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SUBJECT: Forwards response to 871218 request for addl info re  
 evaluation of reduction of station safety-related batteries  
 duty cycle from 8- to 1-h. No industry or NRC requirement that  
 battery be sized for specific duty cycle exists.

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

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2  
DOCKET NO. 50-261/LICENSE NO. DPR-23  
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION - STATION BATTERIES

Gentlemen:

The response to the December 18, 1987 "Request for Additional Information - Evaluation of Reduction of Station Safety-Related Batteries Duty Cycle From Eight Hours to One Hour" is attached.

Questions regarding this matter may be referred to Mr. R. W. Prunty at (919) 836-7318.

Yours very truly,

S. R. Zimmerman  
Manager

Nuclear Licensing Section

JSK/vtn (5363JSK)

Attachment

cc: Dr. J. Nelson Grace  
Mr. R. Lo  
NRC Resident Inspector (HBR)

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## ATTACHMENT I

### QUESTION 1:

". . . In view of your proposed reduction of safety-related battery duty cycle from eight hours to one hour, provide a justification for this proposed change."

### RESPONSE:

Currently there is no industry or NRC requirement that a battery be sized for a specific duty cycle. The battery duty cycle is addressed in IEEE-485, "IEEE Recommended Practice for Sizing Large Lead Storage Batteries for Generating Stations and Substations" and IEEE-946, "IEEE Recommended Practice for the Design of Safety-Related DC Auxiliary Power Systems for Nuclear Power Generating Stations."

Per IEEE-485, the duty cycle is "Dependent upon the requirements of the installation." IEEE-946 expands on these requirements and states: "In addition, the overall period (total battery discharge time) of the duty cycle cannot be less than the estimated time interval necessary to restore AC power (either from an on-site engine-generator source or an off-site power source) to the battery chargers and other auxiliaries following a loss of off-site power. This estimated time interval is determined by engineering judgement which is greatly influenced by operating experience and by the quantity, reliability, and flexibility of the specific off-site power sources (generators and transmission system network equipment) and on-site power sources (engine generators and distribution systems)."

At the Robinson Plant the battery chargers are shed upon a loss of AC power and require manual reconnection upon restoration of AC power from either the emergency diesel generator or the off-site power system. Under emergency conditions, Emergency Operating Procedures require that the affected charger(s) be reset (therefore returned to service) within 1/2 hour. A one-hour duty cycle assures an additional 1/2 hour margin (or 100% conservatism) for this action.

Since the function of the batteries is to provide DC power specifically in the time span between loss of off-site/loss of normal on-site AC power and the startup and loading of the emergency diesel generators, and since extended loss of all AC power (i.e., Station Blackout) is not a Design Basis Accident, the only challenge to the batteries are the FSAR Chapter 15 events in which loss of off-site power and emergency diesel generator loading are assumed. From FSAR Chapter 15, these events are main steam line breaks, loss of normal feedwater, and LOCA. However, even for these events, the batteries only carry the DC load for 30 minutes (based on a well established procedural response time for operator action) until redundant and independent chargers support them. Further, this proposed battery duty cycle combined with the dedicated shutdown diesel would meet the requirements of the current draft of the Station Blackout rule.

In summary, within the requirements of the single-failure criteria and in accordance with the site Emergency Operating Procedures, AC input power to at least one DC train will be restored within the established duty cycle period of one hour. This one-hour duty cycle period inherently assures 100% of conservatism for safety margin as discussed above. Therefore, as concluded in the original 50.59 evaluation, CP&L believes the one-hour duty cycle is acceptable.

This change is being incorporated in the regularly scheduled 1988 annual FSAR update.

## QUESTION 2:

". . . , we believe that TMI requirement GL-3 is valid. Provide an analysis acceptable to the staff to justify your position on proposed plant modifications to support the plant power requirements for safety systems."

## RESPONSE:

The reduction of the battery duty cycle from eight hours to one hour does not affect the basis for the NRC's approval of Carolina Power & Light Company's position regarding recommendation GL-3 for the H. B. Robinson Steam Electric Plant, Unit No. 2 (HBR2). Our position was accepted by a Safety Evaluation dated January 6, 1983. The basis for NRC approval is that "the dedicated shutdown system and limited procedural manual actions provide adequate assurance that the turbine driven AFW pump can be started within the required time. Transfer of control for the steam supply valves for the AFW pump turbine to the dedicated shutdown control panel and manual realignment of cooling water flow to the turbine driven pump lube oil coolers can be accomplished before steam generator water inventory is appreciably depleted (dryout). This capability has been verified in control room evacuation procedure walk-throughs." The station batteries were not credited for AFW operations during a loss of off-site power. The dedicated shutdown system, which includes a third, diverse diesel, was appropriately credited as a backup for the Emergency Diesel Generators.

It should be noted that the January 28, 1986 event was a loss-of-offsite-power event, not a loss-of-all-AC-power event. The Emergency Diesel Generator system functioned as designed, and the Dedicated Shutdown Diesel was available had it been needed.

## QUESTION 3:

". . . Provide a justification for not having the LCOs in your Technical Specification or propose a technical specification revision."

## RESPONSE:

A limiting condition for operation for batteries and associated electrical distribution systems does exist in Technical Specifications (TS) and is explained as follows:

Technical Specification Section 3.7.e requires both batteries (battery banks) and their associated electrical distribution systems to be operable whenever the reactor is critical. If either battery bank or associated distribution system becomes inoperable; i.e., unable to meet TS 3.7.e, then TS 3.0 "Limiting Conditions for Operations" would require the unit be placed in hot shutdown within eight hours and in cold shutdown within the next thirty hours unless corrective measures are taken that permit operation.

The Plant Operations Manual contains a procedure, OMM-008, "Minimum Equipment List" the purpose of which is to verify the availability of the Limiting Conditions for Operation (LCO) equipment on a shift-to-shift basis; the station batteries and chargers are included in the Minimum Equipment List.