April 15, 2007

MEMORANDUM TO: Stephanie M. Coffin, Branch Chief
AP1000 Projects Branch
Division of New Reactor Licensing
Office of New Reactors

FROM: Stephen R. Monarque, Project Manager ***/RA/***
AP1000 Projects Branch
Division of New Reactor Licensing
Office of New Reactors

SUBJECT: SOUTHERN NUCLEAR OPERATING COMPANY (SNC) EARLY SITE PERMIT (ESP) APPLICATION FOR THE VOGTLE ESP SITE-SUMMARY OF TELEPHONE CALL HELD ON MARCH 9, 2007 TO DISCUSS SITE SAFETY ANALYSIS REPORT (SSAR) SECTION 2.4

This memorandum documents a telephone conference call between the U.S. Nuclear Regulatory Commission (NRC) staff and Southern Nuclear Operating Company on March 9, 2007. The purpose of this call was to discuss the NRC staff's request for additional information pertaining to Section 2.4 of the Vogtle early site permit application. A summary of this call held is enclosed.

Docket No. 52-011

Enclosure:
As stated

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NAME	KGoldstein	SMonarque	SCoffin
DATE	03/22/07	03/21/07	04/15/07

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Telephone Call Summary

Subject: Request for Additional Information (RAI) Letter on Section 2.4, "Hydrology"

Date of Call: March 9, 2007

Participants

NRC	Applicant	Betchel	PNNL
Stephen Monarque	Jim Davis	John Prebula	Chris Cook
Hosung Ahn	Don Moore	Stew Taylor	Lance Vail
Allen Fetter		Greg Kasel	
Goutam Bagchi		Louise Headland	
		Bob Prunty	

Referenced documents

Title
NRC staff's Draft RAI on Vogtle Early Site Permit (ESP) Site Safety Analysis Report (SSAR) Section 2.4.

Actions

Topic	NRC	Applicant
RAI Letter on Hydrology	Revise several questions and issue RAI to SNC.	Upon receipt of NRC staff's RAI, provide timely response to NRC staff's RAI.

Other Discussion

On March 9, 2007, the U.S. Nuclear Regulatory Commission (NRC) staff and Southern Nuclear Operating Company (SNC) conducted a conference call to discuss the NRC's RAI on the Vogtle ESP application. SNC requested this conference call in order to clearly define the specific information the NRC staff needed to complete its hydrology review. Refer to Enclosure 2 for draft RAI on Section 2.4. After this call, the NRC staff made the following changes to the RAI. Renumber question 2.4.7-1 as 2.4.1-1 and revise this question to clarify the NRC staff's request for the values of the total water demand. Renumbered 2.4.10-1 to 2.4.7-1 and clarified the question to request a reference be provided in the Site Safety Analysis Report (SSAR) 2.3.1.3.4 through 2.4.10. Question 2.4.12-1 a. was revised to clarify whether OW-1001 or OW-1001 provided valid or invalid data. Revised 2.4.12-1 b. to request that SNC provide an explanation in the SSAR text instead of the SSAR Appendices. Revised 2.4.12-1 c. to address the potential for leakage into the confined Tertiary aquifer. Revised 2.4.12-2 to add a question requesting information on the process used to develop the site hydrologic conceptual model. In

addition, 2.4.12-2 a. was revised to clarify the information on potential contamination pathways. Revised 2.4.12-3 to request specific information on the historical groundwater levels at the water table aquifer near the ESP site. Questions 2.4.13-1 and 2.4.12-4 a. were deleted as this information had already been requested previously. Questions 2.4.12-4 b., c., and d. were then moved to 2.4.13-1. Revised 2.4.13-3 to provide clarification of the requested information.

DRAFT REQUEST FOR ADDITIONAL INFORMATION FOR VOGTLE EARLY SITE PERMIT (ESP)

SITE SAFETY ANALYSIS REPORT (SSAR), SECTION 2.4

RAI Number	Reviewer	Full Text
2.4.4-1	H. Ahn G. Bagchi PNNL	During the January site safety audit (1/10-11/2007) the staff requested and the applicant provided a narrative (AR-07-0302, 2/13/2007) describing the process used to compute the maximum stage due to a cascade failure of upstream dams, including the sensitivity of the initial water surface elevations in each reservoir, and showed how the calculations provide the bounding case. The narrative included a summary of all dam breach analysis parameters. Please update the SSAR to incorporate the information and data contained in the narrative.
2.4.7-1	H. Ahn G. Bagchi PNNL	Please revise the SSAR by including a reference to ER Section 2.3.2, Tables 2.3.2-12 and 2.3.2-13 which report the rates of total well water demand, power plant makeup water, and service water system makeup water for the new plants. In the text of the SSAR provide further breakdown to cooling water, make-up water, and fire protection water required by the new plants.
2.4.10-1	H. Ahn G. Bagchi PNNL	To clarify the way of determining the intensity of short term rainfall for roof drainage, probable maximum winter precipitation that combines with the snow accumulation for roof loading of all safety-related structures, the SSAR is to be revised by providing a reference in SSAR Section 2.4.10 to SSAR Section 2.3.1.3.4.
2.4.12-1	H. Ahn G. Bagchi PNNL	a. Discuss the reasons why OW-1001 well failed. b. Provide an explanation in SSAR Appendix 2.4A, (e.g., pages 2.4A-6 and -14), as well as Appendix 2.5A, (e.g., Table 2 of MACTEC Field Boring and CPT Summary), regarding the nomenclature used to denote an abandoned well, especially OW-1001A which is denoted abandoned in Appendix 2.4A, and OW-1001A which is apparently a functioning well in Appendix 2.5A. c. Because well OW-1001A data are not indicative of hydraulic head in the water table aquifer, data from this well should be removed from SSAR Figures 2.4.12-8 through -11 and ER Figures 2.3.1-17 through -20, and these contour plots should be updated.

2.4.12-2	H. Ahn G. Bagchi PNNL	a. Figure 2.4.12-4 indicates that water table aquifer recovery to an asymptotic value following cessation of dewatering required 1.5 to 2 years. However, there is not a record of the period preceding the dewatering activity in the figure. Also Figures 2.4.12-4, -5 & -6 show that the groundwater levels in the Water Table Aquifer vary significantly from year to year or even from season to season for some periods of time and not for others. These facts indicate that the Water Table Aquifer is able to undergo substantial change in water table elevation (with a corresponding movement of water) while not undergoing substantial local stress (pumping), and being isolated from the underlying confined Tertiary aquifer that is stressed by Unit 1 & 2 operations. It is essential that the underlying conceptual model of the unconfined aquifer and key parameters describing the aquifer be shown to be in agreement with this known system behavior, (e.g., that the hydraulic conductivity, storativity, porosity, etc., are consistent with the ability of the unconfined aquifer to respond to dewatering, severe drought, and the return to a normal precipitation level). b. Discuss the reasons why the temporal variability of the water levels in the Water Table Aquifer during the period from 2005 to 2006 (Figure 2.4.12-6) were reduced substantially compared to those before 2005 (Figures 2.4.12-4&5).
2.4.12-3	H. Ahn G. Bagchi PNNL	a. Include in the SSAR all available information and data, and update the contour maps depicting the (i) thickness of the Utley Limestone layer, and the (ii) top and (iii) bottom elevations of the Blue Bluff member of the Lisbon Formation in the ESP site area. It is desirable to depict as much of the area as possible in the vicinity of the ESP site in the contour map(s), (i.e., include as much of the area from the southern drainages to Telfair Pond, the northern drainage to Mallard Pond, the eastern drainage to Savannah River). b. In conjunction with the above information, data and plots, include a discussion of the continuity of the Utley Limestone, the composition and integrity of the Utley Limestone relative to Huddlestun and Summerour report (1996), and the presence or absence of Karst characteristics. Incorporate the discussion into the subsurface conceptual model.

2.4.12-4	H. Ahn G. Bagchi PNNL	a. Provide and incorporate into the SSAR a discussion of the process used to develop the site hydrologic conceptual model. Discuss the various conceptual models considered in developing the final conceptual model, and how your model contrasts with the conceptual models of the VEGP UFSAR, and USGS studies (Clark and West 1997; Cherry 2006). Describe the data sets and rationale used to establish the final conceptual model. This discussion of the conceptual model should cover the continuity or discontinuity of the hydrologic units, their connectivity to the Savannah River and other surface water features. b. Provide and incorporate into the SSAR a discussion of the process used to establish that the conceptual model for the transport pathways and travel times presented in the SSAR represent the most conservative (pessimistic) pathway from the various other feasible alternative pathways. c. Provide and incorporate into the SSAR a discussion of the process used to conservatively bound the hydraulic properties (gradient, hydraulic conductivity, porosity, etc.) used in safety related calculations. Provide a summary data set utilizing data from the ER and SSAR that presents the bounding hydraulic properties of soil/sediment overlying the Blue Bluff Marl of the Lisbon Formation. d. Provide and incorporate into the SSAR new calculations of the accidental release from the effluent hold-up tank that utilize the above described and supported conceptual model and data.
2.4.13-1	H. Ahn G. Bagchi PNNL	For the new plants, describe briefly the facilities and protocols to prevent accidental releases from radwaste tanks, auxiliary buildings, and piping systems to the surface and the ground water bodies. Include in this discussion a description regarding how waste is transferred to the effluent hold-up tank identified in the safety analysis. What are the likely locations, quantities (including radionuclide separated by each type) of accidental liquid radiological release. Describe why the bounding failure occurred in the Auxiliary Building, and why it could not occur in the Radwaste Building.
2.4.13.2	H. Ahn G. Bagchi PNNL	Discuss the process used to evaluate the potential for and the impact of chelation and complexation agents (e.g. organic acids) to mix with radiological liquid effluents either within the facility or along the transport pathway in the environment outside the facility. In this discussion, make a clear statement regarding whether or not it is possible for any chelation agents to be mixed with radiological liquid effluents within the ESP facility.

2.4.13-3	H. Ahn G. Bagchi PNNL	The SSAR should include a description of (1) the process followed to arrive at the method used to and (2) the basis for - both the estimate of groundwater outflow to Mallard Pond from the accidental release, and the estimate of the minimum discharge from Mallard Pond. The typographic error reporting a value of 0.7 gpm as the groundwater outflow to the pond from the accidental release will be corrected in the next revision of the SSAR. A redacted version of the calculation package showing all parameters, measurements, and assumptions used in the calculation of the 0.07 gpm rate will be provided. A redacted version of the calculation package showing all parameters, measurements, and assumptions leading to the minimum discharge flow rate estimate of 250 gpm for Mallard Pond will be provided. In both cases, the redaction will simply remove final calculated values.