PMBelCOL PEmails

From: Habib, Donald
Sent: Friday, September 04, 2009 2:31 PM
To: 'andrea sterdis'; 'Spink, Thomas E'; Amy Aughtman; Wes Sparkman
Cc: Joshi, Ravindra; Anderson, Brian; Hughes, Brian; Simms, Tanya; Coffin, Stephanie; BelCol Resource; Haggerty, Sharon; Patel, Chandu; Goetz, Sujata; Huang, Jason; Snyder, Amy; Comar, Manny; VogtleCOL Resource; 'bobhirman@live.com'; 'richard.grumbir@excelservices.com'; 'erg-xl@cox.net'; Martin, Jody; Hodgdon, Ann; Wade, Tony; Sebrosky, Joseph
Subject: Bellefonte Chapter 18 SER with Open Items
Attachments: Bellefonte SER Chapter 18.pdf; Bellefonte SER Chapter 18 Cover Letter to Applicant.pdf

To all,

Attached is Chapter 18 of the Bellefonte SER with open items and the transmittal cover letter. Please note that we are conservatively marking each page of the SER as proprietary until either: (1) 10 days have passed and we have not heard from TVA regarding a proprietary claim, or (2) TVA informs us that there is no proprietary information in the document. Once it is clear that there is no proprietary information in the Chapter, the proprietary markings will be removed and the rest of the distribution for the document will be completed.

Sincerely,

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18.0 HUMAN FACTORS ENGINEERING

18.1 Overview (No corresponding section in RG 1.206)

This section provides definitions of the terms used and a roadmap of the sections that follow.

Section 18.1 of the Bellefonte (BLN) combined license (COL) Final Safety Analysis Report (FSAR), Revision 1, incorporates by reference, with no departures or supplements, Section 18.1 of Revision 17 of the AP1000 Design Control Document (DCD). The Nuclear Regulatory Commission (NRC) staff reviewed the application and checked the referenced DCD to ensure that no issue relating to this section remained for review.[1] The NRC staff's review confirmed that there is no outstanding issue related to this section.

AP1000 DCD, Revision 17, Section 18.1 is identical to Section 18.1 of Revision 15 of the AP1000 DCD, which is incorporated by reference into Title 10 of the *Code of Federal Regulations* (CFR) 10 CFR Part 52, Appendix D. This section is not affected by the changes that Westinghouse proposed in Revision 17 to the AP1000 DCD. Pursuant to 10 CFR 52.63(a)(5) and 10 CFR Part 52, Appendix D, Section VI.B.1, all nuclear safety issues relating to the overview section have been resolved.

18.2 Human Factors Engineering Program Management (Related to RG 1.206, Section 18.1, "HFE Program Management")

18.2.1 Introduction

The Human Factors Engineering (HFE) Program Management plan describes the HFE program in sufficient detail to ensure that all aspects of the human-system interfaces (HSIs), procedures, staffing, and training are developed, designed and evaluated on the basis of a structured top-down systems analysis using accepted HFE guidance.

18.2.2 Summary of Application

Section 18.2 of BLN COL FSAR, Revision 1, incorporates by reference Section 18.2 of the AP1000 DCD, Revision 17.

In addition, in BLN COL FSAR Section 18.2.1.3, the applicant provided the following:

AP1000 COL Information Item

- BLN COL 18.2-2

The applicant provided additional information in BLN COL 18.2-2 to address COL Information Item 18.2-2 related to the emergency operations facility (EOF).

[1] See Section 1.2.2 for a discussion on the staff's review related to verification of the scope of information to be included within a COL application that references a design certification.

18.2.3 Regulatory Basis

The regulatory basis of the information incorporated by reference is addressed within the "Final Safety Evaluation Report Related to Certification of the AP1000 Standard Design," (FSER) related to the DCD, (NUREG-1793).

In addition, the relevant requirements of the Commission regulations for BLN COL 18.2-2, and the associated acceptance criteria, are in Chapter 18 of NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," (SRP).

The applicable regulatory requirements for BLN COL 18.2-2 are as follows:

- 10 CFR 52.79(c), "Contents of applications referencing a standard design"
- 10 CFR 52.47(a)(8), "Contents of applications specific to HFE"

The related acceptance criteria are as follows:

- NUREG-0711, "Human Factors Engineering Program Review Model," Revision 2, Chapter 2

- NUREG-0696, "Functional Criteria for Emergency Response Facilities"

18.2.4 Technical Evaluation

The NRC staff reviewed Section 18.2 of the BLN COL FSAR, Revision 1, and checked the referenced DCD to ensure that the combination of the DCD and the information in the COL represent the complete scope of information relating to this review topic.[1] The NRC staff's review confirmed that the information contained in the application and incorporated by reference addresses the required information relating to the HFE program management. Section 18.2 of the AP1000 DCD is being reviewed by the staff under Docket Number 52-006. The NRC staff's technical evaluation of the information incorporated by reference related to the HFE program management will be documented in the staff safety evaluation report (SER) on the design certification (DC) amendment application for the AP1000 design.

The staff reviewed the information contained in the BLN COL FSAR:

AP1000 COL Information Item

- BLN COL 18.2-2, addressing the emergency operations facility

The NRC staff reviewed BLN COL 18.2-2 related to HFE design requirements for the EOF included under Section 18.2.1.3 of the BLN COL FSAR. COL Information Item 18.2-2 from Chapter 18 of the DCD, Revision 17 states:

> Specific information regarding the location of the emergency operations facility and emergency operations facility communications will be provided by the Combined Operating License applicant to address the Combined License information requested in this subsection.

The commitment was also identified as COL Action Item 18.2.3.1-1 in Appendix F of the NRC staff's FSER related to the AP1000 DCD (NUREG-1793), which states:

> The COL applicant will design the emergency operations facility, including the specification of the location, in accordance with the AP1000 HFE program.

The applicant stated that the EOF is located at the existing fleet common EOF facility in Chattanooga, Tennessee, referred to as the Central Emergency Control Center (CECC). It is about 44 miles from the BLN Units 3 and 4 proposed site. The EOF communications strategy would be consistent with the existing CECC communications strategy and is described in the emergency plan included in Part 5 of the COL application. The CECC currently supports Watts Bar, Browns Ferry, and Sequoyah Nuclear Plants.

There is no HFE related regulatory guidance associated with the EOF location. Other regulatory guidance associated with the EOF location is addressed in Chapter 13.3 of this SER.

Operating experience with the existing common EOF facility demonstrates that the communications strategy has been effective. The staff concludes there is reasonable assurance that the same communication strategy will continue to be effective for BLN Units 3 and 4.

In its September 2, 2008, response to RAI 18-3, the applicant stated that the scope of the HFE design includes implementation and verification of applicable EOF/Technical Support Center (TSC) displays consistent with the AP1000 HFE program. TR-136 (APP-GW-GLR-136, Revision 1, "AP1000 Human Factors Program Implementation for the Emergency Operations Facility and Technical Support Center") indicates that the Westinghouse DCD does not cover all aspects of the HSI design (such as panel layouts, room configuration, and indications/controls) for the EOF/TSC. The applicant states that the EOF/TSC functions and tasks that are not within the scope of the AP1000 HFE Program will be subject to HFE principles and practices as described in NUREG-0737, "Clarification of TMI [Three Mile Island] Action Plan Requirements."

The staff was concerned that, since NUREG-0737 does not have HFE guidance comparable to that of NUREG-0711, EOF/TSC design elements would fall outside the scope of the HFE program. The applicant addressed this concern in its RAI 18-4 response dated February 23, 2009, stating that the HSI design will meet the data and availability criteria in NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants, Section II.H, 'Emergency Facilities and Equipment,'" which states that the TSC and the EOF will be established in accordance with NUREG-0696.

The staff agrees that NUREG-0696 describes an acceptable method for meeting EOF/TSC requirements and contains guidance for managing the EOF/TSC HFE design based on the following:

- NUREG-0696, Section 2.8, states, "The design of the TSC data system equipment shall incorporate human factors engineering with consideration for both operating and maintenance personnel."

- NUREG-0696, Section 4.7, states, “The design of the EOF data -system equipment shall incorporate human-factors engineering with consideration for both operating and maintenance personnel.”

- NUREG-0696, Section 4.8, states, “Human-factors engineering shall be incorporated in the design of the EOF.” This section of the NUREG also addresses data availability and human factors design criteria.

- The AP1000 DCD includes a structured approach for identifying data needed to support the EOF/TSC functions.

- The guidance in NUREG-0696 addresses information usability. While some guidance is generic, the staff concludes APP-OCS-J1-002, “AP1000 HSI Design Guidelines,” which is included by reference in Chapter 18 of the AP1000 DCD, is applicable to the definition of more explicit, measurable design acceptance criteria. Use of these guidelines will ensure that general design principles, such as “callup, manipulation, and presentation of data can be easily performed,” and, “display formats shall present information so that it can be easily understood,” will be subject to more explicit design acceptance criteria.

Emergency planning drills and inspections provide repeated opportunities to identify improvements to HSIs. In the case of BLN, for which a common EOF will be used, EOF design improvements have already been implemented based on operating experience.

HFE design verification and validation (V&V) is a second area of NUREG-0711 guidance that is not being directly applied by the applicant. As an alternative, the applicant states in their RAI 18-4 response dated February 23, 2009, that V&V of the EOF HFE design is achieved by the evaluation of equipment and personnel performance during drills and exercises. The staff concludes that although the specific guidance in NUREG- 0711 for V&V is not being applied, the alternative V&V approach provides reasonable assurance that the HFE aspects of the EOF and TSC will be acceptably designed based on the following:

- NUREG-0696 contains guidance on V&V. Section 9 states, “The design, development, qualification, and installation of the SPDS [safety parameter display system], TSC, EOF, and NDL [nuclear data link] facilities and systems shall be independently verified and validated by qualified personnel other than the original designers and developers.”

  The RAI 18-4 response indicates both equipment and personnel performance will be evaluated during drills and exercises.

- Exercises and drills are conducted on a periodic basis, and therefore, provide repeated opportunities to test and improve the HSIs.

- The first exercise is included as an inspection, test, analysis and acceptance criterion (ITAAC) that ensures EOF/TSC functionality prior to fuel load. The BLN COL application Part 10, "Proposed License Conditions," Revision 1, Table 3.8-1, ITAAC contain the following inspections, tests and analyses:

  ITAAC 1.1: An inspection of the control room, TSC, and CECC will be performed to verify that they have displays for retrieving facility system and effluent parameters in specific emergency action levels (EALs).

  ITAAC 8.1: A full-participation exercise (test) will be conducted within the specified time periods of Appendix E to 10 CFR Part 50.

- Exercises and drills are conducted in the actual facilities, (vice a simulator), allowing direct observation of the HSI.

18.2.5 Post Combined License Activities

There are no post-COL activities related to this section.

18.2.6 Conclusions

The NRC staff reviewed the application and checked the referenced DCD. The NRC staff's review confirmed that the applicant addressed the required information relating to HFE program management, and there is no outstanding information expected to be addressed in the BLN COL FSAR related to this section.

The Westinghouse application to amend Appendix D to 10 CFR Part 52 includes changes to Section 18.2 of the AP1000 DCD, as stated in Revision 17 of the AP1000 DCD. The staff is reviewing this information under Docket Number 52-006. The results of the NRC staff's technical evaluation of the information incorporated by reference in the BLN COL FSAR will be documented in a supplement to NUREG-1793. The supplement to NUREG-1793 is not yet complete, and this is being tracked as part of Open Item 1-1. The staff will update Section 18.2 of this SER to reflect the final disposition of the DC application.

In addition, the staff concludes that the relevant information presented within the COL FSAR is acceptable and meets the requirements of 10 CFR Part 50, Appendix B, 10 CFR 52.79, and Chapter 18 of NUREG-0800. The staff based its conclusion on the following:

- BLN COL 18.2-2 is acceptable because the applicant will design the EOF/TSC in accordance with appropriate elements of the AP1000 HFE program and approved staff guidance associated with emergency response facility design.

18.3 Operating Experience Review (Related to RG 1.206, Section 18.2, "Operating Experience Review")

Operating experience review identifies and analyzes HFE-related problems and issues in previous designs. In this way, negative features associated with predecessor designs may be avoided in the current one, while retaining positive features. This section describes the applicant's operating experience review (OER) and how it was used to identify HFE-related

safety issues. OER includes a summary discussion of the source materials, such as documents, event reports, and personnel interviews. OER-identified issues are included along with their resolution.

Section 18.3 of the BLN COL FSAR, Revision 1, incorporates by reference, with no departures or supplements, Section 18.3 of Revision 17 of the AP1000 DCD. The NRC staff reviewed the application and checked the referenced DCD to ensure that no issue relating to this section remained for review.[1] The NRC staff's review confirmed that there is no outstanding issue related to this section.

Section 18.3 of Revision 17 of the AP1000 DCD is identical to Section 18.3 of Revision 15 of the AP1000 DCD, which is incorporated by reference into 10 CFR Part 52, Appendix D. This section is not affected by the changes that Westinghouse proposed in Revision 17 to the AP1000 DCD. Pursuant to 10 CFR 52.63(a)(5) and 10 CFR Part 52, Appendix D, Section VI.B.1, all nuclear safety issues relating to the OER have been resolved.

18.4 Functional Requirements Analysis and Allocation (Related to RG 1.206, Section 18.3, "Functional Requirements Analysis and Function Allocation")

Functional requirements analysis and function allocation demonstrate that functions are allocated to human and system resources in a manner that takes advantage of human strengths and avoids human limitations. The scope includes identification and analysis of those functions that must be performed to satisfy the plant's safety objectives that is, to prevent or mitigate the consequences of postulated accidents that could cause undue risk to the health and safety of the public.

Section 18.4 of the BLN COL FSAR, Revision 1, incorporates by reference, with no departures or supplements, Section 18.4 of Revision 17 of the AP1000 DCD. The NRC staff reviewed the application and checked the referenced DCD to ensure that no issue relating to this section remained for review.[1] The NRC staff's review confirmed that there is no outstanding issue related to this section.

Section 18.4 of Revision 17 of the AP1000 DCD is identical to Section 18.4 of Revision 15 of the AP1000 DCD, which is incorporated by reference into 10 CFR Part 52, Appendix D. This section is not affected by the changes that Westinghouse proposed in Revision 17 to the AP1000 DCD. Pursuant to 10 CFR 52.63(a)(5) and 10 CFR Part 52, Appendix D, Section VI.B.1, all nuclear safety issues relating to functional requirements analysis and allocation have been resolved.

18.5 AP1000 Task Analysis Implementation Plan (Related to RG 1.206, Section 18.4, "Task Analysis")

Task analyses identify the specific tasks that are needed for function accomplishment and their information, control, and task support requirements. The analyses address how representative and important operations, maintenance, test, inspection, and surveillance tasks are selected, as well as the range of operating modes included in the analyses. This includes the use of probabilistic risk assessment (PRA)/human reliability analysis (HRA) for the identification of the risk-important HAs, including the monitoring and backup of automatic actions. The task analysis results are used as input to the design of HSIs, procedures, and training programs.

Section 18.5 of the BLN COL FSAR, Revision 1, incorporates by reference, with no departures or supplements, Section 18.5 of Revision 17 of the AP1000 DCD. The NRC staff reviewed the application and checked the referenced DCD to ensure that no issue relating to this section remained for review.[1] The NRC staff's review confirmed that there is no outstanding issue related to this section.

The Westinghouse application to amend Appendix D to 10 CFR Part 52 includes changes to Section 18.5 of the AP1000 DCD, as stated in Revision 17 of the AP1000 DCD. The staff is reviewing this information under Docket Number 52-006. The results of the NRC staff's technical evaluation of the information incorporated by reference in the BLN COL FSAR, Revision 1, will be documented in a supplement to NUREG-1793. The supplement to NUREG-1793 is not yet complete, and this is being tracked as part of Open Item 1-1. The staff will update Section 18.5 of this SER to reflect the final disposition of the DC amendment application.

18.6 Staffing (Related to RG 1.206, Section 18.5, "Staffing and Qualification")

18.6.1 Introduction

Staffing and qualification analyzes the requirements for the number and qualifications of personnel in a systematic manner that includes a thorough understanding of task requirements and applicable regulatory requirements.

This section is coordinated with Section 13.1 of this SER, which also relates to organization and staffing. The staffing analysis is iterative in nature and discusses how the initial staffing goals have been reviewed and modified as the analyses associated with other HFE elements are complete. Staffing and qualifications are also shown to be in compliance with 10 CFR 50.54(i) through (m).

18.6.2 Summary of Application

Section 18.6 of the BLN COL FSAR, Revision 1, incorporates by reference Section 18.6 of the AP1000 DCD, Revision 17.

In addition, in BLN COL FSAR Section 18.6, the applicant provided the following:

AP1000 COL Information Item

- STD COL 18.6-1

The applicant provided additional information in STD COL 18.6-1 to resolve COL Information Item 18.6-1, addressing staffing level and qualification of plant personnel.

18.6.3 Regulatory Basis

The regulatory basis of the information incorporated by reference is addressed within the FSER related to the DCD.

In addition, the relevant requirements of the Commission regulations for STD COL 18.6-1, and the associated acceptance criteria, are in Chapter 18 of NUREG-0800.

The applicable regulatory requirements for STD COL 18-1 are as follows:

- 10 CFR 52.79(c), "Contents of applications referencing a standard design"
- 10 CFR 52.47(a)(8), "Contents of applications with respect to HFE"
- 10 CFR 50.54(m), "Conditions of licenses with respect to staffing"

The related acceptance criterion is as follows:

- NUREG-0711, "Human Factors Engineering Program Review Model," Revision 2, Section 6.4

18.6.4 Technical Evaluation

The NRC staff reviewed Section 18.6 of the BLN COL FSAR and checked the referenced DCD to ensure that the combination of the DCD and the information in the COL represent the complete scope of information relating to this review topic.[1] The NRC staff's review confirmed that the information contained in the application and incorporated by reference addresses the required information relating to staffing and qualification. Section 18.6 of the AP1000 DCD is being reviewed by the staff under Docket Number 52-006. The NRC staff's technical evaluation of the information incorporated by reference related to staffing and qualification will be documented in the staff SER on the DC amendment application for the AP1000 design.

The staff reviewed the information contained in the BLN COL FSAR:

AP1000 COL Information Item

STD COL 18.6-1, addressing staffing level and qualification of plant personnel.

The applicant provided additional information in STD COL 18.6-1 to resolve COL Information Item 18.6-1. COL Information Item 18.6-1 states:

> Combined License applicants referencing the AP1000 design will address the staffing levels and qualifications of plant personnel including operations, maintenance, engineering, instrumentation and control technicians, radiological protection technicians, security, and chemists. The number of operators needed to directly monitor and control the plant from the main control room, including the staffing requirements of 10 CFR 50.54(m), will be addressed.

The commitment was also captured as COL Action Item 18.6.3-1 in Appendix F of the NRC staff's FSER for the AP1000 DCD (NUREG-1793), which states:

> The COL applicant will address the staffing level and qualifications of plant personnel including operations, maintenance and control technicians, radiological protection technicians, security, and chemists. Specifically, the COL applicant will (1) address the staffing considerations in NUREG-0711, and (2) identify the minimum documentation that is necessary for the staff to complete the review.

Information pertaining to the staffing level and qualifications is contained in BLN COL FSAR Chapter 13 and is summarized here. The applicant provided the estimated staffing levels for

different categories of personnel that are addressed by the HFE program in accordance with NUREG-0711. The minimum staffing level for control room personnel is also stated. Information about the staffing level of security personnel is contained in the separately submitted physical security plan. Qualification requirements of Technical Support Personnel, Nuclear Plant Personnel, and Security Personnel are also included.

The baseline level of staffing is derived from experience from current operating nuclear power plants. Iterative adjustments are implemented with input from other elements of the HFE program.

The NRC staff reviewed the resolution to COL Information Item 18.6-1 related to staffing and qualifications included under Section 18.6 of the BLN COL FSAR, Revision 1.

NUREG-0711 states that satisfying criterion 4 for the staffing and qualifications should be in part based on an operating experience review. The applicant addresses this in Chapter 13, Conduct of Operations, by stating:

> The Tennessee Valley Authority (TVA) has over 30 years of experience in the design, construction and operation of nuclear generating stations. TVA has designed, constructed, and operates six nuclear units at three sites: Browns Ferry Nuclear Plant Units 1, 2, and 3; Watts Bar Nuclear Plant Unit 1; and Sequoyah Nuclear Plant Units 1 and 2.

NUREG-0711, Criterion 1 states that the staffing and qualifications should address applicable guidance in NUREG-0800, Section 13.1 and 10 CFR 50.54.

Section 18.6 references BLN COL FSAR Section 13, which discusses staffing levels that meet the requirements in 10 CFR 50.54.

NUREG-0711, Criterion 2 states that the staffing analysis should determine the number and background of personnel for the full range of plant conditions including operational tasks, plant maintenance, and plant surveillance and testing.

Section 18.6 of the COL states that Table 13.1-201 of the COL application contains the estimated staffing levels for those categories of personnel that are addressed in NUREG-0711, as follows:

> 1) licensed operators, 2) shift supervisors, 3) non-licensed operators, 4) shift technical advisors, 5) instrumentation and control technicians, 6) mechanical maintenance technicians, 7) electrical maintenance technicians, 8) radiation protection technicians, 9) chemistry technicians, and 10) engineering support.

The applicant states that the minimum level of control room staffing is also stated in Table 13.1-201 and meets the requirements of 10 CFR 50.54(m).

The staff reviewed the requirements of 10 CFR 50.54, which state:

> A senior operator licensed pursuant to Part 55 shall be present at the facility or readily available on call at all times during its operations, and shall be present at the facility during initial start-up and approach to power, recovery from an

> unplanned or unscheduled shut-down or significant reduction in power, and refueling.

This section of 10 CFR contains a table that describes the minimum staffing requirements in the control room for one, two and three unit sites. For example, a one unit site with one control room is required to maintain two Senior Operators, and two Operators at all times. Table 13.1-201 describes numbers for control room operators that meet these limits and, therefore, meet the requirements for operator staffing in 10 CFR 50.54.

NUREG-0711 states that the applicant should have systematically analyzed the need for the number and qualifications of personnel and have demonstrated a thorough understanding of task requirements and regulatory requirements. NUREG-0711 also references NUREG-0800, Section 13.1 that describes the roles and responsibilities for design and construction activities and pre-operational activities. NUREG-0711 also spells out specific acceptance criteria for providing the NRC with specific information about qualification levels of the staff. In Section 13.1 of the BLN COL FSAR, the applicant describes in detail the organizational structure of the AP1000 plant. The roles and qualifications described include: Management and Technical Support Organization; Engineering; Quality Assurance; Chemistry; Radiation Protection; Fueling and Refueling Support; Training and Development; Maintenance Support; Operations Support; and Fire Protection. Each of these sections describes the applicant's commitment for maintaining qualified staff to carry out the responsibilities of each position. For example, in Section 13.1.1.2.1, "Engineering," the applicant states:

> The engineering department consists of system engineering, design engineering, engineering programs, and safety and engineering analysis. These groups are responsible for performing the classical design activities as well as providing engineering expertise in other areas. Each of the engineering groups has a functional manager who reports to the manager in charge of engineering and site support.

The applicant then describes the overall roles that the engineering department is responsible for, such as:

> Support of plant operations in the engineering areas of mechanical, structural, electrical, thermal-hydraulic, metallurgy and materials, electronic, instrument and control and fire protection. Priorities for support activities are established based on input from the plant manager with emphasis on issues affecting safe operation of the plant.

Review Criterion 3 in NUREG-0711 states that the staffing analysis should be iterative, meaning that staffing goals should be reviewed and modified as the analyses associated with other elements are completed. The applicant addresses this criterion by stating:

> Iterative adjustments are implemented to the staffing, as necessary, based on findings and input from periodic reviews and staffing analysis. Input to this analysis includes information derived from the other elements of the human factors engineering program, particularly operating experience reviews, functional requirements analysis and function allocation, task analysis, human reliability analysis, human-system interface design, procedure development, and training program development.

The staff finds this information sufficient for meeting the criteria for the level and qualification of staffing contained in NUREG-0711, NUREG-0800, and 10 CFR 50.54.

18.6.5 Post Combined License Activities

There are no post-COL activities related to this section.

18.6.6 Conclusion

The NRC staff reviewed the application and checked the referenced DCD. The NRC staff's review confirmed that the applicant addressed the required information relating to staffing and qualification, and there is no outstanding information expected to be addressed in the BLN COL FSAR related to this section.

The Westinghouse application to amend Appendix D to 10 CFR Part 52 includes changes to Section 18.6 of the AP1000 DCD, as stated in Revision 17 of the AP1000 DCD. The staff is reviewing this information on Docket Number 52-006. The results of the NRC staff's technical evaluation of the information incorporated by reference in the BLN COL FSAR will be documented in a supplement to NUREG-1793. The supplement to NUREG-1793 is not yet complete, and this is being tracked as Open Item 1-1. The staff will update Section 18.6 of this SER to reflect the final disposition of the DC amendment application.

In addition, the staff concludes that the relevant information presented within the COL FSAR is acceptable and meets the acceptance criteria defined in NUREG-0711, Section 6.4. The staff based its conclusion on the following:

- STD COL 18.6-1 is acceptable because it is within the scope of the DC and adequately incorporates by reference Section 18.6 of the AP1000 DCD, and meets the acceptance criteria defined in NUREG-0711, Section 6.4.

18.7 Integration of Human Reliability Analysis with Human Factors Engineering (Related to RG 1.206, Section 18.6, "Human Reliability Analysis")

HRA is an integral activity of a complete PRA. HRA seeks to evaluate the potential for, and mechanisms of, human error that may affect plant safety. Thus, it is an essential element in achieving the HFE design goal of providing a design that will minimize personnel errors, allow their detection, and provide recovery capability.

Section 18.7 of the BLN COL FSAR, Revision 1, incorporates by reference, with no departures or supplements, Section 18.7 of Revision 17 of the AP1000 DCD. The NRC staff reviewed the application and checked the referenced DCD to ensure that no issue relating to this section remained for review.[1] The NRC staff's review confirmed that there is no outstanding issue related to this section.

The Westinghouse application to amend Appendix D to 10 CFR Part 52 includes changes to Section 18.7 of the AP1000 DCD, as stated in Revision 17 of the AP1000 DCD. The staff is reviewing this information on Docket Number 52-006. The results of the NRC staff's technical evaluation of the information incorporated by reference in the BLN COL FSAR, Revision 1, will be documented in a supplement to NUREG-1793. The supplement to NUREG-1793 is not yet

complete, and this is being tracked as Open Item 1-1. The staff will update Section 18.7 of this SER to reflect the final disposition of the DC application.

18.8 Human-System Interface Design (Related to RG 1.206, Section 18.7, "Human-System Interface Design")

18.8.1 Introduction

HSI design describes the design process and scope, including the translation of function and task requirements into the detailed design of alarms, displays, controls, and other aspects of the HSI through the systematic application of HFE principles and criteria. It also describes the process by which HSI design requirements are developed and HSI designs are identified and refined.

18.8.2 Summary of Application

Section 18.8 of the BLN COL FSAR, Revision 1, incorporates by reference Section 18.8 of the AP1000 DCD, Revision 17.

In addition, in BLN COL FSAR Section 18.8, the applicant provided the following:

Tier 2 Departure

The applicant proposed the following Tier 2 departure from the AP1000 DCD, Revision 17:

- BLN DEP 18.8-1, addressing the location of the TSC and Operational Support Center (OSC)

18.8.3 Regulatory Basis

The regulatory basis of the information incorporated by reference is addressed within the FSER related to the DCD.

In addition, the relevant requirements of the Commission regulations for BLN DEP 18.8-1, and the associated acceptance criteria, are given in Chapter 18 of NUREG-0800.

The applicable regulatory requirements for BLN DEP 18.8-1 are as follows:

- 10 CFR Part 52, Appendix D, Section VIII, "Processes for changes and departures"
- 10 CFR 52.79(c), "Contents of applications referencing a standard design"
- 10 CFR 52.47(a)(8), "Contents of applications with respect to HFE"

18.8.4 Technical Evaluation

The NRC staff reviewed Section 18.8 of the BLN COL FSAR and checked the referenced DCD to ensure that the combination of the DCD and the information in the COL represent the complete scope of information relating to this review topic.[1] The NRC staff's review confirmed that the information contained in the application and incorporated by reference addresses the required information relating to the HSI design. Section 18.8 of the AP1000 DCD is being reviewed by the staff under Docket Number 52-006. The NRC staff's technical evaluation of the

information incorporated by reference related to HSI design will be documented in the staff SER on the DC amendment application for the AP1000 design.

The staff reviewed the information contained in the BLN COL FSAR:

Tier 2 Departure

- BLN DEP 18.8-1, addressing the location of the TSC and OSC

HFE design implementation within the TSC is not location-dependent. Therefore, the location change is acceptable from an HFE program perspective. HFE design elements applicable to the TSC are identified and implemented in accordance with AP1000 DCD, Chapter 18, which is addressed in Section 18.2.1.4 of this SER.

The OSC is not in the HFE program scope. Therefore, the OSC location change is not evaluated from an HFE program perspective. The OSC location as it relates to emergency preparedness is evaluated in the staff's SER, Chapter 13.3, "Emergency Planning."

The location changes have the potential to affect technical data availability, communications, power supply reliability, security, and habitability. The acceptability of the location changes relative to these attributes is addressed in Section 13.3 of this SER.

18.8.5 Post Combined License Activities

There are no post-COL activities related to this section.

18.8.6 Conclusion

The NRC staff reviewed the application and checked the referenced DCD. The NRC staff's review confirmed that the applicant addressed the required information relating to HSI design, and there is no outstanding information expected to be addressed in the COL FSAR related to this section.

The Westinghouse application to amend Appendix D to 10 CFR Part 52 includes changes to Section 18.8 of the AP1000 DCD, as stated in Revision 17 of the AP1000 DCD. The staff is reviewing this information on Docket Number 52-006. The results of the NRC staff's technical evaluation of the information incorporated by reference in the BLN COL FSAR will be documented in a supplement to NUREG-1793. The supplement to NUREG-1793 is not yet complete, and this is being tracked as Open Item 1-1. The staff will update Section 18.8 of this SER to reflect the final disposition of the DC amendment application.

In addition, the staff concludes that the relevant information presented within the COL FSAR is acceptable and meets the acceptance criteria defined in NUREG-0711, Section 8.4. The staff based its conclusion on the following:

- Implementation of HFE design within the TSC is not location dependent and the HFE design elements applicable to the TSC are in accordance with AP1000 DCD, Chapter 18.

18.9 Procedure Development (Related to RG 1.206, Section 18.8, "Procedure Development")

Procedure development documents, in coordination with BLN COL FSAR Section 13.5, ensure that the HFE principles and criteria, along with other design requirements, are incorporated in developing procedures that are technically accurate, comprehensive, explicit, easy to use, and validated. The procedure development program addresses the requirements specified in 10 CFR 50.34(f)(2)(ii) and describes the procedure writer's guide that establishes the process for developing technical procedures. The writer's guide ensures that procedures are consistent in organization, style, and content, and it also specifies which procedures fall within the purview of the guide.

The NRC staff reviewed the application and checked the referenced DCD. The NRC staff's review confirmed that the applicant addressed the required information relating to HFE program management, and there is no outstanding information expected to be addressed in the BLN COL FSAR related to this section.

The Westinghouse application to amend Appendix D to 10 CFR Part 52 includes changes to Section 18.9 of the AP1000 DCD, as stated in Revision 17 of the AP1000 DCD. The staff is reviewing this information under Docket Number 52-006. The results of the NRC staff's technical evaluation of the information incorporated by reference in the BLN COL FSAR, Revision 1, will be documented in a supplement to NUREG-1793. The supplement to NUREG-1793 is not yet complete, and this is being tracked as part of Open Item 1-1. The staff will update Section 18.9 of this SER to reflect the final disposition of the DC amendment application.

18.10 Training Program Development (Related to RG 1.206, Section 18.9, "Training Program Development")

18.10.1 Introduction

Training programs help to provide reasonable assurance that plant personnel have the knowledge, skills, and abilities to properly perform their roles and responsibilities. The training program as discussed in this section, is coordinated with the training discussions in BLN COL FSAR Section 13.2, and describes how the training program follows a systems approach to training, and how it addresses the requirements of 10 CFR 50.120, 10 CFR 52.79(a)(33), and 10 CFR Part 55.

18.10.2 Summary of Application

Section 18.10 of the BLN COL FSAR, Revision 1, incorporates by reference Section 18.10 of the AP1000 DCD, Revision 17.

In addition, in BLN COL FSAR Section 18.10, the applicant provided the following:

AP1000 COL Information Item

STD COL 18.10-1

The applicant provided additional information in STD COL 18.10-1 to resolve COL Information Item 18.10-1, addressing the execution of a training plan.

18.10.3 Regulatory Basis

The regulatory basis of the information incorporated by reference is addressed within the FSER related to the DCD.

In addition, the relevant requirements of the Commission regulations for STD COL 18.10-1, and the associated acceptance criteria, are given in Chapter 18, Section II.A.9 of NUREG-0800.

The applicable regulatory requirements for STD COL 18.10-1 are as follows:

- 10 CFR 52.79(c), "Contents of applications referencing a standard design"
- 10 CFR 52.47(a)(8), "Contents of applications specific to HFE"

The related acceptance criteria are as follows:

- NUREG-0711, "Human Factors Engineering Program Review Model," Revision 2, Section 10.4

- Nuclear Energy Institute (NEI) 06-13A, "Template for an Industry Training Program Description," Revision 1

18.10.4 Technical Evaluation

The NRC staff reviewed Section 18.10 of the BLN COL FSAR and checked the referenced DCD to ensure that the combination of the DCD and the information in the COL represent the complete scope of information relating to this review topic.[1] The NRC staff's review confirmed that the information contained in the application and incorporated by reference addresses the required information relating to training program development. Section 18.10 of the AP1000 DCD is being reviewed by the staff under Docket Number 52-006. The NRC staff's technical evaluation of the information incorporated by reference related to training program development will be documented in the staff SER on the DC amendment application for the AP1000 design.

The staff reviewed the information contained in the BLN COL FSAR:

AP1000 COL Information Item

STD COL 18.10-1, addressing execution of a training plan

The applicant provided additional information in STD COL 18.10-1 to resolve COL Information Item 18.10-1. COL Information Item 18.10-1 refers to Section 13.2, where the COL information item in Section 13.2.1 states:

> Combined License applicants referencing the AP1000 certified design will develop and implement training programs for plant personnel. This includes the training program for the operations personnel who participate as subjects in the human factors engineering verification and validation. These Combined License applicant training programs will address the scope of licensing examinations as well as new training requirements.

The commitment was also captured as COL Action Item 18.10.3-1 in Appendix F of the NRC staff's FSER for the AP1000 DCD (NUREG-1793), which states:

> With regard to the training program development, the COL applicant will: (1) address the training program development in NUREG-0711; (2) address relevant concerns identified in NUREG-1793; and (3) identify the minimum documentation that the COL applicant will provide to enable the staff to complete its review.

The NRC staff reviewed the resolution to COL Information Item 18.10-1 related to staffing and qualifications included under Section 18.10 of the BLN COL FSAR, Revision 1. Section 18.10 in the BLN COL FSAR refers to Section 13.1, "Organizational Structure of Applicant," and Section 13.2, "Training," regarding the training program development. In Section 13.2 of the BLN COL FSAR, the applicant provided the referenced, NRC approved, NEI 06-13A [Revision 1], "Template for an Industry Training Program Description" to address COL Information Item 18.10-1. The applicant also noted that a systematic approach to training development will be conducted in accordance with the referenced staff approved WCAP-14655, "Designer's Input for the Training of the Human Factors Engineering Verification and Validation Personnel."

The applicant provided information for the operational programs relating to non-licensed plant staff training, reactor operator training, and reactor operator re-qualification, by referencing NEI 06-13A [Revision 1], "Template for an Industry Training Program Description."

NEI 06-13A was created to provide applicants with a generic program description for use with COL application submittals. In a letter dated March 7, 2007, the staff stated that the template was an acceptable means for describing reactor operator and non-licensed plant staff training programs. The staff finds this approach to be acceptable because NEI 06-13A addresses non-licensed plant staff training, reactor operator training, and reactor operator re-qualification.

18.10.5 Post Combined License Activities

There are no post-COL activities related to this section.

18.10.6 Conclusion

The NRC staff reviewed the application and checked the referenced DCD. The NRC staff's review confirmed that the applicant addressed the required information relating to training program development, and there is no outstanding information expected to be addressed in the COL FSAR related to this section.

The Westinghouse application to amend Appendix D to 10 CFR Part 52 includes changes to Section 18.10 of the AP1000 DCD, as stated in Revision 17 of the AP1000 DCD. The staff is reviewing this information on Docket Number 52-006. The results of the NRC staff's technical evaluation of the information incorporated by reference in the BLN COL FSAR will be documented in a supplement to NUREG-1793. The supplement to NUREG-1793 is not yet complete, and this is being tracked as Open Item 1-1. The staff will update Section 18.10 of this SER to reflect the final disposition of the DC application.

In addition, the staff concludes that the relevant information presented within the COL FSAR is acceptable and is sufficient to close COL Action Item 18.10.3-1. The staff based its conclusion on the following:

- COL Information Item 18.10-1, relating to training, appropriately references Section 13.2 "Training." In Section 13.2, the applicant has committed to using WCAP-14655 to ensure a systematic approach to training development, and the applicant has referenced the staff-endorsed NEI 06-13A, Revision 1.

- Information involving non-licensed plant staff training, reactor operator training, and reactor operator re-qualification are acceptably addressed because the applicant referenced NEI 06-13A, Revision 1.

- The staff's review of the BLN training program is found in Sections 13.2 and 13.4 of this SER.

18.11 Human Factors Engineering Verification and Validation (Related to RG 1.206, Section 18.10, "Verification and Validation")

Human factors V&V documents the V&V activities confirming that the HSI design conforms to HFE design principles and that it enables plant personnel to successfully perform their tasks to achieve plant safety and other operational goals.

Section 18.11 of the BLN COL FSAR, Revision 1, incorporates by reference, with no departures or supplements, Section 18.11 of Revision 17 of the AP1000 DCD. The NRC staff reviewed the application and checked the referenced DCD to ensure that no issue relating to this section remained for review.[1] The NRC staff's review confirmed that there is no outstanding issue related to this section.

The Westinghouse application to amend Appendix D to 10 CFR Part 52 includes changes to Section 18.11 of the AP1000 DCD, as stated in Revision 17 of the AP1000 DCD. The staff is reviewing this information on Docket Number 52-006. The results of the NRC staff's technical evaluation of the information incorporated by reference in the BLN COL FSAR, Revision 1, will be documented in a supplement to NUREG-1793. The supplement to NUREG-1793 is not yet

complete, and this is being tracked as Open Item 1-1. The staff will update Section 18.11 of this SER to reflect the final disposition of the DC amendment application.

18.12 Inventory (No corresponding section in RG 1.206)

The specific sensors, instrumentation, controls, and alarms that are needed to operate the various plant systems constitute the inventory. The instruments, alarms, and controls for each system are documented in the piping and instrumentation diagrams. The minimum inventory required to safely shutdown the reactor and maintain it shutdown is also identified.

Section 18.12 of the BLN COL FSAR, Revision 1, incorporates by reference, with no departures or supplements, Section 18.12 of Revision 17 of the AP1000 DCD. The NRC staff reviewed the application and checked the referenced DCD to ensure that no issue relating to this section remained for review.[1] The NRC staff's review confirmed that there is no outstanding issue related to this section.

Section 18.12 of Revision 17 of the AP1000 DCD is identical to Section 18.12 of Revision 15 of the AP1000 DCD, which is incorporated by reference into 10 CFR Part 52, Appendix D. This section is not affected by the changes that Westinghouse proposed in Revision 17 to the AP1000 DCD. Pursuant to 10 CFR 52.63(a)(5) and 10 CFR Part 52, Appendix D, Section VI.B.1, all nuclear safety issues relating to inventory have been resolved.

18.13 Design Implementation (Related to RG 1.206, Section 18.11, "Design Implementation")

Design implementation verifies that the as-built design conforms to the verified and validated design that resulted from the HFE design process. The scope of the design implementation includes the following considerations:

- V&V of design aspects that cannot be completed as part of the HSI V&V program
- confirmation that the as-built HSI, procedures, and training conform to the approved design
- confirmation that all HFE issues in the tracking system are appropriately addressed

Section 18.13 of the BLN COL FSAR, Revision 1, incorporates by reference, with no departures or supplements, Section 18.13 of Revision 17 of the AP1000 DCD. The NRC staff reviewed the application and checked the referenced DCD to ensure that no issue relating to this section remained for review.[1] The NRC staff's review confirmed that there is no outstanding issue related to this section.

Section 18.13 of Revision 17 of the AP1000 DCD is identical to Section 18.13 of Revision 15 of the AP1000 DCD, which is incorporated by reference into 10 CFR Part 52, Appendix D. This section is not affected by the changes that Westinghouse proposed in Revision 17 to the AP1000 DCD. Pursuant to 10 CFR 52.63(a)(5) and 10 CFR Part 52, Appendix D, Section VI.B.1, all nuclear safety issues relating to design implementation have been resolved.

18.14 Human Performance Monitoring (Related to RG 1.206, Section 18.12, "Human Performance Monitoring")

18.14.1 Introduction

Human performance monitoring is used to assure that no significant safety degradation occurs because of any changes that are made in the plant and to confirm that the conclusions that have been drawn from the integrated system validation remain valid over time. Human performance monitoring is a program that begins after plant operation commences. Therefore, the applicant describes the documentation to be maintained after the program is implemented. The objective of this review is to verify that the applicant has prepared a human performance monitoring strategy for ensuring that no significant safety degradation occurs because of any changes that are made in the plant.

The program describes: (1) a human performance monitoring strategy; (2) how it trends human performance relative to changes implemented in the plant after startup; and (3) how it demonstrates that performance is consistent with that assumed in the various analyses conducted to justify the changes.

The program provides for specific cause determination, trending of performance degradation and failures, and determination of appropriate corrective actions. Detailed implementation plans and procedures for human performance monitoring remain available for NRC review.

18.14.2 Summary of Application

Section 18.14 of the BLN COL FSAR, Revision 1, incorporates by reference Section 18.14 of the AP1000 DCD, Revision 17.

In addition, in BLN COL FSAR Section 18.14, the applicant provided the following:

AP1000 COL Information Item

- STD COL 18.14-1

The applicant provided additional information in STD COL 18.14-1 to resolve COL Information Item 18.14-1, addressing human performance monitoring after the plant is placed in operation.

18.14.3 Regulatory Basis

The regulatory basis of the information incorporated by reference is addressed within the FSER related to the DCD.

In addition, the relevant requirements of the Commission regulations for STD COL 18.14-1, and the associated acceptance criteria, are given in Chapter 18, Section II A.12 of NUREG-0800.

The applicable regulatory requirements for STD COL 18.14-1 are as follows:

- 10 CFR 52.79(c), "Contents of applications referencing a standard design"
- 10 CFR 52.47(a)(8), "Contents of applications specific to HFE"

The related acceptance criteria are as follows:

- NUREG-0711, Section 13.4

18.14.4 Technical Evaluation

The NRC staff reviewed Section 18.14 of the BLN COL FSAR and checked the referenced DCD to ensure that the combination of the DCD and the information in the COL represent the complete scope of information relating to this review topic.[1] The NRC staff's review confirmed that the information contained in the application and incorporated by reference addresses the required information relating to human performance monitoring. Section 18.14 of the AP1000 DCD is being reviewed by the staff under Docket Number 52-006. The NRC staff's technical evaluation of the information incorporated by reference related to human performance monitoring will be documented in the staff SER on the DC amendment application for the AP1000 design.

The staff reviewed the information contained in the BLN COL FSAR:

AP1000 COL Information Item

- STD COL 18.14-1 (COL Action Item 18.13-1)

The applicant provided additional information in STD COL 18.14-1 to resolve COL Information Item 18.14-1. COL Information Item 18.14-1 states:

> Human performance monitoring applies after the plant is placed in operation, and is a Combined License Applicant responsibility.

The commitment was also captured as COL Action Item 18.13-1 in Appendix F of the NRC staff's FSER for the AP1000 DCD (NUREG-1793), which states:

> The COL applicant is responsible for human performance monitoring after the plant is placed into operation. The human performance monitoring process implements the guidance and methods as described in DCD Section 18.14 Reference 1 (NUREG-0711).

The applicant noted that the human performance monitoring process implements the guidance and methods as described in DCD Section 18.14. The applicant defines a broad outline of the structure of the human performance monitoring process and the assurances that can be obtained through implementation of the process. The human performance monitoring process for risk-informed changes is integrated into the corrective action program, training program, and other programs as appropriate. The cause determination process is also defined. It states that monitoring strategies for human performance trending after the implementation of the design changes are capable of demonstrating that performance is consistent with that assumed in various analyses conducted to justify the changes. Risk-informed changes are screened commensurate with their safety importance to determine if the changes require monitoring.

The NRC staff reviewed the resolution of COL Information Item 18.14-1 relating to human performance monitoring included under Section 18.14 of the BLN COL FSAR, Revision 1.

The BLN COL FSAR describes the human performance monitoring program found in NUREG-0711. It also states:

> The human performance monitoring process for risk-informed changes is integrated into the corrective action program, training program and other programs as appropriate. Identified human performance conditions/issues are evaluated for human factors engineering applicability.

Criterion 5 of NUREG-0711 states:

> As part of the monitoring program, it is important that provisions for specific cause determinations, trending of performance degradation and failures, and corrective actions be included. The cause determination should identify the cause of the failure or degraded performance to the extent that corrective action can be identified that would preclude the problem or provide adequate assurance that it is anticipated prior to becoming a safety concern.

The applicant's use of cause investigation:

- Identifies the cause of the failure or degraded performance to the extent that corrective action can be taken consistent with the corrective action program requirements.

- Addresses failure significance, which includes the circumstances surrounding the failure or degraded performance, the characteristics of the failure, and whether the failure is isolated or has generic or common cause implications.

- Identifies and establishes corrective actions necessary to preclude the recurrence of unacceptable failures or degraded performance in the case of a significant condition adverse to quality.

The staff has determined that the information included in Section 18.14 of the BLN COL FSAR is consistent with criteria found in NUREG-0711 and is sufficient for the staff to consider COL Information Item 18.14-1 closed.

18.14.5 Post Combined License Activities

There are no post-COL activities related to this section.

18.14.6 Conclusion

The NRC staff reviewed the application and checked the referenced DCD. The NRC staff's review confirmed that the applicant addressed the required information relating to human performance monitoring, and there is no outstanding information expected to be addressed in the COL FSAR related to this section.

The Westinghouse application to amend Appendix D to 10 CFR Part 52 includes changes to Section 18.14 of the AP1000 DCD, as stated in Revision 17 of the AP1000 DCD. The staff is reviewing this information on Docket Number 52-006. The results of the NRC staff's technical evaluation of the information incorporated by reference in the BLN COL FSAR will be documented in a supplement to NUREG-1793. The supplement to NUREG-1793 is not yet complete, and this is being tracked as Open Item 1-1. The staff will update Section 18.14 of this SER to reflect the final disposition of the DC amendment application.

In addition, the staff concludes that the relevant information presented within the COL FSAR is acceptable and meets the acceptance criteria defined in NUREG-0711. The staff based its conclusion on the following:

- STD COL 18.14-1, addressing human performance monitoring after the plant is placed in operation, outlines a structured approach for accomplishing this monitoring.

The Westinghouse application to amend Appendix D to 10 CFR Part 52 includes changes to Section 18.14 of the AP1000 DCD, as stated in Revision 17 of the AP1000 DCD. The staff is reviewing this information on Docket Number 52-006. The results of the NRC staff's technical evaluation of the information incorporated by reference in the BLN COL FSAR will be documented in a supplement to NUREG-1793. The supplement to NUREG-1793 is not yet complete, and this is being tracked as Open Item 1-1. The staff will update Section 18.14 of this SER to reflect the final disposition of the DC amendment application.

In addition, the staff concludes that the relevant information presented within the COL FSAR is acceptable and meets the acceptance criteria defined in NUREG-0711. The staff based its conclusion on the following:

- STD COL 18.14-1, addressing human performance monitoring after the plant is placed in operation, outlines a structured approach for accomplishing this monitoring.

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[redacted]

September 4, 2009

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SUBJECT: BELLEFONTE UNITS 3 AND 4 SAFETY EVALUATION REPORT WITH OPEN ITEMS FOR CHAPTER 18, "HUMAN FACTORS ENGINEERING"

Dear Ms. Sterdis and Mr. Miller:

By letter dated October 30, 2007 (ML073110527), as supplemented by letters dated November 2, 2007 (ML073090428), January 8, 2008 (ML080100104), and January 14, 2008 (ML080160252), the Tennessee Valley Authority (TVA) submitted its application to the U.S. Nuclear Regulatory Commission (NRC) for a combined license (COL) for two AP1000 advanced passive pressurized water reactors in accordance with the requirements of 10 CFR 52, "Licenses, Certifications and Approvals for Nuclear Power Plants." The NRC formally docketed the application on January 18, 2008. These reactors are identified as Bellefonte (BLN) Units 3 and 4 and would be located near the town of Scottsboro in Jackson County, Alabama. The docket numbers established for Units 3 and 4 are 52-014 and 52-015, respectively. Subsequent to the original BLN COL application, TVA has updated and revised the application by letters dated October 10, 2008 (ML083100262), November 18, 2008 (ML083250490), and January 21, 2009 (ML090290406).

Based on our review of your application, the staff prepared the enclosed Safety Evaluation Report (SER) with Open Items for Chapter 18, "Human Factors Engineering." Unless otherwise stated in the SER with Open Items, the staff's review was based on revisions and updates made

Enclosure(s) transmitted herewith contain SUNSI. When separated from enclosure, this transmittal document is decontrolled.

[redacted]

to the BLN COL application through January 21, 2009. The SER with Open Items is being provided to support the upcoming meeting of the subcommittee of the Advisory Committee on Reactor Safeguards (ACRS) scheduled to be held on October 6-7, 2009. The ACRS Full Committee meeting will be held at a later date. Issuance of this SER is an important milestone in the staff's review to determine whether TVA's application meets the Commission's regulations.

In a letter dated April 28, 2009, the NuStart Energy Development, LLC, consortium informed the NRC that it had changed the Reference COL designation for the AP1000 Design Center from BLN Nuclear Plant, Units 3 and 4 to the Vogtle Electric Generating Plant (VEGP), Units 3 and 4. The NRC staff is taking steps necessary to implement this change. During this transition, the BLN Units 3 and 4 docket will continue to be the vehicle of standard content for the ACRS subcommittee reviews. It is the staff's understanding that Southern Nuclear Operating Company will be responsible for responding to open items related to standard content within a 45-day response period.

The staff concludes that the enclosed SER with Open Items does not contain any information for which exemption from public disclosure has been sought or approved. However, the NRC will withhold the enclosed SER from public disclosure for ten calendar days from the date of this letter to allow TVA the opportunity to verify the staff's conclusion that the SER contains no such exempt information. If within that time, you do not request that all or portions of the SER be withheld from public disclosure in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding," the enclosure will be made available for public inspection through the NRC's Public Document Room and the Publicly Available Records component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the Public Electronic Reading Room section of the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

Should you have any questions, please contact Mr. Donald Habib, the NRC project manager at (301) 415-1035, donald.habib@nrc.gov or Mr. Joseph Sebrosky, the lead project manager for the BLN COL application at (301) 415-1132, joseph.sebrosky@nrc.gov .

Sincerely,

/RA/

Stephanie Coffin, Branch Chief
AP1000 Projects Branch 1 (NWE1)
Division of New Reactor Licensing
Office of New Reactors

Docket Nos. 52-014
52-015
52-025
52-026

Enclosure:
As stated

cc w/ encl: see next page

Should you have any questions, please contact Mr. Donald Habib, the NRC project manager at (301) 415-1035, donald.habib@nrc.gov or Mr. Joseph Sebrosky, the lead project manager for the BLN COL application at (301) 415-1132, joseph.sebrosky@nrc.gov.

Sincerely,

/RA/

Stephanie Coffin, Branch Chief
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Office of New Reactors

Docket Nos. 52-014
52-015
52-025
52-026

Enclosure:
As stated

cc w/ encl: see next page

Accession No.: ML091671859 **ACRS Memo: ML091671863**
SER: ML091190760 **PKG: ML091671851**

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