

**UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION**

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)	Docket No. 52-011-ESP
)	
Southern Nuclear Operating Company)	ASLBP No. 07-850-01-ESP-BD01
)	
(Early Site Permit for Vogtle ESP Site))	January 9, 2009

**TESTIMONY OF DR. CHARLES C. COUTANT
ON BEHALF OF
SOUTHERN NUCLEAR OPERATING COMPANY
CONCERNING ENVIRONMENTAL CONTENTION 1.3**

Q1: Please state your name, address and current occupation.

A1: My name is Charles Coe Coutant. I am a retired Distinguished Research Staff Member of the Oak Ridge National Laboratory, Oak Ridge, Tennessee. My combined business and home address is 120 Miramar Circle, Oak Ridge, TN 37830-8220. I now serve as a private consultant on matters of aquatic ecology and fisheries biology.

Q2: Please summarize your educational and professional qualifications.

A2: My professional and educational experience is summarized in the curriculum vitae (CV) (*see* Exhibit SNC000012). I received a Ph.D. in Biology (focus on ecology) from Lehigh University in 1965. I have conducted thermal effects and other cooling water studies since 1959. For five years post doctorate, I studied thermal effects on aquatic life of the Columbia River, Washington.

While at the Oak Ridge National Laboratory since 1970, I conducted individual research on thermal effects, entrainment and impingement on aquatic life, led a team of scientists studying these power plant cooling issues (for which I have numerous publications listed in my CV), and

participated in the preparation of NEPA Environmental Impact Statements for nuclear power plants for the U.S. Atomic Energy Commission, and later the Nuclear Regulatory Commission (NRC), in which thermal, entrainment and impingement issues were analyzed (Palisades, Shoreham, Indian Point). I also participated in the preparation of NEPA analyses for several hydropower facilities (for the Federal Energy Regulatory Commission, (FERC)), and participated in the development of national water quality criteria for temperature (National Academies and the Environmental Protection Agency (EPA)) as well as the interagency (NRC and EPA) implementation document for the thermal effects of Section 316(a) of the Clean Water Act. I have assisted numerous electricity generators with aquatic environmental licensing issues, including Virginia Power (now Dominion) with its North Anna Nuclear Power Plant. I have served on several task forces to develop biological criteria for environmentally benign siting, design and operation of power station cooling-water facilities.

Q3: Please describe your professional activities.

A3: My professional activities have included active participation in the American Fisheries Society, the dominant professional society for fisheries scientists and managers in North America. I served as President of the Society in 1996-1997 after several years of membership on the Governing Board. I also have served as President of the Water Quality Section, the Tennessee Chapter, and the Southern Division. For many years, I was an active participant in the literature review committee of the Water Pollution Control Federation (now Water Environment Federation), producing annual reviews of thermal effects literature. I have served on panels of the American National Standards Institute and the American Nuclear Society developing environmental standards for cold shock and entrainment, and of the American Society of Testing and Materials for contaminant transport models. I am also a member of the

Ecological Society of America, in which I was an officer of the Applied Ecology Section. I have served as an advisor to international agencies with respect to power station cooling-water impacts (Germany, Sweden, Canada, New Zealand, International Atomic Energy Agency (IAEA), and Unesco). The IAEA and Unesco activities resulted in reference manuals for siting, design and operation of steam power stations to minimize detrimental aquatic environmental impacts.

Q4: Please state the purpose of your testimony.

A4: The purpose of my testimony is to assure the Board that the middle Savannah River in the vicinity of the proposed Vogtle Units 3 and 4 does not have “extremely sensitive biological resources” that are necessary for the maintenance of the shortnose sturgeon and robust redhorse. First, I examine the meaning of the term “extremely sensitive biological resources” and the alleged presence of the same in the vicinity of the Vogtle site. Second, I discuss my evaluation of published research and administrative documents regarding the shortnose sturgeon and robust redhorse. Next, I discuss the portions of the Final Environmental Impact Statement (FEIS) that relate to the shortnose sturgeon and robust redhorse. Finally, I discuss the letter issued by the U.S. National Marine Fisheries Service (NMFS) that confirms the FEIS findings regarding the shortnose sturgeon and robust redhorse.

I also note that I have submitted testimony on behalf of SNC regarding Environmental Contention – EC 1.2. In that testimony, I testify regarding the general purpose of an EIS and the sufficiency and adequacy of the Vogtle FEIS, among other issues.

Q5: Are you familiar with the term “extremely sensitive biological resources”?

A5: Yes. Environmental Contention 1.3 in this proceeding is based on Joint Intervenors’ assertion that there are “extremely sensitive biological resources” present in the

Savannah River in the vicinity of the Vogtle site. Specifically, Joint Intervenors allege the presence of the shortnose sturgeon and the robust redhorse.

Q6: What is an “extremely sensitive biological resource”?

A6: The term “extremely sensitive biological resources” is drawn from the Preamble of the final rule for Section 316(b) of the Clean Water Act (CWA). Section 316(b) governs cooling water intake structures at new electricity generation facilities. In the Preamble of the final rule, the EPA rejected dry cooling as the best available technology for power generation cooling systems. However, the EPA stated that it “does not intend to restrict the use of dry cooling or to dispute that dry cooling may be the appropriate cooling technology for some facilities . . . in areas with limited water available for cooling or waterbodies with extremely sensitive biological resources (e.g., endangered species, specially protected areas).” In my opinion, extremely sensitive biological resources means more than that endangered species such as the shortnose sturgeon or non-listed but sensitive species such as the robust redhorse are present in the Savannah River watershed (which they are) but that they are sensitive to alterations of the environment in the vicinity of the proposed cooling system. That is, the new cooling system would have to pose significant risks to these species.

Q7: In your opinion, does the area of the Savannah River near the Vogtle power plant site have “extremely sensitive biological resources” necessary for maintenance of the shortnose sturgeon or robust redhorse?

A7: It is my opinion that it does not. Very briefly, in the case of the shortnose sturgeon, the Savannah River at the Vogtle site is a migration corridor for this estuarine and coastal species, which spawns in gravel habitats in the vicinity of Augusta, but there is no indication that the cooling system would diminish the ability of either adults to migrate upstream

(and return downstream) or juveniles to migrate downstream past the site. In the case of the robust redhorse, this species also has been found to spawn in limited gravel habitats near Augusta and is merely presumed to be distributed elsewhere in the Savannah River (none have been collected near Vogtle).

Q8: Have you personally conducted an evaluation of the shortnose sturgeon in the Savannah River and come to an opinion about it?

A8: Yes, I have. At the request of SNC, I surveyed the literature on shortnose sturgeon, including scientific studies and agency status reports and management plans and provided a summary and document list to SNC. The studies I relied on for my opinion are listed on Exhibit SNC000019, each with a short summary of the relevant information for the question of whether the river reach near Vogtle is an extremely sensitive biological resource for the shortnose sturgeon. In addition, my opinion is based on the impingement and entrainment studies conducted by SNC, which studies started in March 2008. To date in these studies, SNC has not collected any shortnose sturgeon or robust redhorse. *See Exhibits SNC000004 and SNC000005.*

Q9: Please summarize your findings and opinion.

A9: I located relatively recent articles that would contribute to understanding the distribution of shortnose sturgeon in the Savannah River and possible importance of the Vogtle reach to the population. In aggregate, the studies and analyses support the belief that the Savannah River at the Vogtle location is not an extremely sensitive habitat for shortnose sturgeon and that the cooling system poses minimal risk to the species. The river at Vogtle serves mainly as a migration corridor for adults and juveniles going to and from upstream spawning grounds (RM 171-173 according to Hall et al. 1991). Specifically, adults migrate

upstream to spawn from mid-February to mid-March, and return downriver mid-March to early May according to telemetry studies by Hall, et al. (1991). Migration rates were rapid, up to 33 km per day, and thus passage through the Vogtle reach would be brief. The very fact that successful spawning occurs consistently many miles upstream of the Vogtle Units 1 & 2 intake and discharge indicates that there is an effective zone of passage for pre-spawning adults moving upstream, spawned adults moving downstream, and juveniles moving downstream. The Vogtle 1 & 2 intake and discharge are thus not in critical zones of passage and do not compromise any extremely sensitive biological resources needed by the shortnose sturgeon. The similarly designed intake and discharge for Units 3 & 4 would likely also not be in critical zones of passage and would not compromise any extremely sensitive biological resources. While thirteen larval shortnose sturgeon were captured in ichthyoplankton surveys in the Savannah River for the SRS (Paller, et al. (1986)), none were collected in SNC's impingement and entrainment study this spring. Larval and juvenile shortnose sturgeon, like most sturgeon species, occupy the river bottom, where they are unlikely to encounter the Vogtle intake canal or thermal discharge.

Q10: Are you familiar with the robust redhorse?

A10: Yes. I have studied the scientific and administrative literature regarding this species that are listed on Exhibit SNC000020.

Q11: What is your understanding of its status?

A11: The robust redhorse, *Moxostoma robustum*, is an imperiled, large, river sucker with wild populations found in three Atlantic slope drainages: (Ocmulgee and Oconee Rivers (Georgia), Pee Dee River (North Carolina and South Carolina), and Savannah River (South Carolina and Georgia). It is found in small numbers in the lower 300 km (186 miles) of the Savannah River. Small, stocked populations have been established by introducing fish in the

Ocmulgee, Ogeechee, and Broad Rivers in Georgia. It was essentially lost to science until “rediscovered” in 1991 in the Oconee River. It is not listed under the federal Endangered Species Act (ESA), but its recovery is under supervision of an interagency Robust Redhorse Conservation Committee formed by Memorandum of Agreement in accordance with Section 4(b)(1)(A) of the ESA (web site for the Robust Redhorse Conservation Committee, www.robustredhorse.com). A conservation strategy has been adopted (Nichols 2003). *See* Exhibit SNC000021.

Q12: Is there critical habitat for the robust redhorse near the Vogtle site?

A12: No. Other than scattered individuals that may occur in the lower river, the only critical habitat is the spawning location considerably upriver of the Vogtle site.

Q13: Would you explain the location of this spawning in relation to Vogtle?

A13: Spawning (in May) in the Savannah River is known to occur only on small, mid-channel gravel bars near Augusta, Georgia, in the tailwaters of the New Savannah Bluff Lock and Dam between river kilometers (rkm 300 and 280) (river miles 186 and 184). The Vogtle site is more than 30 river miles downstream. The gravel bars are unique in the lower Savannah River (Freeman and Freeman 2001; Grabowski and Isely 2006, 2007b). The fish aggregate in large clusters of individuals (80-85) for spawning, and eggs are deposited in the gravel (Grabowski and Isely 2008). After 10-15 days in the gravel, larvae disperse downstream. The gravel bars are susceptible to dewatering (Grabowski and Isely 2007a) and pulsed, high-velocity flow (Wyers et al. 2003), which appears to be the dominant threat to the species in the Savannah River.

Q14: Does the conservation strategy for the robust redhorse identify any impacts from the Vogtle power plant as problems facing the species?

A14: No. The principal problems facing the species are identified as sedimentation from watershed development and dams that restrict spawning movements and access to probable spawning sites, both of which appear to have limited the amount of suitable spawning habitat (Nichols 2003). Historically, unrestricted harvest likely reduced populations to isolated remnants.

Q15: Have you reviewed the FEIS analysis with regard to the shortnose sturgeon and robust redhorse?

A15: Yes.

Q16: In your opinion, does the FEIS demonstrate that NRC Staff conducted an adequate analysis of potential impacts of the proposed project on the shortnose sturgeon and robust redhorse?

A16: Yes. The FEIS describes an analysis that is thorough, uses standard methods, and is consistent with the level of detail that the estimated impacts warrant. In the FEIS, the NRC Staff analyzed SNC's proposed closed-cycle wet cooling system and determined that the impact of such system on the shortnose sturgeon and robust redhorse would be SMALL. FEIS, Section 9.3.2. With regard to the shortnose sturgeon, the FEIS finds that (i) there is no designated "critical habitat" in or near the Vogtle site; (ii) there are no spawning areas for the shortnose sturgeon or robust redhorse in the vicinity of the Vogtle site; and (iii) that the design of the intake structure inhibits entrainment and impingement. FEIS, Sections 2.7.2.1-2, 5.4.2.2, and 9.3.2. The FEIS concludes that the "overall impact on aquatic resources of operating the proposed VEGP Units 3 and 4 . . . would be SMALL[.]" FEIS, Section 5.4.2.9. In addition, the NRC

Staff determined that design and operation of the proposed cooling water intake system are not likely to adversely impact shortnose sturgeon because the area affected by thermal discharge is small in comparison to the width of the Savannah River at the Vogtle site. FEIS, Section 5.4.3.2.

The potential impacts of the closed-cycle cooling system on the robust redhorse are also addressed by the FEIS. NRC Staff found that the robust redhorse spawning areas are 25 miles upstream of the Vogtle site and the adults stay primarily within the main channel as they move up and down the river. As a result, the FEIS states that “the potential for impact to the State Listed robust redhorse from entrainment, impingement, and thermal or chemical discharges would be minor.” FEIS, Section 5.4.2.6.

Accordingly, given the absence of significant impacts, the NRC Staff’s analysis of dry cooling as an alternative is adequate. Moreover, notwithstanding the contents of the FEIS, the further analysis that I and SNC have conducted and the additional evidence I describe in this testimony establish that the proposed project will have no effect on the shortnose sturgeon and robust redhorse.

Q17: Are you familiar with the letter of August 11, 2008 from Roy E. Crabtree, Regional Administrator of the Southeast Regional Office of the U.S. National Marine Fisheries Service to William Burton of the NRC?

A17: Yes, I am.

Q18: What is that letter about?

A18: It is a letter that conveys the NMFS’ concurrence with the NRC’s determination for the “Vogtle ESP Environmental Impact Statement” that the proposed addition of Vogtle 3 and 4 is not likely to adversely affect shortnose sturgeon, a species listed under the ESA, and that there is no designated “critical habitat” in or near the project area. *See Exhibit SNC000022.*

Q19: Why is such a letter important for this proceeding?

A19: Section 7 of the ESA requires that the agency preparing an EIS consult with agencies in charge with protecting listed species (“Section 7 consultation”). The shortnose sturgeon is listed and occurs in the lower and middle Savannah River. The NMFS is the designated authority for the shortnose sturgeon, which is migratory from marine waters into coastal rivers and thus under marine protection (strictly fresh water species would be under the jurisdiction of the U.S. Fish and Wildlife Service).

Q20: What is entailed in obtaining this letter and its concurrence?

A20: The EIS agency (in this case, the NRC) prepares a Biological Assessment of impacts to the listed species and formally requests concurrence from NMFS or FWS. As the letter indicates, NRC did that in January 2008. The NMFS staff reviewed the information in the Draft Environmental Impact Statement (DEIS), which is summarized in the letter to demonstrate that the NMFS understands the scope of the proposed project. The NMFS identified potential impacts to the shortnose sturgeon and conducted its independent analysis of those potential impacts. As the letter states, the NMFS found the impacts insignificant and the Vogtle reach of the river to not contain essential fish habitat. The letter is the formal document providing the legal concurrence by NMFS.

Q21: Why has the NRC Staff not requested a similar letter from NMFS for the robust redhorse?

A21: The robust redhorse is not a species listed under the ESA and thus does not require Section 7 consultation.

Q22: Does your evaluation described above confirm the findings of the NMFS letter?

A22: Yes. My research and analysis are fully consistent with the NMFS determination as well as the FEIS findings.

Q23: Are true, accurate and correct copies of each of the exhibits heretofore referenced in your testimony attached to this pre-filed written testimony, and do they accurately portray the facts they purport to portray?

A23: Yes, except for Exhibit SNC000012, which is attached to my testimony regarding Environmental Contention 1.2, and Exhibits SNC000004 and SNC000005, which are attached to the testimony of Anthony R. Dodd/Matthew T. Montz regarding Environmental Contention 1.2.

Q24: Are the items listed on Exhibits SNC000019 and SNC000020 scholarly or learned journals, articles or treatises commonly relied upon in your profession?

A24: Yes.

Q25: Does this conclude your testimony?

A25: Yes.

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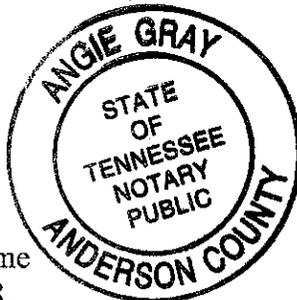
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AFFIDAVIT OF DR. CHARLES C. COUTANT IN SUPPORT OF SOUTHERN NUCLEAR'S
PRE-FILED TESTIMONY ON ENVIRONMENTAL CONTENTION 1.3

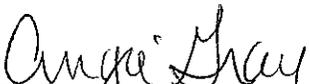
I, Dr. Charles C. Coutant, do hereby state as follows:

1. I am a retired Distinguished Research Staff Member of the Oak Ridge National Laboratory. A statement of my professional qualifications is attached to the SNC pre-filed testimony to be submitted on January 9, 2009, in response to hearing issues identified by the Board.
2. I have read the foregoing prepared testimony regarding environmental matters at the Plant Vogtle Site.
3. I attest to the accuracy of those statements, support them as my own, and endorse their introduction into the record of this proceeding. I declare under penalty of perjury that those statements, and my statements in this affidavit, are true and correct to the best of my knowledge, information and belief.




Dr. Charles C. Coutant

Subscribed and sworn to before me
this 23 day of December, 2008.


Notary Public

Comm exp. 08/25/2010