



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

September 5, 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

**BELLEFONTE COMBINED LICENSE APPLICATION – RESPONSE TO REQUEST FOR
ADDITIONAL INFORMATION – CONDENSATE CLEANUP SYSTEM**

Reference: Letter from Brian C. Anderson (NRC) to Andrea L. Sterdis (TVA), Request for
Additional Information Letter No. 113 Related to SRP Section 10.04.06 for the
Bellefonte Units 3 and 4 Combined License Application, dated August 07, 2008.

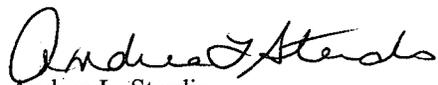
This letter provides the Tennessee Valley Authority's (TVA) response to the Nuclear Regulatory
Commission's (NRC) request for additional information (RAI) items included in the reference
letter.

A response to each 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 5th day of Sep, 2008.


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

Enclosure
cc: See Page 2

*DOB5
NRC*

Document Control Desk

Page 2

September 5, 2008

cc: (w/Enclosure)

B. Anderson, NRC/HQ
J. P. Berger, EDF
E. Cummins, Westinghouse
S. P. Frantz, Morgan Lewis
M.W. Gettler, FP&L
R. C. Grumbir, NuStart
P. S. Hastings, NuStart
P. Hinnenkamp, Entergy
B. Hughes, NRC/HQ
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)

M. M. Comar, 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
J. M. Sebrosky, NRC/HQ

Enclosure
TVA letter dated September 5, 2008
RAI Responses

Responses to NRC Request for Additional Information letter No. 113 dated August 07, 2008
(5 pages, including this list)

Subject: Condensate Cleanup System in the Final Safety Analysis Report

<u>RAI Number</u>	<u>Date of TVA Response</u>
10.04.06-01	This letter – see following pages
10.04.06-02	This letter – see following pages
10.04.06-03	This letter – see following pages

Associated Additional Attachments / Enclosures

Pages Included

None

Enclosure
TVA letter dated September 5, 2008
RAI Responses

NRC Letter Dated: Aug 7, 2008

NRC Review of Final Safety Analysis Report

NRC RAI NUMBER: 10.04.06-01

In order to ensure compliance with GDC 14, SRP Section 10.4.6 refers to SRP Section 5.4.2.1, "Steam Generator Materials," for acceptance criteria for secondary water chemistry. SRP Section 5.4.2.1 refers to Branch Technical Position, BTP 5-1, "Monitoring of Secondary Side Water Chemistry in PWR Steam Generator," which states, in part, "The applicant should address how its program meets industry guidelines (e.g., EPRI's Secondary Water Chemistry Guidelines and Nuclear Energy Institute (NEI) 97-06)." BTP 5-1 also indicates that the secondary water chemistry program should control pH. Although consistency with industry guidelines was addressed in the AP1000 DCD, the applicant made the selection of the pH control and oxygen scavenger agents to meet COL information item 10.4.12.2. In FSAR Section 10.4.7.2.1, to address COL information item 10.4.12.2, the applicant identified the oxygen scavenger agents as hydrazine and carbohydrazide, and pH control agents as ammonia/monoethylamine. (Please clarify whether the two pH control agents will be used separately, together, or both.) The EPRI Secondary Water Chemistry Guidelines provide guidance on how pH is to be optimized in conjunction with the selected amine. The EPRI Secondary Water Chemistry Guidelines also recommend a site-specific materials compatibility review for plants implementing advanced amine treatment. Please provide the following information:

How will monoethylamine, or ammonia/monoethylamine be qualified for secondary systems pH control?

BLN RAI ID: 1104

BLN RESPONSE:

The use of AVT (all-volatile treatment) amine agents for pH control in order to achieve an alkaline condition on the PWR secondary-side has been successfully utilized for many years. More recently, the use of advanced amine treatment agents including the combination of ammonia/monoethylamine has been undertaken. Their ultimate qualification for use will be based on industry-wide PWR operating experience gained over the next several years. At the present time, it is anticipated that the ammonia and monoethylamine will be used both separately as well as together to maintain the ammonia cycle on the secondary-side.

Amine chemical usage will be combined with the use of oxygen-scavenging agents such as hydrazine and carbohydrazine. In addition, water chemistry parameters will be closely monitored including but not limited to cation conductivity, dissolved oxygen and electrochemical potential (ECP). This will be performed in tandem with constant attention to crucial programs and daily activities designed to minimize the ingress of impurities, as is recommended in the EPRI Secondary Water Chemistry Guidelines.

The EPRI Secondary Water Chemistry Guidelines are referenced within NEI 97-06, to which this COL applicant is committed. Note that section 3.3.1 of Revision 6 of the EPRI Secondary Chemistry Guidelines discusses pH additive selection and optimization, including the use of alternate and advanced amines, while Section 4.4.7 of the EPRI Secondary Chemistry Guidelines discusses Secondary System pH Control techniques.

EPRI Secondary Chemistry Guidelines, Chapter 4, provides a detailed method for performing plant-specific optimization, including development of a modified chemistry program. The choice of the optimum amine or mixture of amines is a strong function of plant design. EPRI PWR

Enclosure
TVA letter dated September 5, 2008
RAI Responses

Advanced Amine Application Guidelines, TR-102952, will be used in these evaluations as indicated in EPRI secondary water chemistry guidelines.

Thus, monoethylamine, and/or ammonia/moethylamine will be qualified for secondary systems pH control based on industry-wide PWR operating experience and application of EPRI Guidelines.

This response is PLANT-SPECIFIC.

ASSOCIATED BLN COL APPLICATION REVISIONS:

No COLA revisions have been identified associated with this response.

ASSOCIATED ATTACHMENTS/ENCLOSURERS:

None

Enclosure
TVA letter dated September 5, 2008
RAI Responses

NRC Letter Dated: Aug 7, 2008

NRC Review of Final Safety Analysis Report

NRC RAI NUMBER: 10.04.06-02

How will pH in secondary systems be optimized in conjunction with the selected amines?

BLN RAI ID: 1105

BLN RESPONSE:

The secondary-side pH will be controlled in conjunction with the selected amine, but true pH optimization will only be achieved in tandem with the optimized usage and performance of secondary-side water treatment systems, including the Steam Generator Blowdown Demineralizers and Condensate Polishers, as well as the optimization of other plant chemistry parameters. These aspects must be viewed collectively.

EPRI Secondary Chemistry Guidelines will be followed for pH and overall plant secondary-side chemistry optimization. Note that Section 4 of the EPRI Secondary Chemistry Guidelines, Revision 6 addresses the "Methodology for Plant-Specific (Chemistry) Optimization".

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/ENCLOSURERS:

None

Enclosure
TVA letter dated September 5, 2008
RAI Responses

NRC Letter Dated: Aug 7, 2008

NRC Review of Final Safety Analysis Report

NRC RAI NUMBER: 10.04.06-03

Will the EPRI Secondary Water Chemistry Guidelines be used as guidance with respect to the qualification of the selected pH control agents and the optimization of the pH?

BLN RAI ID: 1106

BLN RESPONSE:

The EPRI Secondary Water Chemistry Guidelines will be used for guidance on selection of pH control agents and pH optimization. This is based on the proposed FSAR revision to follow the guidelines of NEI 97-06, which refers to these EPRI guidelines.

Note that the NEI 97-06 document is currently referenced in Section 5.4.2.5 and will also be added to Subsection 10.4.7.2.1 of the FSAR in a future revision of the COLA.

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

ASSOCIATED BLN COL APPLICATION REVISIONS:

1. COLA Part 2, FSAR, Chapter 10, Section 10.4.7.2.1 will be revised to add the following paragraph after the first paragraph:

STD SUP 10.4-2 Oxygen scavenging and ammoniating agents are selected and utilized for plant secondary water chemistry optimization following the guidance of NEI-97-06, "Steam Generator Program Guidelines" (Ref 201). The EPRI Pressurized Water Reactor Secondary Water Chemistry Guidelines are followed as described in NEI 97-06.

1. COLA Part 2, FSAR, Chapter 10, Section 10.4 will be revised to add Subsection 10.4.13 as follows:

10.4.13 REFERENCES

201. Nuclear Energy Institute, "Steam Generator Program Guidelines," NEI 97-06, Revision 2, May 2005.

ASSOCIATED ATTACHMENTS/ENCLOSURES:

None