September 11, 1980

FILE: NG-3514(B) SERIAL NO: NO-80-1315

Office of Nuclear Reactor Regulation
ATTENTION: Mr. T. A. Ippolito, Chief
Operating Reactors Branch No. 2
United States Nuclear Regulatory Commission
Washington, D. C. 20555

BRUNSWICK STEAM ELECTRIC PLANT UNIT NOS. 1 AND 2
DOCKET NOS. 50-325 AND 50-324
LICENSE NOS. DPR-71 AND DPR-62
EFFECT OF DC POWER SUPPLY FAILURE ON ECCS PERFORMANCE

Dear Mr. Ippolito:

In partial response to your letter of April 25, 1980, Carolina Power & Light Company (CP&L) provides the following:

Your letter of April 25, 1980 supplied information from a generic General Electric (GE) study regarding the effects of a DC power supply failure on ECCS performance and requested that CP&L provide a schedule for a full response on this issue. Our May 29, 1980 letter provided this schedule, and the analysis results of ECCS availability relative to DC power failure are included herein for the Brunswick Steam Electric Plant (BSEP).

A review of the ECCS equipment availability with a DC power supply failure has been conducted. The attached Tables 1 and 2 reflect the results of this review.

NOTE: Tables 1 and 2 address a DC power failure relative to one loop in one unit only for both a suction and discharge recirculation line break. A study for the remaining loop/unit would yield the same ECCS combinations as presented in Tables 1 and 2.

A comparison of Tables 1 and 2 has been conducted relative to the GE report "DC Power Source Failure for BWR 3 and 4" for each hypothesized accident. The following summarizes the results of this comparison of remaining operable equipment for each analyzed condition; and, as indicated in the notes, GE's worst case combination is conservative for BSEP.

Small Break Analysis: Suction and Discharge - Loss of DC

GE Combination: 1 CS + 1 LPCI + ADS

Actual BSEP Combination: 1 CS + 1 LPCI + ADS + HPCI

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Large Break Analysis - DC Power Failure

Discharge

GE Combination: 1 CS + 1 LPCI + ADS

Actual BSEP Combination: 2 CS + HPCI + ADS

NOTE: Although the BSEP combination differs from the GE combination presented in GE's Table 5, BSEP's worst case combination matches GE's worst case combination (LPCI-Injection Valve Failure) presented in the Appendix K analysis for large break recirculation discharge line.

Suction

GE Combination: 1 CS + 3 LPCI

Actual BSEP Combination: 2 CS = 2 LPCI + HPCI + ADS

NOTE: Although the BSEP combination differs from the GE combination presented in their report (1 CS + 3 LPCI), BSEP's worst case combination matches GE's worst case combination (LPCI-Injection Valve Failure) presented in the Appendix K analysis for large break recirculation suction line.

In our May 29, 1980 letter, we stated that the response to the loss of equipment due to water spillage would be provided by September 17, 1980. Due to the extensive number of manhours expended during the past outages on torus modifications and CRD piping supports, the analysis for the loss of equipment due to spillage will not be completed as scheduled. A review of the status of this project is currently in progress and a new schedule will be provided when this review is complete.

Yours very truly,

E. E. Utley

E. E. Utley
Executive Vice President
Power Supply and
Engineering and Construction

RMP/dk
Attachments

TABLE 1

PRESENT DESIGN-DISCHARGE LINE BREAK LOOP-A ANALYSIS FOR FAILURE OF ONE (1) BATTERY (D.C. POWER) UNIT 2

| FAILURE | LOSS DUE TO CONTROL PWR FAILURE | LOSS DUE TO EMERGENCY PWR SYSTEM | LOSS DUE TO LPCI/INJECTION VLV. FAILURE/TO OPEN | LOSS DUE TO PIPE BREAK | RUNNING |
|---|---|---|---|---|---|
| Batt. 2A<br>Unit 2<br>Div. I | D/G #3<br>4KV SWGR. E3<br>HPCI | C.S. Pump 2A<br>RHR Pump 2A | | RHR Pump 2C | C.S. Pump 2B<br>RHR Pump 2B<br>RHR Pump 2D<br>ADS |
| Batt. 2B<br>Unit 2<br>Div. II | D/G #4<br>4KV SWGR. E4 | C.S. Pump 2B<br>RHR Pump 2B | | RHR Pump 2A<br>RHR Pump 2C | C.S. Pump 2A<br>RHR Pump 2D<br>ADS<br>HPCI |
| Batt. 1A<br>Unit 1<br>Div. I | D/G #1<br>4KV SWGR. E1 | RHR Pump 2C | RHR Pump 2A | | C.S. Pump 2A<br>C.S. Pump 2B<br>RHR Pump 2B<br>RHR Pump 2D<br>ADS HPCI |
| Batt. 1B<br>Unit 1<br>Div. II | D/G #2<br>4KV SWGR. E2 | RHR Pump 2D | RHR Pump 2B | RHR Pump 2A<br>RHR Pump 2C | C.S. Pump 2A<br>C.S. Pump 2B<br>ADS HPCI |

TABLE 2

PRESENT DESIGN-SUCTION LINE BREAK LOOP-A ANALYSIS FOR
FAILURE OF ONE (1) BATTERY (D.C. POWER) UNIT 2

| FAILURE | LOSS DUE TO CONTROL PWR FAILURE | LOSS DUE TO EMERGENCY PWR SYSTEM | LOSS DUE TO LPCI/INJECTION VLV. FAILURE/TO OPEN | LOSS DUE TO PIPE BREAK | RUNNING |
|---|---|---|---|---|---|
| Batt. 2A<br>Unit 2<br>Div. I | D/G #3<br>4KV SWGR. E3<br>HPCI | C.S. Pump 2A<br>RHR Pump 2A | | | C.S. Pump 2B ADS<br>RHR Pump 2B<br>RHR Pump 2C<br>RHR Pump 2D |
| Batt. 2B<br>Unit 2<br>Div. II | D/G #4<br>4KV SWGR. E4 | C.S. Pump 2B<br>RHR Pump 2B | | | C.S. Pump 2A ADS<br>RHR Pump 2A HPCI<br>RHR Pump 2C<br>RHR Pump 2D |
| Batt. 1A<br>Unit 1<br>Div. I | D/G #1<br>4KV SWGR. E1 | RHR Pump 2C | RHR Pump 2A | | C.S. Pump 2A ADS<br>C.S. Pump 2B HPCI<br>RHR Pump 2B<br>RHR Pump 2D |
| Batt. 1B<br>Unit 1<br>Div. II | D/G #2<br>4KV SWGR. E2 | RHR Pump 2D | RHR Pump 2B | | C.S. Pump 2A ADS<br>C.S. Pump 2B HPCI<br>RHR Pump 2A<br>RHR Pump 2C |