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Docket No.: 52-011

AR-07-0934

U.S. Nuclear Regulatory Commission  
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Washington, DC 20555-0001

Southern Nuclear Operating Company  
Vogtle Early Site Permit Application  
Response to Requests for Additional Information Letter No. 7

Ladies and Gentlemen:

By letter dated April 19, 2007, the U.S. Nuclear Regulatory Commission (NRC) provided Southern Nuclear Operating Company (SNC) with Request for Additional Information (RAI) Letter No. 7 on the Vogtle Early Site Permit (ESP) Application. The RAIs in that letter pertain to the ESP Application Part 3, Environmental Report (ER), Section 5.4, *Radiological Impacts of Normal Operation*. SNC's response to the RAIs is provided in the enclosure to this letter. In addition, these responses were incorporated in revision 2 of the ESP.

The SNC contact for this RAI response letter is J. T. Davis at (205) 992-7692.

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Mr. J. A. (Buzz) Miller states he is a Senior Vice President of Southern Nuclear Operating Company, is authorized to execute this oath on behalf of Southern Nuclear Operating Company and to the best of his knowledge and belief, the facts set forth in this letter are true.

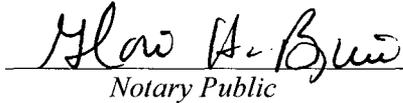
Respectfully submitted,

SOUTHERN NUCLEAR OPERATING COMPANY



Joseph A. (Buzz) Miller

Sworn to and subscribed before me this 21 day of May, 2007

  
*Notary Public*

My commission expires: 05/06/08

JAM/BJS/dmw

Enclosure: Response to Vogtle ESP Application RAI Letter No. 7 Involving Environmental Report Section 5.4

cc: Southern Nuclear Operating Company

Mr. J. B. Beasley, Jr., President and CEO (w/o enclosure)  
Mr. J. T. Gasser, Executive Vice President, Nuclear Operations (w/o enclosure)  
Mr. T. E. Tynan, Vice President - Vogtle (w/o enclosure)  
Mr. D. M. Lloyd, Vogtle Deployment Director (w/o enclosure)  
Mr. C. R. Pierce, Vogtle Development Licensing Manager (w/o enclosure)  
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Nuclear Regulatory Commission

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Ms. S. M. Coffin, AP1000 Manager of New Reactors (w/o enclosure)  
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Mr. G. J. McCoy, Senior Resident Inspector of VEGP (w/o enclosure)

Georgia Power Company

Mr. O. C. Harper, Vice President, Resource Planning and Nuclear Development (w/o enclosure)

Oglethorpe Power Corporation

Mr. M. W. Price, Chief Operating Officer (w/o enclosure)

Municipal Electric Authority of Georgia

Mr. C. B. Manning, Senior Vice President and Chief Operating Officer (w/o enclosure)

Dalton Utilities

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Bechtel Power Corporation

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Ms. K. K. Patterson, Project Manager (w/o enclosure)

**Southern Nuclear Operating Company**

**AR-07-0934**

**Enclosure**

**Response to Vogtle ESP Application RAI Letter No. 7**

**Involving Environmental Report Section 5.4**

## **ER Section 5.4 Radiological Impacts of Normal Operation**

**11-7 The total 50-mile population in the LADTAPII input file (LADTVOG2.dat) is different than that cited in response to RAI 11-5d. Please clarify this inconsistency and include the correct value in Environmental Report (ER) Table 5.4-1. The population input in LADTAP II is 673,570 and the response to the RAI states 764,101.**

Response:

The correct 50-mile population number is 674,101. ER Table 5.4-1 was modified in Revision 2 of the ESP application, submitted in SNC letter AR-07-0887, dated May 4, 2007, to specify this population number. In addition, the revised LADTAP analysis presented in Revision 2 of the ESP application ER now uses a 50-mile population of 674,101.

**11-8 Please explain how the population data for input into the collective exposure calculations were derived and provide justification for using the following populations. Currently, they are not cited in the application. These values should be included in ER Table 5.4.1.**

- **sport fishing = 35,000**
- **drinking water from Port Wentworth = 26,300**
- **drinking water from BJWSA - Chelsea = 73,600**
- **drinking water from BJWSA - Purrysburg = 55,000**
- **shoreline usage = 960,000**
- **swimming = 960,000**
- **boating = 1,100,000**

Response:

The collective population doses are based on information from the Savannah River Site (SRS) Annual Environmental Monitoring Report, as now noted in modified ER Table 5.4-1 of Revision 2 of the ESP application. These values are appropriate because SRS and Vogtle Electric Generating Plant (VEGP) are directly across the Savannah River from each other, and both release radionuclides to the Savannah River. The populations affected by both facilities are essentially the same. The drinking water populations are not included in Revision 2 of the ESP application because both the public water intakes on the Savannah River and the populations they serve are greater than 50 miles from the VEGP site. In keeping with the requirements of Regulatory Guide 1.109, the calculation of population dose only includes populations within 50 miles of the site.

**11-9 Please justify why the collective exposures do not include the use of public water for gardening.**

Response:

As noted in the response to RAI 11-8, Revision 2 of the ESP application ER only addresses collective exposures within 50 miles of the VEGP site, as required by Regulatory Guide 1.109. Because there are no public water intakes or populations using such intakes within 50 miles of the site, this pathway is not addressed.

**11-10 Please justify the use of a dilution factor of 1.28 for calculating collective dose, and include the value in Table 5.4.1.**

Response:

In ER Section 5.4 of Revision 2 of the ESP application, calculation of collective dose now conservatively assumes a downstream dilution factor of one (1). That is, the discharge is assumed fully mixed with the river flow passing the VEGP site and no additional downstream dilution is assumed. ER Table 5.4-1 specifies a downstream dilution factor of one.

**11-11 Doses to the Maximum Exposed Individual (MEI) from liquid pathways do not include the scenario where meat cattle drink Savannah River water directly. Please provide justification to eliminate this exposure pathway, particularly given that meat cattle are found in compass sectors that border the Savannah River downstream of the plant.**

Response:

Georgia Power Company environmental monitoring personnel conduct the land use surveys for VEGP. They performed the survey that identified the compass sectors containing meat cattle that are adjacent to the Savannah River and confirmed that such cattle do not have access to the Savannah River. Therefore, cattle drinking water in compass sectors adjacent to the Savannah River is not an evaluated scenario.

**11-12 Response to RAI 11-5a states that the total plant discharge flow into the Savannah River is 9,608 gallons per minute (gpm). The LADTAPII input file (LADTVOG2.dat) and ER Table 5.4-1 lists the plant discharge as a much larger value - 9,229 cubic feet per second (cfs). Which is the correct discharge flow and why?**

Response:

ER Table 5.4-1 has been modified in Revision 2 of the ESP application to more clearly indicate that the liquid discharge was assumed fully mixed with the average river flow passing the VEGP site and thus, the LADTAP input parameter of discharge flow was taken equal to the river flow (i.e., 9,229 cfs).

**11-13 Accounting for a single unit release, the thyroid dose listed in Table 5.4-5 is different than that shown in the LADTAPII output file (LADTVOG2.out). Please explain this apparent inconsistency.**

Response:

The thyroid dose specified in ER Table 5.4-5 is a single-unit dose or one-half of the two-unit infant dose shown in the LADTAPII output file (LADTVOG2.OUT). ER Table 5.4-5 has been modified in Revision 2 of the ESP application to note that the thyroid dose is that of the dose to an infant. The liquid pathway thyroid dose to an infant exceeds that to the other age groups.

**11-14** When matching the GASPARII output files with the doses listed in ER Table 5.4-6, it appears that the applicant used the output file GAS2OUTC.dat for the MEI results. A detailed review of this file revealed several apparent inconsistencies, identified below:

**a) The population data in the GASPARII run has multiple inconsistencies when compared to ER Table 2.5.1-1. Which is correct?**

Response:

The GASPARII input and output files have been revised in ESP application Revision 2 so that the files are consistent with ER Table 2.5.1-1.

**b) The source term data in the GASPARII run is inconsistent with ER Table 3.5-2 for Kr-85, Xe-135 and Cs-137. Which is correct?**

Response:

The GASPARII source term input has been revised in ESP application Revision 2 so that the input is consistent with ER Table 3.5-2 for all radionuclides.

**c) According to ER Table 2.7-15, the annual average dispersion and deposition values for the dose calculation EAB are 5.4 E-06 and 1.7 E-08, respectively. These values are in the NE sector at 0.5 miles. According to the GASPARII run, the MEI doses shown in Table 5.4-6 were calculated for the NE sector at 0.67 miles with corresponding dispersion and deposition values of 3.4 E-06 and 1.0 E-08, respectively. In addition, according to ER Table 2.7-17 the dispersion and deposition factors that match those used in the GASPARII run are for the NW sector at 0.5 mile. Please clarify these apparent inconsistencies and explain why the maximum values (NE at 0.5 mile) are not used to calculate the MEI doses.**

Response:

ER Section 2.7 tables have been revised in Revision 2 of the ESP application. The dispersion and deposition factors in those tables now match those used in the GASPARII runs. The MEI doses are calculated at 0.67 miles since that is the distance to the nearest residence. The doses at 0.5 miles represent site boundary impacts.

**d) Sector dispersion and deposition values for collective dose in the GASPARII run do not match any of the values listed in ER Tables 2.7-18 through 24. Please explain these apparent inconsistencies.**

Response:

As noted in the response to RAI 11-14c, ER Section 2.7 tables have been revised in Revision 2 of the ESP application, and the dispersion and deposition factors in those tables now match those used in the GASPARII runs.

**e) Even when accounting for the two unit releases, the gamma and beta air doses listed in Table 5.4-7 do not match the GASPARI run for the MEI. Please explain these apparent inconsistencies.**

Response:

The gamma and beta air doses listed in ER Table 5.4-7 are calculated at the site boundary (i.e., at a distance of 0.5 miles from the release). However, as described in the response to RAI 11-14c, the MEI is located 0.67 miles from the release.

**11-15 The total maximum organ dose for the thyroid in ER Table 5.4-7 does not match the sum of the ground shine, vegetable, meat and inhalation doses in Table 5.4-6. They should be equal. Please clarify this apparent inconsistency.**

Response:

In Revision 2 to the ESP application, the "Iodine and particulates" thyroid dose in ER Table 5.4-7 has been revised to include the contribution from H-3 and C-14. This single-unit dose to a child is now one-half of the sum of ground shine, vegetable, meat and inhalation doses in ER Table 5.4-6.

**11-16 The comparison in ER Table 5.4-7 appears to be incorrect for gaseous effluents. Please include H-3 and C-14 in all pathways when making the comparison to the 10 CFR 50, Appendix I limits for the critical organ.**

Response:

ER Table 5.4-7 has been modified in Revision 2 to the ESP application and the specified gaseous effluent annual doses were corrected to include tritium and carbon-14 dose contributions.