



May 21, 2009
NND-09-0139

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

ATTN: Document Control Desk

Subject: V. C. Summer Nuclear Station Units 2 and 3
Docket Numbers 52-027 and 52-028
Combined License Application – Environmental Report Audit
Information Needs: GW-1, 2, 3, 9, and 10, and SE-5

- Reference:
1. Letter from S.A. Byrne to Document Control Desk, Submittal of a Combined License Application for V. C. Summer Nuclear Station Units 2 and 3, dated March 27, 2008.
 2. Letter from Ronald B. Clary to Document Control Desk, Submittal of Revision 1 to Part 3 (Environmental Report) of the Combined License Application for the V. C. Summer Nuclear Station Units 2 and 3, dated February 13, 2009.

By letter dated March 27, 2008, South Carolina Electric & Gas Company (SCE&G) submitted a combined license application (COLA) for two Westinghouse AP1000 units, designated V.C. Summer Nuclear Station (VCSNS) Units 2 and 3, to be located at the existing VCSNS site in Fairfield County, South Carolina. Subsequently the Environmental Report (ER), Part 3 of the application, was revised and submitted to the NRC (reference 2).

During the week of March 9, 2009, the NRC conducted an Environmental Audit to gather information to assist in the review of the ER. The purpose of this letter is to submit a portion of the ER Information Needs identified by the NRC including: GW-1, 2, 3, 9, and 10, and SE-5.

Please address any questions to Mr. Alfred M. Paglia, Manager, Nuclear Licensing, New Nuclear Deployment, P. O. Box 88, Jenkinsville, S.C. 29065; by telephone at 803-345-4191; or by email at apaglia@scana.com.

D083
NRC

I declare under penalty of perjury that the foregoing is true and correct.

Executed on this 21 day of May 2009



Ronald B. Clary
General Manager
New Nuclear Deployment

ARR/RBC/ar

Enclosures

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VCSNS UNITS 2 and 3

Response to NRC Information Needs

Information Item Number: GW-1 Revision: 0

Statement of the Information Needs Item:

Information Needs Item GW-1:

Provide copies for review of boring logs, pump test data, well logs.

SCE&G Follow Up Action:

Provide clean hard copy of MACTEC 2007 report.

Make available calculation packages Hydraulic Conductivity From Slug Tests, Radionuclide Transport, and Groundwater Data.

Response:

An electronic copy of the MACTEC 2007 report was provided in COLA Part 11, COLA Enclosure 1.

Copies of the calculation packages for Hydraulic Conductivity from Slug Tests (25242-K-018), Radionuclide Transport (25242-K-019), and Groundwater Data (25242-K-020) are available for NRC review in the VCSNS designated reading rooms.

COLA Revisions:

No COLA revision is required as a result of the response to this Information Needs item.

VCSNS UNITS 2 and 3

Response to NRC Information Needs

Information Item Number: GW-2 Revision: 0

Statement of the Information Needs Item:

Information Needs Item GW-2:

Referenced to ER Section 2.3.1.2.

Provide an expert to discuss the aquifer testing conducted at the site and material property measurements of samples from the saprolite/shallow bedrock zone and deep bedrock zone.

SCE&G Follow Up Action:

Provide electronic AQTESOLVE input/output files used in slug test analysis.

Provide description of bedrock total and effective porosity based on geologic interpretations and relevant studies. Provide citable written description of the uncertainty in the value of the effective porosity of the saprolite.

Response:

The electronic AQTESOLV input/output files were provided in SCE&G letter NND-09-0104, dated April 29, 2009.

Bedrock and saprolite effective porosities are discussed in initial RAI 02.04.13-3 and RAI 02.04.13-8 responses (Reference: Letter from Ronald B Clary (SCE&G) to Document Control Desk, Response to NRC RAI Letter No. 044, letter NND-09-0115 dated 5/7/09.).

COLA Revisions:

Future ER Section 2.3.1.2 revisions, if applicable, will be based on final RAI 02.04.13-3 and RAI 02.04.13-8 responses.

VCSNS UNITS 2 and 3

Response to NRC Information Needs

Information Item Number: GW-3 Revision: 0

Statement of the Information Needs Item:

Information Needs Item GW-3:

Referenced to ER Section 2.3.1.2.

Provide an expert to describe groundwater pathways from the site along with the potential for an eastern pathway toward Mayo Creek (in both the shallow and deep zones) and larger-scale groundwater flow directions in the area beyond the site.

SCE&G Follow Up Action:

Provide evaluation of groundwater flow patterns east of the VCSNS Units 2 and 3 site up to and beyond Mayo Creek utilizing available topographic, geologic, and any existing well data for initial response to this information need. Confirmatory hard data to follow (potential new wells for monitoring).

Provide estimated travel times in the saprolite and bedrock to potential receptors based on evaluation above. Provide similar evaluation for the western pathways.

Provide rationale for selection of conservative value of hydraulic conductivities (saprolite and bedrock.)

Response:

The subject of this information needs item is addressed in the initial responses to RAI 02.04.13-3, RAI 02.04.13-4 and RAI 02.04.13-5 (Reference: Letter from Ronald B Clary (SCE&G) to Document Control Desk, Response to NRC RAI Letter No. 044, letter NND-09-0115 dated 5/7/09.).

COLA Revisions:

ER Section 2.3.1.2 revisions, if applicable, will be based upon RAI 02.04.13-3, RAI 02.04.13-4 and RAI 02.04.13-5 final responses.

VCSNS UNITS 2 and 3

Response to NRC Information Needs

Information Item Number: GW-9 Revision: 0

Statement of the Information Needs Item:

Information Needs Item GW-9:

Referenced to ER Section 4.2.1.

Provide an expert to describe the impact on site groundwater flow rates and directions from construction activities (e.g. site grading, fill material hydraulic properties, and filling in eastern portion of site for cooling towers) and operations.

SCE&G Follow Up Action:

Provide discussion of how excavation, placement of backfill, construction of stormwater ponds grading, ground surface cover will impact ground water levels and groundwater flow direction.

Response:

The subject of this information needs item is addressed in the response to FSAR RAI 02.04.12-6 (Reference: Letter from Ronald B Clary (SCE&G) to Document Control Desk, Response to NRC RAI Letter No. 041, letter NND-09-0109 dated 5/1/09.)

COLA Revisions:

None

VCSNS UNITS 2 and 3

Response to NRC Information Needs

Information Item Number: GW-10 Revision: 0

Statement of the Information Needs Item:

Information Needs Item GW-10:

Provide an expert to describe the extent of dewatering activities (i.e. locations, rates, duration) that could be conducted at the site during construction and operation. This description should include a description of dewatering/pumping that is occurring at Unit 1.

SCE&G Follow Up Action:

Provide description of process of excavation planning and permitting related to dewatering during Units 2 and 3 construction, including Unit 1 construction dewatering experience.

Response:

Currently the dewatering plans the EPC contractor is developing are conceptual and details of rates, durations, and discharge locations are still being established. At this time the anticipated locations where dewatering will take place are the two power block excavations. Plans include installing several drains at the bottom of each excavation with gravity fed lines leading to sumps. The water will then be pumped from the sumps to filter bags installed in a temporary basin. From the basin the water will be pumped through additional filters and discharged to natural drainage features.

Due to the topographic height at the Unit 1 site, dewatering during construction of Unit 1 was minimal and generally accomplished with portable sumps and fire hoses discharging to lower terrains. However, Monticello Reservoir began its filling process in 1977, thereby causing the groundwater table in the immediate area to rise. At that time there was the need to dewater near the Turbine Building. To alleviate the influx of groundwater, two dewatering wells were placed near the building.

After construction of Unit 1 was complete there were constant problems of groundwater seeping into the lower levels of the plant. After many efforts from within the plant trying to fix areas vulnerable to leaking, it was decided to install approximately 40 dewatering wells around the site in order to draw down the water table in the immediate vicinity.

Although the filling of Monticello Reservoir resulted in elevated groundwater levels at Unit 1, no relationship has been identified between the water level in the Monticello Reservoir and the groundwater level observed in the wells installed at the Units 2 and 3 site in support of the subsurface investigation. Therefore, the Monticello Reservoir does not impact groundwater levels at the Units 2 and 3 site and would not cause extensive dewatering at this location.

VCSNS UNITS 2 and 3

Response to NRC Information Needs

Information Item Number: GW-10 **Revision:** 0

There are no permitting requirements for dewatering. The South Carolina Department of Health and Environmental Control Stormwater Management Best Management Practices Field Manual states that as long as there is a proper filtration system (i.e. sediment basin, filter bags, mesh screens, etc.) and there is not a direct discharge into water bodies of the State, then no permit is required.

COLA Revisions:

No COLA revision is required as a result of the response to this Information Needs item.

VCSNS UNITS 2 and 3

Response to NRC Information Needs Item SE-5

Information Item Number: SE-5 Revision: 0

Statement of the Information Item:

Provide an expert to discuss construction workforce assumptions including the following:

- Basis for assumptions about skilled and managerial labor supply locations
- Basis for assumptions used in reference to worker relocations and commuting
- Anticipated overtime wage assumptions

SCE&G Follow Up Action:

Provide non-proprietary information.

Response:

Item 1 - Basis for Construction Workforce Assumptions

The basis for the assumptions regarding the construction workforce begins with an order of magnitude estimate of the size of the workforce.

Because a detailed definitive material quantity estimate was not available for the items of installation for the AP1000, and the detailed design was incomplete or unavailable to develop a material takeoff of quantities, an alternative methodology was employed to arrive at a workforce size order of magnitude estimate. As a result, construction workforce estimates were based upon actual Bechtel historical data from a completed reference project. This data is considered by Bechtel to be confidential and proprietary.

The estimate utilized the actual hours expended in building a two unit, (2 x 1100+ MW Class) PWR, at a greenfield site, constructed post-10 CFR 50 Appendix B (after 1974), utilizing closed-loop cooling with cooling towers.

That project was similar in scope to the V. C. Summer Units 2 and 3 project, and work was scheduled as a 3 x 8 hour per day work shifts, 5 days per week (40 hour workweek with some overtime worked on weekends for essential items). The actual hours of the reference units were 25.85 hours per net kilowatt. This included all construction field non-manual hours, all craft manual hours, all subcontractor hours, and all startup organization hours (less operations staff worked on site).

Because of the high degree of civil and mechanical/pipe modularization design for the AP1000 units, a credit was applied for the hours which would move from on site locations to off-site module fabrication facilities. The credit reduction

VCSNS UNITS 2 and 3

Response to NRC Information Needs Item SE-5

estimated for the modularization was approximately 20%, arriving at 20.5 hours per net kilowatt. The total hours were then calculated as follows:

$2 \times 1100 \text{ MW Net} \times 1000 = 2,200,000 \text{ kW} \times 20.5 \text{ Mhr/kW} = 45,100,000$ total work hours. The total work hours are then converted to person months based on a scheduled work week of 40 hours \times 4.33 weeks per month or 173 hours per month per person. The person months are converted to total persons per quarter, 519 hours per person per quarter. The person quarters to be worked off are then spread across the SCE&G total project schedule duration (123 months) on a typical project ramp-up curve with three years between commercial operation dates of the units.

In theory, should scheduled overtime hours be worked in addition to a standard scheduled 40 hour work week, the peak would decrease. However, Construction Industry Institute and Business Roundtable studies indicate that when overtime hours are worked for extended periods of time, a productivity decrease will occur (Reference 1). Any decrease in productivity will require additional hours to be expended to make up for the productivity loss.

Therefore, the peak number of approximately 3,600 persons is considered bounding.

Item 2 - Basis of assumptions about skilled and managerial labor supply locations.

Regarding the managerial labor supply location it was assumed that the engineering procurement constructor (EPC) contractor would supply a qualified, experienced, trained, and certified field non-manual construction staff fully knowledgeable of the contractor's QA/QC, engineering, procurement, and construction program, systems, procedures, instructions, and work processes. A qualified field non-manual staff would make up about 30% of the 3,600 person site workforce or approximately 1,080 people. As an EPC contractor, Bechtel typically provides the field non-manual staff from the permanent employee pool of approximately 40,000 people, and move them to the project area from various other projects being completed around the world.

It is assumed other large EPC contractors would also transfer their experienced field non-manual staff from other locations.

Skilled craftsmen typically include the following labor types:

- general foremen and foremen for all trades
- carpenters
- laborers
- cement finishers
- brick masons

VCSNS UNITS 2 and 3

Response to NRC Information Needs Item SE-5

- iron workers
- equipment operators
- truck drivers
- pipe fitters
- electricians
- boilermakers
- painters
- millwrights
- sheet metal workers
- insulators

Skilled craftsman make up the largest percentage of the construction workforce of about 70% or 2,520 persons. The local labor market would be targeted to obtain these skill sets. To estimate what percentage would be available locally, and how many would be travelers, coming in from outside the 50-mile area, the available local labor pool was reviewed and historical experience was applied.

According to the U.S. Department of Labor, Bureau of Labor Statistics data over the last 10 years, the construction industry labor pool of manual and non-manual in South Carolina statewide for Heavy and Civil Engineering Construction is approximately 16,000 workers. Specialty Trade contractors employ about 65,000 workers, while building contractors employ about 29,000 workers in the construction of buildings for a total of approximately 110,000 persons. Of the 110,000 total construction people, the Bureau of Labor Statistics data indicates approximately 17.5% or 19,250 of these people reside in the Columbia, South Carolina area. Assuming the labor in the Columbia, South Carolina area is proportional to the three sectors statewide, 2,800 workers would be in Heavy and Civil Engineering Construction category; 11,375 in Specialty Trades, and 5,075 in Building Construction. Removing the managerial and non-manual from these numbers at a rate of 30% leaves a craft workforce of 1,960 Heavy and Civil Construction, 7,963 Specialty Trades, and 3,552 Building Construction for a total local construction labor pool of 13,475.

Power plant construction draws much of the labor from the Heavy and Civil Engineering Construction sector for the bulk commodity installations, and some labor from the specialty trades and building sectors for such items as ancillary pre-engineered buildings, metal siding, built-up roofing, fireproofing, security systems, fire protection, roll-up doors, architectural finishes, penetration seals, elevators, railroad track, heavy equipment handling, field erected tanks, dewatering, hazardous waste disposal, etc.

The V. C. Summer project would compete for local labor against all other capital and maintenance projects occurring at the same time as V. C. Summer construction. Because power plant construction generally provides for a longer

VCSNS UNITS 2 and 3

Response to NRC Information Needs Item SE-5

term employment than most other construction projects, it is viewed by many construction craft people as more stable employment, and considered desirable jobs for which they would leave one construction employer to join the project. Considering the size of the current local labor pool, and the Bechtel experience recruiting craft labor to perform major modification work (SGR) at V. C. Summer Unit 1 in 1993 and 1994 (where approximately 50% of the craft labor was locally recruited and 50% were travelers from outside the area) it is estimated that a similar experience will occur during the construction of Units 2 and 3. Most regions can typically supply skilled local civil crafts and some specialty labor; however, the numbers of the highly skilled and certified craft such as welders, electricians, and heavy equipment operators are more likely to require recruiting from outside the area.

Item 3 - Anticipated Overtime Wage Assumptions

As mentioned in the response to Item 1, construction workforce assumptions included a 40 hour workweek (i.e. 3 x 8 hour per day work shift, 5 days per week). Therefore, no anticipated overtime wage assumptions were used to estimate the size of the workforce.

Response Reference:

- 1) "Effects of Scheduled Overtime on Labor Productivity: A Quantitative Analysis" A report to The Construction Industry Institute; The University of Texas at Austin, Under the Guidance of the Overtime Task Force from The Pennsylvania State University, August 1994. (Copyright)

COLA Revisions:

No COLA revision is required as a result of the response to this Information Needs item.