



John S. Keenan
Vice President
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SERIAL: BSEP 02-0041
TSC-2001-09

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

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 REGARDING
REQUEST FOR LICENSE AMENDMENTS - EXTENDED POWER UPRATE
(NRC TAC NOS. MB2700 AND MB2701)

Ladies and Gentlemen:

On August 9, 2001 (Serial: BSEP 01-0086), Carolina Power & Light (CP&L) Company requested a revision to the Operating Licenses (OLs) and the Technical Specifications for the Brunswick Steam Electric Plant (BSEP), Units 1 and 2. The proposed license amendments increase the maximum power level authorized by Section 2.C.(1) of OLs DPR-71 and DPR-62 from 2558 megawatts thermal (MWt) to 2923 MWt. Subsequently, on February 6, 2002, a conference call was held between the NRC and CP&L to discuss the affect of the planned extended power uprate on offsite doses. As a result of this conversation, the NRC requested additional information concerning the offsite doses reported in (1) the "Supplement to the Brunswick Steam Electric Plant Environmental Report" provided as Enclosure 5 of the August 9, 2001, submittal, and (2) CP&L's submittal dated December 17, 2001 (Serial: BSEP 01-0162). The response to this RAI is enclosed.

Please refer any questions regarding this submittal to Mr. Leonard R. Beller, Manager - Regulatory Affairs, at (910) 457-2073.

Sincerely,


John S. Keenan

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MAT/mat

Enclosure:

Response to Request for Additional Information (RAI) 16

John S. Keenan, having been first duly sworn, did depose and say that the information contained herein is true and correct to the best of his information, knowledge and belief; and the sources of his information are officers, employees, and agents of Carolina Power & Light Company.



Notary (Seal)

My commission expires: 8/29/04

cc:

U. S. Nuclear Regulatory Commission, Region II
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U. S. Nuclear Regulatory Commission
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ENCLOSURE

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Background

On August 9, 2001 (Serial: BSEP 01-0086), Carolina Power & Light (CP&L) Company requested a revision to the Operating Licenses (OLs) and the Technical Specifications for the Brunswick Steam Electric Plant (BSEP), Units 1 and 2. The proposed license amendments increase the maximum power level authorized by Section 2.C.(1) of OLs DPR-71 and DPR-62 from 2558 megawatts thermal (MWt) to 2923 MWt. Subsequently, on February 6, 2002, a conference call was held between the NRC and CP&L to discuss the affect of the planned extended power uprate (EPU) on offsite doses. As a result of this conversation, the NRC requested additional information concerning the offsite doses reported in (1) the "Supplement to the Brunswick Steam Electric Plant Environmental Report" provided as Enclosure 5 of the August 9, 2001, submittal, and (2) CP&L's submittal dated December 17, 2001 (Serial: BSEP 01-0162). The response to this RAI follows.

NRC Question 16-1

Table 8-6 of the "Supplemental Environmental Report Brunswick Steam Electric Plant EPU" indicates that the average (i.e., 1996 to 2000) maximum dose at the site boundary for all pathways, from iodine-131, iodine-133, tritium, and particulates is 7.09 mrem. Is this an organ dose or a whole body dose? The text associated with the table indicates that it is a whole body dose.

Response to Question 16-1

Table 8-6 of the Supplemental Environmental Report denotes Radiation Dose from Gaseous Effluent Pathways for the period of 1996-2000. In the narrative preceding Table 8-6, initial terminology specified an average annual whole body dose at the site boundary from the release of iodines, tritium, and particulate radionuclides as 7.09 mrem. This value is actually related to an estimated, hypothetical site boundary dose for the critical organ when exposed to all pathways. The subsequent value listed in the narrative is correctly identified as an annual dose to the critical organ from these releases. This value denotes organ dose exposure from actual pathways for the highest dose sector surrounding the plant. The critical organ, for releases

evaluated in the Supplemental Environmental Report, is the thyroid. The referenced values are obtained from the dose assessment summary of the Annual Radiological Effluent Release Report for the plant.

NRC Question 16-2

In response to NRC Question 9-6a (BSEP 01-0162, dated December 17, 2001), CP&L provided the calculated whole body doses, at the site boundary, from skyshine for each of the past 3 years. Based on the provided numbers, it cannot be concluded that post-EPU doses for the nearest resident will be below 40 CFR 190 limits. Please provide a demonstration that post-EPU offsite doses will remain below 40 CFR 190 limits.

Response to Question 16-2

The calculated whole body doses at the site boundary from skyshine, provided in CP&L's response to NRC Question 9-6a, were based on quarterly environmental thermoluminescent dosimeter (TLD) results. This data included contributions from background radiation and, as such, resulted in the higher than anticipated whole body doses. Based on a re-evaluation of doses at the site boundary, CP&L has concluded that post-EPU doses will be well below 40 CFR 190 limits. A summary of this re-evaluation follows.

The Annual CP&L Radiological Environmental Operating Report includes an evaluation of off-site external radiation exposure due to BSEP operation. This evaluation is based on the results of 179 environmental TLDs located throughout the area surrounding BSEP. TLD locations are based upon meteorological factors, preoperational monitoring data, and the results of land use surveys. TLDs are located such that there is an "inner" and "outer" ring of TLDs. TLDs in the inner ring are located between 0.5 to 3.0 miles from BSEP, while the TLDs in the outer ring are located from 5.0 to 10.0 miles from BSEP. The BSEP radiation exposure contribution to outer ring TLDs are considered minimal, and the results of these TLDs can be interpreted as background radiation. The 1998, 1999, and 2000, BSEP Radiological Environmental Operating Report evaluations of off-site external radiation exposure concluded that, "no discernible off-site exposure has occurred from plant operations."

An evaluation of inner ring and outer ring TLD results over the past three years (i.e., 1999 to 2001) is shown in the table below. Although the 2001 TLD results are available, the 2001 Radiological Environmental Operating Report has not yet been submitted to the NRC. These annual doses are based on continuous exposure with no consideration of shielding or occupancy factors.

COMPARISON OF BSEP ENVIRONMENTAL TLD RESULTS 1999 - 2001					
	Avg. Inner Ring TLDs (annual mrem)	Avg. Outer Ring TLDs (annual mrem)	Difference Avg. Inner - Outer Ring (mrem)	Max. Inner Ring TLD (annual mrem)	Difference Max. Inner - Avg. Outer Ring (mrem)
1999	39.0	38.5	0.5	45.2	6.7
2000	39.0	38.7	0.3	44.4	5.7
2001	40.4	39.7	0.7	46.7	7.0

The difference in the average inner ring (i.e., background radiation plus radiation due to BSEP operation) and outer ring (i.e., background radiation) TLD results show that BSEP operation accounted, on average, for less than 1.0 mrem of off-site external radiation exposure during each of the past three years. These results support the conclusion of the annual Radiological Environmental Operating Reports that there is no discernible off-site radiation exposure attributable to BSEP operation.

Using the highest inner ring TLD result and the average outer ring TLD results, the maximum BSEP contribution to off-site external exposure over the past three years is 7.0 mrem in 2001. This worst-case scenario for annual whole body dose is still only a fraction (i.e., 28%) of the 40 CFR 190 standard of 25 mrem.

Based on the above, it can be concluded that post-EPU doses for the nearest resident, located approximately 0.7 miles from the plant, will be well below 40 CFR 190 limits.