between the WOG test procedure and the test procedure to be used and provide the rationale/justification for these differences."

CP&L Response

The Generic test procedure proposed by WOG (June 14, 1983 submittal, J. J. Sheppard to Eisenhut, OG-101) was used as a basis to develop the plant-specific test procedure to independently verify operability of the undervoltage and shunt trip devices in response to an automatic shunt trip signal. The functional sequence of the plant surveillance tests agrees with the WOG recommended test with no deviations.

Item 5

"Verify that the circuitry used to implement the automatic shunt trip function is Class IE (safety-related), and that the procurement, installation, operation, testing, and maintenance of this circuitry will be in accordance with the quality assurance criteria set forth in Appendix B to 10 CFR 50".

CP&L Response

The relays and test switches are installed in a mild environment. IEEE Standard 323-1983 states that in a mild environment "seismic is the only design basis event (DBE) of consequence". Therefore, as CP&L will seismically qualify the relays and test switches, the circuitry used to implement the automatic shunt trip will be Class 1E. The procurement, installation, operations, testing, and maintenance of the circuitry is in accordance with the quality assurance criteria set forth in Appendix B to 10 CFR 50.

Item 6

"Verify that the shunt trip attachments and associated circuitry are/will be seismically qualified (i.e., be demonstrated to be operable during and after a seismic event) in accordance with the provisions of Regulatory Guide 1.100, Revision 1, which endorses IEEE Standard 344, and that all nonsafety-related circuitry/components in physical proximity to or associated with the automatic shunt trip function will not degrade this function during or after a seismic event."

CP&L Response

Carolina Power & Light Company has qualified the MDR series automatic shunt trip relays and the test selector switches in accordance with the HBR2 seismic criteria set forth in our updated FSAR. The Westinghouse Owners' Group (WOG) is working with Westinghouse to obtain seismic qualification of the shunt trip attachments. Upon completion of the WOG qualification program, CP&L will review the results and will take appropriate action. The NRC, in its letter of August 10, 1983 to the WOG states that "installation of the automatic shunt trip modification need not be delayed pending completion of the seismic qualification testing". The only nonsafety-related component in the reactor trip breaker switchgear is the shunt trip attachment, and that is being upgraded to safety-related. There will not be any nonsafety-related circuitry/components in the physical proximity to, or associated with, the automatic shunt trip function to degrade this function during or after a seismic event.

(946JSK/crs)

Item 7

"Verify that the components used to accomplish the automatic shunt trip function are designed for the environment where they are located."

CP&L Response

The relays and test switches are installed in the reactor trip breaker switchgear which is located in the south cable vault of the auxiliary building, at elevation 226' 0" above sea level. This is a mild environment with the following parameters:

Temperature: 70° to 105°F
Humidity: 50% to 90%
No radiation

These conditions are enveloped by Table 1, "Normal and Abnormal Operating Conditions" of the WOG Generic Design Package.

Item 8

"Describe the physical separation provided between the circuits used to manually initiate the shunt trip attachments of the redundant reactor trip breakers. If physical separation is not maintained between these circuits, demonstrate that faults within these circuits can not degrade both redundant trains."

CP&L Response

There is physical separation between the Train "A" and "B" circuits used to manually initiate a shunt trip. At the main control board the Train "A" and Train "B" signals are in separate metal braid enclosed cables. The cables are then routed in separate Train "A" or "B" cable trays. At the switch gear, the relay compartment has a metal barrier between the Train "A" side and the Train "B" side.

Item 9

"Verify that the operability of the control room manual reactor trip switch contacts and wiring will be adequately tested prior to startup after each refueling outage. Verify that the test procedure used will not involve installing jumpers, lifting leads, or pulling fuses and identify any deviations from the WOG procedure. Permanently installed test connections (i.e., to allow connection of a voltmeter) are acceptable."

CP&L Response

Carolina Power & Light Company has developed a maintenance surveillance test procedure in which the operability of the control room manual reactor trip switch contacts and wiring are tested at refueling intervals. HBR2 control room has two (2) manual reactor trip pushbuttons located on the Reactor Turbine Generator Board (RTGB).

(946JSK/crs)

The recommended WOG methodology is applied in testing of the Undervoltage trip attachments (UV coil voltage). The normally closed contacts of the RTGB pushbuttons used to open the UV coils circuit for both the reactor trip breakers and bypass breakers are tested by monitoring the voltage across the UV coil, while operating each pushbutton individually. Upon operation of each pushbutton; the voltage drop to zero across each undervoltage coil is verified.

The recommended WOG methodology of monitoring the voltage across the shunt trip coils is not performed, but the shunt trip coils are functionally tested. Each manual pushbutton is tested with the UVTA trip function blocked, and tripping of the reactor trip breakers and bypass breakers are verified during the test. Therefore, CP&L believes this functional test demonstrates the operability of the shunt trip attachments and is acceptable.

The current HBR2 test procedure does not utilize permanently installed test connectors but jumpers are used between the terminals to block the reactor trip conditions and to keep the undervoltage trip device energized during the test. These jumpers are necessary in order to independently check the signals and functions of the undervoltage trip attachment (UVTA) and shunt trip attachment (STA). Although the jumpers are used, CP&L believes the current administrative controls in the test procedure are adequate for controlled usage of the jumpers. Appropriate precautions and verifications are identified in the procedure, whereby, prior to the removal of the wiring or attaching of the jumpers, positive wire and terminations are identified. In addition, two (2) signoffs are required in the procedure for verification when the jumpers are removed between the terminations.

Therefore, CP&L believes the current test procedure utilizing the jumpers between terminals in conjunction with administrative controls is adequate, obviating permanently installed test connection.

Item 10

"Verify that each bypass breaker will be tested to demonstrate its operability prior to placing it into service for reactor trip breaker testing."

CP&L Response

HBR2's current surveillance test verifies each bypass breaker is operable prior to placing it into service for reactor trip breaker testing.

Item 11

"Verify that the test procedure used to determine reactor trip breaker operability will also demonstrate proper operation of the associated control room indication/annunciation.

CP&L Response

The breaker red (closed) and green (open) lights on the RTGB provide indication that the shunt trip circuit is ready to perform its function when required. The current procedure for the testing of the automatic shunt trip and undervoltage trip also shows that these lights are operating correctly.

(946JSK/crs)

Item 12

"Verify that the response time of the automatic shunt trip feature will be tested periodically and shown to be less than or equal to that assumed in the FSAR analyses or that specified in the technical specifications.

CP&L Response

HBR2 currently measures the opening times of both reactor trip and bypass breakers as part of the preventive maintenance program at refueling intervals. The response time of the UVTAs are measured to verify that the response time is not greater than 167 milliseconds, per the Westinghouse Specification. The response time of the STA's are not currently being tested as part of the maintenance program. Upon final completion of the WOG life cycle testing of the STAs and UVTAs, CP&L will evaluate the results and determine, as applicable, necessary revisions to the maintenance program. In the interim, CP&L has incorporated the replacement of the UVTAs on every third refueling cycle.

Item 13

"Propose technical specification changes to require periodic testing of the undervoltage and shunt trip functions and the manual reactor trip switch contacts and wiring."

CP&L Response

Carolina Power & Light Company believes on-line testing of automatic shunt trip and undervoltage trip is currently addressed in our Technical Specifications, Table 4.1-1, item 30. The Technical Specifications address monthly testing of control rod drive trip breakers in which the testing of the automatic shunt trip and undervoltage test is performed. In addition, testing is performed during an annual maintenance surveillance test and prior to starting up from an outage in which the monthly interval test cannot be performed.

The maintenance surveillance test of the manual reactor trip switch contacts and wiring are performed at refueling intervals as discussed in our response to Question 9. Carolina Power & Light Company believes our current administrative requirement to perform the test on a refueling interval is adequate and no additional Technical Specification requirement is necessary.

(946JSK/crs)