

**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))	February 6, 2009
)	

**SOUTHERN NUCLEAR OPERATING COMPANY’S RESPONSE STATEMENT
ON ENVIRONMENTAL CONTENTION 1.2**

Pursuant to 10 C.F.R. § 2.1207(a)(2) and the Atomic Safety and Licensing Board’s (“ASLB” or “Board”) Orders of October 24, 2008 and December 15, 2008,¹ Southern Nuclear Operating Company (“SNC”) hereby submits its response to the legal arguments, factual assertions and supporting materials filed by Joint Intervenors on January 9, 2009, and revised on February 2, 2009, specifically with respect to Environmental Contention 1.2 (“EC 1.2”).² This Response Statement is supported by rebuttal testimony of Dr. Charles Coutant, Mr. Tom Moorer, Mr. Matthew Montz and Mr. Tony Dodd (“Coutant 1.2 Rebuttal Testimony,” “Moorer 1.2 Rebuttal Testimony,” and “Montz/Dodd 1.2 Rebuttal Testimony”) and the initial testimony of these witnesses.

I. Introduction

The procedural background of EC 1.2 is discussed in SNC’s Initial Statement of Position on EC 1.2, filed on January 9, 2009. EC 1.2 asserts that the Final Environmental Impact

¹ Memorandum and Order (Revised General Schedule) (“October 24 Order”) and Memorandum and Order (Contested Evidentiary Hearing Administrative Matters) (“December 15 Order”).

² Response Statements on EC 1.3 and EC 6.0 are being filed separately.

Statement (“FEIS”) fails to identify and adequately consider impacts of the proposed cooling system intake and discharge structures on aquatic resources. As discussed below, Joint Intervenors’ Initial Statement of Position fails to explain how the FEIS does not satisfy the Staff’s National Environmental Protection Act (“NEPA”) obligations, and Joint Intervenors have provided no evidence that the FEIS analysis is inadequate or that its conclusions are wrong.

II. Applicable Legal Standards

As an initial matter, Joint Intervenors mistakenly assign the burden in this case solely to SNC. *See* Joint Intervenors’ Revised Initial Written Statement of Position and Prefiled Direct Testimony, Feb. 2, 2009, at 3 (“Joint Intervenors’ Revised Position Statement”). Instead, the Staff and SNC share the burden to demonstrate compliance with NEPA. *See In re La. Energy Servs. L.P.* (Claibourne Enrichment Center), 45 N.R.C. 367, 373 (1997).³

Likewise, in regard to EC 1.2, Joint Intervenors discuss only half of the legal standard applicable. As SNC has fully briefed, the legal issue in controversy is whether the Staff took a “hard look” at aquatic impacts, subject to a “rule of reason.” [SNC’s] Initial Statement of Position on Intervenors’ [EC] 1.2, Jan. 9, 2009, at 11 (“SNC’s EC 1.2 Position Statement”). SNC has provided thorough discussion of what this standard means. *Id.* at 5-7. In their discussion of EC 6.0, Joint Intervenors concede that the “hard look” standard is subject to a “rule of reason,” that “[a]gencies are given broad discretion in determining how thoroughly to analyze a particular subject,” and that “an agency may, in its discretion, rely on data, analyses, or reports prepared by persons or entities other than agency staff.” Joint Intervenors’ Revised Position Statement at 20-21. Of course, the NEPA standard is the same for all of the environmental

³ And while SNC and the Staff share the overall burden, Joint Intervenors must also provide support for their contention. *See In re Private Fuel Storage, LLC* (Independent Spent Fuel Storage Installation), 61 N.R.C. 319, 326 (2005) (“[H]earings are held on only those issues that an intervenor brings to the fore. And the burden of going forward on any issues that make it to the hearing process is on the intervenor that is pursuing that issue.”).

contentions, and Joint Intervenors' failure to acknowledge the "rule of reason" in its discussion of the legal standards for EC 1.2 is not defensible.

At bottom, it is clear that the Board must apply for itself the same substantive standard applicable to the Staff's NEPA review, i.e., the "hard look" standard, subject to the "rule of reason." *See Ka Makani 'O Kohala Ohana Inc. v. Dep't of Water Supply*, 295 F.3d 955, 959 (9th Cir. 2002).

III. SNC's Rebuttal Testimony

SNC's rebuttal testimony on EC 1.2 is presented by the same witnesses who submitted pre-filed written testimony in support of SNC's Initial Statement of Position on EC 1.2: Dr. Charles Coutant, Mr. Tom Moorer and Messrs. Tony Dodd and Matt Montz. As demonstrated in their direct testimony, these witnesses have significant and essential experience with NEPA analyses and with the actual conditions at the proposed site for Vogtle Units 3 & 4. *See* [SNC's] Testimony of Dr. Charles Coutant Concerning EC 1.2, Jan. 9, 2009, at 3-5 ("Coutant EC 1.2 Testimony"); [SNC's] Testimony of Thomas Moorer Concerning EC 1.2, Jan. 9, 2009, at 2 ("Moorer EC 1.2 Testimony"); [SNC's] Testimony of Anthony Dodd and Matt Montz Concerning EC 1.2, Jan. 9, 2009, at 2-3 ("Montz/Dodd EC 1.2 Testimony"). This is in stark contrast to Joint Intervenors' witnesses Dr. Shawn Young and Mr. Barry Sulkin, neither of whom identifies any NEPA experience, personal observations of, or other familiarity with the site as a basis for their testimony. *See* Revised Pre-filed Direct Testimony Shawn P. Young, Feb. 2, 2009, at A.4, A.6, A.8 ("Young Revised EC 1.2 Testimony"); Revised Pre-filed Direct Testimony of Barry W. Sulkin in Support of EC 1.2, Feb. 2, 2009, at A.4, A.6 ("Sulkin Revised EC 1.2 Testimony").

IV. SNC's Response Statement on EC 1.2

Joint Intervenors' Initial Statement of Position essentially alleges that the FEIS analysis is "inaccurate" in a number of respects.⁴ This complaint is illustrated by various challenges to the information the Staff considered in reaching its conclusions, each of which is addressed below. In each case, Joint Intervenors' assertions are irrelevant to the Board's decision and do nothing to demonstrate that the Staff failed to take the reasonable "hard look" required by NEPA. For example, Joint Intervenors criticize the FEIS for not making precise distinctions regarding the extent of SMALL impacts. At best, Joint Intervenors appear to demand that the Staff precisely quantify impacts that are indisputably insignificant, ignoring the fact that "how small is small" is not relevant to the Staff's NEPA analysis. In most cases, Joint Intervenors' call for more precision is either misleading or a cover for their disagreement, however unsupported, with the Staff's conclusions. Certainly none of Joint Intervenors' concerns is supported by evidence or explanation as to how those concerns could change the conclusions in the FEIS. Nor do Joint Intervenors offer any legal support for the implied proposition that their standard of precision is the correct one. Applying the rule of reason, this Board should conclude that the FEIS more than adequately satisfies the Staff's NEPA obligations.

A. Baseline Data

There is no dispute that baseline data is necessary in order to assess impacts. Nor can there be any dispute that the FEIS contains substantial information of this nature. Joint Intervenors contend that the data is not "detailed" enough. As Dr. Coutant has testified, conclusions regarding impacts due to entrainment are substantiated and appropriate given the baseline data included in the FEIS. Coutant EC 1.2 Testimony at 10. The additional level of

⁴ See generally Joint Intervenors' Revised Position Statement at 9-11.

detail of “[l]ife history stages of Savannah River fish near the VEGP site, the migration timing of each species’ life history, fish distribution patterns in the immediate vicinity of the VEGP site, [and] population numbers” requested by Joint Intervenors is neither required nor necessary to assess impacts. *Id.* at 17-18.

The testimony presented by SNC and the NRC Staff supports a finding that the FEIS is more than adequate, and Joint Intervenors offer no evidence that the analysis or conclusions in the FEIS are wrong.

1. Quantitative Surveys

Joint Intervenors argue that current, Vogtle-specific field studies are required to assess aquatic impacts. Joint Intervenors’ Revised Position Statement at 9. They provide no legal support for this assertion. And, in fact, NEPA does not require it. Still, Dr. Young states that “[t]he most effective method to determine current ichthyoplankton species composition, distribution, and vulnerability to entrainment in the vicinity of the VEGP site is an ichthyoplankton-net collection. . .[which should be] conducted at equal intervals from riverbank to riverbank, surface to bottom, during a stratified sampling period occurring day and night several times per week during each month of the year.” Young Revised EC 1.2 Testimony at A.19. Dr. Young ignores, or disregards, the fact that much of the data relied upon in the FEIS was the product of published field studies of the Savannah River in the vicinity of the Vogtle site that were conducted by other parties. Moreover, as Dr. Coutant testifies, although additional studies of this kind are neither required nor necessary in order to assess impacts for purposes of NEPA, SNC has conducted just such site-specific field studies of impacts from entrainment and impingement at Units 1 and 2 in the last year. These recent studies confirm the data relied upon and conclusions reached in the FEIS. As Dr. Coutant explains in his Rebuttal Testimony, “SNC

has provided the study essentially as proposed by Dr. Young in his Direct Testimony.” Coutant 1.2 Rebuttal Testimony at 7; *see also* Montz/Dodd 1.2 Rebuttal Testimony at 2.

As an example of Joint Intervenors’ specific criticism, they argue that the FEIS “provides only a cursory and inaccurate summary” regarding American Shad and “incorrectly characterizes the location within the Savannah River where American shad eggs are concentrated.” Joint Intervenors’ Revised Position Statement at 10. Dr. Young testifies, without any citation or support, that the “FEIS states that American shad eggs are concentrated along the bottom of the water column, and then concludes – because of such concentrations – that the current and future operation of VEGP will result in only minor impacts.” Young Revised EC 1.2 Testimony at A.18. Essentially, Joint Intervenors want more information on American Shad. However, as Dr. Coutant has previously testified, the discussion in the FEIS of American Shad is adequate and accurate: “It is apparent to me that life histories were considered and the conclusions reached are consistent with the analysis I would have done.” Coutant EC 1.2 Testimony at 18.

Similarly, Joint Intervenors challenge the sufficiency of the FEIS because “the staff illogically relies on oxbow population data, which is not relevant to its analysis of the mainstream ichthyoplankton community.” Young Revised EC 1.2 Testimony at A.18, *citing* FEIS at 2-82. This criticism is highly obtuse. The FEIS, on the very page cited by Joint Intervenors, is plainly discussing riverine populations. It only notes for comparison the relative absence of shad in oxbows and in no way “relies” on that information in the manner suggested by Joint Intervenors. The excerpt cited by Joint Intervenors and their witness in full reads as follows:

Specht (1987) reported that American shad were the dominant taxa in the ichthyoplankton assemblage (primarily as eggs) in the river. They were not as abundant in the oxbows, creeks or intake canals on the Savannah River Site indicating that the primary location for spawning was the river. Bailey et al. (2004) estimated the

population size of American shad that reached the New Savannah Bluff Lock and Dam (located approximately 56 km [35 mi] upstream of the VEGP site) at 158,000 in 2001 and 217,000 in 2002. These numbers suggest a substantial numbers of American shad pass by the VEGP site during their annual spawning runs.

FEIS at 2-82. While in most cases Joint Intervenors complain that additional, non-essential data must be provided, here, the apparent complaint is that too much data is offered.

2. Larval Fish

Dr. Young also challenges the Staff's "group conclusion" regarding the ability of larval fish to endure a velocity of 1 ft/sec. Young Revised EC 1.2 Testimony at A.15. This challenge is completely manufactured. First, Dr. Young mischaracterizes the FEIS. He claims "[t]he FEIS at 5-30 states that 'species and life stages evaluated in various studies could endure a velocity of 1 ft/sec.' However, many of the endangered or important fish of the Savannah River cannot endure that water intake velocity." *Id.* The FEIS does not conclude this; this was EPA's conclusion, and it is simply reported as such by the Staff in the FEIS. Dr. Young fails to mention that the FEIS goes on immediately to state that after EPA determined that species could endure a velocity of 1.0 ft/sec, it "then applied a safety factor of two to derive the threshold of 0.5 ft/sec. Southern has stated that the proposed Units 3 and 4 intake structure would have a design through-screen velocity of less than [0.5 ft/sec]." FEIS at 5-30. Joint Intervenors' decision to exclude this material and relevant information from their quotations is egregious.

Next, Dr. Young asserts that because of this irrelevant 1 ft/sec threshold, the larval fish of the Robust Redhorse (capable of swimming speeds ranging from 3 to 5 inches/sec) would not be able to swim through the affected area. Young Revised EC 1.2 Testimony at A.15. This assertion completely ignores the fact that only a small portion of the channel in the immediate proximity to the intake screen itself would experience these velocities. Velocity at the entrance to the intake canal is less than 0.1 ft/sec. *See* FEIS 5-31.

Finally, and most important to assessing the adequacy of the Staff's "hard look," Joint Intervenors are raising a question, the answer to which has no bearing on the Staff's conclusions at all. In assessing impacts, the Staff assumed that no fish were capable of avoiding the water intake velocities. Moorer 1.2 Rebuttal Testimony at 4. Thus, by example, when the Staff bases its conclusions that impacts will be SMALL on the assumption that 10 fish will be impacted, Joint Intervenors challenge the analysis, saying it could be 6 or 8 fish instead, depending on getting more precise about which juveniles can swim away. Surely, Joint Intervenors cannot be concerned that the Staff overestimated impacts.

3. Species Decline

Joint Intervenors assert, through the testimony of Dr. Young, that in order to accurately evaluate the impingement/entrainment and thermal impacts, the causes for the decline in population of six species identified in the FEIS "must be articulated." Young Revised EC 1.2 Testimony at A.12. As with their other complaints, accepted causes of decline are already noted in the FEIS – Joint Intervenors simply want more. *See* FEIS 2-83, 2-84, 2-89, 2-91. Joint Intervenors do not claim that Units 1 and 2 are the cause for the decline; neither do they claim that Units 3 and 4 would be the cause of further decline. And, as Dr. Coutant testifies, "[c]auses for population declines should factor in the analysis only if the estimated impacts of the proposed facility would contribute a significant added source of mortality." Coutant 1.2 Rebuttal Testimony at 4. Joint Intervenors offer no evidence to either make this claim or support it.

In sum, Joint Intervenors seem to view the FEIS evaluation of the baseline as a research project with the principal purpose of advancing the detailed understanding of discrete sub-issues in aquatic biology. This is not the purpose of NEPA, and it is not the Staff's obligation. The baseline data is plainly adequate to support the analyses in the FEIS.

B. Staff's Assumptions and Methodology

Similarly, Joint Intervenors' complaints regarding the Staff's use of certain assumptions and approaches to ascertain impacts are unfounded. In their Initial Statement of Position, Joint Intervenors challenge: 1) the assumption of uniform drift distribution; 2) the assumption that fish and shellfish can adapt to varying flow regimes and velocities; 3) the Staff's assumptions of various river flows and the effect on impacts from entrainment; 4) assumptions considered in assessing impacts from the thermal plume and discharge; and 5) the use of withdrawal rate as a percentage of total flow as an indicator of impacts. *See generally* Joint Intervenors' Revised Position Statement at 8-16. Again, each of these complaints reduces to the Joint Intervenors' desire for increased "accuracy." However, as explained below, the assumptions and approaches in the FEIS are reasonable and appropriate.

1. Uniform Drift Distribution

As Dr. Coutant testifies, "the use of simplifying assumptions such as uniform distribution of ichthyoplankton in the river and impacts being proportional to the amount of water withdrawn is a common and accepted practice for estimating the scale of impact to be expected." Coutant 1.2 Rebuttal Testimony at 5-6. Dr. Young's assertion that this assumption is flawed is unsupported by any claim or evidence that local distributions are so significantly non-uniform that it should change the conclusions in the FEIS. Moreover, the results of SNC's 2008 entrainment study "demonstrated that the entrained ichthyoplankton in the intake canal is actually much lower in abundance than [what is] found in the river." *Id.* at 6; SNC000005. Thus, this criticism of the Staff's FEIS is without merit.

2. Adaptation to Flow Regimes and Velocities

Similarly, Joint Intervenors' criticism that the FEIS "assumes that shellfish can easily adapt to the varying flow regimes and velocities which would result from operation of Units 3 and 4" is without merit. *See* Joint Intervenors' Revised Position Statement at 12. Dr. Coutant testifies that "[i]t has been well recognized in the scientific literature for over a century that organisms dwelling in rivers are adapted to changing flows and velocities." Coutant 1.2 Rebuttal Testimony at 7. Dr. Young asserts that the FEIS fails to distinguish between natural and human-induced variability and cites several studies to support his claim that human-induced variability is the primary cause of decreased freshwater biodiversity in the United States. However, as Dr. Coutant points out, the references cited by Dr. Young "deal primarily with biological impacts to mussels and fish from flow changes from impoundments and with other species declines due to human activities unrelated to flow." *Id.* Thus, Joint Intervenors provide no relevant evidence to support this claim.

3. Conclusions Based on River Flows

Joint Intervenors criticize the Staff's low flow analysis and call for inclusion of "Drought Level 4;" however, they completely ignore the fact that the Staff considered flows as low as 2000 cfs at the plant site. *See* FEIS at 5-25. As Mr. Moorer testifies, the Staff's approach is conservative. Moorer 1.2 Rebuttal Testimony at 8. In many instances, Joint Intervenors or their witnesses state or imply that flows at Plant Vogtle have dropped to 3100 cfs. *E.g.* Sulkin Revised EC 1.2 Testimony at A.14. This simply is not true. Updated flow data attached to Mr. Moorer's rebuttal testimony demonstrates that the flow has consistently been around 4000 cfs, twice the level discussed in the FEIS. Moorer 1.2 Rebuttal Testimony at 11-12; SNC000054. It is possible Joint Intervenors do not apprehend the relation between releases at Thurmond and

flow at Vogtle. As Mr. Moorer explains, releases at Thurmond flow downstream and are joined by several hundred or more cfs of local inflows. *Id.* Joint Intervenors also ignore the fact that low river flows do not coincide with the peak presence of vulnerable ichthyoplankton. As Dr. Coutant testifies, “ichthyoplankton [that is vulnerable to entrainment], occurs in the Savannah River in spring and early summer when flows generally are at seasonal highs.” Coutant 1.2 Rebuttal Testimony at 11.

Joint Intervenors, through their witness Mr. Sulkin, also challenge the Staff’s compilation of various withdrawal rates. Sulkin Revised EC 1.2 Testimony at A.14, A.15; JTI000021. Mr. Sulkin’s tables offer no evidence to support a finding that the Staff’s FEIS is inadequate. Rather, based on Mr. Sulkin’s calculations, cumulative withdrawal of Units 1 – 4 will begin to exceed 5% at normal operating mode at 3,100 cfs in the vicinity of the intake structure. Sulkin Revised EC 1.2 Testimony at A.20. Notwithstanding that such low flows in the vicinity of the site have not been experienced, even in periods of extreme drought, it is not likely in any event that ichthyoplankton will be impacted should such flows occur in the future because the lowest flows typically do not coincide with spawning. Exhibit SNC00051; Coutant 1.2 Rebuttal Testimony at 12. Additionally, Dr. Coutant testifies that “[t]here is no indication that there will be a high frequency or long duration of low flows below 2,000 cfs at the Vogtle site in spring-early summer when ichthyoplankton are present. Thus, estimates of impacts would not change considering this information.” Coutant 1.2 Rebuttal Testimony at 12. The Staff’s assumption in the FEIS that low river flows will not change its conclusions regarding impacts from impingement and entrainment is explained and supported. Joint Intervenors’ claim that this assumption is “inadequately supported and misleading” is without merit.

4. Impacts from Thermal Plume and Discharge

Joint Intervenors' criticism of the Staff's conclusions regarding impacts from the thermal discharge ignores the relation between water temperatures and presence of vulnerable ichthyoplankton. *See* Montz/Dodd 1.2 Rebuttal Testimony at 5; Coutant 1.2 Rebuttal Testimony at 9-10. The river discharge would not reach the lethal temperatures cited by Dr. Young during the spring and early summer when eggs and larvae of the ichthyoplankton are most likely drifting past the Vogtle thermal discharge plume. Montz/Dodd 1.2 Rebuttal Testimony at 5; Coutant 1.2 Rebuttal Testimony at 9. Additionally, Dr. Young's assertion ignores the duration of exposure necessary at those lethal temperatures to cause mortality. "It is well known that the lethal effects of high temperature are caused by a combination of exposure temperature and the duration of that exposure." Coutant 1.2 Rebuttal Testimony at 9. According to Dr. Coutant, "the duration of exposure to any potentially lethal temperatures in all likelihood would be too brief to cause mortality, even assuming that temperatures in the plume were above the long-term lethal level at some points." *Id.* at 10.

Joint Intervenors also criticize the FEIS discussion predicting the size of the thermal plume. The Staff used the EPA-approved CORMIX model to assess impacts from the thermal discharge. SNC also conducted a field study of the thermal plume which "indicated the presence of a relatively small zone of detectable difference between discharge and ambient temperatures." *See* Montz/Dodd EC 1.2 Testimony at 19. Joint Intervenors provide no evidence that impacts will be different than those predicted by the Staff. Therefore, this claim is also without merit.

5. Use of Withdrawal Rate as Percentage of Flow

Contrary to Joint Intervenors' assertion that the conclusions in the FEIS are based on "fundamentally flawed methodology," the Staff's use of withdrawal rate as a percentage of total

flow and reference to EPA's 5% threshold are appropriate and accurate indicators of whether potential impacts will be SMALL. First, it is not credible to suggest that impacts from entrainment or impingement are not related to withdrawal percentages. EPA certainly believes so. *See* 66 Fed. Reg. 65256 (Dec. 18, 2001) (stating that the quantity of water withdrawn is directly related to the number of organisms affected); SNC000055; Coutant 1.2 Rebuttal Testimony at 5-6 (stating that the assumption that impacts are proportional to the amount of water withdrawn is a common and accepted practice). Also, EPA's 5% of average annual flow threshold is based on its Clean Water Act § 316(b) rule, and it is used in the FEIS as a guidepost. FEIS at 5-30. Joint Intervenors imply that the FEIS relies only on the percent withdrawn to support its conclusions. To the contrary, although percent withdrawal is highly informative, the FEIS relies on several factors to reach its conclusions. For example, the technology employed is the undisputed Best Available Technology for reducing entrainment and impingement impacts. Moorer 1.2 Rebuttal Testimony at 12. The FEIS tables and text inform the decision-maker of flow scenarios that could exceed the 5% threshold in the short term; and the Staff's conclusions regarding the likelihood and duration of such flows are appropriate.

V. Conclusion

Joint Intervenors' EC 1.2 should not be sustained. The claims made by Joint Intervenors in their Initial Statement of Position and through their Pre-filed Direct Testimony are unfounded and unsupported. SNC again respectfully requests that the Board rule that the FEIS adequately considers direct, indirect and cumulative impacts from impingement/entrainment and thermal discharge on aquatic resources.

Respectfully submitted,

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Dated this 6th day of February, 2009.

**UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION**

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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CERTIFICATE OF SERVICE

I hereby certify that copies of SOUTHERN NUCLEAR OPERATING COMPANY'S RESPONSE STATEMENT ON ENVIRONMENTAL CONTENTION 1.2 in the above captioned proceeding have been served by electronic mail as shown below, this 6th day of February, 2009, and/or by e-submittal.

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* And upon any other persons designated on the official service list compiled by the Nuclear Regulatory Commission in this proceeding.

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