

June 6, 2003

Mr. J. W. Moyer, Vice President
Carolina Power & Light Company
H. B. Robinson Steam Electric Plant,
Unit No. 2
3581 West Entrance Road
Hartsville, South Carolina 29550

SUBJECT: H. B. ROBINSON STEAM ELECTRIC PLANT UNIT 2 - COMPLETION OF
LICENSING ACTIVITY FOR ADEQUACY OF DELAYED OFFSITE POWER
CIRCUIT (TAC NO. M97957)

Dear Mr. Moyer:

As a result of lessons learned from the Maine Yankee Independent Safety Assessment, NRC reviewed the offsite power system designs and Technical Specifications (TS) for operating plants licensed prior to 1980. Multi-Plant Action (MPA) B-48, "Adequacy of Station Electrical System Voltage," was initiated by the NRC to determine if the onsite distribution system in connection with the offsite power sources had sufficient capacity and capability to start and operate all required safety loads within the equipment voltage rating. This review identified that H. B. Robinson Steam Electric Plant, Unit 2 (HBRSEP2) is a plant that was licensed with only one immediately available offsite power circuit and a delayed offsite circuit that requires the main generator links to be removed before offsite power can be restored to the onsite power distribution system.

The NRC staff's Safety Evaluation dated May 18, 1970, states:

Should a loss-of-coolant accident occur following transformer failure, the engineered safety features would be dependent on the redundant diesel generators for power until disconnect links could be removed from the station generator to permit the backfeeding of offsite power to the auxiliary electrical system through the station main transformer. This would require about 8 hours to accomplish.

This statement in the original NRC staff's Safety Evaluation confirms that the design of the offsite power system for HBRSEP2 was accepted on the basis that the design of the plant had a backfeed capability in the event of a transformer failure.

HBRSEP2 was constructed prior to the issuance of the current General Design Criterion (GDC) 17, "Electric Power Systems." The licensee-proposed design criterion, identified in Chapter 8 of the original Final Safety Analysis Report (FSAR) as GDC 39, is different than the draft GDC 39 published in the *Federal Register* on July 11, 1967. The published draft GDC 39, "Emergency Power for Engineered Safety Features (Category A)," differed from the licensee's proposed criterion in that it separated the onsite power system requirements and explicitly stated that redundancy in each power system is required. Therefore, it is not clear in the licensee's version of GDC 39 whether the emergency power source refers to onsite, offsite, or both power system requirements.

On July 21, 1988, the NRC amended its regulations in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50 by adding a new Section 50.63, "Loss of Alternating Current Power." The objective of this rule is to reduce the risk of severe accidents resulting from station blackout (SBO) by maintaining a highly reliable AC power system and, as additional defense in depth, ensuring that plants can maintain adequate reactor core cooling and appropriate containment integrity for required durations. In its initial SBO submittal, the Carolina Power & Light Company (CP&L, the licensee) took credit for removing the main generator disconnect links and backfeeding power from the 230 kV switchyard to qualify as a 4-hour coping plant. CP&L revised its coping duration, however, from 4 to 8 hours when the NRC staff questioned the time needed to actually remove the generator links and backfeed the onsite distribution system.

By a letter dated February 14, 1997, the NRC staff requested information regarding the adequacy of the delayed offsite power circuit for HBRSEP2. In its response, CP&L stated that an analysis has not been performed to demonstrate that the offsite power circuit can be made available in sufficient time following a loss of Startup Transformer #2 to prevent fuel design limits and design conditions of the reactor coolant pressure boundary from being exceeded. CP&L further indicated in its response that it would take significantly longer than the minimum time of the 4 hours stated in the updated FSAR (UFSAR) to establish offsite power following a loss of Startup Transformer #2.

By a letter dated June 10, 1997, the NRC staff noted that the licensing basis for offsite power was modified from the original licensing requirements by CP&L during the NRC staff's resolution of MPA B-48. The current licensing basis for HBRSEP2 offsite power is one immediately available offsite power circuit (the 115 kV source via Startup Transformer #2) and one delayed offsite power circuit (backfeeding through the main and unit auxiliary transformers). The delayed offsite power circuit must be established in approximately 4 hours following a loss of Startup Transformer #2 to power safety buses E1 and E2, as required for nuclear safety consideration.

During a meeting with the NRC on July 31, 1997, CP&L described planned enhancements that will improve the capability to cope with a loss of the startup transformer. The enhancements included a modification to install a disconnect switch to isolate the main generator from the main transformer, developing pre-staged clearances, enhancing pre-staged equipment, and additional training of plant staff.

During a meeting with the NRC on August 17, 1998, CP&L described the results of the Refueling Outage 18 demonstration activities, provided activity timelines, and summarized probabilistic safety analysis results. By a letter dated October 15, 1998, CP&L stated that the existing plant configuration need not be changed because of the following:

- (1) CP&L has demonstrated the capability of providing adequate assurance of the ability to establish the backfeed through the unit auxiliary transformer within approximately 4 hours as stated in the UFSAR;
- (2) The Dedicated Shutdown Diesel Generator provides power to equipment necessary for safe shutdown within 1 hour of loss of onsite power and for the duration of the 8-hour SBO coping period;

- (3) Proposed modification (addition of generator disconnect switch) to reduce the timelines does not result in appreciable improvements to CDF; and
- (4) There is no appreciable increase in risk to the public from the accidental offsite release of radioactive material or potential impact on radiological exposure to the facility workers.

During June 2001, a team of five NRC inspectors from Region II conducted a safety design and performance capability inspection at HBRSEP2. The inspection was conducted in accordance with base inspection Procedure 71111.21, "Safety Systems Design and Performance Capability." No findings of significance were identified during the inspection.

By a letter dated April 4, 2003, CP&L informed the NRC staff that it has confirmed through walkdowns and time validation activities that the backfeed alignment can be accomplished within the 4-hour time period identified in the UFSAR. CP&L further stated that the previously completed minor modification to the backfeed procedure and associated timelines, and any potential future changes in this area, have been and will be controlled in accordance with the Emergency Operating Procedures program and the requirements of 10 CFR 50.59. However, Revision 15 of the UFSAR (1998) indicated that a minimum time of 16 hours is estimated to accomplish backfeeding the plant busses through the unit auxiliary transformer. On May 12, 2003, CP&L revised UFSAR (Rev. 18) to indicate that approximately 4 hours is estimated to accomplish backfeeding the plant busses through the unit auxiliary transformer. In view of the above revision of the UFSAR, the NRC staff finds that this issue is resolved.

Sincerely,

/RA/

Chandu P. Patel, Project Manager, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-261

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- (3) Proposed modification (addition of generator disconnect switch) to reduce the timelines does not result in appreciable improvements to CDF; and
- (4) There is no appreciable increase in risk to the public from the accidental offsite release of radioactive material or potential impact on radiological exposure to the facility workers.

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Sincerely,

/RA/

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Division of Licensing Project Management
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