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ZWOLINSKI,J.A. Operating Reactors Branch 5

SUBJECT: Forwards addl info re design mod to reactor trip breakers & review of implications of ATWS events,per Generic Ltr 83-28. W/two oversize drawings.Aperture cards available in PDR.

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March 19, 1985

Director of Nuclear Reactor Regulation
Attention: Mr. John A. Zwolinski, Chief
Operating Reactors Branch No. 5
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Supplemental Information to RG&E letter
In response to Generic letter 83-28 dated/November 4, 1983
R. E. Ginna Nuclear Power Plant
Docket No. 50-244

Dear Mr. Zwolinski:

This letter is in response to your office's request for additional design information specific to Rochester Gas and Electric's design modification to the reactor trip breakers at Ginna Station.

Attachment A is enclosed which addresses the thirteen (13) specific requests for information associated with your review of Ginna Station's Required Actions based on Generic Implications of Salem ATWS Events.

Very truly yours,

Roger W. Kober

Roger W. Kober

Enclosures

DRAWINGS TO:
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Ginna Station
Additional Information
on
Shunt Trip Modification

ITEM 1 - Request for Drawings: "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."

Response: Attached to this letter please find 3 copies of RG&E drawing 33013-673 sheets 1 and 2 which are the Control Schematics for the reactor trip (RT) and bypass breakers. These drawings detail all the automatic trip features along with closing circuits and all local and remote status indication.

ITEM 2 - Verify that the sources used for the Shunt Trip Coils

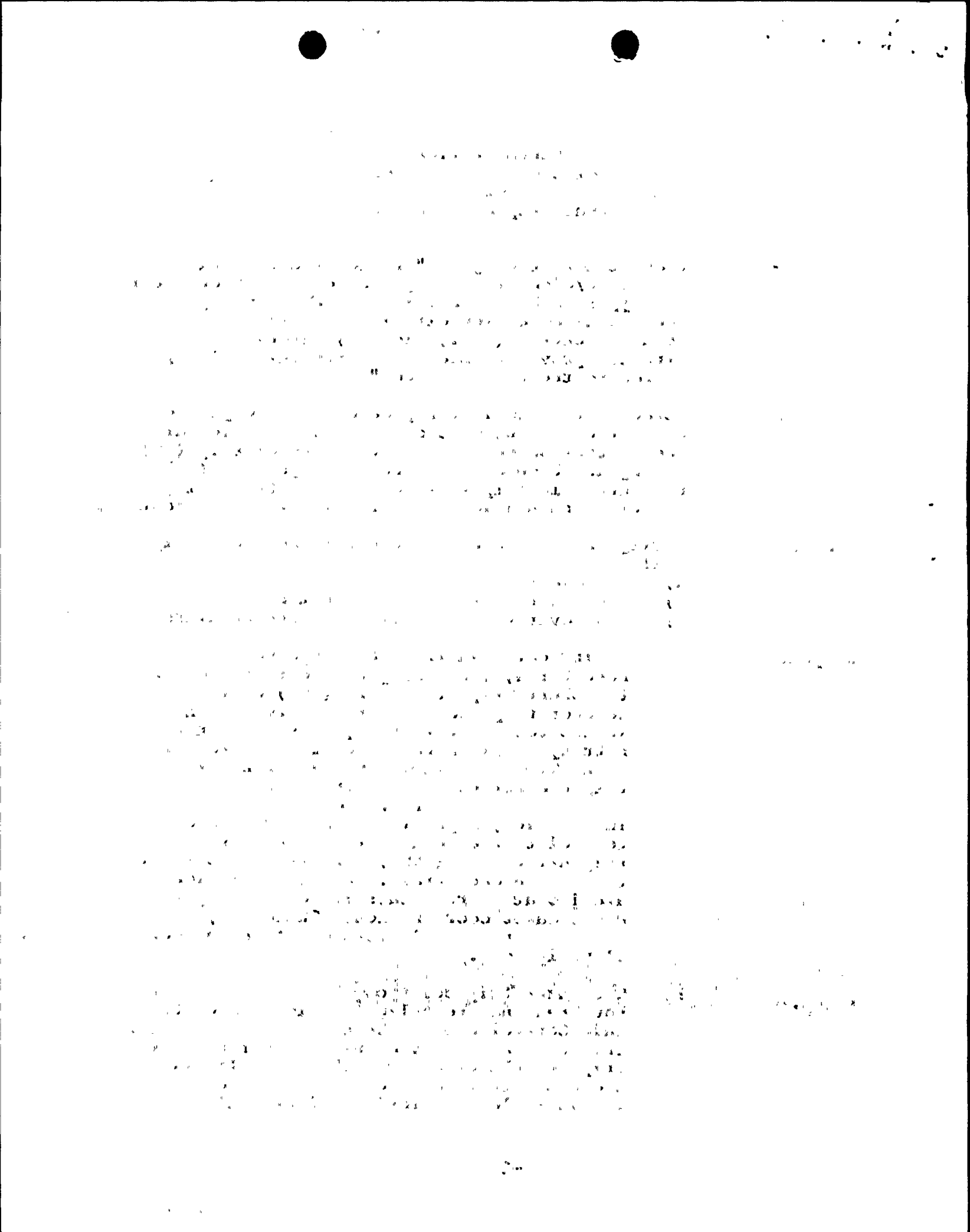
a) are Class 1E
b) have annunciation and indication
c) have over voltage protection and/or alarm

Response:

a) As indicated in the RG&E response dated November 4, 1983 the power sources used on the Shunt Trip Attachment (STA) on the two reactor trip breakers are the two Class 1E 125 volt dc battery systems. Train A battery supplies the reactor trip breaker A and Train B battery supplies reactor trip breaker B.

In addition, separate dc fuses are used to isolate the dc feed to the undervoltage trip attachment (UVTA) from the dc source to the STA on each train. Non Class 1E loads are isolated from Class 1E loads using fuse and breaker coordination. Therefore, a faulted non Class 1E load would not affect a Class 1E load.

b) The shunt trip coils on the RT breakers have both red and green light indication on the Main Control Board. These lights are powered from the same 125 VDC fuses used for shunt tripping the breakers. The green light indicates that the breaker is open and power is available for closing and tripping the



breaker. The red light indicates that the breaker is closed. The red light is connected in series with the shunt trip coil and an "a" auxiliary contact which indicates that power is available to the shunt trip device. It also indicates that there is circuit continuity to the shunt trip device and that there is circuit continuity in the shunt trip coil assembly. This combination of lights provides an adequate assurance that the shunt trip coils are ready to perform their function when required. Therefore, it will not be necessary to add new control room indication/ annunciation due to the shunt trip modification.

c) The control circuits used on the UVTA and the proposed STA are from the two Class 1E dc systems. Each Class 1E battery system has a dc monitoring system which is set to alarm as close as practical to 115% of 125 volts. The normal dc voltage system at Ginna operates at 132 volts continuously. However, a maximum sustained voltage equal to 140 volts occurs when a battery system is on an "Equalization Charge". The STA and UVTA coils are rated for a maximum dc voltage of 115% of its 125 volt dc rating which is higher than the maximum expected voltage. Since the coil ratings are higher than the maximum source voltage, no additional overvoltage protection is required.

ITEM 3 - Request for Information on Added Relays

Response: The proposed Ginna Station modification does not require the addition of a relay to operate the STA. As discussed in the November 4, 1983 submission, a reverse logic will be formed using spare contacts on the RT relays. This logic will automatically operate the STA.

ITEM 4 - Description of the Ginna Test procedure
a) Is it identical to the WOG procedure
b) Identify and discuss any differences

Response: Ginna Station Test procedures will be developed to perform both preoperational testing (a modification acceptance test) and periodic surveillance testing on the Reactor Trip breaker systems. The procedures will not be identical to the Westinghouse Owners Group (WOG) generic procedure as described in section 4.4 of the letter identified in reference 2.0. As stated in the WOG procedure, each utility is required to develop plant specific procedures

from the general guidance provided. The Ginna procedure format is significantly different from the suggested procedure.

In addition, the proposed shunt trip modification at Ginna differs from the Westinghouse generic approach in that it does not require auxiliary relays or test switches.

The Ginna procedures will be used to independently verify the ability of the shunt trip and undervoltage trip attachments to automatically trip the reactor trip breakers consistent with the intent of the WOG procedure. The only significant deviation from the intent of the WOG procedure is "on-line" testing. The preoperational testing of the installed diverse tripping attachments on the reactor trip system will be performed as if the plant were on-line. An intention of this test is to fully demonstrate that on-line testing can be performed if necessary or desireable. In light of the desire to minimize the possibility of unplanned on-line trips, this preoperational test will be performed off-line.

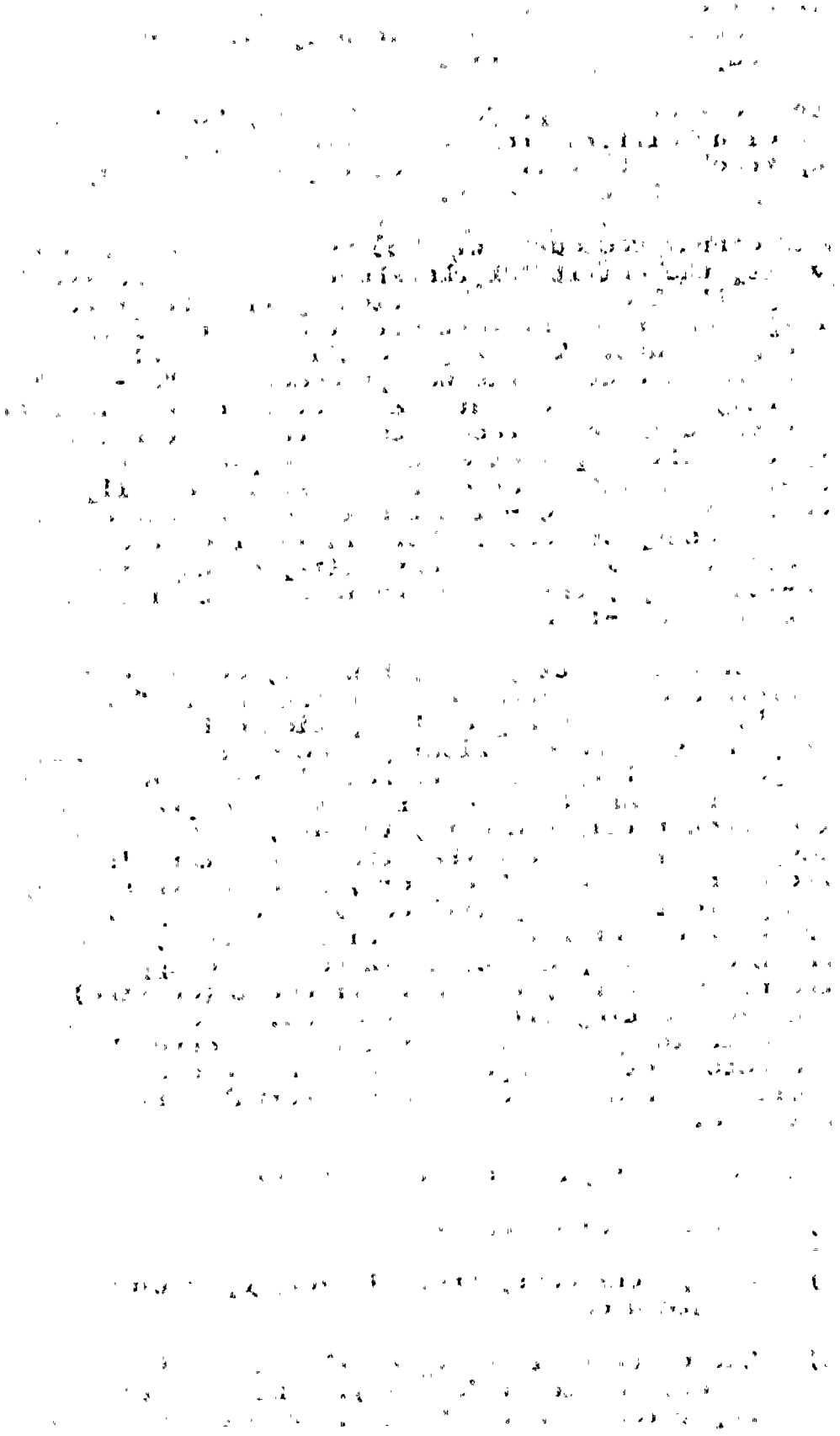
The periodic testing will, however, continue to be performed on an annual or refueling basis "off line". The frequency of the periodic testing program is based on existing reactor trip breaker response history. The breaker clearing times will be recorded and trended for signs of degradation. The reactor trip breakers, to date, have exhibited response times faster than the manufacturer's recommended value. Therefore, based on this data, the periodic testing will continue to be performed on an annual or refueling basis. However, should the breaker response times increase and approach the maximum value, then more frequent (on line) function testing will be performed. The maximum valve is 10 cycles and should the as found RT breakers exhibit response times that exceed 8 cycles, then a six month test interval will be followed.

ITEM 5 - Additional Design information concerning:

a) STA control circuitry

b) STA procurement, installation, operation and maintenance

Response: a) The control circuitry on the STA coils is safety related (Class 1E). The STA wiring is separated from the UVTA wiring within the RPS



relay cabinets and on the breaker assemblies. Physical separation is used to the extent practical given the existing plant configuration. The existing control wiring between the RT breakers and the Reactor Protection System (RPS) logic cabinets are routed in dedicated conduit so as to afford train separation.

In addition, a teflon shield will be used on the STA control wiring within the RPS rack and on the breaker assemblies. The shield will afford additional mechanical protection to the wiring.

b) The proposed STA was procurred from Westinghouse and was suitable for reactor trip breaker use. All activity associated with the procurement, installation, operation, testing and maintenance has been using Ginna Station procedures which are consistent with the criteria set forth in Appendix B to 10CFR Part 50. The RG&E submittal of November 4, 1983 verifies that the added Class 1E circuitry is designated as Class 1E in Appendix A to the Ginna Quality Assurance Manual.

ITEM 6 - Seismic Qualification

"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 non-safety 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."

Response: The RG&E design does not add new components which would require a new seismic qualification test program for the breakers. The new STA's are identical to the original STA's except that Westinghouse has "base line" data on their manufacture and test. The new STA's are being seismically qualified to IEEE 344-1974 under the Westinghouse Owners Group (WOG) program.

ITEM 7 - Environmental Qualification

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

Response: The STA are being qualified to a non harsh environment at an ambient temperature of 120°F. The intermediate building, where the RT breakers are located, has a maximum accident temperature based on a postulated high energy line break of 215°F. Based on the documentation submitted to the NRC in support of the qualification of the reactor trip breakers, Reference 1.0, RG&E has determined that this equipment would be able to perform its safety function as required following a high energy line break.

ITEM 8 - Separation

"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."

Response: The components, cabling, and panel wiring for the UV and shunt trip circuitry are redundant ("A" and "B" Trains). The circuitry of each redundant safety-related Class 1E train is train aligned and physically separated. Each of the two manual reactor trip switches actuates both UV and shunt trip coils for both trains of protection. The wires associated with each switch are separated to the maximum extent possible in the Main Control Board. A fault on any one control circuit will not degrade both redundant trains.

ITEM 9 - Test Procedure of Control Board Manual Switches

"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."

Response: Normally closed contacts on the Reactor Emergency Trip Switches, located in the Main Control Board (MCB) trip both the RT breakers and the bypass breakers by deenergizing the UVTA devices through two sets of auxiliary relays.

Both manual trip switches will be tested prior to startup after each refueling outage. The test

will monitor the voltage across the UVTA coils using the existing neon lights on the RT breaker enclosures. Each switch will be operated and the operation of the auxiliary relays, the RT relays and the deenergization of the UV coil will be verified. The UV coil deenergization will be verfied using the neon light without adding jumpers or lifting leads.

In a similar manner the normally-open contacts of the MCB switches used to enerize the Shunt Trip coil for both the trip breakers and bypass breakers will be tested by monitoring the voltage across the combination of the Shunt Trip coil and the series connected 52a auxiliary switch contact. Upon operation of each switch, it will be verified that the voltage goes to 125 VDC. A voltmeter may be connected across this combination at the field terminals of the RT switchgear without adding jumpers or lifting leads.

These tests may be performed without cycling of the breakers.

Item 10 - Bypass Breaker Testing

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

Response: Bypass Breaker Testing - The bypass breaker at Ginna Station will undergo a function test, on an annual basis, during the RPS logic test. The RPS logic test procedure will be modified to include a bypass breaker UVTA Test. The bypass breaker test will insure operability should it be required during on-line operation to test the RT breakers.

Item 11 - Reactor Trip Breaker Operability and Indication Test Procedure

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

Response: The existing test procedures used to demonstrate operability of the undervoltage and shunt trip devices include verification of the proper operation of the associated control room indication.

Item 12 - Response Time Testing

"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."

Response: RG&E is participating in and supporting the WOG testing of the shunt trip attachment, including life cycle testing. As a minimum, response time testing of each RT breaker will be performed each refueling outage. More frequent periodic online testing of breaker response time would be considered if life cycle testing shows that breaker trip response time degrades with operation. The acceptance criteria will be consistant with the maximum value assumed in the Ginna Station accident analysis. Specifically, test values will be compared and trended to the upper limit of 10 cycles. Ginna Station Maintenance Procedures will be used to test and trend:

a) the dropout voltage on the UVTA

b) the mechanical force needed to operate the tripper bar

c) RT breaker insulation resistance

Item 13 - Technical Specification Changes

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

Response: Technical Specification Changes - A review of existing testing intervals identified no requirements for changes. Results of the Technical Specification Optimization Program being performed by the Westinghouse Owners Group may be used to justify changes in the future.

References:

1.0 Letter Maier to Crutchfield, dated November 6, 1984 subject: Environmental Qualification of Electrical Equipment

2.0 Westinghouse Owners Group letter OG101 dated June 14, 1983. J.J. Sheppard, Chairman, WOG, to D.G. Eisenhut, USNRC.