



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

October 16, 2008

10 CFR 52.79

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

In the Matter of)
015)
Tennessee Valley Authority)

Docket No. 52-014 and 52-

**BELLEVILLE COMBINED LICENSE APPLICATION – RESPONSE TO REQUEST FOR
ADDITIONAL INFORMATION – REGIONAL CLIMATOLOGY**

- Reference:
- 1) Letter from Joseph M. Sebrosky (NRC) to Andrea L. Sterdis (TVA), Request for Additional Information Letter No. 022 Related to SRP Section 2.3.1 for the Bellefonte Units 3 and 4 Combined License Application, dated May 20, 2008.
 - 2) Letter from Andrea L. Sterdis (TVA) to Document Control Desk (NRC), Response to Request for Additional Information – Regional Climatology, dated June 12, 2008.
 - 3) Letter from Andrea L. Sterdis (TVA) to Document Control Desk (NRC), Response to Request for Additional Information – Regional Climatology, dated August 18, 2008.

This letter provides the Tennessee Valley Authority's (TVA) revised response to the Nuclear Regulatory Commission's (NRC) request for additional information (RAI) items included in the reference letters. This revised responses to RAIs 02.03.01-01 and 02.03.01-02 are submitted as requested by the NRC following verbal clarifications of the requested information.

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 Thomas Spink at 1101 Market Street, LP5A, Chattanooga, Tennessee 37402-2801, by telephone at (423) 751-7062, or via email at tespink@tva.gov.

DOES
NRC

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

Executed on this 16th day of Oct, 2008.



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

Enclosure
cc: See Page 3

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cc: (w/ Enclosures)

J.P. Berger, EDF
J. M. Sebrosky, NRC/HQ
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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

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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 October 16, 2008
RAI Response

Response to NRC Request for Additional Information letter No. 22 dated May 20, 2008
(6 pages, including this list)

Subject: Regional Climatology in the Final Safety Analysis Report

<u>RAI Number</u>	<u>Date of TVA Response</u>
02.03.01-01	June 12, 2008 & August 18, 2008 Revised by this letter – see following pages; revised response provided in this letter replaces the original response in its entirety.
02.03.01-02	June 12, 2008 & August 18, 2008 Revised by this letter – see following pages; revised response provided in this letter replaces the original response in its entirety.
02.03.01-03	June 12, 2008 & August 18, 2008
02.03.01-04	June 12, 2008
02.03.01-05	June 12, 2008 & August 18, 2008
02.03.01-06	June 12, 2008
02.03.01-07	June 12, 2008 & August 18, 2008
02.03.01-08	August 18, 2008

Associated Additional Attachments / Enclosures

Pages Included

None

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TVA letter dated October 16, 2008
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NRC Letter Dated: May 20, 2008

NRC Review of Final Safety Analysis Report

NRC RAI NUMBER: 02.03.01-01

It appears that the tornado wind speed values in FSAR section 2.3.1.2.1.2 (e.g., 10⁻⁷ probability of expected maximum tornado wind speed of 285 mi/h) were taken from NUREG/CR-4461 Rev. 1, while the Design Basis Tornado Parameters in FSAR section 2.3.1.4 (e.g., Design Basis Tornado maximum wind speed of 230 mi/h) were taken from Revision 1 of Regulatory Guide 1.76, which is based on NUREG/CR-4461 Rev. 2. Justify the inconsistency between these values.

BLN RAI ID: 2037

BLN RESPONSE:

When the original draft of FSAR Section 2.3 was developed, only Revision 1 of NUREG/CR-4461 was available. Subsequently, Revision 1 of Regulatory Guide 1.76 was issued (which is based on Revision 2 of NUREG/CR-4461) and FSAR Subsection 2.3.1.4 was revised to use Regulatory Guide 1.76 as the source for the design basis conditions. Use of Revision 2 of NUREG/CR-4461 results in a reduction in both the expected maximum tornado windspeed and the upper limit of the expected windspeed. As discussed in Revision 2 of NUREG/CR-4461, this reduction in windspeeds is a result of switching from the Fujita Scale to the Enhanced Fujita Scale. The revised site-specific values are provided by the Application Revisions shown below. These changes will be incorporated in a future revision of the FSAR.

This response is PLANT SPECIFIC.

ASSOCIATED BLN COL APPLICATION REVISIONS:

COLA Part 2, FSAR Chapter 2, Subsection 2.3.1.2.1.2, third paragraph will be revised from:

This result shows that the frequency of a tornado in the immediate vicinity of the site is less than the frequency in the surrounding counties. Another methodology for determining the tornado strike probability at the BLN site is given in NUREG/CR-4461. Based on a two degree longitude and latitude box centered on the BLN site, the number of tornadoes is 385. The corresponding expected maximum tornado wind speed and upper limit (95 percentile) of the expected wind speed is given below with the associated probabilities.

Probability	Expected maximum tornado windspeed mph	Upper limit (95 percent) of the expected tornado windspeed mph
10 ⁻⁵	182	190
10 ⁻⁶	237	245
10 ⁻⁷	285	294

The design basis tornado characteristics for the BLN site are given in Subsection 2.3.1.4.

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To read:

This result shows that the frequency of a tornado in the immediate vicinity of the site is less than the frequency in the surrounding counties. Another methodology for determining the tornado strike probability at the BLN site is given in NUREG/CR-4461, Revision 2. Based on a two degree longitude and latitude box centered on the BLN site, the number of tornadoes is 385. The corresponding expected maximum tornado wind speed and upper limit (95th percentile) of the expected wind speed is given below with the associated probabilities.

Probability	Expected maximum tornado windspeed mph	Upper limit (95 th percentile) of the expected tornado windspeed mph
10^{-5}	150	155
10^{-6}	186	192
10^{-7}	219	225

The design basis tornado characteristics for the BLN site are given in Subsection 2.3.1.4.

ASSOCIATED ATTACHMENTS/ENCLOSURES:

None

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NRC Letter Dated: May 20, 2008

NRC Review of Final Safety Analysis Report

NRC RAI NUMBER: 02.03.01-02

FSAR section 2.3.1.2.1.3 estimated 17 thunderstorm events per year in northeast Alabama and extreme south central Tennessee. The NCDC Local Climatological Data from the first order NWS station at Huntsville, AL identified a frequency of 55.6 thunderstorms per year. Please justify the value chosen.

BLN RAI ID: 2038

BLN RESPONSE:

The data presented in FSAR Subsection 2.3.1.2.1.3 was obtained from the NCDC Storm Event database for the time period of 01/01/1950 through 12/31/2005. Examination of this database indicates that thunderstorm and high wind events may have been under reported prior to 1983. Consequently, the edited NCDC Local Climatological Data (LCD) from the first order NWS station at Huntsville, AL will be used and the FSAR data presentations will be revised as shown in the Application Revisions section below.

This response is PLANT SPECIFIC.

ASSOCIATED BLN COL APPLICATION REVISIONS:

1. COLA Part 2, FSAR, Chapter 2, Subsection 2.3.1.2.1.3 will be revised from:

Locations in northeast Alabama and extreme south central Tennessee experience approximately 17 thunderstorms events per year. Regionally, storms with wind speeds reaching 35 to 50 mph may occur several times a year. During the period 1950-2005, there were 132 thunderstorm or high wind events in Jackson County (see Table 2.3-209). Of these, 86 events had a wind speed of greater than or equal to 50 knots (≥ 57 mph). The number of high wind speed (50 knots) events is 1.5 per year in Jackson County. Approximately 51 percent of the thunderstorms in Jackson County occur during the warm months (June-August), indicating that the majority are warm air-mass thunderstorms. From 1950-2005, 933 thunderstorms are listed for this seven county region, with Jackson County receiving 14.1 percent, DeKalb County receiving 14.5 percent, Marshall County receiving 16.0 percent, Madison County receiving 28.9 percent, Franklin County, Tennessee receiving 11.9 percent, Marion County, Tennessee receiving 10.0 percent, and Dade County, Georgia receiving 4.6 percent of the thunderstorms. (Reference 208)

To read:

Locations in northeast Alabama and extreme south central Tennessee experience approximately 53 thunderstorms events per year (Reference 234).

2. COLA Part 2, FSAR Chapter 2, Subsection 2.3.7, will be revised to add new reference 234 to read:

234. Local Climatological Data (LCD) for Huntsville Alabama NWS station (HSV WBAN: 03856) for years 1997-2007, NCDC, Asheville, NC.

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3. COLA Part 2, FSAR Section 2.3, Table 2.3-209, will be revised from two sheets to one sheet to read:

TABLE 2.3-209 (Sheet 1 of 1)
 THUNDERSTORMS
 HUNTSVILLE NWS STATION

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total per year
1997	6	4	6	5	7	11	6	8	3	4	2	1	63
1998	1	2	6	5	7	10	15	3	2	2	1	1	55
1999	7	2	5	8	7	8	9	4	2	0	0	2	54
2000	2	5	7	8	2	9	7	9	7	1	3	2	62
2001	0	3	3	3	10	9	9	7	3	2	2	1	52
2002	1	1	7	5	8	6	16	8	5	3	1	2	63
2003	0	3	3	5	9	7	7	9	3	3	1	0	50
2004	0	1	4	5	4	3	12	5	0	3	3	2	42
2005	2	1	5	7	2	7	11	8	2	0	3	1	49
2006	3	1	2	5	11	7	9	6	4	3	1	1	53
2007	0	3	1	5	1	10	8	8	2	0	3	1	42
Average	2.0	2.4	4.5	5.5	6.2	7.9	9.9	6.8	3.0	1.9	1.8	1.3	53.2
Average ¹	5.52	4.95	6.68	4.54	5.24	4.22	4.40	3.32	4.29	3.54	5.22	5.59	57.51

Notes: ¹ 49 year average

Reference 234

4. COLA Part 2, FSAR Section 2.3, the title of Table 2.3-263, will be revised from:
 TEMPERATURE MEANS AND EXTREMES AT SCOTTSBORO, ALABAMA – 1971 – 2000

To read:

MONTHLY TEMPERATURE MEANS AND EXTREMES AT SCOTTSBORO, ALABAMA – 1971 – 2000

5. COLA Part 2, FSAR Subsection 2.3.1.1, General Climate, page 2.3-4, fifth paragraph, will be revised from:

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Table 2.3-263 presents temperature means and extremes for Scottsboro collected over a twenty-nine year period.

To read:

Table 2.3-263 presents monthly temperature means and extremes for Scottsboro collected over a twenty-nine year period.

6. COLA Part 2, FSAR Subsection 2.3.2.1.2, Air Temperature, 2.3-18, first paragraph, will be revised from:

Table 2.3-263 indicates that temperature extremes for Scottsboro, Alabama for the years 1971 through 2000 have ranged from the highest mean temperature of 81.8°F (July 1993) to the lowest mean of 26.8°F (January 1977) (Reference 226).

To read:

Table 2.3-263 indicates that monthly temperature extremes for Scottsboro, Alabama for the years 1971 through 2000 have ranged from the highest mean temperature of 81.8°F (July 1993) to the lowest mean of 26.8°F (January 1977) (Reference 226).

ASSOCIATED ATTACHMENTS/ENCLOSURES:

None