



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

February 20, 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

**BELLEVILLE COMBINED LICENSE APPLICATION – RESPONSE TO REQUEST FOR
ADDITIONAL INFORMATION – SITE CHEMICALS**

Reference: Letter from Joseph Sebrosky (NRC) to Andrea L. Sterdis (TVA), Request for
Additional Information Letter No. 137 Related to SRP Section 02.02.03 for the
Belleville Units 3 and 4 Combined License Application, dated
November 18, 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 also
identifies any associated changes that will be made in a future revision of the BLN application.

If you should have any questions, please contact Tom 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 20th day of Feb, 2009.

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

Enclosure
cc: See Page 2

DOB5
NRO

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cc: (w/ 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 February 20, 2009
RAI Responses

Responses to NRC Request for Additional Information letter No. 137 dated November 18, 2008
(5 pages, including this list)

Subject: Site Chemicals in the Final Safety Analysis Report

<u>RAI Number</u>	<u>Date of TVA Response</u>
02.02.03-10	This letter – see following pages

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

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NRC Letter Dated: November 18, 2008

NRC Review of Final Safety Analysis Report

NRC RAI NUMBER: 02.02.03-10

RG 1.206 provides guidance regarding the information that is needed to ensure potential hazards in the site vicinity are identified and evaluated to meet the siting criteria in 10 CFR 100.20 and 10 CFR 100.21. Westinghouse furnished a more detailed and chemical specific list used for AP1000 design to Vogtle (SCOLA) which is derived from the original AP1000 DCD Table 6.4-1. BLN (RCOLA) needs to provide a discussion in FSAR Section 2.2.3.1.1 that could be used as standard information in SCOLAs of how these chemicals and any additional site specific chemicals used, along with quantities and locations stored onsite for BLN units 3 & 4, were analyzed for potential control room habitability impacts.

BLN RAI ID: 2223

BLN RESPONSE:

The Westinghouse DCD evaluated chemicals, along with quantity and location, are identified in the proposed COL Application Revisions shown below with an LMA of STD SUP 6.4-1. As indicated in DCD Subsection 6.4.4, the analysis of these sources was in accordance with Regulatory Guide 1.78 and the methodology in NUREG-0570, and the analysis showed that "these sources do not represent a toxic hazard to control room personnel." The STD SUP items are supported by the NRC's AP1000 FSER (NUREG-1793) Subsection 6.4 which indicated "The staff performed an independent evaluation. On the basis of the data Westinghouse furnished regarding quantity, sizes, and locations, the staff concludes that these onsite chemicals meet the guidelines of RG 1.78, Revision 1." The hazards identified in the DCD have been evaluated in a standard manner (as discussed in the DCD) and these evaluations are relied upon to support the hazard information in the COLA. The discussion of these hazards identified in the DCD is incorporated by reference into the COLA. (Note that DCD Table 6.4-1 has recently been revised by Westinghouse to include the line item for hydrogen in the liquid state which is reflected in the attached proposed Application Revision. See WEC letter DCP/NRC2345 dated January 19, 2009.)

As part of the evolving design details, Westinghouse has modified the specified quantities and/or locations for some of the chemicals in the original main control room (MCR) chemical hazards calculation. The specific DCD Table 6.4-1 volume or location changes for the chemicals evaluated in the original chemical hazards calculation have been assessed using the same calculation methodologies and results and were found to be satisfactory in protecting the MCR from these hazards. These revisions are included in the proposed COL Application Revisions shown below with an LMA of STD COL 6.4-1 and include increases in the quantities of CO₂, Nitrogen, and the algacide.

A screening of the plant-specific chemicals designated for use in maintaining CWS water quality was performed to determine any potential impact to control room habitability. The CWS chemical storage area is to be near the existing cooling towers and will be greater than the distance (from the control room HVAC intake) identified in the table in the Application Revisions shown below; however, the distance shown in the table is used for the screening and any subsequent analyses as a conservative distance. The chemicals screening identified no impact except for sodium hypochlorite.

Further evaluation of the sodium hypochlorite was performed to determine if protective actions are required to protect the control room operator in the event of a worst case scenario involving a tank rupture. Results indicate IDLH values do not exceed the 10 ppm threshold and no actions are required. The bounding results are based on the amount of sodium hypochlorite in a single tank not exceeding 5000 gallons.

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The quantity of chemicals used for circulating water system presented in proposed FSAR Table 6.4-202 are based on continuous chemical addition to the liquid effluent stream per unit with weekly replenishment.

This response is expected to be PLANT-SPECIFIC. However, as indicated above, portions of the FSAR revisions are STANDARD as identified by the left margin annotations (LMA).

ASSOCIATED BLN COL APPLICATION REVISIONS:

1. COLA Part 2, FSAR Chapter 2, Subsection 2.2.3.1.1.4, will be revised from:

"... The plant gas system provides hydrogen, carbon dioxide, and nitrogen gases to the plant systems as required. The effects of the plant gas system on main control room habitability are addressed in DCD Section 6.4 including explosive gases and burn conditions for those gases. For explosions, the plant gas system is designed for conformance with Regulatory Guide 1.91 (DCD Subsection 9.3.2.3)."

To read:

"... The plant gas system provides hydrogen, carbon dioxide, and nitrogen gases to the plant systems as required. The effects of the plant gas system on main control room habitability are addressed in DCD Section 6.4 including explosive gases and burn conditions for those gases. For explosions, the plant gas system is designed for conformance with Regulatory Guide 1.91 (DCD Subsection 9.3.2.3).

There are no solid material explosion, confined, unconfined vapor explosion, toxic gas release event hazards identified for the Bellefonte nuclear site from hazardous chemicals that are outside the scope of the DCD identified in the Table 6.4-202."

2. COLA Part 2, FSAR Chapter 6, Subsection 6.4.4, will be revised to add the following information with LMAs STD SUP 6.4-2 and BLN COL 6.4-1:

Insert the following information at the end of the eighth paragraph of DCD Subsection 6.4.4.

Table 6.4-202 provides additional details regarding the evaluated onsite chemicals.

3. COLA Part 2, FSAR Chapter 6, new Table 6.4-202 will be added (with LMAs as shown) to read {Reviewer's Note: The DCD evaluated hazards are identified in FSAR Table 6.4-202 as standard supplemental (STD SUP) material. Revisions to the amounts and distances evaluated by WEC since the time of the DCD material approval are identified as standard COL information item (STD COL) material. Any additional site specific chemicals used, along with quantities and locations stored onsite are also identified in the new FSAR Table 6.4-202 as site specific COL information item (BLN COL) material. This note for reviewer information only and is not a part of the COLA change.}:}

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TABLE 6.4-202
ONSITE CHEMICALS⁽¹⁾

	<u>Material</u>	<u>State</u>	<u>Quantity</u>	<u>Distance to MCR intake</u>	<u>Location</u>
STD SUP 6.4-1	Hydrogen	Gas	500 ft ³	375 ft	Gas storage
STD SUP 6.4-1	Hydrogen	Liquid	2000 gal	375 ft	Gas storage
STD COL 6.4-1	Nitrogen	Liquid	1500 gal	328 ft	Gas storage
STD COL 6.4-1	CO ₂	Liquid	6 tons	328 ft	Gas storage
STD SUP 6.4-1	Oxygen Scavenger [Hydrazine]	Liquid	1600 gal	245 ft	Turbine building
STD SUP 6.4-1	pH Addition [Morpholine]	Liquid	1600 gal	245 ft	Turbine building
BLN COL 6.4-1	pH Addition [Sulfuric Acid]	Liquid	85 gal	2000 ft	CWS area ⁽²⁾
STD SUP 6.4-1	Sulfuric Acid	Liquid	20,000 gal	328 ft	Turbine building
BLN COL 6.4-1	Sulfuric Acid		[see pH Addition above]		CWS area ⁽²⁾
STD SUP 6.4-1	Sodium Hydroxide	Liquid	20,000 gal	328 ft	Turbine building
BLN COL 6.4-1	Sodium Hydroxide	Not used	Not used	Not used	CWS area ⁽²⁾
BLN COL 6.4-1	Dispersant [Polymeric silt dispersant]	Liquid	6000 gal	328 ft	Turbine building
BLN COL 6.4-1	Dispersant [Polymeric silt dispersant]	Liquid	10,000 gal	2000 ft	CWS area ⁽²⁾
STD SUP 6.4-1	Fuel Oil	Liquid	200,000 gal	328 ft	DG fuel oil storage tank; DG building; Annex building
STD SUP 6.4-1	Corrosion Inhibitor [Sodium Molybdate (molybdic acid, disodium salt)]	Liquid	5000 gal ^(b)	328 ft	Turbine building
BLN COL 6.4-1	Corrosion Inhibitor [Ortho polyphosphate]	Liquid	1450 gal	2000 ft	CWS area ⁽²⁾
STD SUP 6.4-1	Scale Inhibitor [Sodium Hexametaphosphate]	Liquid	5000 gal ^(b)	328 ft	Turbine building
BLN COL 6.4-1	Scale Inhibitor [Phosphonate]	Liquid	1050 gal	2000 ft	CWS area ⁽²⁾
STD SUP 6.4-1	Biocide/Disinfectant [Sodium hypochlorite]	Liquid	10,000 gal	378 ft	Turbine building
BLN COL 6.4-1	Biocide/Disinfectant [Sodium hypochlorite]	Liquid	5000 gal	2000 ft	CWS area ⁽²⁾
STD COL 6.4-1	Algaecide [Ammonium comp polyethoxylate]	Liquid	800 gal	378 ft	Turbine building
BLN COL 6.4-1	Algaecide [Quaternary amine]	Liquid	3500 gal	2000 ft	CWS area ⁽²⁾

Notes:

- 1) This table supplements DCD Table 6.4-1. Quantities are by largest container content for the specified location per unit.
- 2) The CWS area is in the vicinity of the cooling tower and greater than 2000 ft from the control room HVAC intake.

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4. COLA Part 2, FSAR Chapter 10, Subsection 10.4.5.2.2, will be revised under “Circulating Water Chemical Injection” from:

- Silt Dispersant – Polyacrylate

To read:

- Silt Dispersant – Polymeric silt dispersant

ASSOCIATED ATTACHMENTS/ENCLOSURES:

None