Georgia Power Company
333 Piedmont Avenue
Atlanta, Georgia 30308
Telephone 404 526-6526

Mailing Address
Post Office Box 4545
Atlanta, Georgia 30302

Georgia Power
the southern electric system

G. F. Head
Vice President and General Manager
Fossil and Hydro Generation

May 18, 1981



Director of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

NRC DOCKETS 50-321, 50-366
OPERATING LICENSES DPR-57, NPF-5
EDWIN I. HATCH NUCLEAR PLANT UNITS 1, 2
SUPPLEMENTAL RESPONSE TO 10 CFR 50.48 AND APPENDIX R

Gentlemen:

Georgia Power Company hereby submits the information requested in Enclosure 1 Section 8 of the NRC's letter dated February 20, 1981. The enclosed information addresses NRC concerns with the remote shutdown system and supplements the general system description submitted with our March 19, 1981, letter to the NRC on 10 CFR 50.48 and Appendix R.

Should you have any questions or comments with regard to this submittal, please contact this office.

G. F. Head states that he is Vice President of Georgia Power Company and is authorized to execute this oath on behalf of Georgia Power Company, and that to the best of his knowledge and belief the facts set forth in this letter are true.

GEORGIA POWER COMPANY

By: G. F. Head
G. F. Head

Sworn to and subscribed before me this 18th day of May, 1981.

Mae H. Battle
Notary Public

Notary Public, Georgia, State at Large
My Commission Expires Sept. 20, 1983

WEB/mb

Enclosure

xc: M. Manry
R. F. Rogers, III

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RESPONSE TO ENCLOSURE 1 SECTION 8

OF THE

U.S.N.R.C. FEBRUARY 20, 1981 LETTER

ON THE SUBJECT OF

FIRE PROTECTION RULE 45 FR 76602, NOV. 19, 1980

(Generic Letter 81-12)

(a)

## UNIT 1 AND 2 RESPONSE

A description of the Remote Shutdown System for Units 1 and 2 has been submitted to the U.S.N.R.C. in Georgia Power Company's March 19, 1981 response to 10 CFR 50.48 and Appendix R. The system description is of an existing system. Any modifications to this existing system as a result of Georgia Power's ongoing review of the "Protection Of Safe Shutdown Equipment" will be presented on or before March 19, 1982. This commitment was made in Section IV of Georgia Power's March 19, 1981 response to the U.S.N.R.C. on 10 CFR 50.48 and Appendix R.

(b) UNIT 1 AND 2 RESPONSE

Elementary drawings H-27970 thru H-27980 for Unit 2, and H-19610 thru H-19614 plus H-19572 and H-19573 are attached. These elementary drawings show the remote (alternate) control portion of one train of shutdown equipment. These same elementary drawings reference the particular elementary drawings, also attached, which show the normal (main control room) control portion of this same train of shutdown equipment. Also shown are those portions of the control circuits which are common to both remote and normal shutdown control. These circuits are common because they do not pass through the Fire Area which is hereby defined as the Cable Spreading and Main Control Room. Furthermore, the elementary drawings show that portion of the shutdown system which is "dedicated". This dedicated portion, generally instrumentation, is related only to remote shutdown, and as such, is not involved with the fire area.

Power circuits, either 600 VAC or 250 VDC for motor operated valves and small pumps or 4160 VAC for large pumps, are also shown on the elementary drawings. These power circuits are common to the remote and normal shutdown systems and are not involved with the fire area. These circuits are routed from the electrical busses directly to the shutdown components, both of which are not in the fire area. By explicit design practice these power cables are not permitted in the cable spreading or main control room.

Control power circuits, both 120 VAC and 125 VDC, are also shown on the elementary drawings. These circuits are routed from the distribution power panels directly to the remote shutdown panels both of which are not in the fire area.

Section b also requests that the location of components and the wiring in and out of the fire area be submitted. In compliance with that request the following materials are attached. Note that each of the material packages is packaged and identified as follows:

A - ELEMENTARY DRAWINGS UNIT 1
B - ELEMENTARY DRAWINGS UNIT 2
C - PHYSICAL RACEWAY DRAWINGS UNIT 1
D - PHYSICAL RACEWAY DRAWINGS UNIT 2
E - ELECTRICAL CIRCUIT SCHEDULES UNIT 1
F - ELECTRICAL CIRCUIT SCHEDULES UNIT 2
G - SUPPLEMENTAL CIRCUIT AND RACEWAY DATA UNIT 1
H - SUPPLEMENTAL CIRCUIT AND RACEWAY DATA UNIT 2
I - BLOCK DIAGRAMS UNIT 2 (Unit 1 block diagrams are either included in A or were not used in design.)

The following is a general discussion of how the above listed material can be used to locate components, and wiring in or out of the fire area.

The first step, using package A and B, is to locate the elementary diagram of both the normal and remote portions of a particular shutdown component such as a motor operated valve or pump. Next, all the circuit (cable) numbers on the elementary diagram are identified. Note that the circuit numbers

for Unit 1 are found on the elementary drawings package A, and the circuit numbers for Unit 2 are found in package I. Following this, the electrical circuit schedule, package E and F are referenced. These documents identify the cable number, the "from and to" ends of the cable, and most importantly the raceway in which the cable is routed. Finally, the physical raceway drawings, packages C and D are referenced as to the particular location of the raceway in the plant relative to the fire area. Note that packages G and H, supplemental circuit and raceway data, can be used to locate all the remote shutdown circuits in a particular raceway as well as the particular drawing associated with each raceway.

As an additional aid in using the attached packages, the following is added:

1. Each cable number on the elementary or block diagram related to the shutdown components is highlighted in yellow. Additionally, a code is assigned to each cable. This code, made expressly for this review is as follows:

    1 - Control or control power cable that does not enter fire area.
    2 - Cable enters fire area but is switched out of control circuit upon actuation of the transfer switch. This includes either switching out the particular cable, or "effectively" switching out the cable by switching out another of the shutdown cables.
    3 - Cable does enter fire area but does not affect remote shutdown. For example, an annunciator cable associated with the main control room.
    4 - Power cables, either 600 VAC, 250 VDC, or 480 VAC, which do not enter the fire area. These cables are not identified in the submitted circuit and raceway packages because by design they are excluded from the cable spreading and control room.

2. Each cable number on the electrical circuit schedules, related to this review, is highlighted in yellow and assigned a code as as explained above.

3. Each raceway that contains cables related to this review is highlighted in yellow on the physical raceway drawings. Additionally, each shutdown component is this review and the cable spreading and control room are highlighted in yellow on the physical raceway drawings.

(c) UNIT 2 RESPONSE

In addition to the quality and seismic classification and system analysis provided in the FSAR, the following is included to demonstrate that the interface between the Remote Shutdown System and other safety systems does not degrade those other safety systems.

The interfaces between the Remote Shutdown System and other safety systems is by way of manual transfer switches. These transfer switches are located on Remote Shutdown Panels 2C82-P001 and 2H21-P173. Access to these panels and hence access to the transfer switches is administratively controlled. Specifically, both remote shutdown panels are located in a locked metal partition. Furthermore, each transfer switch is wired to an annunciator located in the Main Control Room. This annunciator will alarm if any of the transfer switches are in the emergency position. Additionally, the Main Control Room indicating lights for any component, that is interfaced with the Remote Shutdown System, will go out if its respective transfer switch is in the emergency position. Thus, the Main Control Room operators are at all times aware of the position of the transfer switches.

All of the transfer switches are General Electric type SB-1 manufactured and tested to the same quality standards as any of the switches on other safety systems. Furthermore, the environmental qualifications of these switches have been thoroughly reviewed as part of NRC IE Bulletin 79-01B. Reference to Georgia Power's "Response To IE Bulletin 79-01B" Volume 2 Section C.2.2.2 Sheet 11, Section C.2.2.7 Sheet 20, and Section C.2.2.10 Sheet 19 will show that all environmental considerations have been favorably addressed.

The Remote Shutdown Panels and the transfer switches have appropriate seismic qualification. In addition to the analyses provided in the FSAR, two additional seismic reports are available for review and are identified as follows:

1. Seismic Analysis Of 2H21-P173 Panel - Access Number SX-28813
2. Seismic Qualification Summary Remote Shutdown Vertical Board - Access Number SX-24095 (includes SB-1 Switches)

The Remote Shutdown transfer switches are interfaced with other safety systems in such a manner as to comply with the Single Failure Criterion. Specifically, any failure of a single transfer switch does not jeopardize a Class 1E safety function. This is readily apparent by examining the elementary, wiring, and physical layout drawings

of the Remote Shutdown System. Note that no one transfer switch is associated with more than one safety division. Furthermore, note that each Class 1E division (wiring and individual components) are enclosed in seperate panels or in seperate bays of a panel completely isolated from other bays by metallic barriers.

## UNIT 1 RESPONSE

The Unit 1 Remote Shutdown System did not initially include transfer switches but Ammendment 3 of February 1978 to the "Evaluation Of The Hatch Nuclear Plant Fire Protection Program" committed Georgia Power to add interfacing transfer switches similar to the Unit 2 design. The following is included to demonstrate that the interface between the Remote Shutdown System and other safety systems does not degrade those other safety systems.

The interfaces between the Remote Shutdown System and other Safety systems is by way of manual transfer switches. These transfer switches are located on Remote Shutdown Panels H21-P173, H21-P175, H21-P176, H21-P177, C82-P001, and C82-P002. (Note that as a matter of record, the transfer switches located in Panels H21-P176 and H21-P177 do not interface with Class 1E Systems.) Access to all of the transfer switches is administratively controlled. Panels H21-P173, C82-P001, and C82-P002 have locked doors which provide controlled access to the transfer switches. Although Panels H21-P175, H21-P176, AND H21-P177 are not provided with doors, access to the control of the transfer switches is controlled by lockable covers. Unauthorized operation of individual component control switches on these latter three panels is of no consequence because control is blocked by the transfer switch. The Main Control Room operator's awareness of the position of the transfer switches is assured in an identical manner as described in the Unit 2 response.

All of the transfer switches are Electroswitch type Series 40. The control switches for individual component remote control on Panels C82-P001 and C82-P002 are Electroswitch type Series 20. This latter fact is significant because those control switches are interfaced with existing safety systems regardless of the position of the transfer switch (reference the response to section i). Both the control and transfer switches are qualified and tested to the same quality standards as any of the switches on other safety systems. The environmental qualifications of both the transfer and control switches have been thoroughly reviewed as part of NRC IE Bulletin 79-01B. Reference to Georgia Power's "Response to IE Bulletin 79-01B" Volume 2 Section C.2.1.21 Sheets 95 and 96 will show that all environmental considerations have been favorably addressed.

Both the transfer switches and control switches have appropriate seismic qualification. Engineering test reports are available for review and are as follows:

1. Electro Switch Corp. Engineering Test Report No. 2070-1 of May 24, 1976. --Report of Seismic Qualification Tests of the Series 10, Series 20, Series 24, and Series 40 Switches, and the Lock-Out Relay (LOR), Electric Reset Lock-Out Relay (LOR/ER), and Control Switch Relya (CSR).

2. Electro Switch Corp. Engineering Test Report No. 1981-2 of November 20, 1975. --Report Of Seismic Qualification Tests of the Series 10 and 20 Switches.

Remote Shutdown Panels H21-P173, C82-P001, and C82-P002 have appropriate seismic qualification. Documentation is available for review and is as follows:

1. Seismic Integrity Analysis of Panel H21-P173--Access No. SX-16959.

2. Seismic Analysis of the Remote Shutdown Panels C82-P001 and C82-P002--Access No. SX-18318.

Remote Shutdown Panels H21-P175 and H21-P176 and associated transfer switches do not interface with any safety systems and as such no seismic information is provided.

Documentation of the seismic structural integrity of Remote Shutdown Panel H21-P177 is not available at this time. This panel interfaces with only one safety division of existing safety systems by way of seismically qualified transfer switches. Seismic documentation will be supplied when available. Submittal is expected on or prior to March 19,1982. This date coincides with committments made in the Section (a) Response.

The information supplied relative to the Single Failure Criterion for Unit 2 is applicable in full to Unit 1.

(d) UNIT 1 AND 2 RESPONSE

A detailed review of the wiring of the alternate shutdown cricuitry was made to ensure that this circuitry is indeed independent of the fire area. A demonstration of the methods used can be found by referencing the response to section b.

(e) UNIT 1 AND 2 RESPONSE

The alternate shutdown power sources circuit breakers, the circuit breakers control circuits (trip & close), and the relationship between those control circuits and the fire area (cable spreading and control room) is as follows:

1. 4 KV bus main incoming feeder breakers for both the offsite power sources and the onsite emergency diesel generators -

   The 125 VDC control circuits for these circuit breakers are not disconnected from the fire area. However, procedures exist (HNP-1-1908 and HNP-2-1908) for manually closing or tripping the circuit breakers within a time frame which ensures the unimpaired maintenance of a safe shutdown condition. These procedures basically involve disconnecting the 125 VDC control power to the circuit breaker operating mechanism and manually (mechanically) operating the circuit breakers.

2. 4 KV bus feeder breakers for those pumps (RHR, RHRSW, PSW, and CRD) controlled from the Remote Shutdown Panels -

   The 125 VDC control circuits for these circuit breakers are disconnected from the fire area and control is transferred to the Remote Shutdown Panels after actuation of the remote shutdown transfer switches. In the event the control power circuit breaker trips before the remote shutdown transfer switch is actuated, the operators are instructed by procedures (HNP-1-1908 and HNP-2-1908) to either reset the control circuit breaker or to manually operate the 4 KV circuit breaker as indicated in "1." above.

3. 4 KV bus feeder breakers to the 4160/600 VAC station service transformers which supply power to the 600 VAC busses -

   The statements made in "1." are applicable.

4. 600 VAC bus main incoming feeder breakers and 600 VAC feeder breakers to the motor control centers.

   The statements made in "1." are applicable.

5. 600 VAC feeder breakers to the 600/208 VAC distrubution transformers which supply power to the 120 VAC distrubution cabinets and 600 VAC feeder breakers to the battery chargers which support the DC systems-

   None of the circuit breakers are provided with control from the Main Control Room and as such their control circuits do not enter the fire area.

6. 250 VDC breaker for battery charger, and 250 VDC feeder breaker for the DC motor control centers and 125 VDC distribution panels-

   The statements made in "5." are applicable.

(f) UNIT 1 AND 2 RESPONSE

Both Units 1 and 2 have existing procedures (HNP-1908 & HNP-2-1908) which detail the methods used to achieve hot and cold shutdown from outside the Main Control Room.

The procedures begin with the determination by the Shift Foreman that continued operation from the Main Control Room is not conducive to safe plant operation. At this point the Shift Foreman directs all operators to report to the Remote Shutdown Panel where they are given two-way radios and/or sound-powered telephones as well as various assignments depending on the particular situation.

The following is a summary of the key aspects of implementing the procedures.

If for any reason the reactor was not put in the SHUTDOWN mode before evacuation from the Main Control Room, the Plant Operator will SCRAM the reactor by tripping the circuit breakers feeding the APRM circuitry or by manually actuating the scram discharge volume high-high level switches.

If the main turbine was not tripped from the Main Control Room, the Plant Operator will trip the turbine at the front standard.

The Plant Operators will operate the transfer switches at the Remote Shutdown Panels. This will disconnect control of the shutdown components from the Main Control Room and assure control from the Remote Shutdown Panels.

The feedwater control system should maintain normal reactor water following the SCRAM and turbine trip. The pressure regulator should open the bypass valve, as required to maintain the pressure setpoint.

If reactor level cannot be controlled as stated above, the Plant Operator will operate the relief valves and initiate RCIC operation from the Remote Shutdown Panel. The RCIC system will be secured when reactor water level reaches +45" as measured from the bottom of the steam dryer skirt.

When reactor pressure decays to approximately 840 psi the MSIV's will isolate. A Plant Operator will close the SJAE inlet steam valves and trip the RFP turbine locally.

With the MSIV's closed reactor pressure will be controlled by operation of the steam relief valves from the Remote Shutdown Panels. Reactor water level is controlled from the Remote Shutdown Panel using the RCIC system.

The Plant Operator will confirm that each scram inlet and outlet valve is open, close the CRD charging water header valve, verify isolation of the scram discharge volume drain valve, and maintain CRD flow control. The CRD is secured when reactor level reaches +60" as measured from the bottom of the steam dryer skirt.

The Plant Operator initiates torus cooling from the Remote Shutdown Panel by starting RHR pump, RHR service water pump, and aligning the required valves. The procedures specify which valves can be operated from the Remote Shutdown Panel and which valves are operated locally using the valve handwheel.

When the reactor pressure reaches 135 psig RHR shutdown cooling mode is initiated by the Plant Operator. The procedures specify which valves can be operated from the Remote Shutdown Panel and which valves are operated locally using the valve handwheel.

At this point cooldown of the reactor proceeds at less than or equal to 100°F per hour, and attempts are made to regain entry to the Main Control Room.

If at any time during performance of the above procedures, the Shift Foreman determines, from loss of area lighting and/or loss of power to electrical busses, that a loss-of offsite power or loss of power source to essential busses has occured, the Plant Operators are directed to restore power. Detailed procedures on how to accomplish this are contained in Appendices to the main procedures.

(g)

## UNIT 1 AND 2 RESPONSE

The implementation of the Hatch Unit 1 and 2 procedures for shutting down the plant from outside the control room does not require spare fuses. Generally, actuation of the transfer switches not only disconnects control from the Cable Spreading and Control Room, but switches in a new source of control power complete with a set of protective fuses. Reference the procedures noted in Section f,and Section 5.2.3 of the Remote Shutdown Description submitted in Georgia Power Company's March 19, 1981 response to 10 CFR 50.48 and Appendix R.

(h)

Unit 2 Technical Specifications Appendix A Section 6.2.2 Paragraph f mandates requirements relating to fire protection and the safe shutdown of Units 1 & 2. Paragraph f reads "A Fire Team of at least five members shall be maintained onsite at all times. The Fire Team shall not include the minimum shift crew necessary for safe shutdown of Units 1 and 2 or any personnel required for other essential functions during a fire emergency."

Tables 1 and 2 of Procedure HNP-16 (Manning of Main Control Room) establishes the minimum number of personnel required for manning the control room during various operational conditions of each unit. Excluding the cases where one of the units is in either cold shutdown or refueling, that number is eight, consisting of five licensed operators and three non-licensed operators. Excluding one licensed operator, namely one of the shift foreman who must respond to the fire as required by Procedure HNP-4200 (General Fire Procedure), seven personnel, four of whom are licensed operators, are available to bring both Units 1 and 2 to a safe shutdown from outside the control room utilizing remote shutdown procedures HNP-1-1908 and HNP-2-1908.

An example of how each of the seven people can be deployed in performing remote shutdown follows. However, the actual deployment and duties depend on the particular circumstances as evaluated by the shift-foremen.

UNIT 2

The team consist of three people, two licensed operators, and one non-licensed operator. One licensed operator who is responsible for directing the shutdown of Unit 2 monitors the instrumentation and manipulates controls on remote shutdown panels 2H21-P173 and 2C82-P001. (Note panels are adjacent) The other licensed operator is available to SCRAM the reactor, monitor the CRD system, and assist the non-licensed operator in restoring electrical power. The non-licensed operator is available for restoring essential power to electrical busses, tripping and monitoring the main and feed pump turbine, and manually operating (handwheel operation) valves.

UNIT 1

The team consist of four people, two licensed operators and two non-licensed operators. One licensed operator who is responsible for directing the shutdown of Unit 1 monitors instrumentation and manipulates controls on remote shutdown panel H21-P173. The other licensed operator is available to SCRAM the reactor and manipulate controls on remote shutdown panels C82-P001 and C82-P002. One non-licensed operator is available for restoring essential power to electrical busses, monitoring the CRD system, tripping and monitoring the main and feed pump turbine, and manually operating (handwheel operation) valves. The other non-licensed operator is available to manipulate local controls on the

the diesel building remote shutdown panels H21-P175, H21-P176, H21-P177, and for restoring power to electrical busses in the diesel building.

(i)

## UNIT 1 AND 2 RESPONSE

The Unit 2 Remote Shutdown System including transfer switches is part of the original design of Unit 2 and thus was part of the preoperational testing program (Preop. 2C82-3510) performed prior to startup as to be in compliance with 10 CFR 50.55a. The Unit 1 Remote Shutdown System was modified after the issuance of the operating license in order to add the transfer switch capability. This recent modification made under 10 CFR 50.59 was functionally tested (DCR 78-201 functional test) to ensure the design intent was met.

Procedure HNP-2-10428 was performed to demonstrate that Unit 2 could be brought from a normal initial steady-state power level to the point where cooldown is initiated and under control, and the reactor vessel pressure and water level are controlled using equipment and controls located outside the main control room. The Unit 1 Remote Shutdown System was similarily tested during initial startup.

The following is added to clarify the Hatch Remote Shutdown System relative to the operation of the Remote Shutdown Transfer Switches (RSTS) and Remote Shutdown Control Switches (RSCS) located on the Remote Shutdown Panels. In all cases but one the following applies. With the RSTS in the "Normal" position operation of components from the main control room is assured and operation of components using the RSCS is electrically blocked. With the RSTS in the "Emergency" position operation from the main control room is blocked and operation of components from the remote shutdown panels using the RSCS is assured. The exception noted to the above concerns the RSCS on the Unit 1 shutdown panels C82-P001 and C82-P002. In this case operation of all switches is the same as above when the RSTS are in the "Emergency" position. However, operation of the RSCS are not electrically blocked when the RSTS are in the "Normal" position. Unauthorized operation of the RSCS in this mode is positively precluded by locking the remote shutdown panel doors. Furthermore, realizing that the RSCS are interfaced with existing safety systems when the RSTS are in the "Normal" position, the RSCS are designed and qualified as any other Class IE component. (Reference response to section c)

(j) UNIT 1 AND 2 RESPONSE

At this time the existing Technical Specifications do not define the frequency of which the Remote Shutdown System interfaces with shut down components should be checked for operability.

As a matter of record it is noted that Unit 2 Technical Specification section 3/4.3.6 page 3/4 3-50 defines the "Limiting Conditions For Operation and Surveillance Requirements" of the Remote Shutdown System Monitoring Instrumentation.

A review of desirable and necessary changes to the surveillance requirements and limiting conditions for operation of both the Unit 1 and 2 Remote Shutdown Systems will be made. If the results of that review indicate a need for technical specifications changes, they will be proposed. This submittal is expected to be made by March 19, 1982. This date coincides with the committments made in the Section (a) Response.

(k) UNIT 1 AND 2 RESPONSE

The "Remote Shutdown System Description" submitted to the NRC as an attachment to Georgia Power Company's March 19, 1981 reply to 10 CFR 50.48 and Appendix R demonstrates the capability to achieve hot and cold shutdown from outside the Main Control Room. Included as part of that description are the design basis and a related system's interface which addresses each of the systems (equipment) in Sections 6 and 7 of Enclosure 1 to the NRC's February 20, 1981 letter.

(L) UNIT 1 & 2 RESPONSE

The implementation of the Hatch Unit 1 and 2 procedures for shutting down the plant from outside the Main Control Room does not require any repairs. Reference is made to Procedures HNP-1-1908 and HNP-2-1908 as summarized in Section f.

(L)

# SEE

# APERTURE

# CARDS

APERTURE CARD NO#_____

AVAILIBILITY ✓ PDR_____ CF_____ HOLD_____

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