Tennessee Valley Authority, 1101 Market Street, LP 5A, Chattanooga, Tennessee 37402-2801

February 23, 2009

10 CFR 52.79

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

In the Matter of)
Tennessee Valley Authority)

Docket No. 52-014 and 52-015

BELLEFONTE COMBINED LICENSE APPLICATION – RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION – HUMAN FACTORS ENGINEERING

Reference: Letter from Brian Anderson (NRC) to Andrea L Sterdis (TVA), Request for Additional Information Letter No. 143 Related to SRP Section 18 for the Bellefonte Units 3 and 4 Combined License Application, dated January 8, 2009

This letter provides the Tennessee Valley Authority's (TVA) response to the Nuclear Regulatory Commission's (NRC) request for additional information (RAI) item included in the reference letter.

A response to the NRC request in the subject letter is addressed in the enclosure which does not identify any associated changes to be made in a future revision of the BLN application.

If you should have any questions, please contact Thomas Spink at 1101 Market Street, LP5A, Chattanooga, Tennessee 37402-2801, by telephone at (423) 751-7062, or via email at tespink@tva.gov.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on this 23rd day of Feb, 2009.

Andrea L. Sterdis
Manager, New Nuclear Licensing and Industry Affairs
Nuclear Generation Development & Construction

Enclosure
cc: See Page 2

D085
NRO

cc: (w/Enclosure)
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Enclosure
TVA letter dated February 23, 2009
RAI Response

Response to NRC Request for Additional Information letter No. 143 dated January 8, 2009
(4 pages, including this list)

Subject: Human Factors Engineering in the Final Safety Analysis Report

RAI Number	Date of TVA Response
18-004	This letter – see following pages

Associated Additional Attachments / Enclosures	Pages Included
None	

NRC Letter Dated: January 8, 2009

NRC Review of Final Safety Analysis Report

NRC RAI NUMBER: 18-004

NUREG-0711 section 2.4.1 (3): The HFE program should address the ... technical support center (TSC) and the emergency operations facility (EOF).....

This is a supplemental request for information on site specific activities associated with the HFE program as applied to the TSC and EOF. It supplements NRC RAI NUMBER 18-03 (accession #: ML082001068) addressing COL action item BLN COL 18.2-2 which states: "The Combined License applicant referencing the AP1000 certified design is responsible for designing the emergency operations facility, including specification of the location and communication with the facility, in accordance with the AP 1000 human factors engineering program."

BACKGOUND:

RAI 18-03 (EPM 357) was issued on 7/18/08 requesting information on BLN COL action item 18.2-2 which states:

"The Combined License applicant referencing the AP1000 certified design is responsible for designing the emergency operations facility, including specification of the location and communication with the facility, in accordance with the AP 1000 human factors engineering program."

Specifically the staff was seeking clarification on the applicant's participation and commitment to the following Westinghouse documents:

- APP-OCS-GGR-110-P, "AP 1000 Technical Support Center and Emergency Operations Facility Work Shop," revision 1, in February 2008
- APP-GW-GLR-136, "AP 1000 Human Factors Program Implementation for the Emergency Operations Facility and Technical Support Center," revision 1, issued October 26, 2007 (TR-136)

There were a number of questions on these documents that had been sent to Westinghouse as part of the AP1000 DCD review and this RAI also served to notify the RCOL applicant of these questions. An RAI response received on 9/2/08 stated that the plant HFE program would be established based on the approved AP 1000 HFE program described in DCD Chapter 18 for the Main Control Room and other scoped- in items as described in AP1000 HFE program. The COL applicant's scope of work includes implementation and verification of applicable TSC/EOF displays per AP 1000 HFE program. The TSC and EOF 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.

Supplemental RAI

In the RAI response of 9/2/08, the COL applicant states that its scope of work includes implementation and verification of applicable TSC/EOF displays per the AP1000 HFE program. TSC and EOF 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. This NUREG does not have specific HFE guidance similar to that of NUREG-0711 and thus potentially leaves EOF/TSC design elements out of the HFE program scope. For example, TR-136 specifically states that the Westinghouse DCD does not cover all aspects of the HSI design (such as panel layouts, room configuration, and indications/controls) as identified in the following quotes:

- "The task analysis will inevitably identify task steps not related to the display or provision of plant data, such as the need to use the communication facilities or to utilize the displays of system in the TSC or EOF that are not a part of the AP1000 systems (e.g., dose assessment software). For completeness, these tasks will be identified but not considered in any detail." (section 2.4.2)
- "The COL applicant possesses overall responsibility for the human factors adequacy of the TSC and EOF." (Section 2.4.4)

These elements could require application of NUREG-0711 program elements. The applicant's current position does not address elements that are outside the AP1000 DCD scope. Westinghouse has confirmed that it does not intend to address elements outside the AP1000 scope. Please address how these elements will be addressed relative to HFE principles of NUREG-0711.

BLN RAI ID: 2694

BLN RESPONSE:

The AP1000 Human Factors Program (Program) is a graded or tailored approach which recognizes that appropriate application of human factors engineering (HFE) principles varies by functional area based on nuclear safety and operational importance. With that in mind, the Program was tailored to apply HFE principles primarily to the Main Control Room (MCR) and Remote Shutdown Room (RSR) and to a lesser extent to the Emergency Operations Facility (EOF) and Technical Support Center (TSC). This tailoring recognizes that the EOF and TSC, while very important, do not contribute to nuclear safety to the same extent as the MCR and RSR.

Current regulation recognizes this graded approach in that the EOF/TSC facilities do not require the same level of engineering detail or configuration oversight as the plant. Further, the NRC has developed robust requirements for the EOF and TSC facilities through various NUREG's, such as NUREG-0654, 0696, and 0737, that are used by the licensees to design, construct and maintain the EOF and TSC facilities.

Compliance with these regulatory guidance documents provides reasonable assurance that the licensee's facilities and personnel perform as expected.

The HFE grading and tailoring efforts for the EOF/TSC are documented in the following reports:

- APP-OCS-GGR-110-P, "AP 1000 Technical Support Center and Emergency Operations Facility Work Shop," revision 1, in February 2008
- APP-GW-GLR-136, "AP 1000 Human Factors Program Implementation for the Emergency Operations Facility and Technical Support Center," revision 1, issued October 26, 2007 (TR-136)

These reports state how the AP1000 Human Factors Program will be applied to selected functions in the EOF and TSC and define affected resources, which are selected HSI displays. They also describe various NUREG requirements that are more appropriate to the EOF and TSC, considering that these facilities can and will be used to support non-AP1000 units.

The following items illustrate how HFE elements are addressed by existing requirements and industry practices for the EOF and TSC:

1. HFE Program Management – The applicant complies with the NRC approved Emergency Plan which complies with 10CFR 50.47, 10CFR 50 Appendix E, and NUREG-0654.
2. Operating Experience Review –Emergency Preparedness professionals participate in the facility design and layout and incorporate OE both formally and informally.

3. Functional Requirements – The applicant will use the criteria in NUREG-0737 Supplement 1 (Sections 3.0, 8.2 and 8.4), NUREG-0654 (Section II), and NUREG-0696 for the TSC and EOF.
4. Task Analysis – The EOF and TSC have been or will be designed and staffed based on the functional tasks described in NUREG-0654. Feedback is provided as part of the corrective action process when performance problems are identified during evaluated drills and exercises.
5. Staffing - Staffing levels will satisfy the criteria contained in NUREG-0654 Section 2.B. Staffing levels are also evaluated during drills and exercises and are adjusted in accordance with corrective action findings.
6. Human Reliability Analysis -human reliability is assessed during drills and exercises.
7. Human-System Interface Design – HSI design will meet the data and availability requirements contained in NUREG-0654.
8. Procedure Development - EP implementing procedures are developed as part of the applicant's procedure development and control program. The adequacies of procedures are evaluated during drills and exercises.
9. Training Program Development - Training program content will conform to NUREG-0654 Section 2.O.
10. Human Factors Verification and Validation – V&V is achieved by the evaluation of equipment and personnel performance during drills and exercises.
11. Design Implementation – Design processes for the TSC and EOF are in accordance with NUREG-0654 Section II for planning EOF and TSC.
12. Human Performance Monitoring - Human performance is monitored during drills and exercises and any problems are disposition via the Corrective Action Program.

This response is expected to be STANDARD for the S-COLAs.

ASSOCIATED BLN COL APPLICATION REVISIONS:

No COLA revisions have been identified associated with this response.

ASSOCIATED ATTACHMENTS/ENCLOSURES:

None