



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555
November 27, 1978

Docket Nos. 50-348/364

PIA

Alabama Power Company
ATTN: Mr. Alan R. Barton
Senior Vice President
P. O. Box 2641
Birmingham, Alabama 35291

Gentlemen:

RE: JOSEPH M. FARLEY NUCLEAR PLANTS UNIT NO. 1 AND NO. 2

We are continuing our review of the onsite emergency power systems of all operating nuclear power facilities to assess the susceptibility of their safety related electrical equipment with regard to (1) sustained degraded voltage conditions at the offsite power sources and (2) interaction between the offsite and onsite emergency power systems.

We have completed our initial review of your November 7, 1977 response to our August 30, 1977 generic request for information relative to the electrical power distribution systems. Based on this initial review, we have prepared Staff Positions on Degraded Electrical Power Grid Conditions for Farley Units No. 1 and No. 2 contained in Enclosure 1.

We request that you compare the design proposed in your November 7, 1977 letter for the emergency power systems at your facility(ies) with the Staff Positions in Enclosure 1 and; within 45 days of receipt of this letter:

- (1) propose additional Unit No. 1 and Unit No. 2 modifications as necessary to meet the Staff Positions, including completion schedules or
- (2) provide a detailed analysis which shows that the design of your facilities has equivalent capabilities and protective features.

Additionally, we require that certain Technical Specifications be incorporated into all facility operating licenses. Model Technical Specifications, consistent with the Staff Positions contained in Enclosure 1, are provided in Enclosure 2.

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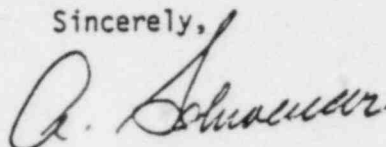
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November 27, 1978

We request that you apply, within forty-five days of the receipt of this letter, for an amendment to your Unit No. 1 operating license to incorporate Technical Specifications comparable to those presented in Enclosure 2.

If you have any questions on this matter, please contact us.

Sincerely,



A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors

Enclosures:

1. Staff Positions
2. Model Technical Specifications

cc: See next page

November 27, 1978

cc: Ruble A. Thomas, Vice President
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ENCLOSURE 1
STAFF POSITIONS ON
DEGRADED ELECTRICAL POWER GRID CONDITIONS
FOR FARLEY UNITS NO. 1 AND NO. 2

1. It is our position that the design of additional undervoltage relays that you proposed to install at safeguard busses 1E and 1G shall satisfy the following criteria:
 - a. The selection of voltage and time set points shall be determined from an analysis of the voltage requirements of the safety-related loads at all onsite system distribution levels;
 - b. The voltage protection shall include coincidence logic on a per bus basis to preclude spurious trips of the offsite power source;
 - c. The time delay selected shall be based on the following conditions:
 - (1) The allowable time delay, including margin, shall not exceed the maximum time delay that is assumed in the SAR accident analyses;
 - (2) The time delay shall minimize the effect of short duration disturbances from reducing the availability of the offsite power source(s); and
 - (3) The allowable time duration of a degraded voltage condition at all distribution system levels shall not result in failure of safety systems or components;

- d. The voltage sensors shall automatically initiate the disconnection of offsite power sources whenever the voltage set point and time delay limits have been exceeded;
- e. The voltage sensors shall be designed to satisfy the applicable requirements of IEEE Std. 279-1971, "Criteria for Protection Systems for Nuclear Power Generating Stations"; and
- f. The Technical Specifications shall include limiting condition for operation, surveillance requirements, trip set points and minimum and maximum limits, and allowable values for the second-level voltage protection sensors and associated time delay devices.

Provide a modified design that meets our above requirements.

2. We require that the current system design that automatically prevents load shedding of the emergency buses (once the onsite sources are supplying power to all sequenced loads on the emergency buses) shall have the capability of the load shedding feature to be automatically reinstated if the onsite source supply breakers are tripped. The automatic bypass and reinstatement feature shall be verified during the periodic testing identified in position 3.

3. We require that the Technical Specifications include a test requirement to demonstrate the full functional operability and independence of the onsite power sources at least once per 18 months during shutdown. The Technical Specifications shall include a requirement for tests: (1) simulating loss of offsite power; (2) simulating loss of offsite power in conjunction with a safety feature actuation signal; and (3) simulating interruption and subsequent reconnection of onsite power sources to their respective buses. Proper operation shall be determined by:
 - a. Verifying that on loss of offsite power the emergency buses have been de-energized and that the loads have been shed from the emergency buses in accordance with design requirements.
 - b. Verifying that on loss of offsite power the diesel generators start on the autostart signal, the emergency buses are energized with permanently connected loads, the auto-connected shutdown loads are energized through the load sequencer, and the system operates for five minutes while the generators are loaded with the shutdown loads.
 - c. Verifying that on a safety features actuation signal (without loss of offsite power) the diesel generators start on the autostart signal and operate on standby for five minutes.

- d. Verifying that on loss of offsite power in conjunction with a safety features actuation signal the diesel generators start on the autostart signal, the emergency buses are energized with permanently connected loads, the auto-connected emergency (accident) loads are energized through the load sequencer, and the system operates for five minutes while the generators are loaded with the emergency loads.

- e. Verifying that on interruption of the onsite sources the loads are shed from the emergency buses in accordance with design requirements and that subsequent loading of the onsite sources is through the load sequencer.

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NO. OF CHANNELS</u>	<u>CHANNELS TO TRIP</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE OPERATING MODES**</u>	<u>ACTION ***</u>
LOSS OF POWER					
a. 4.16 kv Emergency Bus Undervoltage (Loss of Voltage)	* 4(3)/Bus	2/Bus	3(2)/Bus	1, 2, 3	A or B
b. 4.16 kv Emergency Bus Undervoltage (Degraded Voltage)	4(3)/Bus	2/Bus	3(2)/Bus	1, 2, 3	A or B

MODEL TECHNICAL SPECIFICATIONS

ENCLOSURE 2

*(Entries in parenthesis are applicable for 2 out of 3 coincidence logic)

**Required when ESF equipment is required to be operable

**Action A for 2 out of 4 logic
Action B for 2 out of 3 logic

TABLE 3.3-3 (Continued)

ACTION STATEMENTS

- ACTION A - With the number of OPERABLE channels one less than the Total Number of Channels operation may proceed provided both of the following conditions are satisfied:
- a. The inoperable channel is placed in the tripped condition within one hour.
 - b. The Minimum Channels OPERABLE requirement is met; however, one additional channel may be bypassed for up to 2 hours for surveillance testing per Specification (4.3.2.1.1).
- ACTION B - With the number of OPERABLE Channels one less than the Total Number of Channels operation may proceed until performance of the next required CHANNEL FUNCTIONAL TEST provided the inoperable channel is placed in the tripped condition within 1 hour.

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION TRIP VALUES

<u>FUNCTIONAL UNIT</u>	<u>TRIP VALUE</u>	<u>ALLOWABLE VALUES</u>
LOSS OF POWER		
a. 4.16 kv Emergency Bus Undervoltage (Loss of Voltage)	{ $\frac{+}{-}$ } volts with a second time delay	{ $\frac{+}{-}$ } volts with a second time delay
b. 4.16 kv Emergency Bus Undervoltage (Degraded Voltage)	{ $\frac{+}{-}$ } volts with a second time delay	{ $\frac{+}{-}$ } volts with a second time delay

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>FUNCTIONAL UNIT</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL CALIBRATION</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>OPERATING MODES IN WHICH SURVEILLANCE REQUIRED</u>
LOSS OF POWER				
a. 4.16 kv Emergency Bus Undervoltage (Loss of Voltage)	S	R	M	1, 2, 3
b. 4.16 kv Emergency Bus Undervoltage (Degraded Voltage)	S	R	M	1, 2, 3

S = at least once per 12 hours
R = at least once per 18 months
M = at least once per 31 days

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS

4.8.1.1.X Each diesel generator shall be demonstrated OPERABLE:

- a. At least once per 18 months during shutdown by:
 1. Simulating a loss of offsite power in conjunction with a safety injection actuation test signal, and:
 - a) Verifying de-energization of the emergency busses and load shedding from the emergency busses.
 - b) Verifying the diesel starts from ambient condition on the auto-start signal, energizes the emergency busses with permanently connected loads, energizes the auto-connected emergency loads through the load sequencer and operates for ≥ 5 minutes while its generator is loaded with the emergency loads.
 - c) Verifying that on diesel generator trip, the loads are shed from the emergency busses and the diesel re-starts on the auto-start signal, the emergency busses are energized with permanently connected loads, the auto-connected emergency loads are energized through the load sequencer and the diesel operates for ≥ 5 minutes while its generator is loaded with the emergency loads.