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Vice President
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Grand Gulf Nuclear Station

October 17, 1991

U.S. Nuclear Regulatory Commission
Mail Station P1-137
Washington, D.C. 20555

Attention: Document Control Desk

Subject: Grand Gulf Nuclear Station
Unit 1
Docket No. 50-416
License No. NPF-29
Response to Generic Letter 91-06; Resolution of Generic
Issue A-30, "Adequacy of Safety-Related DC Power
Supplies"

GNRO-91/00141

Gentlemen:

Generic Letter 91-06 dated April 29, 1991 (GNRI-91/00092), requests response to questions related to Generic Issue (GI) A-30, "Adequacy of Safety Related DC Power Supplies". As part of the resolution of GI A-30, this generic letter seeks information pertaining to preventive maintenance, surveillance requirements, and alarm indication for safety related DC power supplies. The responses to these questions for Grand Gulf Nuclear Station (GGNS) are contained in the attachment.

If you have any questions please advise.

Yours truly,

WTC/JEO/ams
enclosure: Response to Generic Letter 91-06
cc: (See Next Page)

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cc:

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BEFORE THE
UNITED STATES NUCLEAR REGULATORY COMMISSION

LICENSE NO. NPF-29

DOCKET NO. 50-416

IN THE MATTER OF

MISSISSIPPI POWER & LIGHT COMPANY
and
SYSTEM ENERGY RESOURCES, INC.
and
SOUTH MISSISSIPPI ELECTRIC POWER ASSOCIATION
and
ENTERGY OPERATIONS, INC.

AFFIRMATION

I, W. T. Cottle, being duly sworn, state that I am Vice President, Operations GGNS of Entergy Operations, Inc.; that on behalf of Entergy Operations, Inc., System Energy Resources, Inc., and South Mississippi Electric Power Association I am authorized by Entergy Operations, Inc. to sign and file with the Nuclear Regulatory Commission, this response to Generic Letter 91-06 for Grand Gulf Nuclear Station; that I signed this submittal as Vice President, Operations GGNS of Entergy Operations, Inc.; and that the statements made and the matters set forth therein are true and correct to the best of my knowledge, information and belief.

W. T. Cottle
W. T. Cottle

STATE OF MISSISSIPPI
COUNTY OF CLAIBORNE

SUBSCRIBED AND SWORN TO before me, a Notary Public, in and for the County and State above named, this 17 day of October, 1991.

(SEAL)

Patricia H. Hagan
Notary Public

My commission expires:

My Commission Expires July 1, 1993

GGNS RESPONSE TO GENERIC LETTER 91-06

10CFR50.54(f) REQUEST - GENERIC ISSUE (GI) A-30
"ADEQUACY OF SAFETY-RELATED DC POWER SUPPLIES"

The following questions from GL 91-06 are reproduced, followed by the GGNS response (which is underlined):

The following information is to be provided for each unit at each site:

1. Unit Grand Gulf Nuclear Station Unit 1
2.
 - a. The number of independent redundant divisions of Class 1E or safety-related dc power for this plant is three. (Include any separate Class 1E or safety-related dc, such as any dc dedicated to the diesel generators.)
 - b. The number of functional safety-related divisions of dc power necessary to attain safe shutdown for this unit is two.
3. Does the control room at this unit have the following separate, independently annunciated alarms and indications for each division of dc power?
 - a. Alarms
 1. Battery disconnect or circuit breaker open? Divisions 1 and 2 have the position of their feeder breaker monitored by control room annunciation. Division 3's feeder breaker is not alarmed in the control room. However, should this breaker open, an undervoltage relay monitoring the bus will provide a trouble alarm in the control room.
 2. Battery charger disconnect or circuit breaker open (both input ac and output dc)? Divisions 1 and 2 battery chargers' AC input and DC output breakers are monitored by a control room computer point, not a control room alarm. Division 3's AC input breaker is indirectly monitored by an annunciator monitoring an undervoltage relay.
 3. dc system ground? For Divisions 1 and 2 the ground detection relay is monitored by a computer point, while Division 3 ground detection relay brings in an annunciator in the control room.
 4. dc bus undervoltage? For Divisions 1 and 2 the bus undervoltage relay brings in a computer point, while Division 3's bus undervoltage relay brings in an annunciator in the control room.
 5. dc bus overvoltage? For Divisions 1 and 2 the charger's DC overvoltage relay brings in a computer point, while Division 3's charger's DC overvoltage relay brings in an annunciator in the control room.

6. Battery charger failure? There is an under/over voltage relay on the output of each of the ESF battery chargers which monitors the output voltage of these chargers. The Divisions 1 and 2 charger's under/over voltage relay brings in a computer point. The Division 3 battery charger's under/over voltage relay brings in a control room annunciator.
7. Battery discharge? A combination of the above indications (bus u/v, breaker position, charger status) will provide indication of battery discharged state.

b. Indications

1. Battery float charge current? Battery float charge current indication is located locally on the Battery Bus for Divisions 1 & 2. The Division 3 float charge indication is provided by the difference of total load current displayed local to the Bus and total charger output current displayed local to the charger.
2. Battery circuit output current? Battery circuit output current is a local indication.
3. Battery discharge? yes (see a.7. above).
4. Bus voltage? There is a voltmeter for each of the three ESF battery buses located in the control room.

c. Does the unit have written procedures for response to the above alarms and indications? yes .

4. Does this unit have indication of bypassed and inoperable status of circuit breakers or other devices that can be used to disconnect the battery and battery charger from its dc bus and the battery charger from its ac power source during maintenance or testing? yes (see 3.a.1. and 3.a.2.).
5. If the answer to any part of question 3 or 4 is no, then provide information justifying the existing design features of the facility's safety-related dc systems. *See note below.

The justification for GGNS' existing design of the safety-related dc systems is stated in the Safety Evaluation Report (SER) Section 8.3.2, September 1981 edition. This report stated "The specific requirements for dc power systems monitoring derived from recommendations embodied in Section 5.3.2(4), 5.3.3(5) and 6.3.4(5) of IEEE std. 308-1974, and guidelines in Regulatory Guide 1.47. In summary, these general recommendations and guidelines state that the dc system (batteries, distribution systems and chargers) shall be monitored to the extent that it is shown to be ready to perform its intended function." Accordingly, requirements were made in the SER for certain Class 1E DC power supply indications and alarms to be installed in the control room. These requirements, with some noted and qualified exceptions, were implemented.

In conclusion, the SER stated that based upon review, evaluation, and imposed requirements, Grand Gulf's Class 1E dc power supply system was found to be acceptable.

6. (1) Have you conducted a review of maintenance and testing activities to minimize the potential for human error causing more than one dc division to be unavailable? yes and (2) do plant procedures prohibit maintenance or testing on redundant dc divisions at the same time? yes

If the facility Technical Specifications have provisions equivalent to those found in the Westinghouse and Combustion Engineering Standard Technical Specifications for maintenance and surveillance, then question 7 may be skipped and a statement to that effect may be inserted here.

N/A

7. Are maintenance, surveillance and test procedures regarding station batteries conducted routinely at this plant? Specifically:

a. At least once per 7 days are the following verified to be within acceptable limits:

1. Pilot cell electrolyte level? yes
2. Specific gravity or charging current? yes
3. Float voltage? yes
4. Total bus voltage on float charge? yes
5. Physical condition of all cells: yes

(Ref. for 7.a.(1-5) Procedure 06-EL-1L11-W-0001)

- b. At least once per 92 days, or within 7 days after a battery discharge, overcharge, or if the pilot cell readings are outside the 7-day surveillance requirements are the following verified to be within acceptable limits:

1. Electrolyte level of each cell? yes
2. The average specific gravity of all cells? yes
3. The specific gravity of each cell? yes
4. The average electrolyte temperature of a representative number of cells? yes

5. The float voltage each cell? yes
6. Visually inspect or measure resistance of terminals and connectors (including the connectors at the dc bus)?
yes

(Ref. for 7.b.(1-6) Procedure 06-EL-1L11-Q-0001)

- c. At least every 18 months are the following verified:

1. Low resistance of each connection (by test)? yes
2. Physical condition of the battery? yes
3. Battery charger capability to deliver rated ampere output to the dc bus? yes
4. The capability of the battery to deliver its design duty cycle to the dc bus? yes
5. Each individual cell voltage is within acceptable limits during the service test? yes

(Ref. for 7.c.(1-2) Procedure 06-EL-1L11-R-0001)

(Ref. for 7.c.(3-5) Procedure 06-EL-1L11-R-0003)

- d. At least every 60 months, is capacity of each battery verified by performance of a discharge test? yes
- e. At least annually, is the battery capacity verified by performance of a discharge test, if the battery shows signs of degradation or has reached 85% of the expected service life?
yes

(Ref. for 7.d. and e. Procedure 06-EL-1L21-0-0001)

8. Does this plant have operational features such that following loss of one safety-related dc power supply or bus:
 - a. Capability is maintained for ensuring continued and adequate reactor cooling? yes
 - b. Reactor coolant system integrity and isolation capability are maintained? yes
 - c. Operating procedures, instrumentation (including indicators and annunciators), and control functions are adequate to initiate systems as required to maintain adequate core cooling? yes

9. If the answer to any part of question 6, 7 or 8 is no, then provide your basis for not performing the maintenance, surveillance and test procedures described and/or the bases for not including the operational features cited. *See note below. N/A

*Note: For questions involving supporting type information (question numbers 5 and 9) instead of developing and supplying the information in response to this letter, you may commit to further evaluate the need for such provisions during the performance of your individual plant examination for severe accident vulnerabilities (IPE). If you select this option, you are required to:

- (1) So state in response to these questions, and
- (2) Commit to explicitly address question 5 and 9 in your IPE submittal per the guidelines outlined in NUREG-1335 (Section 2.1.6, Subitem 7), "Individual Plant Examination: Submittal Guidance."