



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

August 15, 2008

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

**BELLEVILLE COMBINED LICENSE APPLICATION – RESPONSE TO REQUEST FOR  
ADDITIONAL INFORMATION – ACCIDENTAL RELEASES OF RADIOACTIVE LIQUID  
EFFLUENTS IN GROUND AND SURFACE WATERS**

Reference: Letter from Joseph Sebrosky (NRC) to Andrea L. Sterdis (TVA), Request for  
Additional Information Letter No. 073 Related to SRP Section 2.4.13 for the  
Belleville Units 3 and 4 Combined License Application, dated July 16, 2008.

This letter provides the Tennessee Valley Authority's (TVA) response to the Nuclear Regulatory  
Commission's (NRC) request for additional information (RAI) items 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 Phillip Ray at 1101 Market Street, LP5A,  
Chattanooga, Tennessee 37402-2801, by telephone at (423) 751-7030, or via email at  
pmray@tva.gov.

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

Executed on this 15<sup>th</sup> day of Aug, 2008.

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

Enclosure  
cc: See Page 2

D085  
NRO

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cc: (Enclosures)

J. P. Berger, EDF  
J. M. Sebrosky, NRC/HQ  
E. Cummins, Westinghouse  
S. P. Frantz, Morgan Lewis  
M.W. Gettler, FP&L  
R. Grumbir, NuStart  
P. S. Hastings, NuStart  
P. Hinnenkamp, Entergy  
M.C. Kray, NuStart  
D. Lindgren, Westinghouse  
G. D. Miller, PG&N  
M.C. Nolan, Duke Energy  
N. T. Simms, Duke Energy  
K. N. Slays, NuStart  
G. A. Zinke, NuStart

cc: (w/o Enclosure)

B. C. Anderson, NRC/HQ  
M.M. Comar, NRC/HQ  
B. Hughes/NRC/HQ  
R. G. Joshi, NRC/HQ  
R. H. Kitchen, PGN  
M C Kray, NuStart  
A. M. Monroe, SCE&G  
C. R. Pierce, SNC  
R. Reister, DOE/PM  
L. Reyes, NRC/RII  
T. Simms, NRC/HQ

Enclosure  
TVA letter dated August 15, 2008  
RAI Response

Responses to NRC Request for Additional Information letter No.073 dated July 16, 2008  
(3 pages, including this list)

Subject: Accidental Releases of Radioactive Liquid Effluents in Ground and Surface Waters in the Final  
Safety Analysis Report

<u>RAI Number</u>	<u>Date of TVA Response</u>
02.04.13-05	This letter – see following pages

<u>Associated Additional Attachments / Enclosures</u>	<u>Pages Included</u>
None	

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**NRC Letter Dated: July, 16, 2008**

**NRC Review of Final Safety Analysis Report**

**NRC RAI NUMBER: 02.04.13-05**

Describe how the applicant determined that the analysis of the dose consequences of an accidental release was bounding, in the sense of being the most extreme plausible dose consistent with the conceptual site model of the subsurface, with assumptions regarding the radionuclide source term associated with the accidental release, and with the physical processes in the subsurface environment that govern transport of radionuclides. This description should focus on the process that was used for the determination rather than the details of the resulting dose consequences, which are discussed elsewhere in the application.

Examples of elements that may be relevant to this description (but are not necessarily required) include: work plans for the analysis of accidental release consequences; management controls and processes for implementation of work plans; kinds of technical specialists involved in developing the analysis, and how they interacted; reviews of technical literature; the manner in which the conceptual model of the subsurface was used in the analysis; how measurements of material properties such as Kd were integrated into the analysis; exploration of possible extreme conditions or assumptions; sensitivity analyses; and the process used for preparing the final description of the results of the analysis.

**BLN RAI ID: 0705**

**BLN RESPONSE:**

The process of identifying a conservative plausible dose resulting from an accidental release began with determining the most appropriate method for data collection and evaluation. This process was initiated through discussions involving subject matter experts (SME) in several disciplines, including, but not limited to, geologists, engineers, health physicists, and regulatory specialists. The goal of these discussions was to define the objectives and methods used in performing the evaluation of the accidental release scenario. These initial discussions led to the eventual decision to use the RESRAD-OFFSITE Version 2.0 code as the model of choice for this evaluation as opposed to a more manual method using spreadsheets and data tables.

Subsequent discussions centered on identifying the conservative parameters to be used as input values to the RESRAD-OFFSITE model. These discussions aided in determining the origin of various data, including when it was appropriate to use RESRAD-OFFSITE default values, when region-specific values were appropriate, and when site-specific data was required. During the conceptual model evolution, numerous parameters were determined to have no effect on the outcome; the values for these parameters subsequently remained as the RESRAD-OFFSITE default value or were disabled, as appropriate.

Collection of site-specific hydrogeologic data determined to be relevant to the accident scenario was carried out under the direction of the geologist SME during the site groundwater investigation. This data was compiled and provided to the health physicist SME for inclusion in the RESRAD-OFFSITE model. The data compilation aided in defining the shortest straight-line pathway using the hydrogeological conditions at the Bellefonte site. The TVA response to BLN-RAI-LTR-063, dated August 1, 2008, provides additional information pertaining to parameter selection. When the dose consequence evaluation was complete, the review and approval process included the engineering and regulatory SMEs.

Branch Technical Position 11-6 directs that the accident evaluation be performed for the nearest potable water source within an unrestricted area. Town Creek was identified during the site investigation process as that potable water source. Choosing the environmental parameters for use in the RESRAD-OFFSITE model began with identifying parameter values that contributed to the most rapid groundwater transport to Town Creek, which subsequently provides the greatest concentration of radionuclides in the receptor body. Individual parameter values were selected using the following hierarchy until such a point where an available, appropriate and conservative individual parameter value was identified:

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1. A single, appropriate site-specific parameter value
2. A conservative parameter value from a site-specific range
3. A single, appropriate region-specific parameter value
4. A conservative parameter value from a region-specific range
5. A conservative parameter value from appropriate published values
6. The RESRAD-OFFSITE default parameter value.

Using this ordered list, the selection of the most appropriate, yet conservative value available was assured as input to the RESRAD-OFFSITE model.

Sensitivity analyses were performed on numerous parameters to determine that the chosen value for each parameter was appropriate. The sensitivity analyses also demonstrated that under varying conditions that may affect those parameter values, the radionuclide concentration in the receptor body remains within the comparison values.

Throughout the process, independent reviews of the RESRAD-OFFSITE model were carried out by a reviewer equally proficient with the RESRAD-OFFSITE code to confirm a conservative plausible evaluation was being performed. Additional discussions between the SMEs upon completion of the RESRAD-OFFSITE model identified the method for documenting the results and preparing the final description of the analysis results.

This response is PLANT-SPECIFIC.

**ASSOCIATED BLN COL APPLICATION REVISIONS:**

No COLA revisions have been identified associated with this response.

**ASSOCIATED ATTACHMENTS/ENCLOSURES:**

None