SummerCEm Resource

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Cc: Patricia Vokoun; Don Winslow; Bob Perry; Ken Prosser; Steve DeKozlowski; Breck Carmichael; Hal Beard; Elizabeth Osier; Greg Mixon; Ron Ahle
Subject: Virgil C. Summer Nuclear Plant, South Carolina
Attachments: image001.jpg; VC Summer 030609.doc

Please find attached comments by the South Carolina Department of Natural Resources on the combined license application for the addition of Units 2 & 3 to the Virgil C. Summer Nuclear Plant.
Thank you for the opportunity to participate in the scoping process.

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March 6, 2009

Chief, Rules and Directives Branch
Division of Administrative Services
Office of Administration
Mail Stop TWB-05-B01M
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

REFERENCE: REQUEST FOR PARTICIPATION IN THE SCOPING PROCESS AND LIST OF STATE LISTED PROTECTED SPECIES FOR THE ENVIRONMENTAL REVIEW FOR THE VIRGIL C. SUMMER NUCLEAR STATION, UNITS 2 AND 3, COMBINED LICENSE APPLICATION

Dear Chief, Rules and Directives Branch:

Reference is made to the Combined License Application (COL) submitted by South Carolina Electric and Gas Company (SCE&G) and South Carolina Public Service Company (Santee Cooper) in support of application for a combined license for construction and operation of two nuclear power plants at its Virgil C. Summer Nuclear Station (VCSNS) site. South Carolina Department of Natural Resources (DNR) staff reviewed the extensive COL. This correspondence includes comments on the COL, respectfully submitted.

The VCSNS site is co-owned by SCE&G and Santee Cooper and is located in Fairfield County, South Carolina on the Broad River. The VCSNS site currently has one operating pressurized light water reactor with the capacity to generate 966 megawatts of electricity. SCE&G proposes to construct two new nuclear units adjacent to the existing site. SCE&G has also identified the need for transmission line corridor expansion. The siting area for proposed transmission lines would include Calhoun, Chester, Colleton, Dorchester, Hampton, Lancaster, Lexington, Orangeburg, and Richland counties, in addition to Fairfield County.

Chief, Rules and Directives Branch
Virgil C. Summer Nuclear Station
March 6, 2009

The Broad River is an outstanding resource of state and regional significance and is important habitat for the priority conservation species robust redhorse (*Moxostoma robustum*) and American shad (*Alosa sapidissima*), a wide diversity of freshwater fish and mussel species, and economically important recreational fisheries. The river also supports numerous populations of the rare and sensitive plant species rocky shoals spider lily (*Hymenocallis coronaria*). High quality natural areas and hardwood forests occur along the river corridor and are home to a diversity of game and non-game wildlife species. Many nesting populations of bald eagle (*Haliaeetus leucocephalus*) inhabit its floodplain and depend on the Broad as a source of food. The river is also an important water supply resource for municipalities, hydropower and various industries.

Overall the COL is thorough and the information is well organized, concise and clearly written. DNR recognizes and appreciates efforts by the licensee to avoid and minimize impacts to natural resources. However, our agency has identified a number of concerns regarding potential impacts of the planned facility, particularly those affecting water supply and aquatic habitat of the Broad River and associated water bodies. These concerns are described as follows, and reference the section of the COL to which they correspond:

CHAPTER 2 ENVIRONMENTAL DESCRIPTION

Sec. 2.2.2 Transmission Corridors and Off-Site Areas

The COL provides a broad overview of existing and proposed transmission line corridors. Final routes will be identified in the upcoming Phase 3 transmission line study. DNR requests consultation throughout Phase 3 and the final route selection process.

Sec. 2.3.1.1.1 Rivers and Streams

The COL refers to the calculation of mean daily and mean monthly flow in the Broad River using the Richtex, Alston and Carlisle USGS stream gauges. However, it is unclear what methods or additional data were used to estimate inflow into the Parr Reservoir. Were flows estimated using a combination of USGS gauge flow data, scaled down to the drainage area of the reservoir, or were they estimated with a water balance equation? A complete description of methodology is needed to evaluate flow estimates provided in the COL.

Sec. 2.3.1.1.3 Low Flows

The COL describes a seven-day average low flow of 156 cfs calculated from 2002 flow data from the Alston gauge, located approximately 1.2 miles downstream of Parr Shoals Dam. A 100-year daily mean flow of 125 cfs, and a 100-year seven-day average low flow of 430 cfs were also calculated for the Alston gauge. The seven-day average low flow at the Parr dam was estimated to be 190 cfs, also in 2002. A 7Q10 flow equaling 853 cfs was estimated from data from the Richtex and Alston gauges. There is no information on historical or estimated low

inflow to the Parr Reservoir other than that provided from the Carlisle gauge, 21 miles upstream of the project site. According to the COL, historical daily mean flows in the Broad River at the

Alston gauge have been as low as 48 cfs (2002). The COL adds that this flow was *not considered representative of natural river flows because it was influenced by the upstream flow diversion from the Parr Reservoir to Fairfield Pumped Storage Facility*. This statement seems to suggest that downstream flows are run-of-river and not regulated by the operation of the Parr project and Fairfield Pumped Storage Facility (FPSF).

The COL states that *the state of South Carolina uses the 7Q10 flow to determine potential impacts*. This statement is misleading. The South Carolina Department of Health and Environmental Control uses the 7Q10 of a water body to determine the assimilative capacity of that water body when setting limits to effluents in National Pollutant Discharge Elimination System permits. DNR follows the guidelines of the South Carolina Water Plan (second edition, 2004) when evaluating potential impacts to state water resources. (www.dnr.sc.gov/water/hydro/water_plan.htm).

Sec. 2.3.1.1.4 Dams and Reservoirs

The COL states that the pan evaporation loss rate from the Parr Reservoir was estimated from data obtained from DNR, but the exact source of this data is not identified. In addition, there is no information provided on how evaporative loss was estimated for the Monticello Reservoir. Complete information is needed on the data and methods used to estimate pan evaporation loss rates for Parr and Monticello reservoirs.

This section provides a very general overview of the operation of the reservoirs and FPSF, stating that *pumping is normally done at maximum capacity*. There is no information on whether operation is modified during times of low flow. Is pumping curtailed during times of extreme low flows? Is operation of the Parr hydro facility modified during low flows? Information on how water is apportioned between reservoirs, the FPSF and the Broad river, particularly during low flow periods, is needed. If no provisions exist, then a drought response plan will need to be developed in consultation with regulatory and resource agencies.

DNR manages the Parr Reservoir and Monticello Reservoir Waterfowl Management Areas, and the Monticello Sub-Impoundment supports a recreational fishery. Water level fluctuations within the reservoirs and their potential impact on waterfowl habitat and fisheries are of concern. Increased temperatures during low flows have caused fish kills in the Monticello Reservoir. In the early to mid-1990s the licensee employed several mitigation measures, including dredging the discharge canal in 1993, to increase water circulation and cool water temperatures during low flow periods. No fish kills have been reported since that time. It is not known what, if any, impacts may accrue from increased reservoir fluctuations attributable to the addition of Units 2 and 3. Additional consultation throughout licensing is requested to address these concerns.

Sec. 2.3.2.2 Local Surface Water Use

On page 2.3-21 the COL indicates that the licensee intends to request a license amendment of the Parr hydro project for increased water withdrawals for the operation of Units 2 and 3. Licensed flows for the Parr Hydro project are 1,000 cfs or average daily natural inflow (less evaporation)

during the striped bass spawning season of March, April and May, and 800 cfs (less evaporation) for the remainder of the year, with a minimum instantaneous flow release of 150 cfs. Estimated evaporative loss from Unit 1 alone is estimated at between 8.7% to 15% of the licensed minimum instantaneous flow of 150 cfs. Increased evaporative loss from the addition of Units 2 and 3 could have significant impacts on downstream flows, particularly during times of low flow. The state of South Carolina continues to experience drought conditions of unprecedented severity and duration. As of this writing, the entire state is in drought status ranging from "incipient" to "extreme". This fact underscores the supreme importance of carefully and thoroughly evaluating the hydrological impact of the proposed expansion.

Sec. 2.4.3.1 Rare/Sensitive Species

As noted in the COL, DNR stocks robust redhorse and smallmouth bass in the Broad River. Smallmouth bass have developed into a spawning population and fishery of increasing local and regional significance. Robust redhorse will continue to be stocked by DNR with the goal of creating a self-sustaining population. Both species were collected in the Monticello Reservoir in 2008. It is not known whether the intake area of the Parr Reservoir and FPSF is attracting these species, and there is a concern that increased pump-back operations may have an adverse impact on smallmouth bass and robust redhorse populations.

CHAPTER 4 IMPACTS OF CONSTRUCTION

General Comments

We recommend the licensee incorporate low impact procedures such as constructed wetlands, rain gardens, and double silt fencing throughout construction. Storm water detention facilities should be built well above floodplains and wetlands, and should not impound any streams. Detention facilities should discharge to constructed wetlands for further treatment of stormwater runoff. In shoreline areas, the applicant should use bioengineering techniques to the greatest extent possible. Maximum width buffers should be maintained between any construction site and any aquatic site. These buffers should be non-disturbance areas that are maintained in natural vegetation.

Sec. 4.3.1.1 The Site and Vicinity

The COL states that *a small portion of a small intermittent stream and its associated wetland extend slightly into the area in which the cooling towers would be located; a portion of this wetland would be impacted by construction activities*. During an interagency meeting with the

licensee on February 5, 2009, anticipated impacts to intermittent stream and wetland were described as totaling approximately 600-700 linear feet and approximately 0.30 acre of wetland. We recommend avoiding all impacts to onsite streams and wetlands to the greatest practicable extent. An appropriate mitigation plan for unavoidable impacts to waters of the United States should be reviewed and approved by resource agencies and provided consistent with the Federal Mitigation Rule.

Sec. 4.3.2.1.1 Construction of Intake Structure and Blowdown Line

Two water intakes and one discharge are included as lake impacts. A raw water intake and a water treatment plant intake will be constructed in the Monticello Reservoir. Construction of the raw water intake will be accomplished in the dry with the assistance of a sheet pile coffer dam surrounded by silt curtains. The applicant has proposed to pump silt-laden water from behind the coffer dam into the space between the coffer dam and the silt curtain. Rather than pumping silt-laden water directly into Monticello, water should be filtered to remove silt and sediment before it is returned to the reservoir.

CHAPTER 5 IMPACTS OF STATION OPERATION

Sec. 5.1.2 Transmission Corridors and Off-Site Areas

See comment above, Sec. 2.2.2.

Sec. 5.3.2.1.2 Modeling of Blowdown Temperatures

The CORMIX model was used to model the extent of the thermal plume that would exceed applicable SCDHEC water quality standards of $T > 90°F$ or ΔT of 5°F above ambient river temperatures. A variety of scenarios were modeled using input flows synthesized from Carlisle and Alston gauge flows. The "worst case scenario" was identified as follows: 2 cycles of concentration through cooling towers, 7Q10 flows, no operation of the FPSF, and max-ΔT(winter). The extent of the plume resulting from these conditions was modeled to be ~ 0.30 to 0.40 acre and would extend ~ 25% of the reservoir's width. Inflow to the Parr reservoir has been considerably lower than the modeled 7Q10 flow. Adverse impacts to aquatic resources can be significant if organisms are not able to avoid or find refugia from the thermal plume. More information is needed on the extent of the plume under very low flow conditions (e.g., flows less than the 7Q10 of 853 cfs). DNR requests additional consultation on the analysis of thermal impacts for low-flow conditions.

CHAPTER 10 PROPOSED ACTION CONSEQUENCES

Sec. 10.5.2 Cumulative Impacts of Operations

The COL indicates that during low flow periods the additional consumptive water loss associated with Units 2 and 3 would be mitigated by removing water from the reservoirs rather than *directly removing water from the Broad.* The COL also identifies the Lee Nuclear plant as a future

upstream water user, adding that cumulative impacts of VC Summer and Lee nuclear plants will be *small* with the addition of any *water supply features and mitigation measures*. However, the COL does not indicate how water is to be allocated between the reservoirs and river, or how operation of the Parr project and FPSF will be modified, to mitigate low flows. The COL indicates a minimum reservoir elevation of 418 ft. What are the operational or physical constraints on minimum reservoir elevation? As stated above, it is of extreme importance that issues of water supply during low flows are thoroughly addressed and appropriate mitigation measures are clearly identified, in consultation with regulatory and resource agencies, during the licensing process.

In conclusion, because of nuclear energy's relatively non-existent green-house gas emissions DNR supports opportunities to consult, review and participate in discussions involving additional reliance on nuclear power for generation of electricity. In view of the magnitude of the above-listed potential impacts, DNR urges diligence and additional documentation/consultation with respect to potential project impacts. We appreciate the opportunity to participate in the scoping process.

Please contact me at 803-734-4199 if you have any questions regarding this matter or if we can be of further assistance.

Sincerely,

Vivianne Vejdani

Vivianne Vejdani,
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