APPENDIX 2

Georgia Power Company
NRC Docket 50-321
Operating License DPR-57
Edwin I. Hatch Nuclear Plant Unit 1
Proposed Changes to Technical Specifications
Emergency Power Systems

The proposed changes to the Plant Hatch Unit 1 Technical Specifications would be incorporated as follows:

Delete Page	Insert Page
3.2-1	3.2-1
	3.2-23a
	3.2-23b
	3.2-49a
	3.2-49b
3.2-68	3.2-68
	3.2-68a
3.2-69	3.2-69
3.9-4	3.9-4
3.9-4a	3.9-4a
3.9-12	3.9-12

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.2 PROTECTIVE INSTRUMENTATION	4.2 PROTECTIVE INSTRUMENTATION
Applicability	Applicability
The Limiting Conditions for Operation apply to the plant instrumentation which performs a protective function.	The Surveillance Requirements apply to the instrumentation which performs a protective function.
Objective	Objective
The objective of the Limiting Conditions for Operation is to assure the operability of protective instrumentation.	The objective of the Surveillance Requirements is to specify the type and frequency of surveillance to be applied to protective instrumentation.
Specifications	Specifications
The Limiting Conditions for Operation of the protective instrumentation affecting each of the following protective actions shall be as indicated in the corresponding LCO table.	The check, functional test, and calibration minimum frequency for protective instrumentation affecting each of the following protective actions shall be as indicated in the corresponding SR table.

	Protective Action	LCO Table	SR Table
A.	Initiates Reactor Vessel and Containment Isolation	3.2-1	4.2-1
B.	Initiates or Controls HPCI	3.2-2	4.2-2
C.	Initiates or Controls RCIC	3.2-3	4.2-3
D.	Initiates or Controls ADS	3.2-4	4.2-4
E.	Initiates or Controls the LPCI Mode of RHR	3.2-5	4.2-5
F.	Initiates or Controls Core Spray	3.2-6	4.2-6
G.	Initiates Control Rod Blocks	3.2-7	4.2-7
H.	Limits Radioactivity Release	3.2-8	4.2-8
I.	Initiates Recirculation Pump Trip	3.2-9	4.2-9
J.	Monitors Leakage Into the Drywell	3.2-10	4.2-10
K.	Provides Surveillance Information	3.2-11	4.2-11
L.	Initiates Disconnection of Offsite Power Sources	3.2-12	4.2-12
M.	Initiates Energization by Onsite Power Sources	3.2-13	4.2-13

TABLE 3.2-12

INSTRUMENTATION WHICH INITIATES THE DISCONNECTION
OF OFFSITE POWER SOURCES

Ref. No. (a)	Instrument (b)	Required Operable Channels	Channels Required To Trip	Trip Setting	Action to be Taken if the Number of Required Operable Channels Is Not Met
1	4.16 kv Emergency Bus Undervoltage Relay (Loss of Voltage Condition)	2/Bus	2/Bus	greater than or equal to 2800 volts. At 2800 volts time delay will be less than or equal to 6.5 sec.	(c)
2	4.16 kv Emergency Bus Undervoltage Relay (Degraded Voltage Condition)	2/Bus	2/bus	greater than or equal to 3280 volts. At 3280 volts time delay will be less than or equal to 21.5 sec.	(c)

NOTES FOR TABLE 3.2-12

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 3.2-12 and items in Table 4.2-12.

b. This instrumentation is required to be operable during reactor startup, power operation, and hot shutdown.

c. With the number of operable channels one less than the required operable channels, operation may proceed until performance of the next required instrument functional test provided a trip signal is placed in the LOSP lock-out relay logic for the applicable inoperable channel.

TABLE 3.2-13

INSTRUMENTATION WHICH INITIATES ENERGIZATION BY
ONSITE POWER SOURCES

Ref. No. (a)	Required Instrument (b)	Required Operable Channels	Channels Required To Trip	Trip Setting	Action to be Taken if the Number of Required Operable Channels Is Not Met
1	Start up auxiliary transformer 1C loss of voltage condition	2	1	Trip setting greater than or equal to 3280 volts. At 3280 volts trip of relay will be instantaneous (no time delay).	(c)

NOTES FOR TABLE 3.2-13

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 3.2-13 on items in Table 4.2-13.

b. This instrumentation is required to be operable during reactor startup, power operation, and hot shutdown.

c. With the number of operable channels one less than the required operable channels, operation may proceed provided the relay is removed from its case. Removing the relay accomplishes the same action as an operable relay operating to open its trip circuit.

TABLE 4.2-12

INSTRUMENTATION WHICH INITIATES THE DISCONNECTION
OF OFFSITE POWER SOURCES

Ref. No. (a)	Instrument (b)	Instrument Check Minimum Frequency	Instrument Functional Test Minimum Frequency	Instrument Calibration Minimum Frequency
1	4.16 Kv Emergency Bus Undervoltage Relay (Loss of Voltage Condition)	N/A	Once/month	Once/operating cycle
2	4/16 kv Emergency Bus Undervoltage Relay (Degraded Voltage Condition)	N/A	Once/month	Once/operating cycle

NOTES FOR 4.2-12

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 3.2-12 and items in Table 4.2-12.

b. Surveillance of this instrumentation is required during reactor startup, power operation, and hot shutdown.

TABLE 4.2-13

INSTRUMENTATION WHICH INITIATES ENERGIZATION BY
ONSITE POWER SOURCES

Ref. No. (a)	Instrument (b)	Instrument Check Minimum Frequency	Instrument Functional Test Minimum Frequency	Instrument Calibration Minimum Frequency
1	Startup auxiliary transformer 1C loss of voltage condition	N/A	Once/Month	Once/Operating cycle

NOTES FOR TABLE 4.2-13

a. The column entitled "Ref. No." is only for convenience so that a one-to-one relationship can be established between items in Table 3.2-13 and items in Table 4.2-13.

b. Surveillance of this instrumentation is required during reactor startup, power operation, and hot shutdown.

3.2.J.4. Scintillation Detector For Monitoring Radioiodine (Continued)

Level reading is indicative of a leak in the nuclear system process barrier in the primary containment. A sample that is continuously drawn from the primary containment is collected on an iodine filter and monitored by a gamma sensitive scintillation detector. Radiation levels are read out by a log rate meter and recorded on a strip chart located in the control room. A high radiation level alarm and a failure alarm are also provided and are annunciated in the control room. Also, a high-low flow alarm is annunicated in the control room.

5. GM Tubes for Monitoring Noble Gases

A set of GM tubes contained in an instrument rack are used to monitor the release of noble gases in the drywell and torus. A high radiation level reading is indicative of a leak in the nuclear system process barrier in the primary containment. A sample that's continuously drawn from the primary containment is passed through a shielded sample chamber which contains the beta sensitive GM tubes. Radiation levels are read out by a log rate meter and recorded on a strip chart located in the control room. A high radiation level alarm and failure alarm are provided and are annunciated in the control room. Also, a high-flow alarm is annunciated in the control room.

K. Instrumentation Which Provides Surveillance Information (Table 3.2-11)

For each parameter monitored, as listed in Table 3.2-11, there are two channels of instrumentation except for the control rod positions indicating system. By comparing readings between the two channels, a near continuous surveillance of instrument performance is available. Any significant deviation in readings will initiate an early recalibration, thereby maintaining the quality of the instrument readings.

The hydrogen and oxygen analyzing systems consist of two redundant, separate systems and are each capable of analyzing the hydrogen and oxygen content of the drywell-torus simultaneously. They are designed to be completely testable at both the analyzer rack and in the control room. With an oxygen concentration of less than 4% by volume, a flammable mixture with hydrogen is not possible.

L. Instrumentation Which Initiates Disconnection of Offsite Power Sources (Table 3.2-12)

The undervoltage relays shall automatically initiate the disconnection of offsite power sources whenever the voltage setpoint and time delay limits have been exceeded. This action shall provide voltage protection for the emergency power systems by preventing sustained degraded voltage conditions due to the offsite power source and interaction between the offsite and onsite emergency power systems. The undervoltage relays have a time delay characteristic that provides protection against both a loss of voltage and degraded voltage condition and thus minimizes the effect of short duration disturbances without exceeding the maximum time delay, including margin, that is assumed in the FSAR accident analyses.

M. Instrumentation Which Initiates Energization by Onsite Power Sources (Table 3.2-13)

The undervoltage relays shall automatically trip the loss of offsite power (LOSP) lockout relays if voltage is lost on the emergency buses and low voltage is sensed on start-up transformer 1C (SUT 1C). This lockout will, if a loss of coolant accident (LOCA) has previously occurred, cause energization of the emergency 4160 volt buses by the Diesel Generators (D/Gs). If the LOSP and LOCA occur simultaneously, the lockout relay will provide a permissive allowing D/G output breaker closure when the D/G voltage is up to normal. The undervoltage relays will have no time delay. The absence of time delay provides a faster response time if the diesel generator has been previously initiated and prevents an additional time delay if it has not. This scheme prevents the connection of the D/G to the offsite power source.

3.2.1 References

1. FSAR Appendix G, Plant Nuclear Safety Operational Analysis

2. FSAR Section 7.3, Primary Containment and Reactor Vessel Isolation Control System

3. FSAR Section 14, Plant Safety Analysis

4. FSAR Section 6, Core Standby Cooling Systems

5. FSAR Section 14.4.4, Refueling Accident

6. FSAR Section 6.5.3, Integrated Operation of the Core Standby Cooling Systems

7. FSAR Section 6.5.3.1, Liquid Line Breaks

8. 10 CFR 100

4.2 PROTECTIVE INSTRUMENTATION

The instrumentation listed in Table 4.2-1 thru 4.2-13 will be functionally tested and calibrated at regularly scheduled intervals. The same design reliability goal as the Reactor Protection System of 0.99999 is generally applied for all applications of one-out-of-two-taken-twice logic. Therefore, on-off sensors are tested once every three months, and bi-stable trips associated with analog sensors and amplifiers are tested once per week.

Those instruments which, when tripped, result in a rod block have their contacts arranged in a one-out-of-n logic, and all are capable of being bypassed. For such a tripping arrangement with bypass capability provided, there is an optimum test interval that should be maintained in order to maximize the reliability of a given channel (Reference 1). This takes account of the fact that testing degrades reliability and the optimum interval between tests is approximately given by:

$$i = \sqrt{\frac{2t}{r}}$$

Where i = the optimum interval between tests.

t = the time the trip contacts are disabled from performing their function while the test is in progress.

r = the expected failure rate of the relays.

To test the trip relays requires that the channel be bypassed, the test made, and the system returned to its initial state. It is assumed this task requires an estimated 30 minutes to complete in a thorough and workmanlike manner and that the relays have a failure rate of 10^{-6} failures per hour. Using this data and the above operation, the optimum test intervals is:

$$i = \sqrt{\frac{2(0.5)}{10^{-6}}} = 10^3 \text{ hours}$$

42 days

A test interval of once-per-month will be used initially.

The sensors and electronic apparatus have not been included here as these are analog devices with readouts in the control room and the sensors and electronic apparatus can be checked by comparison with other like instruments. The checks which are made on a daily basis are adequate to assure operability of the sensors and electronic apparatus, and the test interval given above provides for optimum testing of the relay circuits.

The above calculated test interval optimizes each individual channel, considering it to be independent of all others. As an example, assume that there are two channels with an individual technician assigned to each. Each technician test his channel at the optimum frequency, but the two technicians are not allowed to communicate so that one can advise the other that his channel is under test. Under these conditions, it is possible for both channels to be under test simultaneously. Now, assume that the technicians are required to communicate and that two

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENTS
	4.9.A.6. Emergency 250 Volt DC to 600 Volt AC Inverters (Continued)
	b. Once every scheduled refueling outage, the emergency 250 volt DC/600 volt AC inverters shall be subjected to a load test to demonstrate operational readiness.
3.9.A.7 Logic Systems	4.9.A.7 Logic Systems
The following logic systems shall be operable:	The logic systems shall be tested in the manner and frequency as follows:
a. The common accident signal logic system is operable.	a. Each division of the common accident signal logic system shall be tested every scheduled refueling outage to demonstrate that it will function on actuation of the core spray system to provide an automatic start signal to all 3 diesel generators.
b. The undervoltage relays and supporting system are operable.	b.1. Once every scheduled refueling outage, the conditions under which the undervoltage logic system is required shall be simulated with an undervoltage on each start bus to demonstrate that the diesel generators will start. The testing of the undervoltage logic shall demonstrate the operability of the 4160 volt load shedding and auto bus transfer circuits. The simulations shall test both the degraded voltage and the loss of off-site power relays.
	2. Once per month, the relays which initiate energization of the emergency buses by the Diesel Generators when voltage is lost on the emergency buses and start-up transformer 1C, will be functionally tested.
c. The common accident signal logic system, and undervoltage relays and supporting system are operable.	c. Once per operating cycle each diesel generator shall be demonstrated operable by simulating both a loss of off-site power and a degraded voltage condition in conjunction with an accident test signal and verifying:

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.9.A.7 Logic Systems (Continued)	4.9.A.7 Logic Systems (Continued)
	de-energization of the emergency buses and load shedding from the emergency buses; the diesel starts from ambient condition on the auto-start signal, energizes the emergency buses and sequentially closes all safety load breakers (load breakers in test position): and that on diesel generator trip that safety load breakers on the emergency bus open, and that with an auto-start signal the diesel restarts and energizes the emergency buses and sequentially closes all safety load breakers (load breakers in test position).
	d. The undervoltage relays for the start buses shall be calibrated annually for trip and reset voltages and the measurements recorded.
e. The 600-volt load shedding logic system is operable.	e. Once every scheduled refueling outage, the condition under which the 600-volt load shedding logic system is required shall be simulated to demonstrate that the load shedding logic system will initiate load shedding on the diesel auxiliary boards, react MOV boards, and the 600-volt shutdown boards.
f. 600 volt swing bus transfer circuitry for MCC S018A and S018B.	f. Every two months the swing buses supplying power to the Low Pressure Coolant Injection System valves shall be tested to assure that the transfer circuits operate as designed.
B. Requirements for Continued Operation With Inoperable Components	B. Requirements for Continued Operation With Inoperable Components
Whenever the reactor is in the Start & Hot Standby or Run Mode and the reactor water temperature is greater than 212°F, the availability of auxiliary electrical power shall be as specified in 3.9.A, except as specified herein. If the requirements of this Specification cannot be met, an orderly shutdown shall be initiated and the reactor shall be placed in the Cold Shutdown Condition within 24 hours.	Continued reactor operation is permissible with inoperable components in accordance with Specification 3.9.B provided that the following increased Surveillance Requirements are satisfied.

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. 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 and/or a degraded voltage or LOSP signal.

The periodic testing of the relays which initiate energization of the emergency buses by the diesel generators when voltage is lost on startup transformer 1C will verify operability of these relays.

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

D. 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.