

**UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION**

**BEFORE THE ATOMIC SAFETY AND LICENSING BOARD**

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<b>In the Matter of</b>	)	<b>Docket No. 52-011-ESP</b>
	)	
<b>Southern Nuclear Operating Company</b>	)	<b>ASLBP No. 07-850-01-ESP-BD01</b>
	)	
<b>(Early Site Permit for Vogtle ESP Site)</b>	)	<b>February 6, 2009</b>
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**REBUTTAL TESTIMONY OF CHARLES R. PIERCE  
ON BEHALF OF  
SOUTHERN NUCLEAR OPERATING COMPANY  
CONCERNING ENVIRONMENTAL CONTENTION 1.3**

**Q1. Please state your name, occupation and business address.**

A1. My name is Charles “Chuck” R. Pierce. I hold the position of Licensing Manager for Southern Nuclear Operating Company (“Southern Nuclear”). My business address is: Inverness Office Park, Birmingham, Alabama 35201.

**Q2. Please describe your educational and professional background.**

A2. I earned a B.S. degree in Mechanical Engineering from Mississippi State University in 1974 and a M.S. degree in Mechanical Engineering from Mississippi State University in 1980. I have worked as an engineer at Southern Nuclear for twenty-eight years. My experience encompasses nuclear power plant licensing, design engineering and retrofitting. I have managed license renewal projects for various nuclear facilities, including all aspects of the Nuclear Regulatory Commission’s (“NRC”) new nuclear licensing requirements. I have designed and evaluated safety related systems, changes in licensing to meet regulatory impacts, and site system engineering to solve plant issues.

As relevant to this proceeding, in the area of standard design, I have been involved in the development of standard designs for nuclear power plants with Westinghouse Company (“Westinghouse”) and the licensing of Westinghouse’s standard design with the NRC.

My job requires knowledge of the licensing practices and procedures for nuclear power plants, including all aspects of site design, installation, environmental qualifications, construction and regulatory interpretations. I have experience with all aspects of licensing of nuclear plants, including the regulatory requirements, policies and practices. I have performed evaluations of design changes in licensing and license renewals. I have developed Early Site Permits and Combined Operating License applications, in compliance with the NRC current standards for nuclear power plants. My curriculum vitae is attached. *See* Exhibit SNC000058.

**Q3. Please state the purpose of your rebuttal testimony.**

A3. The purpose of my testimony is to rebut the testimony of Joint Intervenors’ witness Mr. William Powers with regard to the meaning of the AP1000 standard design and to discuss the importance of retaining the standard nuclear power plant design that has been reviewed and certified by the NRC.

**Q4. What is the NRC’s policy regarding use of certified nuclear power plant designs?**

A4. The NRC has repeatedly expressed its desire that the next generation of nuclear plants be standardized in order to enhance safety by making reactors of the same design more uniform and to reform the licensing process by making it more predictable. Based upon this policy, the NRC has certified four standard plant designs that may be used by applicants seeking a license to construct and operate a nuclear plant. These “standard designs” are approved only after a rulemaking that includes a review of the Design

Control Document (“DCD”) for each standard design and after NRC staff issues a final safety evaluation report for each standard design. In addition, the NRC encourages license applicants to standardize the balance of their plants to the extent it is practicable. *See* Exhibits SNC000059, SNC000060, SNC000061, SNC000062, SNC000063, and SNC000064 (Final Statement on Policy of Conduct of New Reactor Licensing Proceedings, 73 Fed. Reg. 20963, at 20971 (April 17, 2008), citing 10 C.F.R. § 52.63 (2006) (“the Commission encourages applicants to standardize the balance of their plants insofar as is practicable.”)). *See also* 10 C.F.R Part 52 (“The NRC issued 10 CFR part 52 . . . to reform the NRC’s licensing process for future nuclear power plants. . . . The processes in 10 CFR part 52 allow for resolving safety and environmental issues early in licensing proceedings and were intended to enhance the safety and reliability of nuclear power plants through standardization.”).

**Q5: On page 7 of his direct testimony (Powers Testimony at A23), Mr. Powers states that “a standard design serves as a point of departure for customizing the design for a specific site with specific site constraints.” How do you respond?**

A5. The statement is misleading. The characterization of the standard design as a point of departure for customization is contrary to the NRC’s policy and intent with regard to the meaning of “standard design.” As I discussed earlier, the NRC has repeatedly expressed its desire that the next generation of nuclear plants be standardized in order to reform the licensing process by making it more predictable and to enhance safety by making reactors of the same design more uniform. The standard plant design will also facilitate and expedite the licensing, procurement, construction, and commercial operation of all the standardized units. While the new Part 52 licensing regulations do carry a departure

process where changes to the standard design can be made, the intent of both the NRC and the industry is that this process will be applied only when absolutely necessary in order to maximize the benefits of the standard design. For example, the current standard design employs a Toshiba turbine. While several of the current five AP1000 applicants have indicated a preference for other turbine manufacturers with which they have had more experience, all have elected to not change that design in order to achieve the benefits of standardization.

**Q6. What is the standard plant cooling system design for the AP1000 nuclear power plant design?**

A6. The standard AP1000 cooling system design includes a closed loop cooling system with a traditional steam surface condenser to condense steam from the turbine and a wet evaporative cooling tower. *See* Exhibit SNC000065, DCD Section 10.4. The conceptual design for the cooling system for the AP1000 nuclear power plant design was developed by Westinghouse with the objective of achieving a generic standardized design for use at all potential sites and for all potential clients. The standard plant design would facilitate and expedite the licensing, procurement, construction, and commercial operation of all the standardized units.

**Q7. What is the standard turbine specified for the AP1000 nuclear power plant design?**

A7. Section 10.2.2 of the DCD specifies the turbine-generator as a TC6F 52-inch last-stage blade unit, which is a multi-stage Toshiba turbine. *See* Exhibit SNC000028. More specifically, the TC6F turbine is designed to operate in conjunction with a single pass/multipressure condensing turbine with a design backpressure of 2.9” HgA.

**Q8. Is the turbine-generator building part of the standard design?**

A8. Yes. The design of the turbine-generator building is also described in Section 10.2.2 of the DCD. *See* Exhibit SNC000028.

**Q9. On pages 6 and 7 of his direct testimony (Powers Testimony at A21-A22), Mr. Powers states that the surface condensers necessary with the wet cooling system in the AP1000 design can be removed to create adequate space for ACC steam ducts and that 20-foot diameter openings in the wall of the turbine building are necessary to install these ducts. Mr. Powers also states that these modifications “in no way rise[s] to the level of reworking the entire turbine building” and do not interfere with the standard design for the AP1000. Do you agree?**

A9. No. Removal of the condensers and creation of 20-foot diameter holes in the turbine building would be substantial changes to the standard design. These modifications would require changes to the wall of the turbine building, the turbine building structural steel cross bracing, and the main turbine deck support system. Moreover, these changes will cause layout changes to other equipment in order to provide a path for the steam ducts and will require the design of a support system for the steam ducts.

**Q10. Would a change to the turbine require a re-evaluation of the final site safety analysis?**

A10. Yes. The final site safety analysis submitted in this proceeding in accordance with Appendix N is based upon the site safety analysis and the DCD prepared by Westinghouse as part of the standard AP1000 plant design. As noted in Section 10.1.2 of DCD Rev. 17, the current Toshiba turbine design and orientation minimize the probability of missile generation and directs potential missiles away from safety-related equipment and structures. Changing the steam turbine to accommodate an ACC would

require a re-working of this analysis. It would also cause a similar effort on Chapter 11 of the DCD, as removing the condensing mechanism from the turbine building and placing it in the open air where a steam tube leak would vent straight to the atmosphere would most certainly impact the analysis of primary-to-secondary system leakage. Thus, further costs would be incurred due to the potential operational and safety analyses that changing to an ACC might necessitate.

**Q11: 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?**

A11. Yes, except for Exhibit SNC000028, which is attached to the pre-filed direct testimony of James W. Cuchens submitted in this proceeding on January 9, 2009.

**Q12: Does this conclude your testimony?**

A12: Yes.

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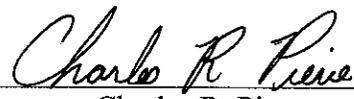
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Southern Nuclear Operating Company	)	ASLBP No. 07-850-01- ESP-BD01
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(Early Site Permit for Vogtle ESP Site)	)	February 6, 2009

AFFIDAVIT OF CHARLES R. PIERCE CONCERNING SOUTHERN NUCLEAR'S  
REBUTTAL TESTIMONY ON ENVIRONMENTAL CONTENTION 1.3

I, Charles R. Pierce, do hereby state as follows:

1. I am employed by Southern Nuclear Operating Company as the Licensing Manager for Vogtle Deployment. A statement of my professional qualifications is attached to the SNC rebuttal testimony to be submitted on February 6, 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.

  
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Charles R. Pierce

Subscribed and sworn to before me  
this 3<sup>rd</sup> day of February, 2009.

  
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Notary Public