CP&L

Carolina Power & Light Company

April 28, 1991

SERIAL: NLS-91-122
10CFR50.90

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
SUPPLEMENT TO REQUEST FOR TEMPORARY WAIVER OF COMPLIANCE
REACTOR WATER CLEANUP SYSTEM DIFFERENTIAL FLOW ISOLATION INSTRUMENT

Gentlemen:

By letter dated April 26, 1991 (Serial: NLS-91-118), Carolina Power & Light Company requested a temporary NRR Waiver of Compliance for the Brunswick Steam Electric Plant, Units 1 and 2. The proposed waiver applies to the reactor water cleanup system differential flow isolation actuation instrument trip setpoint and allowable value specified in Technical Specification Table 3.3.2-2, Item 3.a. Carolina Power & Light Company is continuing to prepare an emergency license amendment request to revise the reactor water cleanup system differential flow isolation actuation trip setpoint and allowable value.

During subsequent telephone discussions on April 26, 1991 with the Nuclear Regulatory Commission (NRC) concerning the submittal, the NRC Staff identified several issues relating to the supporting technical analysis for the waiver request. These issues, and the Company's responses, are provided in Enclosure 1. Revised pages for General Electric Report GE-NE-901-011-0391 are provided in Enclosure 2.

The Company would like to note the April 26, 1991 waiver of compliance request incorrectly refers to the reactor water cleanup system differential flow isolation actuation function as Item 2.a of Technical Specification Table 3.3.2-2. The correct reference for the reactor water cleanup system differential flow function is Item 3.a of Table 3.3.2-2.

On the basis of the information provided in our submittal dated April 26, 1991 and the information herein, Carolina Power & Light Company requests this temporary waiver until such time as the NRC is able to review and approve an emergency license amendment request. In order to avoid the delay of the start-up of Brunswick Units 1 and 2, CP&L now requests that this waiver of compliance be granted prior to 1600 on April 29, 1991. The Plant Nuclear Safety Committee has reviewed and approved submittal of the information provided herein.

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Please refer any questions regarding this submittal to Mr. K. J. Ahern at (919) 457-2404.

Yours very truly,

R. B. Starkey
Vice President
Brunswick Nuclear Project

RBS/WRM/wrm (rwcuwav2.wpf)

Enclosure

cc: Mr. Dayne H. Brown
Mr. S. D. Ebneter
Mr. N. B. Le
Mr. R. L. Prevatte

ENCLOSURE 1

BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2
NRC DOCKET NOS. 50-325 & 50-324
OPERATING LICENSE NOS. DPR-71 & DPR-62
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NRC Question 1:

Provide all major assumptions and associated technical bases (or references thereto) used in the dose consequences calculations, the results of which are summarized in a report prepared by General Electric (General Electric Report GE-NE-901-011-0391).

CP&L Response:

The General Electric calculation provides a conservative analysis of the dose consequences for the reactor water cleanup system cold water rupture accident. The cold water rupture accident encompasses a postulated line break downstream of the reactor water cleanup system heat exchangers, but upstream of the filter demineralizers. For postulated reactor water cleanup system line breaks upstream of the heat exchanger or for a postulated line break downstream of the heat exchangers where the heat exchangers are unable to maintain water temperature below 200 degrees F, such breaks are adequately detected and mitigated by existing area temperature monitors that provide reactor water cleanup system isolation (refer to Technical Specification Table 3.3.2-2, Items 3.b and 3.c).

The following assumptions were used by General Electric in performing the dose consequence analysis for a cold water pipe rupture of the reactor water cleanup system outside of primary containment:

Water temperature: 140 to 160 degrees Fahrenheit. Operation of the reactor water cleanup system resin bed filters is limited to less than these temperatures, else damage to the resin beds will occur.

The standby gas treatment system is assumed to be available and in service. This is based on Technical Specification requirements that the standby gas treatment system be operable when the plant is in Operational Conditions 1, 2, or 3 (Technical Specification 3/4.6.6.1).

The standby gas treatment system filter efficiency is assumed to be 99 percent. This is based on the Technical Specification requirement to demonstrate filter efficiency to be at least 99 percent (Technical Specifications 4.6.6.1.e and 4.6.6.1.f).

Reactor coolant system activity: 0.2 microcuries per gram dose equivalent I-131. This is based on the allowable reactor coolant system activity value specified in the Technical Specifications during normal plant operation (Technical Specification 3/4.4.5).

The fraction of released reactor coolant system activity that is assumed to become airborne is 2 percent. This is based on this analysis applying to a cold water pipe break and associated General Electric enthalpy calculations.

Breathing rate: 3.47 E-4 m^3/secs at 24 hours. This is an accepted standard value.

X/Q values for the low population area:

0 to 8 hours:	4.8 E-5 secs/m^3
8 to 24 hours:	3.3 E-5 secs/m^3
1 to 4 days:	1.4 E-5 secs/m^3
4 to 30 days:	4.1 E-6 secs/m^3

X/Q value for the exclusion area: 4.3 E-4 secs/m^3 for 0 to 8 hours.

Control room infiltration: 0.043 m^3/sec
Control room filter inleakage: 0 m^3/sec
Control room volume: 9741 m^3
Control room recirculation flow through filter: 14.3 m^3/sec
Control room filter efficiency: 95 percent

Control room dose X/Q assumptions:

0 to 8 hours:	3.5 E-3 secs/m^3
8 to 24 hours:	2.1 E-3 secs/m^3
1 to 4 days:	1.1 E-3 secs/m^3
4 to 30 days:	2.3 E-4 secs/m^3

The General Electric X/Q values cited above are conservatively based on a ground level release; however, based on the standby gas treatment system being in service, the actual release would be an elevated release through the plant stack. Where appropriate, General Electric Report GE-NE-901-011-0391 has been revised to clarify certain of the assumptions provided above. The revisions to General Report GE-NE-901-011-0391 are provided in Enclosure 2.

Carolina Power & Light has reviewed the assumptions of the General Electric calculations. The General Electric report uses assumed conditions based on a "reference plant." In most cases, the General Electric assumptions are identical to or bounded by the same parameters for the Brunswick Plant except for the assumed values for control room inleakage, size, and recirculation flow. A comparison of the differences in the General Electric assumptions and the Brunswick Plant values is provided below:

X/Q values for the low population area:

	GE Value	Brunswick Value
0 to 8 hours:	4.8 E-5 secs/m^3	8.8 E-6 secs/m^3
8 to 24 hours:	3.3 E-5 secs/m^3	3.8 E-6 secs/m^3
1 to 4 days:	1.4 E-5 secs/m^3	1.0 E-6 secs/m^3
4 to 30 days:	4.1 E-6 secs/m^3	3.5 E-7 secs/m^3

The Brunswick Plant values are documented in the Updated Final Safety Analysis Report, Table 2.3.4-15. The values for stack release are used based on the assumption that the standby gas treatment system is available and in service (thus resulting in an elevated release via the plant stack).

X/Q value for the exclusion area:

	GE Value	Brunswick Value
0 to 8 hours:	4.3 E-4 secs/m^3	2.0 E-5 secs/m^3

The Brunswick Plant value is documented in the Updated Final Safety Analysis Report, Table 2.3.4-15. The Brunswick Plant value is for an elevated (plant stack) release based on the assumption that the standby gas treatment system is available and in service.

X/Q for the control room:

	GE Value	Brunswick Value
0 to 8 hours:	3.5 E-3 secs/m^3	3.3 E-4 secs/m^3 (0-1/2 hour) to 1.8 E-6 secs/m^3 (1/2 to 8 hours)
8 to 24 hours:	2.1 E-3 secs/m^3	1.1 E-6 secs/m^3
1 to 4 days:	1.1 E-3 secs/m^3	2.0 E-7 secs/m^3
4 to 30 days:	2.3 E-4 secs/m^3	2.7 E-8 secs/m^3

The Brunswick Plant values are documented in a report titled "Control Room Habitability Evaluation, Brunswick Steam Electric Plant, (NRC TMI Action Plan Item III.D.3.4)," Revision 2, NUS Report NUS-3697. The conclusions of this report were accepted by the NRC by letter and Safety Evaluation dated February 16, 1989 (NRC TAC Nos. 57421 and 57422).

Control room habitability parameters:

	GE Value	Brunswick Value
Control room infiltration:	0.043 m^3/sec	0.129 m^3/sec
Control room filter inleakage:	0 m^3/sec	0.010 m^3/sec
Control room volume:	9741 m^3	8362 m^3
Control room recirculation flow through filter:	14.3 m^3/sec	0.933 m^3/sec
Control room filter efficiency:	95 percent	95 percent elemental 95 percent particulate 90 percent organic

The Brunswick Plant values are documented in a report titled "Control Room Habitability Evaluation, Brunswick Steam Electric Plant, (NRC TMI Action Plan Item III.D.3.4)," Revision 2, NUS Report NUS-3697. The conclusions of this report were accepted by the NRC by letter and Safety Evaluation dated February 16, 1989 (NRC TAC Nos. 57421 and 57422).

At the request of Carolina Power & Light Company, General Electric performed a revised analysis using input parameters that are either equal to or more limiting than actual Brunswick Plant values. The Brunswick-specific input parameters used for this analysis are as follows:

Control room unfiltered inleakage: 276 ft^3/min (0.129 m^3/sec)
Control room volume: 8362 m^3
Control room recirculation flow through filter: 0.933 m^3/sec
Control room filter efficiency: 95 percent
X/Q for the control room:

0 to 8 hours:	3.3 E-4 secs/m^3
8 to 24 hours:	1.1 E-6 secs/m^3
1 to 4 days:	2.0 E-7 secs/m^3
4 to 30 days:	2.7 E-8 secs/m^3

The General Electric's Brunswick-specific analysis results in control room dose consequences that are bounded by General Electric's reference plant analysis and which are significantly below the applicable regulatory limits (10 CFR 100 and 10 CFR 20 for offsite doses; 10 CFR 50, Appendix A, General Design Criterion 19 and Standard Review Plan Section 6.4 for control room doses). These results are summarized and compared with both the General Electric reference plant results and applicable regulatory limit below:

	Regulatory Limit	GE Reference Plant Result	Brunswick Result
Control room, thyroid	30 rem	0.095 rem	0.045 rem
Control room, whole body	5 rem	negligible	negligible

Based on a review of this information, the Company has determined that the General Electric calculations and dose consequences bound those that would be obtained using completely Brunswick-specific input parameters. Therefore, the Company believes that based on the proposed change to the trip setpoint and allowable value for the reactor water cleanup system differential flow isolation actuation instrument from "less than or equal to 53 gpm" to "less than or equal to 125 gpm", the Brunswick offsite and control room dose consequences for a postulated reactor water cleanup system cold water break accident would not exceed the regulatory limits of 10 CFR 100 and 10 CFR 20.

<u>NRC Question 2</u>:

For the offsite and control room dose calculations, clarify what portion of coolant activity is assumed to become airborne activity.

<u>CP&L Response</u>:

According to General Electric, an enthalpy balance calculation was used to determine the percentage of fluid mass that will vaporize when released to the ambient environment based on the pressure and temperature of the reactor water cleanup system fluid within the piping system. The resulting ratio was then applied to coolant released to establish the percentage of coolant activity that becomes airborne activity. General Electric selected the 2 percent value based on calculations that show the actual airborne fraction value for initial reactor water cleanup system conditions of 1050 psia and 160 degrees Fahrenheit to be less than the 2 percent value.

NRC Question 3:

In General Electric Report GE-NE-901-011-0391, the analysis results summarized on page 8 are provided in units of millirem. Verify whether these dose results are in terms of millirem or in terms of rem.

CP&L Response:

The dose results provided in the General Electric report are correct (i.e., the resulting doses are in terms of millirem).

NRC Question 4:

Based on the responses to the questions described above, re-affirm that the conclusions of the significant hazards analysis provided in your April 26, 1991 submittal remain valid.

CP&L Response:

Carolina Power & Light Company has re-evaluated the requested temporary waiver of compliance based on the additional information provided by General Electric Company and summarized herein. As discussed in the response to NRC Question 1 above, Carolina Power & Light has reviewed the assumptions of the General Electric calculations. In most cases, the General Electric assumptions which are derived from a GE "reference plant" are identical to or bounded by the same parameters for the Brunswick Plant except for the assumed values for control room inleakage and size. The Company has assessed the significance of these differences and, based on a further General Electric evaluation using plant-specific parameters, determined that the General Electric calculation results provide an adequate basis for concluding that the consequnces of the proposed change to reactor water cleanup system differential flow isolation actuation trip setpoint and allowable value described in the temporary waiver of compliance does not involve a significant hazards consideration and that the conclusions of the significant hazards analysis provided in our April 26, 1991 submittal remain valid.

ENCLOSURE 2

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REVISED PAGES FOR GENERAL ELECTRIC
REPORT GE-NE-901-011-0391