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SUBJECT: Responds to Generic Ltr 91-06, "Resolution of Generic Issue A-30, 'Adequacy of Safety-Related DC Power Supples,'" per 10CFR50.54(f).

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CP&L
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OCT 25 1991

SERIAL: NLS-91-274

G. E. VAUGHN
Vice President
Nuclear Services Department

United States Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, DC 20555

SHEARON HARRIS NUCLEAR POWER PLANT
DOCKET NOS. 50-400/LICENSE NOS. NPF-63
RESPONSE TO GENERIC LETTER 91-06
ADEQUACY OF SAFETY-RELATED DC POWER SUPPLIES

Gentlemen:

The purpose of this letter is to submit Carolina Power & Light Company's response to NRC Generic Letter 91-06, "Resolution of Generic Issue A-30, 'Adequacy of Safety-Related DC Power Supplies', Pursuant to 10 CFR 50.54(f)" for the Shearon Harris Nuclear Power Plant (SHNPP). The Staff requested written responses to questions provided in Enclosure 1 of the Generic Letter within 180 days of the date of the Generic Letter, which was issued on April 29, 1991.

Please refer any questions regarding this submittal to Mr. S. D. Chaplin at (919) 546-6623.

Yours very truly,

G. E. Vaughn

GEV/SDC (GL91-06.hnp)

Enclosure

cc: Mr. S. D. Ebneter
Ms. B. L. Mozafari
Mr. J. E. Tedrow (NRC-SHNPP)

G. E. Vaughn, having been first duly sworn, did depose and say that the information contained herein is true and correct to the best of his information, knowledge and belief; and the sources of his information are officers, employees, contractors, and agents of Carolina Power & Light Company.

Eleanor C. Chappell
Notary (Seal)

ELEANOR C. CHAPPELL NOTARY PUBLIC WAKE COUNTY, N.C.

My commission expires: 2/6/96

A001

ENCLOSURE 1

SHEARON HARRIS NUCLEAR POWER PLANT
NRC DOCKET NOS. 50-400
OPERATING LICENSE NOS. NPF-63
RESPONSE TO GENERIC LETTER 91-06
ADEQUACY OF SAFETY-RELATED DC POWER SUPPLIES

Enclosed is Carolina Power & Light Company's (CP&L) responses to the NRC questions contained in Generic Letter 91-06 for the Shearon Harris Nuclear Power Plant. The NRC questions have been repeated with the necessary information provided in the blanks left by the NRC Staff. In addition, CP&L has provided comments and clarifications to the NRC questions, where appropriate.

NRC QUESTION 1:

Unit 1

NRC QUESTION 2:

a. The number of independent redundant divisions of Class 1E or safety-related dc power for this plant is two. (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 one.

CP&L COMMENT AND CLARIFICATION:

No additional comments.

NRC QUESTION 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? n/a

2. Battery charger disconnect or circuit breaker open (both input ac and output dc)? Yes

3. dc system ground? Yes

4. dc bus undervoltage? Yes

5. dc bus overvoltage? Yes

6. Battery charger failure? Yes

7. Battery discharge? No

b. Indications

1. Battery float charge current? No

2. Battery circuit output current? Yes

3. Battery discharge? Yes

4. Bus voltage? Yes

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

CP&L COMMENTS AND CLARIFICATIONS:

The Shearon Harris Nuclear Power Plant (SHNPP) safety related DC Power System utilizes two chargers for each train (division) of DC power. One charger in each train remains online and operational while the second remains offline as a backup. The safety related DC Power System monitoring features include main control board visual indication and annunciation for both safety related DC power systems (1A-SA & 1B-SB). In addition, safety related DC battery charger trouble lights and visual system indicators are located locally on each battery charger.

The Shearon Harris Nuclear Power Plant uses a single common annunciator for each division of safety related power to indicate emergency DC power trouble in that division (125 VDC emergency bus A & B trouble). The separate and independent annunciator for each train facilitates quick trouble diagnosis of the DC power system.

The NRC staff has reviewed and audited the safety related DC Power System during the licensing of the Harris Plant as noted in the Safety Evaluation Report. Audits such as the Electrical and Instrumentation and Control System Branch Audit conducted in January 1986 has ensured that the DC power system exhibits monitoring features which have proven to provide operations the ability to operate and forecast system operability and malfunctions. This ensures adequate safety related DC power is available for safe shutdown of the plant.

QUESTION 3.a.1.

The 125 VDC emergency bus design does not incorporate a circuit opening device or disconnect means between each safety related

battery and its associated DC bus. Therefore, an alarm for such a device is unnecessary.

QUESTION 3.a.2.

The system design incorporates, for each train, a loss of AC input power to the charger through the phase failure/loss of input alarm relay. Battery charger DC output breaker position is effectively monitored by the no current alarm relay, which is located after the DC output breaker. This alarm relay monitors charger current output and provides annunciation when no DC current is being supplied by the DC charger.

The input and output alarm relays activate the common 125 VDC emergency bus trouble alarm. This annunciator, located on the main control board, notifies operations of DC system trouble.

For these annunciators to be operational, either the AC input breaker, the DC output breaker, or both must be closed to place the alarm circuitry in service. The requirement for at least one breaker to be closed is to prevent annunciation from the back-up battery charger associated with each division of safety related DC power. The back-up charger is normally out of service, with the input AC circuit breaker and the DC output circuit breaker open.

QUESTION 3.a.3.

System design for a DC ground (ground fault) includes an alarm on the main control board. The annunciator used is the common 125 VDC emergency trouble alarm. This alarm is separate and independent for each division of safety related DC power.

QUESTION 3.a.4.

The system design incorporates an undervoltage alarm which annunciates the common 125 VDC emergency bus trouble alarm to notify operations of an undervoltage condition. Emergency bus voltage is also indicated on the main control board by a voltmeter. Both the alarm and voltage indication are separate and independent for each train of DC power.

QUESTION 3.a.5.

Each division of safety related power incorporates an alarm for the DC battery charger (bus) overvoltage via the common 125 VDC emergency bus trouble alarm. Again, this alarm is separate and independent for each division of safety related DC power.

QUESTION 3.a.6.

Each safety related battery charger is equipped with a charger failure relay which annunciates the 125 VDC emergency bus trouble alarm for the respective train. The relay and alarm are separate for each division of safety related power.

QUESTION 3.a.7.

Conditions that may result in a high battery discharge condition can be detected by a bus undervoltage condition which is alarmed in the control room as described in Section 3.a.4.

QUESTION 3.b.1.

Since the safety related battery charger supplies the normal DC plant loads as well as provide the charging current to the DC battery bank, battery charger current is indicated locally at the charger. Each DC battery charger is equipped with a DC ammeter and DC voltmeter.

QUESTION 3.b.2.

When the batteries are supplying the plant DC load, battery output current can be monitored from the DC bus ammeter located in the main control room.

QUESTION 3.b.3.

When the batteries take over plant DC load requirements, the rate of discharge can be monitored from the control room by means of a DC ammeter and DC voltmeter. Each division of DC power has a DC ammeter and DC voltmeter located on the main control board to enable operations the ability to monitor the DC power system.

QUESTION 3.b.4.

Each division of DC power is equipped with a DC voltmeter located on the main control board to allow operations the ability to monitor DC bus voltage. This voltmeter is used to monitor bus voltage when the DC battery chargers are in service as well as when the batteries assume plant DC load requirements.

NRC QUESTION 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? No

CP&L COMMENTS AND CLARIFICATIONS:

As noted in Section 3.a.1, the DC battery cannot be disconnected from its associated DC bus by means of a circuit breaker or other type device during maintenance or testing. Therefore bypassed or inoperable indication is not necessary.

When maintenance or testing of a battery charger or its associated input and/or output breakers is necessary, that charger is taken offline and the alternate charger is placed in service. The online charger has all the indication and alarm features described previously.

NRC QUESTION 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.

CP&L COMMENTS AND CLARIFICATIONS:

See justification for each question answered "No" in the Question Comment and Clarification section of this response.

NRC QUESTION 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 the effect may be inserted here. The SHNPP Technical Specifications were based on and reviewed by the staff against Westinghouse Standard draft Revision 5.

NRC QUESTION 7:

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

CP&L COMMENTS AND CLARIFICATIONS:

See statement above concerning SHNPP technical Specifications.

NRC QUESTION 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 required to maintain adequate core cooling? Yes

CP&L COMMENTS AND CLARIFICATIONS:

No additional comments.

NRC QUESTION 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.

*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 questions 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."

CP&L COMMENTS AND CLARIFICATIONS:

Not applicable based on responses to Questions 6, 7 and 8.