



Serial: NPD-NRC-2009-059  
April 1, 2009

10CFR52.79

U.S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, D.C. 20555-0001

**LEVY NUCLEAR POWER PLANT, UNITS 1 AND 2  
DOCKETS NOS. 52-029 AND 52-030  
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 016  
RELATED TO GENERAL CLIMATE**

Reference: Letter from Brian Anderson (NRC) to Garry Miller (PEF), dated March 4, 2009,  
"Request for Additional Information Letter No. 016 Related to SRP Section 2.3.1 for  
the Levy Nuclear Power Plant, Units 1 and 2 Combined License Application"

Ladies and Gentlemen:

Progress Energy Florida, Inc. (PEF) hereby submits our response to the Nuclear Regulatory Commission's (NRC) request for additional information provided in the referenced letter.

A response to the NRC request is addressed in the enclosure. The enclosure also identifies changes that will be needed in a future revision of the Levy Nuclear Power Plant, Units 1 and 2 application.

If you have any further questions, or need additional information, please contact Bob Kitchen at (919) 546-6992, or me at (919) 546-6107.

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

Executed on April 1, 2009.

Sincerely,

A handwritten signature in black ink that reads 'Garry D. Miller'.

Garry D. Miller  
General Manager  
Nuclear Plant Development

Enclosure

cc : U.S. NRC Director, Office of New Reactors/NRLPO  
U.S. NRC Office of Nuclear Reactor Regulation/NRLPO  
U.S. NRC Region II, Regional Administrator  
Mr. Brian Anderson, U.S. NRC Project Manager

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**Levy Nuclear Power Plant, Units 1 and 2  
Response to NRC Request for Additional Information Letter No. 016 Related to SRP  
Section 2.3.1 for the Levy Nuclear Power Plant, Units 1 and 2 Combined License  
Application, Dated March 4, 2009**

<u>NRC RAI #</u>	<u>Progress Energy RAI #</u>	<u>Progress Energy Response</u>
02.03.01-1	L-0047	Response enclosed – see following pages
02.03.01-2	L-0048	Response enclosed – see following pages
02.03.01-3	L-0049	Response enclosed – see following pages
02.03.01-4	L-0050	Response enclosed – see following pages
02.03.01-5	L-0051	Response enclosed – see following pages
02.03.01-6	L-0052	Response enclosed – see following pages
02.03.01-7	L-0053	Response enclosed – see following pages
02.03.01-8	L-0054	Response enclosed – see following pages
02.03.01-9	L-0055	Response enclosed – see following pages
02.03.01-10	L-0056	Response enclosed – see following pages
02.03.01-11	L-0057	Response enclosed – see following pages

**NRC Letter No.:** LNP-RAI-LTR-016

**NRC Letter Date:** March 4, 2009

**NRC Review of Final Safety Analysis Report**

**NRC RAI #:** 02.03.01-1

**Text of NRC RAI:**

Consistent with NUREG-0800, Section 2.3.1, please identify the National Climatic Data Center (NCDC) state climatic division for the proposed site and make the necessary changes to FSAR Section 2.3.1.1, "General Climate."

**PGN RAI ID #:** L-0047

**PGN Response to NRC RAI:**

The Levy Nuclear Plant (LNP) site is located in Florida's North Central state climate division of the National Climatic Data Center (NCDC); information is available at: [www.cdc.noaa.gov/data/usclimate/map.html](http://www.cdc.noaa.gov/data/usclimate/map.html). FSAR Subsection 2.3.1.1 will be revised to include this information in a future amendment to the FSAR.

**Associated LNP COL Application Revisions:**

The following sentence will be added to the end of the first paragraph of FSAR Subsection 2.3.1.1:

"The LNP site is located in Florida's North Central state climate division of the National Climatic Data Center (NCDC)."

A reference to the source of the information, which was obtained from the NCDC website at: [www.cdc.noaa.gov/data/usclimate/map.html](http://www.cdc.noaa.gov/data/usclimate/map.html), will be included at the time of the amendment.

The revisions described above will be made to ER Subsection 2.7.1.1 in a future revision of the ER.

**NRC Letter No.:** LNP-RAI-LTR-016

**NRC Letter Date:** March 4, 2009

**NRC Review of Final Safety Analysis Report**

**NRC RAI #:** 02.03.01-2

**Text of NRC RAI:**

This request for additional information relates to FSAR Table 2.3.1-202.

The staff compared the extreme wind speeds against data from the National Institute of Standards and Technology (NIST) and Texas Tech. A database of peak gust wind speeds is available at: <http://www.itl.nist.gov/div898/winds/nistttu.htm>. The staff found similar values for all of the stations except Tampa, FL. FSAR table 2.3.1-202 lists an extreme wind gust of 61 mph, which occurred during June, 1988, while the NIST database reports an extreme wind gust of 98 mph, which occurred during May, 1979. Please justify the 61 mph wind speed presented in Table 2.3.1-202. Also make any necessary changes to FSAR Section 2.3.1.2.2.

**PGN RAI ID #:** L-0048

**PGN Response to NRC RAI:**

The 61-mile per hour (mph) wind speed for Tampa, Florida, was obtained from the Gale Research Company (Reference 2.3-202: Gale Research Company, Weather of U.S. Cities, Fourth Edition, ISBN 0-8103-4827-6, 1992). A review of the National Institute of Standards and Technology (NIST) database indicates that on May 8, 1979, a wind speed of 98 mph was observed (22-foot [ft.] anemometer height). In a future amendment to the FSAR, the 61-mph wind speed indicated in FSAR Table 2.3.1-202 will be revised to 98 mph and the NIST database will be referenced.

**Associated LNP COL Application Revisions:**

In FSAR Table 2.3.1-202 (Sheet 2 of 3), under the parameter "wind," the Fastest Mile/Peak Gust value for the Tampa, FL station will be revised from "61 (Jun. 1988)" to "98 (May 1979)<sup>b</sup>." A new footnote "b" will also be inserted to the table, referencing the NIST database.

These same revisions will be made to ER Table 2.7-2 (Sheet 2 of 3) in a future revision of the ER.

**NRC Letter No.:** LNP-RAI-LTR-016

**NRC Letter Date:** March 4, 2009

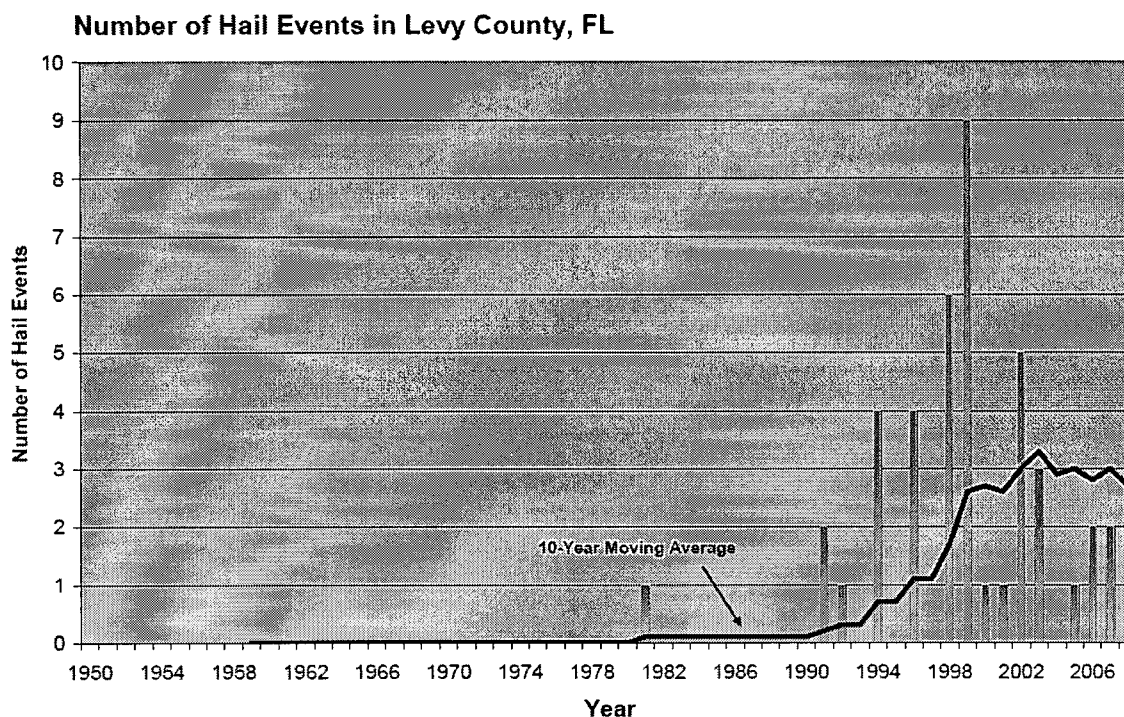
**NRC Review of Final Safety Analysis Report**

**NRC RAI #:** 02.03.01-3

**Text of NRC RAI:**

10 CFR 52.79(a)(1)(iii) states, in part, that the COL application must contain the meteorological characteristics of the proposed site with appropriate consideration of the most severe of the natural phenomena that have been historically reported for the site and surrounding area and with sufficient margin for the limited accuracy, quantity, and time in which the historical data have been accumulated.

The Staff notes that in the NCDC Storm Events Database many severe weather reports are often incomplete or missing for older periods of record. The following graph shows the annual number of hail events that have occurred in Levy County, FL. Note the increase in the number of reported events during the more recent years in the attached graph.



Please revise FSAR Section 2.3.1.2.1 to account for this data deficiency, or provide an explanation why the data presented in Section 2.3.1.2.1 is accurate.

**PGN RAI ID #:** L-0049

**PGN Response to NRC RAI:**

It is acknowledged that there has been an increase in the reported number of storm events over time, primarily as a result of increased reporting efficiency and confirmation skill and the possible overlooking of storms in the early years of data collection. Additionally, the increase in urbanization over the past 50 years has effectively resulted in an increase in the number of reported storms, if for no other reason than there are more targets damaged by hail and thunderstorms in an urban area than in a rural area. As a result, there is a higher frequency of reported incidents in urban areas than in rural areas. The same observation was made with regard to the reported occurrences of tornadoes, as described in FSAR Subsection 2.3.1.2.2 "Tornadoes and Severe Winds." Additional text providing this clarification will be included in FSAR Subsection 2.3.1.2.1 in a future amendment to the FSAR.

**Associated LNP COL Application Revisions:**

The third paragraph of FSAR Subsection 2.3.1.2.1 "Thunderstorms, Hail, and Lightning" will be revised from:

Severe thunderstorms producing hail events with hail greater than 1.9 cm (0.75 in.) or more in diameter were recorded during the period from 1950 to 2006. Forty hail events were reported in Levy County during the period from January 1, 1950, to March 31, 2007. Four storms resulted in reported property and crop damage. (Reference 2.7-013).

to:

Severe thunderstorms producing hail events with hail greater than 1.9 cm (0.75 in.) or more in diameter have been recorded since 1950. Forty-five events were reported in Levy County during the period from January 1, 1950, to November 30, 2008. Four storms resulted in reported property and crop damage (Reference 2.7-013). The number of reported hail events has increased significantly over time, primarily as a result of increased reporting efficiency and confirmation skill and the possible overlooking of storms in the early years of data collection. Additionally, the increase in urbanization over the past 50 years has effectively resulted in an increase in the number of reported storms, if for no other reason than there are more targets damaged by hail and thunderstorms in an urban area than in a rural area. As a result, there is a higher frequency of reported storms in urban areas than in rural areas. While 45 hail storms were reported in Levy County over the period of 1950 to 2008, the more recent storm reports (Reference 2.3-209) indicate that there is a greater frequency of reported storms in more recent years.

The same revisions will be made to the third paragraph of ER Subsection 2.7.3.1 in a future revision to the ER.

**NRC Letter No.:** LNP-RAI-LTR-016

**NRC Letter Date:** March 4, 2009

**NRC Review of Final Safety Analysis Report**

**NRC RAI #:** 02.03.01-4

**Text of NRC RAI:**

From the NCDC database the staff found a total of 1043 reports of waterspouts in the state of Florida between January 1, 1950 and March 31, 2007. This is in contrast to 10 waterspouts reported in FSAR Subsection 2.3.1.2.2 and FSAR Tables 2.3.1.-203 and 2.3.1-205. Please either revise this FSAR Section or justify the number of waterspouts reported.

**PGN RAI ID #:** L-0050

**PGN Response to NRC RAI:**

FSAR Subsection 2.3.1.2.2 states that approximately 10 waterspouts have been reported in the state of Florida for the period of January 1, 1950 through March 31, 2007, a fact obtained by conducting a query for "Tornadoes" in the National Oceanic and Atmospheric Administration, National Climatic Data Center database (Reference 2.3-212: National Oceanic and Atmospheric Administration, National Climatic Data Center, "U.S. Storm Event Database, Tornadoes"). A review of the database under the query "Waterspouts" indicates that approximately 1043 waterspouts have been reported between January 1, 1950 and March 31, 2007. The 10 waterspouts identified in the FSAR will be revised to 1043 in a future amendment of the FSAR.

**Associated LNP COL Application Revisions:**

The number of waterspouts in the eighth bullet in the first paragraph in FSAR Subsection 2.3.1.2.2 will be revised from 10 to 1043 in a future amendment of the FSAR.

The fifth paragraph in FSAR Subsection 2.3.1.2.2 will be revised from:

Waterspouts, which are similar to tornadoes, have been observed to occur only over very large bodies of water, such as the Gulf of Mexico. Waterspouts are only recorded as "Waterspouts/Tornadoes" in the NCDC Storm Event Database (Reference 2.3-212), and a review of the database indicated that approximately 10 waterspouts have been reported in the state of Florida during the period from January 1, 1950, to March 31, 2007.

to:

Waterspouts, which are similar to tornadoes, have been observed to occur only over very large bodies of water, such as the Gulf of Mexico. Waterspouts are recorded in the NCDC Storm Event Database (Reference 2.3-212), and a review of the database indicated that approximately 1043 waterspouts have been reported in the state of Florida during the period from January 1, 1950, to March 31, 2007.



The same revisions will be made to the first and fifth paragraphs of ER Subsection 2.7.3.2 in a future revision of the ER.

**NRC Letter No.:** LNP-RAI-LTR-016

**NRC Letter Date:** March 4, 2009

**NRC Review of Final Safety Analysis Report**

**NRC RAI #:** 02.03.01-5

**Text of NRC RAI:**

In FSAR Section 2.3.1.2.2, the design-basis tornado maximum wind speed site characteristic for the proposed COL site is given as 230 miles per hour (mi/h); however, in FSAR Table 2.0-201, the same site characteristic is listed as 300 mi/h. Please correct or explain this apparent discrepancy.

**PGN RAI ID #:** L-0051

**PGN Response to NRC RAI:**

The discussion of design-basis tornado (DBT) maximum wind speed site characteristics in FSAR Subsection 2.3.1.2.2 identifies the maximum site characteristic wind speeds based on both the original Fujita scale (300 mph) and the Enhanced-Fujita (E-F) scale (230 mph) using NRC's draft and revised guidance document for Design-Basis Tornado and Tornado Missiles for Nuclear Power Plants (i.e., Draft Regulatory Guide DG-1143 and Regulatory Guide 1.76, Revision 1). While RG 1.76, Revision 1 now uses the Enhanced Fujita Scale value of 230 mph, Progress Energy believes that the use of the original Fujita scale value of 300 mph is also appropriate for comparison with the AP 1000 DCD maximum wind speed site parameter, since it is both conservative and consistent with the DCD Site Parameters established for the AP1000. Progress Energy has elected to use the higher of the two values as the site characteristic value. FSAR Subsection 2.3.1.2.2 will be revised as described below in a future revision of the FSAR.

**Associated LNP COL Application Revisions:**

In a future revision of the FSAR, the third to the last paragraph in FSAR Subsection 2.3.1.2.2 will be revised from:

These parameters are NRC's published design-basis tornado parameters for the region surrounding the LNP site. They are less stringent than the proposed design criteria for the AP1000 units that will be used for LNP 1 and LNP 2.

to:

These parameters are NRC's published design-basis tornado parameters for the region surrounding the LNP site. They are less stringent than the proposed design criteria for the AP1000 units that will be used for LNP 1 and LNP 2. However, since the maximum site characteristics for wind speed and pressure drop associated with the guidance in NRC Draft Regulatory Guide (DG)-1143 are higher than those in RG 1.76, Revision 1, the DG-1143 values will be used as the maximum site characteristics for comparison with the DCD site parameters in FSAR Table 2.0-201.

No revisions are required for the ER.

**NRC Letter No.:** LNP-RAI-LTR-016

**NRC Letter Date:** March 4, 2009

**NRC Review of Final Safety Analysis Report**

**NRC RAI #:** 02.03.01-6

**Text of NRC RAI:**

FSAR Section 2.3.1.2.4 states that hurricanes have made landfall on both the Atlantic and Gulf of Mexico coastlines of Florida.

Consistent with NUREG-0800, Section 2.3.1, please provide the annual frequency of hurricanes that have occurred in the vicinity of the Levy site in FSAR 2.3.1.2.4.

**PGN RAI ID #:** L-0052

**PGN Response to NRC RAI:**

A review of the NOAA Coastal Services Center website (information available at [www.maps.csc.noaa.gov/hurricanes/](http://www.maps.csc.noaa.gov/hurricanes/)) indicates that during the period of 1899 to 2007, 21 hurricanes rated Category 1-5 have passed within 50 nautical miles of the LNP site, and 45 hurricanes rated Category 1-5 have passed within 100 nautical miles of the LNP site.

**Associated LNP COL Application Revisions:**

The following paragraph will be inserted at the end of the second paragraph in FSAR Section 2.3.1.2.4:

"The NOAA Coastal Services Center reports that during the 157-year period between 1851 and 2007, 21 hurricanes rated Category 1-5 have passed within 50 nautical miles of the LNP site, and 45 hurricanes rated Category 1-5 have passed within 100 nautical miles of the LNP site. Based on the reported number of hurricanes passing within the vicinity of the LNP site, the annual frequency of hurricanes is estimated to be 0.13 and 0.29 storms per year within 50 and 100 nautical miles of the LNP site, respectively."

A reference to: [www.maps.csc.noaa.gov/hurricanes](http://www.maps.csc.noaa.gov/hurricanes) will be provided at the time of the amendment

The same revisions will be made to ER Subsection 2.7.3.4 in a future revision of the ER.

**NRC Letter No.:** LNP-RAI-LTR-016

**NRC Letter Date:** March 4, 2009

**NRC Review of Final Safety Analysis Report**

**NRC RAI #:** 02.03.01-7

**Text of NRC RAI:**

FSAR Table 2.3.1-206 summarizes the number of tropical storms and hurricanes in Florida by year and the Saffir-Simpson Scale Category for the period from 1899 – 2007. Please provide a reference for the hurricanes and tropical storms that are summarized from 2003 through 2007 in this table considering the source provided (Reference 2.3-218) only provides data from 1899 through 2002 for Florida.

**PGN RAI ID #:** L-0053

**PGN Response to NRC RAI:**

Reference 2.3-218 (National Oceanic and Atmospheric Administration, National Weather Service Forecast Office, "Atlantic Tropical Storms and Hurricanes Affecting the United States: 1899-2002," Website, [www.srh.noaa.gov/lch/research/tropical2.php](http://www.srh.noaa.gov/lch/research/tropical2.php), accessed August 29, 2007) provides the hurricane data for the period 1899 to 2002. Hurricane data for the period 2003 to 2007 were not available in a tabular format; the 5-year period was compiled using the Annual Climate Monitoring Reports for the Atlantic Hurricane Season.

The hurricane data for the period 2003 through 2007 were compiled from the following references:

National Oceanic and Atmospheric Administration, National Climatic Data Center, "Climate Monitoring Reports, Climate of 2003: Atlantic Hurricane Season Reports," Website, [www.ncdc.noaa.gov/oa/climate/research/2003/hurricanes03.html](http://www.ncdc.noaa.gov/oa/climate/research/2003/hurricanes03.html), accessed January 28, 2008.

National Oceanic and Atmospheric Administration, National Climatic Data Center, "Climate Monitoring Reports, Climate of 2004: Atlantic Hurricane Season Reports," Website, [www.ncdc.noaa.gov/oa/climate/research/2004/hurricanes03.html](http://www.ncdc.noaa.gov/oa/climate/research/2004/hurricanes03.html), accessed January 28, 2008.

National Oceanic and Atmospheric Administration, National Climatic Data Center, "Climate Monitoring Reports, Climate of 2005: Atlantic Hurricane Season Reports," Website, [www.ncdc.noaa.gov/oa/climate/research/2005/hurricanes03.html](http://www.ncdc.noaa.gov/oa/climate/research/2005/hurricanes03.html), accessed January 28, 2008.

National Oceanic and Atmospheric Administration, National Climatic Data Center, "Climate Monitoring Reports, Climate of 2006: Atlantic Hurricane Season Reports," Website, [www.ncdc.noaa.gov/oa/climate/research/2006/hurricanes03.html](http://www.ncdc.noaa.gov/oa/climate/research/2006/hurricanes03.html), accessed January 28, 2008.

National Oceanic and Atmospheric Administration, National Climatic Data Center, "Climate Monitoring Reports, Climate of 2007: Atlantic Hurricane Season Reports," Website, [www.ncdc.noaa.gov/oa/climate/research/2007/hurricanes03.html](http://www.ncdc.noaa.gov/oa/climate/research/2007/hurricanes03.html), accessed January 28, 2008.

**Associated LNP COL Application Revisions:**

The following references will be added to FSAR Table 2.3.1-206 and the reference list in FSAR Subsection 2.3.7:

- 2.3-229        National Oceanic and Atmospheric Administration, National Climatic Data Center, "Climate Monitoring Reports, Climate of 2003: Atlantic Hurricane Season Reports," Website, [www.ncdc.noaa.gov/oa/climate/research/2003/hurricanes03.html](http://www.ncdc.noaa.gov/oa/climate/research/2003/hurricanes03.html), accessed January 28, 2008.
  
- 2.3-230        National Oceanic and Atmospheric Administration, National Climatic Data Center, "Climate Monitoring Reports, Climate of 2004: Atlantic Hurricane Season Reports," Website, [www.ncdc.noaa.gov/oa/climate/research/2004/hurricanes03.html](http://www.ncdc.noaa.gov/oa/climate/research/2004/hurricanes03.html), accessed January 28, 2008.
  
- 2.3-231        National Oceanic and Atmospheric Administration, National Climatic Data Center, "Climate Monitoring Reports, Climate of 2005: Atlantic Hurricane Season Reports," Website, [www.ncdc.noaa.gov/oa/climate/research/2005/hurricanes03.html](http://www.ncdc.noaa.gov/oa/climate/research/2005/hurricanes03.html), accessed January 28, 2008.
  
- 2.3-232        National Oceanic and Atmospheric Administration, National Climatic Data Center, "Climate Monitoring Reports, Climate of 2006: Atlantic Hurricane Season Reports," Website, [www.ncdc.noaa.gov/oa/climate/research/2006/hurricanes03.html](http://www.ncdc.noaa.gov/oa/climate/research/2006/hurricanes03.html), accessed January 28, 2008.
  
- 2.3-233        National Oceanic and Atmospheric Administration, National Climatic Data Center, "Climate Monitoring Reports, Climate of 2007: Atlantic Hurricane Season Reports," Website, [www.ncdc.noaa.gov/oa/climate/research/2007/hurricanes03.html](http://www.ncdc.noaa.gov/oa/climate/research/2007/hurricanes03.html), accessed January 28, 2008.

The same revisions will be made to ER Subsection 2.7.3.4 and the ER Reference Subsection 2.7.8 in a future revision of the ER.

**NRC Letter No.:** LNP-RAI-LTR-016

**NRC Letter Date:** March 4, 2009

**NRC Review of Final Safety Analysis Report**

**NRC RAI #:** 02.03.01-8

**Text of NRC RAI:**

Please justify why the extreme wind basic wind speed site characteristic value for safety-related structures is not based on the most severe hurricanes that have been historically reported for the site and surrounding area.

10 CFR 52.79(a)(1)(iii) states, in part, that the COL application must contain the meteorological characteristics of the proposed site with appropriate consideration of the most severe of the natural phenomena that have been historically reported for the site and surrounding area and with sufficient margin for the limited accuracy, quantity, and time in which the historical data have been accumulated.

FSAR Section 2.3.1.2.4 presents information from the NOAA National Weather Service Lake Charles, LA Forecast Office to describe the number of hurricanes that have made landfall in Florida from 1899 through 2007. The staff used NOAA's Coastal Service Center (CSC) historical hurricane track database to discover the number of tropical cyclone storm tracks that have passed within a 100-nautical mile (nm) radius of the LNP site from 1851 through 2007, the staff identified 3 hurricanes that were considered as major (i.e., Saffir-Simpson hurricane category 3 or higher) at the time they made landfall. For each of these major hurricanes the staff used the sustained wind speeds reported in the NOAA CSC database at landfall along with information presented in Table C6-2 of ASCE/SEI 7-05 to estimate the corresponding 3-second gust wind speed over land at landfall. Because hurricane wind speeds typically decrease as storms move inland and the LNP site is located approximately 8-miles inland from the Gulf of Mexico, the staff reduced the gust wind speed at landfall by 5 mi/hr, based on the 5 mi/hr reduction in basic wind speed from the coastline to the inland location of the LNP as shown on Figure 6-1B of ASCE/SEI 7-05.

The staff found that two out of the three major landfall hurricanes had projected gust wind speed values which exceeded the applicant's selected extreme wind basic wind speed site characteristic value of 139 mph for safety related structures. Hurricane Charlie (2004) had an estimated inland peak gust of 184 mph. An unnamed storm in 1896 had projected peak wind gusts of 155 mph.

**PGN RAI ID #:** L-0054

**PGN Response to NRC RAI:**

FSAR Subsection 2.3.1.2.2, Tornadoes and Severe Winds, presents "The maximum published 3-second gust wind speed for these stations is 209 km/h (130 mph) (Orlando and Tampa), and is represented as the nominal design 50-year return 3-second gust at 10 m (33 ft.) above the ground. A conversion factor to estimate the 100-year return period for this value is provided in Table C6-7 of the reference document, 'Conversion Factors for Other

Mean Recurrence Intervals.' The conversion factor for a 100-year return period is 1.07, resulting in the nominal design 3-second gust wind speed of 224 km/h (139 mph)."

A review of the NOAA Coastal Services Center website (information available at [www.maps.csc.noaa.gov/hurricanes/](http://www.maps.csc.noaa.gov/hurricanes/)) indicates that during the period of 1851 to 2007, 45 hurricanes rated Category 1-5 have passed within 100 nautical miles of the LNP site. This included a total of 10 Category 3 hurricane tracks and 1 Category 4 hurricane track. Using information collected from the NOAA Coastal Services Center, a maximum wind speed of 125 knots (144 miles per hour [mph]) was observed during Hurricane Charley on August 13, 2004.

The 3-second gust wind speed was determined based on the American Society of Civil Engineers/Structural Engineering Institute (ASCE/SEI) 7-05, "Minimum Design Loads for Buildings and Other Structures." Using Table C6-2, "Approximate Relationship between Wind Speeds in ASCE 7 and Saffir/Simpson Hurricane Scale," from the reference document, the sustained wind speed over water for a Category 4 hurricane ranges from 131 to 155 mph, which corresponds to a gust wind speed over land of 157 to 191 mph. This relationship was used to calculate the gust wind speed over land from the Hurricane Charley (2004) observed wind speed of 125 knots (144 mph). The maximum gust wind speed over land was estimated to be 172.6 mph based on the ASCE/SEI guidance. The estimated gust wind speed over land of 172.6 mph was used to estimate the nominal design 3-second gust wind speed for a 100-year return period. From Table C6-7 of the reference document, "Conversion Factors for Other Mean Recurrence Intervals," the conversion factor for a 100-year return period is 1.07, resulting in the nominal design 3-second gust wind speed of 297 km/h (185 mph).

FSAR Subsections 2.3.1.2.2 and 2.3.1.2.4 will be revised to include this information in a future amendment to the document.

#### **Associated LNP COL Application Revisions:**

The following text at the end of the second paragraph in FSAR Subsection 2.3.1.2.2 will be revised from:

The maximum published 3-second gust wind speed for these stations is 209 km/h (130 mph) (Orlando and Tampa), and is represented as the nominal design 50-year return 3-second gust at 10 m (33 ft.) above the ground. A conversion factor to estimate the 100-year return period for this value is provided in Table C6-7 of the reference document, "Conversion Factors for Other Mean Recurrence Intervals." The conversion factor for a 100-year return period is 1.07, resulting in the nominal design 3-second gust wind speed of 224 km/h (139 mph).

to:

The maximum published 3-second gust wind speed based on tornado events and severe winds for these stations is 209 km/h (130 mph) (Orlando and Tampa) and is represented as the 50-year return 3-second gust at 10 m (33 ft.) above the ground. A conversion factor to estimate the 100-year return period for this value is provided in Table C6-7 of the reference document, "Conversion Factors for Other Mean Recurrence Intervals." The conversion factor for a 100-year return period is 1.07, resulting in a 3-second gust wind speed of 224 km/h (139 mph).



The same revision will be made to the text at the end of ER Section 2.7.3.2 in a future amendment.

The following paragraphs will be inserted after the second paragraph in FSAR Subsection 2.3.1.2.4:

An additional review of the NOAA Coastal Services Center website (information available at [www.maps.csc.noaa.gov/hurricanes/](http://www.maps.csc.noaa.gov/hurricanes/)) indicates that during the period of 1851 to 2007, 45 hurricanes rated Category 1-5 have passed within 100 nautical miles of the LNP site. This included a total of 10 Category 3 hurricane tracks and 1 Category 4 hurricane track. Using information collected from the NOAA Coastal Services Center, a maximum wind speed of 125 knots (144 miles per hour [mph]) was observed on August 13, 2004 during Hurricane Charley.

The 3-second gust wind speed was determined based on the American Society of Civil Engineers/Structural Engineering Institute (ASCE/SEI) 7-05, "Minimum Design Loads for Buildings and Other Structures." Using Table C6-2, "Approximate Relationship between Wind Speeds in ASCE 7 and Saffir/Simpson Hurricane Scale," from the reference document, the sustained wind speed over water for a Category 4 hurricane ranges from 131 to 155 mph, which correlates to a gust wind speed over land of 157 to 191 mph. This relationship was used to calculate the gust wind speed over land from the Hurricane Charley (2004) observed wind speed of 125 knots (144 mph). The maximum gust wind speed over land was estimated to be 172.6 mph based on this relationship. The estimated gust wind speed over land of 172.6 mph was used to estimate the nominal design 3-second gust wind speed for a 100-year return period. From Table C6-7 of the reference document, "Conversion Factors for Other Mean Recurrence Intervals," the conversion factor for a 100-year return period is 1.07, resulting in the nominal design 3-second gust wind speed of 297 km/h (185 mph).

The same revisions will be made to ER Subsection 2.7.3.4 in a future amendment.

In FSAR Table 2.0-201, the line item entitled "Wind Speed: Operating Basis" will be revised from:

139 mph (3-second gust) (Maximum sustained wind speed 121 mph; importance factor 1.15; exposure C; topographic factor 1.0)

to:

185 mph (3-second gust) (Maximum sustained wind speed 121 mph; importance factor 1.15; exposure C; topographic factor 1.0)

**NRC Letter No.:** LNP-RAI-LTR-016

**NRC Letter Date:** March 4, 2009

**NRC Review of Final Safety Analysis Report**

**NRC RAI #:** 02.03.01-9

**Text of NRC RAI:**

The staff noted several design-basis temperatures listed as "not available" in FSAR Table 2.3.1-207. Please clarify further why these temperatures can not be derived or at least estimated, or specify why these temperatures are not necessary.

**PGN RAI ID #:** L-0055

**PGN Response to NRC RAI:**

FSAR Table 2.3.1-207 "Summary of Wet and Dry Bulb Temperature Observations" will be revised to eliminate unnecessary and missing information.

**Associated LNP COL Application Revisions:**

The last sentence of the first paragraph of FSAR Subsection 2.3.1.2.5 "Normal Operating Heat Sink Design Parameters" will be revised from:

These data were obtained from the 30-year (1961-1990) Solar and Meteorological Surface Observation Network (SAMSON) database (Reference 2.3-219).

to:

These data were obtained from the 30-year (1961-1990) Solar and Meteorological Surface Observation Network (SAMSON) database (Reference 2.3-219) and from the 24-year (1973-1996) NOAA Engineering Weather Data (EWD) database (Reference 2.3-217).

The entire contents of FSAR Table 2.3.1-207 "Summary of Dry and Wet Bulb Temperature Observations" will be replaced with the table below in a future amendment to the FSAR. The same revisions will be made to ER Subsection 2.7.4.1.3.3 "Wet Bulb Temperature" (using Reference 2.7-019) and ER Table 2.7-52 "Summary of Wet and Dry Temperature Observations" in a future revision of the ER.

LNP COL 2.3-1

**Table 2.3.1-207**  
**Summary of Wet and Dry Bulb Temperature Observations**

	Jacksonville		Tallahassee		Tampa	
	Wet Bulb (°C)	Dry Bulb (°C)	Wet Bulb (°C)	Dry Bulb (°C)	Wet Bulb (°C)	Dry Bulb (°C)
Highest Running Average Wet Bulb (with Coincident Dry Bulb)						
30-Day Average	24.9	28.1	24.8	28.3	25.5	28.6
5-Day Average	26.5	31.0	26.1	30.9	26.9	30.2
1-Day Average	27.7	31.2	27.0	32.1	27.6	31.0
Maximum Ambient Dry Bulb (with Coincident Wet Bulb)						
0% Exceedance	26.0	39.4	27.7	39.4	25.4	36.7
1% Exceedance	26.9	33.5	27.2	33.7	26.3	32.6
Minimum Ambient Dry Bulb (with Coincident Wet Bulb)						
100% Exceedance	-15.3	-13.9	-15.7	-14.4	-8.8	-7.2
99% Exceedance	-1.1	0.0	-3.3	-2.2	2.8	4.4
Maximum Ambient Wet Bulb (with Coincident Dry Bulb)						
0% Exceedance	30.3	33.9	30.4	31.7	29.5	34.4
1% Exceedance	26.1	31.1	26.1	31.1	26.7	31.1

Notes:

Period of Record: 1973 – 1996 (Reference 2.3-217), 1961 – 1990 (Reference 2.3-219)

°C = degrees Celsius

Source: References: 2.3-217, 2.3-219

**NRC Letter No.:** LNP-RAI-LTR-016

**NRC Letter Date:** March 4, 2009

**NRC Review of Final Safety Analysis Report**

**NRC RAI #:** 02.03.01-10

**Text of NRC RAI:**

FSAR Table 2.3.1-210 has missing 0% Occurrence values for Gainesville and Orlando. Please either modify FSAR Table 2.3.1-210 to include these values, or provide explanation as to why they are not relevant.

**PGN RAI ID #:** L-0056

**PGN Response to NRC RAI:**

The maximum (0% occurrence) temperature values for the Gainesville and Orlando observing stations are not readily available from published information and would have to be developed from long-term data records. The information provided in Table 2.3.1-210 for the Gainesville and Orlando observing stations was included only to evaluate the potential for those stations to exhibit higher regional temperatures than the Jacksonville, Tallahassee, and Tampa stations. A review of the data in the table indicates that the Gainesville and Orlando temperatures have not exceeded those at Jacksonville, Tallahassee, and Tampa and the 0% occurrence values do not need to be developed. Table 2.3.1-210 "Ambient Dry and Wet Bulb Temperature Observations for Gainesville, Jacksonville, Orlando, Tallahassee, and Tampa, Florida" will be revised in a future amendment to the FSAR to provide additional clarification.

**Associated LNP COL Application Revisions:**

The entire contents of FSAR Table 2.3.1-210 "Ambient Dry and Wet Bulb Temperature Observations for Gainesville, Jacksonville, Orlando, Tallahassee, and Tampa, Florida" will be replaced with the table below in a future amendment to the FSAR. No changes are required for the ER.

LNP COL 2.3-1

Table 2.3.1-210

**Ambient Dry and Wet Bulb Temperature Observations for Gainesville, Jacksonville, Orlando, Tallahassee, and Tampa, Florida**

Maximum and Minimum Dry Bulb Temperatures (with Coincident Wet Bulb Temperatures) (°F)										
	Gainesville		Jacksonville		Orlando		Tallahassee		Tampa	
	Dry Bulb	Coincident Wet Bulb	Dry Bulb	Coincident Wet Bulb	Dry Bulb	Coincident Wet Bulb	Dry Bulb	Coincident Wet Bulb	Dry Bulb	Coincident Wet Bulb
Maximum Temperatures										
0% Occurrence	(f)	(f)	103	79	(f)	(f)	103	82	98	78
0.4% Occurrence	94	77	95	77	93	77	95	77	93	78
1.0% Occurrence	92	77	93	77	92	76	93	76	91	78
2.0% Occurrence	91	76	91	76	91	76	92	76	90	77
"Maximum Safety" <sup>(a)</sup>	(e)	(e)	104.4	82.3	(e)	(e)	105.1	78.7	98.7	78.1
"Maximum Normal" <sup>(b)</sup>	92	77	93	78	92	76	93	76	91	78
Minimum Temperatures										
97.5% Occurrence	38	36	39	35	45	42	32	30	45	42
99.0% Occurrence	33	31	34	31	40	37	28	26	40	37
99.6% Occurrence	29	27	30	26	36	33	24	23	36	33
100% Occurrence	-	-	7	4	-	-	6	4	19	16
"Minimum Safety" <sup>(c)</sup>	4	NA	4	NA	9	NA	3	N/A	12	N/A
"Minimum Normal" <sup>(d)</sup>	33	NA	34	NA	40	NA	28	NA	40	NA
Period of Record (yrs)	30		52		30		53		55	
Maximum Wet Bulb Temperatures (with Coincident Dry Bulb Temperatures) (°F)										
	Gainesville		Jacksonville		Orlando		Tallahassee		Tampa	
	Wet Bulb	Coincident Dry Bulb	Wet Bulb	Coincident Dry Bulb	Wet Bulb	Coincident Dry Bulb	Wet Bulb	Coincident Dry Bulb	Wet Bulb	Coincident Dry Bulb
0% Occurrence	(f)	(f)	87	93	(f)	(f)	87	89	85	94
0.4% Occurrence	80	88	80	90	80	88	80	89	80	88
1.0% Occurrence	79	87	79	88	79	87	79	88	80	88
2.0% Occurrence	78	86	78	87	78	86	78	87	79	87
"Maximum Safety" <sup>(a)</sup>	(e)	NA	84.7	NA	(e)	NA	84.2	NA	85.5	NA
"Maximum Normal" <sup>(b)</sup>	79	NA	79	NA	79	NA	79	NA	80	NA

Notes:

a) "Maximum Safety" temperatures are 100-yr estimates based on indicated POR and regression analyses.

b) "Maximum Normal" temperatures are based on 30-year POR.

c) "Minimum Safety" temperatures are 100-year estimates based on a 30-year POR.

d) "Minimum Normal" temperatures are based on 30-year POR.

e) "Maximum Safety" values not developed for these stations.

f) "0% Occurrence" values not available from published data.

°F = degrees Fahrenheit; NA = Not Applicable per AP 1000 DCD

Sources: References 2.3-217, 2.3-219, and 2.3-226

**RC Letter No.:** LNP-RAI-LTR-016

**NRC Letter Date:** March 4, 2009

**NRC Review of Final Safety Analysis Report**

**NRC RAI #:** 02.03.01-11

**Text of NRC RAI:**

The sentence in FSAR 2.3.1.2.7.2, "The estimated Maximum Safety 100-year recurrent non-coincident wet bulb temperature in the region (85.5°F, Tampa) does not exceed the DCD site parameter value of 85.5°F," does not appear to accurately reflect the data provided in FSAR Table 2.0-201. Please explain this discrepancy or correct the subject sentence.

**PGN RAI ID #:** L-0057

**PGN Response to NRC RAI:** The DCD site parameter value of 85.5°F that is referenced in the second sentence of FSAR Section 2.3.1.2.7.2 is incorrect and should be 86.1°F. The DCD site parameter value of 86.1°F in FSAR Table 2.0-201 is correct and consistent with the DCD site parameter for wet bulb temperature as provided in Table 5.0-1 "Site Parameters" of the AP1000 Design Control Document (Rev. 17). This revision will be made in a future amendment to the FSAR.

**Associated LNP COL Application Revisions:**

The second sentence of FSAR Subsection 2.3.1.2.7.2 will be revised from:

The estimated Maximum Safety 100-year recurrent non-coincident wet bulb temperature in the region (85.5°F, Tampa) does not exceed the DCD site parameter value of 85.5°F.

to:

The estimated Maximum Safety 100-year recurrent non-coincident wet bulb temperature in the region (85.5°F, Tampa) does not exceed the DCD site parameter value of 86.1°F.

No changes are required for the ER.