CP&L

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MAR 03 1998

SERIAL: BSEP 98-0047

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-325 AND 50-324/LICENSE NOS. DPR-71 AND DPR-62
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
DIESEL GENERATOR SURVEILLANCE REQUIREMENTS
(TAC NOS. MA0093 AND MA0094)

Gentlemen:

In a conference call held on February 24, 1998, the NRC requested additional information regarding Carolina Power & Light (CP&L) Company's proposed revision to the Technical Specifications (TSs) for the Brunswick Steam Electric Plant (BSEP), Unit Nos. 1 and 2 (Serial: BSEP 97-0475, dated November 6, 1997), as supplemented on January 27, 1998 (Serial: BSEP 98-0012). The proposed license amendments add a footnote to Surveillance Requirement (SR) 4.8.1.1.2.d to allow performance of SR 4.8.1.1.2.d.1, SR 4.8.1.1.2.d.4, and SR 4.8.1.1.2.d.5 in OPERATIONAL CONDITION 1, 2, 3, 4, or 5 rather than only during shutdown. Enclosure 1 contains CP&L's response to the February 24, 1998, request.

Please refer any questions regarding this submittal to Mr. Warren J. Dorman, Supervisor - Licensing, at (910) 457-2068.

Sincerely,

Keith R. Jury

Keith R. Jury
Manager - Regulatory Affairs
Brunswick Steam Electric Plant

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Enclosures:

1. Response To Request For Additional Information
2. 0AOP-13.0, Revision 22, "Operation During Hurricane, Flood Conditions, Tornado, or Earthquake"
3. 0AP-025, Revision 4, "BNP Integrated Scheduling"

cc (with enclosures):

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The Honorable Jo A. Sanford
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ENCLOSURE 1

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-325 AND 50-324/LICENSE NOS. DPR-71 AND DPR-62
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
DIESEL GENERATOR SURVEILLANCE REQUIREMENTS

NRC Request

Demonstrate how existing procedures prohibit a diesel generator from being removed from service coincident with the Reactor Core Isolation Cooling (RCIC) system or the High Pressure Coolant Injection (HPCI) system.

Response

0AP-025, Revision 4, "BNP Integrated Scheduling," contains the necessary procedural controls to ensure that a diesel generator is not removed from service coincident with RCIC or HPCI. 0AP-025, Revision 3 was provided with the supplement to the proposed license amendments submitted on January 27, 1998 (Serial: BSEP 98-0012). 0AP-25, Revision 4 is included in Enclosure 3 to this letter.

Section 5.6.3 of 0AP-025 states that Plant General Manager approval is required prior to scheduling: (1) system outages on HPCI, (2) HPCI outages concurrent with another system outage, (3) diesel generator outages concurrent with a RCIC outage or service water outage, (4) more than two high safety significant systems to be out of service concurrently, and (5) activities which exceed one half the allowable Limiting Condition for Operation (LCO) time. This will ensure that coincident diesel generator and RCIC or HPCI outages are avoided, except under extreme circumstances. In addition 0AP-025, Attachment 4, "Methodology for Assessing and Managing Plant Risk," step 12.1.1 provides guidance that maintenance which has a high potential of challenging the ability to maintain off-site power to Class 1E systems should not be scheduled concurrent with system outages on the diesel generators, HPCI, or RCIC. Carolina Power & Light (CP&L) Company understands the significance of the insights gained from the probabilistic safety assessment. As a result, coincident diesel generator and RCIC or HPCI outages are not scheduled.

In addition, 0AP-025, Section 5.6.4, "Emergent Failures/Changing Plant Conditions," provides the Shift Superintendent with guidance for managing the risk impact of emergent conditions. Specifically, step 5.6.4.2.c provides direction to return a failed component or system to service as soon as possible. As part of system outage pre-planning, 0AP-025, Section 5.6.2, "System Outage Pre-Planning," step 5.6.2.4 requires that contingency plans and compensatory measures be developed for high safety significant system outages. Worst-case scenarios are to be discussed during pre-job briefings with Operations. These measures will ensure that emergent failures, during a diesel generator outage, are dealt with appropriately.

In summary, 0AP-025 provides the necessary procedural controls to ensure that: (1) diesel generator outages are appropriately scheduled; coincident diesel generator and RCIC or HPCI outages are not scheduled, and (2) pre-planning and pre-job briefings are conducted to ensure that emergent failures, during a diesel generator outage, are dealt with appropriately.

NRC Request

Demonstrate that existing procedures prohibit a diesel from being removed from service with a hurricane approaching.

Response

0AP-025, Revision 4, Section 5.6.4, "Emergent Failures/Changing Plant Conditions," provides the Shift Superintendent with guidance for managing the risk impact of emergent conditions. Specifically, step 5.6.4.2.e provides direction to the Shift Superintendent to be aware of the risk significance of severe weather conditions and the impact on the Operator's ability to control the plant, mitigate events, or place and maintain the unit in a shutdown condition. Step 5.6.4.2.f provides direction to delay scheduled system outages which have not started until plant conditions are favorable. This ensures that significant weather conditions are factored into the decision to take a diesel generator out of service.

Additionally, 0AOP-13.0, Revision 22, "Operation During Hurricane, Flood Conditions, Tornado, or Earthquake," (Enclosure 2) provides actions to be taken in preparation for a hurricane. At a hurricane watch (i.e., a hurricane is between 24 and 48 hours from landfall, all LCOs are reviewed and actions are taken to expedite the return of all safety equipment, especially equipment required for loss of off-site power. At a hurricane warning (i.e., a hurricane is between 12 and 24 hours from landfall), preparations are made to take both units to cold shutdown, with cold shutdown achieved at least two hours prior to arrival of hurricane force winds and each diesel generator that has not been load tested in the previous seven days is started and loaded to ensure operability. These actions ensure that the diesel generators will be available during a hurricane and place the plant in the safest condition for dealing with a loss of off-site power event.

NRC Request

The January 27, 1998 request for additional information response states that the proposed technical specification changes would cause the station blackout (SBO) sequence core damage frequency (CDF) to increase but no other accident sequences would change in CDF value. Provide additional discussion to demonstrate that for a non-SBO event involving loss of off-site power there is no increased risk associated with loss of decay heat removal capability. Include a discussion of Residual Heat Removal (RHR) system and Service Water (SW) system redundancy and its impact on the CDF in this response.

Response

In the January 27, 1998 submittal, CP&L's response to NRC Request 2.b stated, in part:

> The change in CDF of dominant contributors can be bounded by factoring the effects of taking an EDG out of service at power into the above CDF values. This would cause the SBO sequence CDF to increase but no other accident sequences would change in CDF value.

The bounding case assumed an increase in the SBO CDF of 1.1E-6 when one diesel generator was out of service. This conditional incremental risk is primarily associated with SBO events. There is a slight contribution to loss of decay heat removal accident sequence frequency; however, the contribution is small, estimated to be less than 3 E-8/year, and does not change the accident sequence CDF value. This accident sequence involves a loss of off-site power, a loss of one diesel generator, and additional failures that result in a loss of decay heat removal. The diesel generator loss would affect one division emergency power to SW and RHR. The other division, which is normally available, would be failed by independent failures of service water valves or RHR valves. Also, in the decay heat removal cases, no credit was given to recovering off-site power. This would further reduce its effect on the conditional risk.

RHR and SW system redundancy ensures that the chance of losing decay heat removal capability during non-SBO events is extremely small. The Low Pressure Coolant Injection (LPCI) mode of RHR operation uses two identical pump loops, each loop with two pumps in parallel. The power for each unit RHR pump is supplied by a separate emergency bus (i.e., Emergency Bus E1 (E1) feeds RHR pump 1C, E2 feeds RHR pump 1D, E3 feeds RHR pump 1A, and E4 feeds RHR pump 1B). The two loops are arranged to discharge water into different reactor recirculation loops. A cross-connection exists between the pump discharge lines of each RHR loop. Power for the injection valves associated with each RHR loop is supplied by separate emergency buses (i.e., the 1A RHR injection valve is fed from E3 and the 1B RHR injection valve is fed from E4).

Service water can be supplied by five pumps for each unit. Under normal operating conditions, two nuclear service water (NSW) pumps provide water to the nuclear header, while the remaining three conventional service water (CSW) pumps furnish water to the conventional header. Four RHR SW booster pumps, taking suction from either the nuclear or conventional header supply service water for RHR heat exchanger cooling. Power supplies for the nuclear service water pumps are divisionalized (i.e., E1 feeds the 1A NSW pump and E1 feeds the 1B NSW pump). Separate emergency buses also feed each units conventional service water pumps (i.e., E4 feeds 1A CSW pump, E1 feeds 1B CSW pump, and E2 feeds 1C CSW pump). The valving for RHR SW cooling to the heat exchangers is also divisionalized.

NRC Request

Describe how Individual Plant Examination of External Events (IPEEE) risk insights are being incorporated into the work planning process, particularly for fire events.

Response

Based on the IPEEE for fire events for the Brunswick Steam Electric Plant (BSEP), some portions of the fire suppression system have been identified as high safety significant systems and are controlled in accordance with the Maintenance Rule. The existing BSEP Fire Protection Program contains appropriate controls to ensure that fire events will not degrade plant conditions to an unacceptable level. The BSEP Fire Protection Program requires that, as a compensatory action for fire impairments, either a roving or continuous fire-watch be established. Additionally, performance of hot work requires that a dedicated fire-watch be established. While diesel generator work is in progress, the existing fire protection equipment and the defense in depth provided by the existing administrative controls protect against a damaging fire which could affect off-site power or the other diesel generators.