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Docket Nos.: 52-025
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ND-08-1878

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

Southern Nuclear Operating Company
Vogtle Electric Generating Plant Units 3 and 4 Combined License Application
Response to Request for Additional Information Letter No. 017

Ladies and Gentlemen:

By letter dated March 28, 2008, Southern Nuclear Operating Company (SNC) submitted an application for combined licenses (COLs) for proposed Vogtle Electric Generating Plant (VEGP) Units 3 and 4 to the U.S. Nuclear Regulatory Commission (NRC) for two Westinghouse AP1000 reactor plants, in accordance with 10 CFR Part 52. During the NRC's detailed review of this application, the NRC identified a need for additional information, involving accidental release of radioactive liquid effluents, required to complete their review of the COL application's Final Safety Analysis Report (FSAR) Section 2.4, "Hydrologic Engineering." By letter dated November 26, 2008, the NRC provided SNC with Request for Additional Information (RAI) Letter No. 017 concerning this accidental release of radioactive liquid effluents information need. This RAI letter contains one RAI question numbered 02.04.13-1. The enclosure to this letter provides the SNC response to this RAI.


If you have any questions regarding this letter, please contact Mr. Wes Sparkman at (205) 992-5061.

DO92
NRO

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 23rd day of December, 2008

Notary Public: Charlotte A. Graham

My commission expires: 6/9/12

JAM/BJS/lac

Enclosure: Response to NRC RAI Letter No. 017 on the VEGP Units 3 & 4 COL Application
Involving Accidental Release of Radioactive Liquid Effluents

cc: Southern Nuclear Operating Company

Mr. J. H. Miller, III, 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
Mr. C. R. Pierce, Vogtle Development Licensing Manager
Mr. M. J. Ajluni, Nuclear Licensing Manager
Mr. W. A. Sparkman, COL Project Engineer
Document Services RTYPE: AR01.1053
File AR.01.02.06

Nuclear Regulatory Commission

Mr. L. A. Reyes, Region II Administrator (w/o enclosure)
Ms. S. M. Coffin, AP1000 Manager of New Reactors (w/o enclosure)
Mr. C. J. Araguas, Lead Project Manager of New Reactors
Mr. B. Hughes, Project Manager of New Reactors
Mr. R. G. Joshi, Project Manager of New Reactors
Ms. T. E. Simms, Project Manager of New Reactors
Mr. B. C. Anderson, Project Manager of New Reactors
Mr. M. M. Comar, Project Manager of New Reactors
Mr. W. F. Burton, Chief – Environmental Technical Support
Mr. M. D. Notich, Environmental Project Manager
Mr. J. H. Fringer, III, Environmental Project Manager
Mr. G. J. McCoy, Senior Resident Inspector of VEGP

Georgia Power Company

Mr. O. C. Harper, IV, 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, Jr., Senior Vice President, Participant and Corporate Affairs (w/o enclosure)

Dalton Utilities

Mr. D. Cope, President and Chief Executive Officer (w/o enclosure)

Bechtel Power Corporation

Mr. J. S. Prebula, Project Engineer (w/o enclosure)
Mr. R. W. Prunty, Licensing Engineer

Tetra Tech NUS, Inc.

Ms. K. K. Patterson, Project Manager

Shaw Stone & Webster, Inc.

Mr. K. B. Allison, Project Manager (w/o enclosure)
Mr. J. M. Oddo, Licensing Manager

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Westinghouse Electric Company, LLC

Mr. N. C. Boyter, Vice President, AP1000 Vogtle 3 & 4 Project (w/o enclosure)

Mr. J. L. Whiteman, Principal Engineer, Licensing & Customer Interface

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Enclosure

Response to NRC RAI Letter No. 017

on the VEGP Units 3 & 4 COL Application

Involving

Accidental Release of Radioactive Liquid Effluents

FSAR Section 2.4, Hydrologic Engineering

eRAI Tracking No. 1531

NRC RAI Number 02.04.13-1:

SRP 2.4.13, under SRP Acceptance Criteria #5, references Branch Technical Position BTP 11-6, which provides guidance in assessing potential release of radioactive liquids at the nearest potable water supply located in an unrestricted area for direct human consumption or indirectly through animals, crops, and food processing. BTP 11-6 further states the evaluation of the release considers the use of water for direct human consumption or indirectly through animals (livestock watering), crops (agricultural irrigation), and food processing (water as an ingredient).

Southern's analysis does not include a discussion of pathways other than drinking water. The analysis should discuss these other pathways, especially the pathways such as fish and crop irrigation that may result in concentration of the source term. Either discuss other pathways, or justify why they need not be included.

SNC Response:

For the Water Table aquifer, the radionuclide transport analysis presented in Vogtle Early Site Permit Application (ESPA) Site Safety Analysis Report (SSAR) Subsection 2.4.13.1.3.1 demonstrates that all of the radionuclides that could be accidentally released to groundwater would be individually below their 10 CFR Part 20 Appendix B effluent concentration limits (ECLs) before exiting the restricted area (i.e., site boundary) via surface water in the Mallard Pond stream. Eight radionuclides (H-3, Mn-54, Fe-55, Sr-90, Ag-110m, I-129, Cs-137, and Ce-144) were carried through the full decay, retardation, and dilution screening evaluation within the restricted area in the Mallard Pond stream. As shown in SSAR Table 2.4.13-5, tritium accounts for 99.99 percent of the total hypothetical radionuclide activity at this location. Tritium does not bioaccumulate in the environment, therefore evaluation of secondary exposure pathways is not warranted.

Compliance with 10 CFR 20 (Part 20) is further assured considering that nearly the entire reach of this stream, about 1.0 mi. in length, is within the restricted area and is not a potable water supply. The nearest potable water supply in an unrestricted area to which the Part 20 requirements would apply is the Savannah River, with the nearest municipal water users over 100 river miles downstream (SSAR Table 2.4.1-9). Using Savannah River flow rate data presented in SSAR Subsection 2.4.11, mixing of the Mallard Pond stream flow with the Savannah River flow would further dilute radionuclide concentrations by an additional factor of approximately 1,000. Since compliance with Part 20 Appendix B ECLs is demonstrated in the Mallard Pond stream in both the restricted and unrestricted areas prior to reaching the Savannah River, and because of the environmental fate of tritium described above, evaluation of additional (secondary) exposure pathways in the Savannah River was not performed.

Additionally, Part 20, Appendix B, Table 2, imposes additional requirements when the identity and concentration of each radionuclide in a mixture are known. In this case, the ratio present in the mixture and the concentration otherwise established in Part 20 Appendix B for the specific radionuclide not in a mixture must be determined. The sum of such ratios for all of the radionuclides in the mixture may not exceed "1" (i.e., "unity"). This sum of fractions approach was applied to the radionuclide concentrations conservatively summarized above and described in SSAR Subsection 2.4.13.1.4. The ratios for the mixture sum to 0.058 for the Water Table aquifer, which demonstrates that an accidental liquid release of effluents in groundwater would not exceed Part 20 limits in the Mallard Pond stream before reaching the VEGP site property boundary.

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Enclosure

Response to RAI Letter No. 017

As with the Water Table aquifer, all radionuclides that may be accidentally released to the Savannah River from the Tertiary aquifer are well below their respective ECLs. Considering radioactive decay only, the ratios for the mixture sum to 0.036 for the Tertiary aquifer prior to the hypothetical release to the Savannah River indicating compliance with Part 20 limits. Mixing of the Tertiary aquifer release with the Savannah River flow would significantly dilute radionuclide concentrations further. Therefore, evaluation of additional (secondary) exposure pathways in the Savannah River was not performed.