

AUGUST 7 1978

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Docket No. 50-321

Georgia Power Company
 Oglethorpe Electric Membership Corporation
 Municipal Electric Association of Georgia
 City of Dalton, Georgia
 ATTN: Mr. Charles F. Whitner
 Vice President - Engineering
 Georgia Power Company
 Atlanta, Georgia 30302

Gentlemen:

The Commission has issued the enclosed Order for Modification of License, and an interim Exemption to certain requirements of Criterion 2 of Appendix A to 10 CFR 50. You will note that the Order requires immediate implementation of surveillance for the RPS power supply equipment of Hatch Nuclear Plant Unit No. 1.

A copy of the Notice of Granting an Exemption is also enclosed.

Sincerely,

Original signed by

Thomas A. Ippolito, Chief
 Operating Reactors Branch #3
 Division of Operating Reactors

Enclosures:

1. Order for Modification of License
2. Exemption
3. Notice

cc w/enclosure:
 see next page

*Corrections per OELD
 included 8-3-78
 subject to modifications CP 3
 agreed on 8-3-78.*

	ORB#3 SSheppard 8/2/78	ORB#3 Ippolito 8/4/78	AD/ORB/DOR BGrimes 8/4/78	D/DOR VStello 8/4/78	Original NRR signed by EGCase 8/4/78	D/NRR HRDenton 8/4/78
OFFICE >	ORB#3	OELD	AD/ORB/DOR	D/DOR	Original NRR signed by	D/NRR
SURNAME >	DVerrelli:acr	BGrimes	BGrimes	VStello	EGCase	HRDenton
DATE >	8/2/78	8/3/78	8/4/78	8/4/78	8/4/78	8/4/78

Georgia Power Company
Oglethorpe Electric Membership Corporation
Municipal Electric Association of Georgia
City of Dalton, Georgia

cc:

G. F. Trowbridge, Esquire
Shaw, Pittman, Potts and Trowbridge
1800 M Street, N. W.
Washington, D. C. 20036

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Vice President
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Southern Services, Inc.
Birmingham, Alabama 35202

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Region IV Office
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Chief, Energy Systems Analysis Branch (AW-459)
Office of Radiation Programs
U. S. Environmental Protection Agency
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401 M Street, S. W.
Washington, D. C. 20460

During the review of the E. I. Hatch Nuclear Plant Unit No. 2 (Docket No. 50-366), the Staff identified certain defects in the design of the voltage regulator system of the motor/generator sets which supply power to the reactor protection system. One of these defects is that there were potential undetected single failures which could adversely affect the reactor protection system. (Another defect relating to seismic design is addressed in an exemption issued for the Hatch Unit No. 1 on the same date as this Order.)

Criterion 21 of Appendix A to 10 CFR 50 requires in part that the redundancy and independence designed into the reactor protection system be sufficient to assure that no single failure results in loss of the protection function. In applying the single failure criterion to a specific design, it is assumed that all potential undetectable failures are in their failed mode (Appendix 7A of the Standard Review Plan) before the occurrence of the postulated detectable single failure which (in a system meeting the single failure criterion) will not disable the protection function. For the Hatch reactor protection system power supply, a single undetected failure of an output voltage sensor for either motor-generator set could be postulated that would allow the generator output voltage to remain outside the voltage rating (range) of the connected Class IE loads, i.e., $\pm 10\%$ of the nominal value. Such an abnormal voltage, resulting from a possible failure in the motor-generator set voltage regulating circuitry if persisting for a sufficient time, could result in damage to the reactor protection system components with the attendant potential loss of capability to scram the plant.

IEEE Standard 379-1977, "IEEE Standard Application of the Single-Failure Criterion to Nuclear Power Generating Station IE Systems" provides that an otherwise undetectable failure may be deemed detectable by means of appropriate surveillance and/or testing. Accordingly, we determined in the course of the Hatch Unit No. 2 review that the safety problems associated with the postulated single failure could be remedied by additional surveillance; specifically, by assuring that the output voltage of each reactor protection system motor-generator is checked to be within $\pm 10\%$ of the nominal value, approximately every eight hours. Requirements for such surveillance were imposed as part of the Hatch Unit No. 2 Technical Specifications.

The same requirements are necessary for Hatch Unit No. 1 to assure that the failure of the non-Class IE reactor protection system power supply will not cause adverse interaction to the Class IE reactor protection system and that there will be timely detection of failures due to sustained over-voltage or under-voltage conditions. Provided the surveillance set forth in this Order is carried out, there is reasonable assurance that the Hatch Unit No. 1 facility can be operated without endangering public health and safety.

The NRC has determined that public health, safety and interest require that this Order be made effective immediately.

III.

Accordingly, pursuant to the Atomic Energy Act of 1954, as amended, and the Commission's Rules and Regulations in 10 CFR Part 2 and 50, IT IS ORDERED THAT until further authorization by the Commission:

- (1) The output voltage and current of each reactor protection system motor-generator set shall be logged once per shift;
- (2) A motor-generator set shall be removed from service if the output voltage exceeds 132 volts AC or is less than 108 volts AC and cannot be adjusted to fall within this band;
- (3) The protective over-voltage and under-voltage relays and the under-frequency relay shall be calibrated at least once every six months, and after an operating basis earthquake. The tripping logic and the generator output breaker shall be functionally tested as a part of the calibration of these relays. The voltage setpoints shall be within the range specified in Requirement (2) above and the frequency setpoint shall be greater than or equal to 57 Hertz; and
- (4) A protection system functional test shall be conducted upon discovery of a condition beyond the limits of Requirement (2) above. This test shall include all Class IE loads which are connected to the busses.

To effectuate the foregoing, the Technical Specifications for Hatch Nuclear Plant Unit No. 1 (DPR-57) are hereby modified by replacing the appropriate pages with the enclosed revised pages.

By September 11, 1978, the licensee may file a request for a hearing with respect to this Order. Also, by September 11, 1978 any other person whose interest may be affected may file a request for a hearing with respect to this Order. A request for a hearing

must set forth with particularity the interest of the person requesting the hearing in the proceeding, and how that interest may be affected by the results of the proceeding. A request for a hearing by the licensee or another person must be filed with the Office of the Secretary, U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Docketing and Service Section, by the above date. Requests for a hearing filed during the last ten (10) days of the notice period should be accompanied by a collect telephone call to Victor Stello, Director, Division of Operating Reactors, U. S. Nuclear Regulatory Commission at (301) 492-7672 notifying him that a hearing request has been filed. After business hours, calls may be placed to the Duty Officer, Division of Operating Reactors (301) 492-7000. This notification should be received by the end of the notice period on September 11, 1978. A copy of the request for a hearing should also be sent to the Chief Hearing Counsel, Office of the Executive Legal Director, U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, and to G. F. Trowbridge, Shaw, Pittman, Potts and Trowbridge, 1800 M. Street, N. W., Washington, D. C. 20036, the attorney for the licensee.

FOR THE NUCLEAR REGULATORY COMMISSION



Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Attachment:
Technical Specification
changes

Dated at Bethesda, Maryland, this
7 day of August 1978.

3.9.D. Reactor Protection System MG Sets

Applicability:

The limiting conditions for operation apply to the reactor protection system instrumentation.

Objective:

The objective of the limiting condition of operation is to assure that failure of the motor-generator set voltage regulating circuitry will not result in damage to the reactor protection system components with an attendant potential loss of capability to scram the plant.

Specifications:

If in service the RPS instrumentation MG set 1A and/or 1B voltage will be within the range of 108 to 132 VAC.

1. With RPS instrumentation MG set 1A and/or 1B voltage outside the range of 108 to 132 VAC, demonstrate the OPERABILITY of all equipment which could have been subjected to the abnormal voltage for all Class IE loads connected to the associated bus(es) by performance of a CHANNEL FUNCTIONAL TEST, as required, within 24 hours.
2. With RPS instrumentation MG set 1A and/or 1B inoperable, restore the inoperable MG set(s) to OPERABLE status within 30 minutes or remove the inoperable MG set(s) from service.

4.9.D Reactor Protection System MG Sets

Applicability:

The surveillance requirements apply to the periodic testing requirements of the reactor protection system instrumentation.

Objective:

The objective of the surveillance requirements is to verify that the RPS instrumentation MG sets are within their normal range to preclude sustained over-voltage or under-voltage conditions that might compromise the capability of the RPS from performing its intended safety function.

Specifications:

The specified RPS instrumentation MG sets 1A and 1B shall be determined operable:

- a. At least once per 8 hours by verifying:
 1. RPS instrumentation MG sets 1A and 1B voltage to be between 108 and 132 VAC, and
 2. No unexplained change in RPS MG set 1A and/or 1B current, and voltage in excess of 5% from its nominal value.
- b. At least once per 6 months and prior to resetting the Reactor Protection System trips following a seismic event of Operational Basis Earthquake intensity, by demonstrating the OPERABILITY of RPS instrumentation MG set 1A and 1B over-voltage, under-voltage and under-frequency protective instrumentation by performance of a CHANNEL CALIBRATION including simulated automatic actuation of the protective relays, tripping logic and output circuit breakers and verifying the following setpoints:
 1. Over-voltage \leq 132 VAC,
 2. Under-voltage \geq 108 VAC, and
 3. Under-frequency \geq 57 Hz.

3.9.B.4. Emergency 4160 Volt Buses (1E, 1F, or 1G) Inoperable

Each of the three emergency 4160 volt emergency buses (1E, 1F, and 1G) is preferably supplied from the auxiliary startup transformers with each bus normally having a single diesel generator as a standby power supply. The critical emergency safety feature loads are divided among the three emergency 4160 volt buses, and failure of one bus does not prevent a safe shutdown of the reactor. Therefore, operation would be permitted for only seven (7) days after which the reactor shall be placed in the Cold Shutdown Condition.

5. Emergency 600 Volt Buses (1C or 1D) Inoperable

The two emergency 600 volt buses (1C and 1D) are normally supplied from separate emergency 4160 volt buses (1E and 1G with 1F as a backup). Failure of one bus cannot affect its redundant counterpart and loss of either bus will not prevent operation of the minimum required emergency safety feature loads.

6. Emergency 250 Volt DC to 600 Volt AC Inverter Inoperable

The two emergency 250 volt DC to 600 volt AC inverters are normally supplied from separate emergency plant batteries (1A and 1B). Failure of one inverter cannot affect its redundant counterpart, and loss of either bus will not prevent operation of the minimum required emergency safety feature loads.

C. Diesel Generator Requirements (Reactor in the Shutdown or Refuel Mode)

This requirement provides added assurance that a standby power supply is available under certain circumstances even though the reactor may not be critical and the reactor coolant temperature is less than 212°F.

D. RPS MG Sets

The LCO will minimize a possible failure in the motor-generator set voltage regulating circuitry which, if persisting for a sufficient period of time, could potentially result in degradation to the reactor protection system components with the attendant potential loss of capability to scram the plant.

E. References

1. FSAR, Section 8.4, Standby AC Power Supply.
2. General Design Criterion 17 of Appendix A to 10 CFR 50.
3. "Proposed IEEE Criteria for Class 1E Electric Systems for Nuclear Power Generating Stations" (IEEE Standard No. 308), June, 1969.

4.9.A.2.e. Fuel Oil Transfer Pumps

Following the monthly test of the diesels, the fuel oil transfer pumps shall be operated to refill the day tank and to check the operation of these pumps.

3. 125/250 Volt DC Emergency Power System (Plant Batteries 1A and 1B)

The plant batteries may deteriorate with time, but precipitous failure is unlikely. The type of surveillance described in this specification is that which has been demonstrated through experience to provide an indication of a cell becoming irregular or inoperable long before it fails.

4. Emergency 4160 Volt Buses (1E, 1F, and 1G)

The emergency 4160 volt buses (1E, 1F, and 1G) are monitored to assure readiness and capability of transmitting power to the emergency load.

These buses distribute AC power to the required engineered safety feature equipment. The normal feeds and backup to the emergency buses (1E, 1F, and 1G) are taken from the startup auxiliary transformers. If neither startup auxiliary transformer is available, buses 1E, 1F, and 1G will be energized from the standby diesel generators.

5. Emergency 600 Volt Buses (1C and 1D)

The emergency 600 volt buses (1C and 1D) are monitored to assure readiness and capability of transmitting the emergency load.

6. Emergency 250 Volt DC to 600 Volt AC Inverters

The emergency 250 volt DC to 600 volt AC inverters are monitored to assure readiness and capability of transmitting power to the emergency loads.

7. Logic Systems

The periodic testing of the logic systems will verify the ability of the logic systems to bring the auxiliary electrical systems to running standby readiness with the presence of an accident signal or an undervoltage signal on the start buses.

The periodic simulation of accident signals will confirm the ability of the 600 volt load shedding logic system to sequentially shed and restart the 600 volt loads if an accident signal were present and diesel generator voltage were the only source of electrical power.

D. RPS MG Sets

The surveillance requirements for the RPS power supply equipment will ensure the timely detection of potential component failures that might be caused by a sustained over-voltage or under-voltage conditions.

E. References

1. "Proposed IEEE Criteria for Class 1E Electric Systems for Nuclear Power Generating Stations" (IEEE Standard No. 308), June, 1969.
2. American Society for Testing and Materials, 1970 Annual Book of ASTM Standards, Part 17.

NUCLEAR REGULATORY COMMISSION

In the Matter of)
)
Georgia Power Company)
Oglethorpe Electric Membership) Docket No. 50-321
Corporation)
Municipal Electric Association)
of Georgia)
City of Dalton, Georgia)
)
Edwin I. Hatch Nuclear Plant Unit)
No. 1)

EXEMPTION

I.

The Georgia Power Company (the licensee) is the holder of Facility Operating License No. DPR-57 which authorizes operation of the Edwin I. Hatch Nuclear Plant Unit No. 1. This license provides among other things, that it is subject to all rules, regulations, and Orders of the Commission now or hereafter in effect.

The Facility is one of two Boiling Water Reactors located at the licensee's site located on the south bank of the Altamaha River in Appling County, Georgia.

II.

The Hatch Units Nos. 1 and 2 reactor protection system power supplies are identical. During the review of the E. I. Hatch Unit No. 2 nuclear power plant (Docket No. 50-366), the NRC Staff identified

certain defects in the design of the voltage regulator system of the motor generator sets which supply power to the reactor protection system. One of these defects is that there is a postulated sequence of events initiated by an earthquake which could adversely affect the reactor protection system. (Another defect relating to potential single failures is addressed in an Order for Modification of License issued for Hatch Unit No. 1 on the same date as this Exemption).

Criterion 2 of Appendix A to 10 CFR Part 50 requires, that systems important to safety, such as the reactor protection system, be designed to withstand the effects of earthquakes. The Hatch reactor protection system is a Class IE system, hence it is seismic Category I. The reactor protection system power supply however, is not seismically qualified. A sequence of events initiated by the occurrence of an earthquake can, therefore, be postulated which could result in damage to the reactor protection system components with the attendant potential loss of capability to scram the plant. This sequence of events includes (1) the occurrence of an earthquake that would cause the undetected failure of a voltage sensor, (2) the failure of the motor-generator set resulting in abnormal output voltage, (3) persistence of this abnormal output voltage undetected by visual observation and surveillance testing for a time sufficient to damage reactor protection system components, and (4) failure of these components in such a manner that results in loss of scram capability (instead of in the fail-safe mode).

The bases for our conclusion that the exemption is justified are as follows:

- (1) The most likely failure mode of the reactor protection power supply motor-generator sets is complete loss of output. This is not a concern because the reactor protection system is fail-safe, i.e., a scram would result.
- (2) There have been no reported failures in the Class IE loads which are connected to these motor-generator sets which can be attributed to an over-voltage or under-voltage condition in the sets.
- (3) It is our judgment that the occurrence of the sequence of events necessary to result in loss of the capability to scram the plant is unlikely. This sequence of events includes (a) the occurrence of an earthquake that would cause the undetected failure of a voltage sensor, (b) the failure of the motor-generator set resulting in abnormal output voltage, (c) persistence of this abnormal output voltage undetected by visual observation and surveillance testing for a time sufficient to damage reactor protection system components, and (d) failure of these components in such a manner that results in loss of scram capability (instead of in the fail-safe mode).
- (4) The Technical Specifications require that the over-voltage, under-voltage, and under-frequency relays be calibrated and that the tripping logic and generator output breaker be functionally tested following an operating basis earthquake. It is our judgment that the likelihood that a seismic event of a lesser intensity than the operating basis earthquake will damage non-Class IE equipment to the extent that a safe shutdown cannot be initiated is so small as to not require consideration.

(5) It is our judgment that the likelihood that an operating basis earthquake will occur during the interim period that would (a) result in the occurrence of the sequence of events necessary to result in loss of the capability to scram the plant and (b) cause damage to non-Class IE equipment to the extent that a safe shutdown cannot be initiated in the time necessary to detect the seismic event and to initiate a safe shutdown is negligible considering the favorable operating history of this design.

For the foregoing reason, the Staff concluded that the Hatch Unit No. 1 system does not fully conform to General Design Criterion 2. This deficiency should be rectified as promptly as is reasonable. In the interim, the Staff has determined that there is reasonable assurance that continued operation, even though not in full conformance with General Design Criterion 2, will not endanger public health and safety. To require immediate conformance with the applicable requirement of Criterion 2 of Appendix A to 10 CFR Part 50 would necessitate shutdown of the plant until a staff approved Class IE system (capable of de-energizing the reactor protection system power supply when its output voltage exceeds or falls below limits within which the equipment being powered from the power supply has been designed and qualified to operate continuously and without degradation) is designed, fabricated, installed, and tested by the licensee. The licensee estimates, and we agree, that such a system cannot be designed, fabricated, installed, and tested before the end of the next refueling outage.

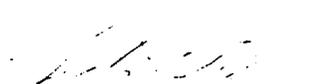
In connection with the identical problem identified with respect to licensing of Unit No. 2, the licensee requested and provided necessary information to support a temporary exemption from General design Criterion 2, including information concerning adverse effects of plant shutdown in the public interest. This information is equally applicable to Unit No. 1.

It is our judgment, based on the favorable operating experience attained with essentially the same reactor protection system power supplies on operating BWR/4 reactors and on the sequence of events that must occur in order to result in the loss of capability to scram the plant, that the plant may operate safely during the period necessary to obtain and install equipment which will enable the reactor protection system power supply to fully conform to the applicable requirements of Criterion 2 of Appendix A to 10 CFR Part 50.

Accordingly, in the absence of any safety significance for the period necessary to obtain and install equipment necessary to achieve full conformance with GDC-2, and in light of the information concerning impact on the public if the facility is not operating during this period, the Commission has determined that, pursuant to 10 CFR 50.12, a specific exemption, for an interim period, authorizing such operation is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest. This exemption is granted until the next refueling outage of the Hatch Nuclear Plant Unit No. 1. This will provide sufficient time to obtain and install necessary equipment.

The NRC Staff has determined that the granting of this exemption for an interim period will not result in any significant environmental impact and that pursuant to 10 CFR 5.5(d)(4) an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with this action.

FOR THE NUCLEAR REGULATORY COMMISSION


Victor Stello, Jr., Director
Division of Operating Reactors
Office of Nuclear Reactor Regulation

Dated at Bethesda, Maryland,
this 7 day of August 1978

UNITED STATES NUCLEAR REGULATORY COMMISSIONDOCKET NO. 50-321GEORGIA POWER COMPANY, ET ALNOTICE OF GRANTING AN EXEMPTION FROM THE
REQUIREMENTS OF GENERAL DESIGN CRITERION 2,
"DESIGN BASES FOR PROTECTION AGAINST NATURAL
PHENOMENA", OF APPENDIX A TO 10 CFR PART 50

The U. S. Nuclear Regulatory Commission (the Commission) has granted an interim exemption from the requirements of General Design Criterion 2, "Design Bases for Protection Against Natural Phenomena", of Appendix A to 10 CFR Part 50 to Georgia Power Company, Oglethorpe Electric Membership Corporation, Municipal Electric Association of Georgia, and City of Dalton, Georgia (the licensees).

This exemption relates to the design of the voltage regulator system of the motor generator sets which supply power to the reactor protection system. This exemption is effective as of the date of issuance. The basis for this action is set forth in the Commission's exemption dated August 7, 1978.

This exemption is granted for an interim period until the next refueling outage of Hatch Unit No. 1 to permit the licensee to design, fabricate, install and test a staff approved Class IE system.

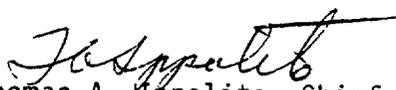
The Commission has determined that the granting of this exemption will not result in any significant environmental impact and that pursuant to 10 CFR Section 51.5(d)(4) an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with this action.

For further details with respect to this action, see the Commission's Exemption dated August 7, 1978.

This item is available for public inspection at the Commission's Public Document Room, 1717 H Street, N. W., Washington, D. C. and at the Appling County Public Library, Parker Street, Baxley, Georgia 31413. A copy of this item may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Operating Reactors.

Dated at Bethesda, Maryland, this 7th day of August 1978.

FOR THE NUCLEAR REGULATORY COMMISSION


Thomas A. Ippolito, Chief
Operating Reactors Branch #3
Division of Operating Reactors