



Carolina Power & Light Company  
PO Box 10429  
Southport NC 28461-0429

JAN 10 1996

SERIAL: BSEP 95-0659

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

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2  
DOCKET NOS. 50-325 & 50-324/LICENSE NOS. DPR-71 & DPR-62  
REQUEST FOR EXEMPTION TO 10 CFR 50, APPENDIX R AND ADDITIONAL  
INFORMATION ON THERMO-LAG ISSUES

Gentlemen:

The purpose of this letter is to provide an update to Carolina Power & Light Company's Request for exemption to 10 CFR 50, Appendix R dated August 31, 1995, (Serial No. BSEP 95-0378), and to provide additional information related Thermo-Lag Issues. Enclosure 1 provides the requested additional information which supports the exemption request. Enclosure 2 provides available information on the impact of Thermo-Lag enclosures on cable ampacity and the results of Thermo-Lag chemical testing program. As stated in the March 23, 1995 submittal (Serial No. BSEP 95-0142), resolution of the overall Thermo-Lag issue for Brunswick Unit 1 and 2 is expected to be completed 90 days after the end of the Brunswick Unit 1 refueling outage (B111R1 - currently scheduled to begin in September, 1996).

Please refer any questions regarding this letter to Mr. George Honma at (910) 457-2741.

Sincerely,

G. D. Hicks  
Manager - Regulatory Affairs  
Brunswick Nuclear Plant

160039

GMT/

Enclosures:

1. Response to support exemption request
2. Response to Thermo-Lag Issues
3. List of Regulatory Commitments

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cc: Mr. S. D. Ebnetter, NRC Regional Administrator, Region II  
Mr. C. A. Patterson, NRC Senior Resident Inspector - Brunswick Plant  
Mr. D. C. Trimble, Jr., NRR Project Manager - Brunswick Plant  
The Honorable H. Wells, Chairman - North Carolina Utilities Commission

## ENCLOSURE 1

BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2  
NRC DOCKET NOS. 50-325 & 50-324  
OPERATING LICENSE NOS. DPR-71 & DPR-62  
REQUEST FOR EXEMPTION TO 10 CFR 50, APPENDIX R AND ADDITIONAL  
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### RESPONSE TO SUPPORT EXEMPTION REQUEST

#### Discussion

By the letter dated August 31, 1995, (Serial No. BSEP 95-0378), Carolina Power & Light Company (CP&L) requested exemptions to 10 CFR 50, Appendix R. The following provides additional information to support the exemption request.

#### III.L Exemption

CP&L requested an exemption on August 31, 1995, pertaining to the extent that reactor coolant must remain above the top of the core during the use of the alternate shutdown system. This exemption would allow the use of Low Pressure Coolant Injection (LPCI) and safety/relief valves as the redundant safe shutdown system for reactor pressure and level control.

The exemption request should have also reflected that the III.L exemption portion is applicable to Section III.G.1.a, III.L.1.b, III.L.1.c in addition to III.L.2.b. Although the capability to maintain hot shutdown identified in these sections cannot be achieved through the use of LPCI and the safety/relief valves, the performance functions outlined in III.L.2 can still be accomplished with the exception of core uncover, by the use of this alternative shutdown approach.

10 CFR 50, Appendix R, Section III.G.1.a identifies that one train of systems necessary to achieve and maintain hot shutdown from either the control room or emergency control stations must be free of fire damage. Section III.L.1.c also identifies that alternate shutdown capability should achieve and maintain hot shutdown conditions. CP&L's August 31, 1995, exemption request addresses the specific requirement related to core uncover in Section III.L.2.b, but did not identify achieving and maintaining the hot shutdown requirements in Sections III.G.1.a and III.L.1.c would also be affected by this exemption request.

As stated in our August 31, 1995 request for exemption, CP&L discussed the use of LPCI in conjunction with the safety relief valves as an alternate shutdown system if a fire disables the normal RCIC shutdown capability. CP&L has determined that a fire in the following areas could potentially disable RCIC:

#### RB1 and RB2 Fire Areas

- 1) For a fire on the north side of the Reactor Building, fire damage could occur to the cables associated with the RCIC steam isolation valve (1/2-E51-F007). These

cables are routed in conduit from the transfer contactor to the drywell penetration on the north side of the Reactor Building.

- 2) For a fire in the separation zone on the Reactor Building 20' elevation east and southwest (Unit 1 only), fire damage could occur to the cables and transfer contactors associated with the RCIC steam isolation valve (1/2-E51-F007), RCIC steam injection valve (1-E51-F013), and the RCIC vent valve (1/2-E51-F062). The cables are routed in conduit as they pass into these separation zones. These zones are controlled by administrative procedures to ensure transient combustibles are not stored in the zone. A fixed suppression and detection system is provided in the separation zones.

#### RB1-6 and RB2-6 Fire Areas

- 1) For a fire in the Emergency Core Cooling System (ECCS) rooms, both the RCIC and High Pressure Coolant Injection (HPCI) steam isolation valves (1/2-E51-F008 and 1/2-E41-F001) and cables are contained in the fire area. Based on discussions with the NRC staff CP&L is currently evaluating the 1 hour Thermo-Lag material protecting the RCIC cables in these fire areas to determine the fire duration capability of the as-built configurations. This evaluation is currently in process and is scheduled for completion in the first quarter of 1996. This analysis in conjunction with the use of the LPCI/safety relief valve, shutdown methodology should demonstrate adequate protection is available in these fire areas.

Although the potential exists for fire damage to occur to the RCIC cables and components identified above, the risk is limited to a small number of locations. The cables involved are contained in enclosed raceways, thereby limiting the potential fire damage. The remaining RCIC system components will be free of fire damage since they are separated in accordance with 10 CFR 50, Appendix R. If the proposed exemption is granted, reactor coolant inventory control and the capability to achieve and maintain cold shutdown will still be available through the use of LPCI in conjunction with the safety relief valves which are separated in accordance with 10 CFR 50, Appendix R.

#### RB1-6 and RB2-6 Exemption

The exemption request submitted on August 31, 1995, requested a change to the existing exemption for fire areas RB1-6 and RB2-6, Emergency Core Cooling System (ECCS) rooms. The change involved removing the 1 hour Thermo-Lag fire wrap protecting the RCIC circuits and using an alternative shutdown methodology (LPCI/safety relief valves).

Based on discussions with the staff, CP&L has begun an analysis of the Thermo-Lag configurations installed in the ECCS rooms (RB1-6 and RB2-6) associated with the raceways containing the Reactor Core Isolation Cooling (RCIC) isolation valve (1/2-E51-F008) cables. This analysis is to be based, in part, on the fire endurance data being provided by the one hour conduit and junction box configurations testing performed by Nuclear Energy Institute's (NEI) Generic Thermo-Lag Fire Testing Program. Preliminary feedback for the fire tests performed December 13-15, 1995, provided favorable results that can be utilized to support our analysis. The test results from the junction box configurations, however, indicate the possible need for further field upgrades to provide a

reasonable fire duration to support our analysis. The NEI test results will be incorporated into our analysis, which is scheduled to be completed in the first quarter of 1996.

#### RB1 and RB2 Exemption

CP&L withdraws the exemption request submitted in August 31, 1995, that would have allowed the removal of the Thermo-Lag material enclosure from a bank of cable trays in each Unit's Reactor Building East separation zones, on the 50 foot elevation, and its replacement with fire breaks at each end of the separation zone. The existing NRC Safety Evaluation, dated December 30, 1986, for this separation zone provides an option to enclose the cable trays with either a one hour enclosure or a non-combustible material enclosure in order to eliminate the intervening combustibles. CP&L now plans to remove the Thermo-Lag material and enclose the cable trays containing cables with a non-combustible material. Based on this approach, the exemption revision request for RB1 and RB2 is no longer required and is being withdrawn.

## ENCLOSURE 2

### BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2 DOCKET NOS. 50-325 AND 50-324/LICENSE NOS. DPR-71 AND DPR-62 REQUEST FOR EXEMPTION TO 10 CFR 50, APPENDIX R AND ADDITIONAL INFORMATION ON THERMO-LAG ISSUES

#### RESPONSE TO THERMO-LAG ISSUES

##### Discussion

The following provides information requested on the impact of Thermo-Lag enclosures on cable ampacity and the results of Thermo-Lag chemical testing program.

##### Cable Ampacity Derating

The raceways enclosed by Thermo-Lag which require consideration for cable derating are limited to three specific areas and will be resolved as follows:

- a) Conduits containing power cables in a Unit 1 Reactor Building separation zone are to have the existing Thermo-Lag material replaced with an alternate three hour rated fire wrap material. This replacement with alternate material will address concerns with the combustibility of Thermo-Lag located in separation zones. Cable ampacity for the new fire wrap material will be addressed as part of the design process.
- b) Power cables contained in the bank of cable trays located in the Reactor Building 50' elevation separation zone are to have the existing Thermo-Lag material replaced with an alternate non-combustible material. The cable derating effects related to the new material will be addressed as part of the design process.
- c) Conduits containing power cables in the Diesel Generator building will have the existing Thermo-Lag removed. The equipment powered by these cables is no longer required to support safe shutdown following a fire, therefore; in order to avoid any cable derating concerns, the Thermo-Lag material located around these cables will be removed.

The actions identified above will be incorporated into the CP&L Thermo-Lag resolution schedule submitted in our March 23, 1995 submittal (Serial No. BSEP 95-0142). This schedule identified that resolution of the overall Thermo-Lag issue for Brunswick Unit 1 and 2 is expected to be completed 90 days after the end of the Brunswick Unit 1 refueling outage (B111R1 - currently scheduled to begin in September, 1996).

## Chemical Testing

As discussed in our March 23, 1995, submittal (Serial No. BSEP 95-0142), CP&L is participating with other utilities in a Thermo-Lag chemical testing program coordinated by NEI. The program consisted of pyrolysis gas chromatography evaluation of 169 samples from the participating utilities to assess organic composition, and energy dispersive x-ray spectroscopy of 33 samples to assess inorganic chemical composition. The sample population consisted of materials manufactured between 1982 and 1995. On the basis of the above tests, the test lab, NUCON International, Inc., concluded that all samples contained the constituents identified by Thermal Science Inc., as essential to fire barrier performance. NUCON also determined that the composition of the sample population was consistent.

The October 20, 1995, NRC letter from Mr. Conrad E. McCracken to Mr Alex Marion of NEI, indicated that a plant-specific response confirming that the Thermo-Lag test samples are representative of the Thermo-Lag products use at the site. CP&L believes that the high degree of chemical consistency exhibited, demonstrates that our materials are equivalent to materials tested in the industry fire endurance tests. The consistent chemical test results from the broad population of Thermo-Lag, including 5 samples from the Brunswick Plant, validates our position that the Thermo-Lag used at Brunswick is chemically sufficient to ensure fire barrier performance. The 5 samples sent by Brunswick are representative of the sites Thermo-Lag population; therefore, CP&L does not plan to conduct any additional chemical composition testing.

ENCLOSURE 3

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2  
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LIST OF REGULATORY COMMITMENTS

The following table identifies those actions committed to by Carolina Power & Light Company in this document. Any other actions discussed in the submittal represent intended or planned actions by Carolina Power & Light Company. They are described to the NRC for the NRC's information and are not regulatory commitments. Please notify the Manager-Regulatory Affairs at the Brunswick Nuclear Plant of any questions regarding this document or any associated regulatory commitments.

Commitment	Committed date or outage
1. Completion of the Thermo-Lag corrective actions, including removal/replacement of the Thermo-Lag material on selected raceways, will be performed in accordance with the schedule outlined in our letter dated March 23, 1995, (Serial No. BSEP 95-0142).	B111R1 + 90 days
1 a. The NEI test results of the Thermo-Lag configurations will be incorporated into the analysis.	N/A
1 b. The Thermo-Lag currently protecting the RCIC cables in the ECCS rooms will be evaluated to determine the fire duration capability of the as-built configurations.	N/A
1 c. Conduits containing power cables in a Unit 1 Reactor Building separation zone are to have the existing Thermo-Lag material replaced with an alternate three hour rated fire wrap material.	N/A
1 d. Power cables contained in the bank of cable trays located in the Reactor Building 50' elevation separation zone are to have the existing Thermo-Lag material replaced with an alternate non-combustible material.	N/A
1 e. Conduits containing power cables in the Diesel Generator building will have the existing Thermo-Lag material around them removed.	N/A