Progress Energy

Serial: NPD-NRC-2009-188 10CFR52.79
August 19, 2009

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

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

References:
1. Letter from Brian C. 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 County Nuclear Plant, Units 1 and 2 Combined License Application"
2. Letter from Garry D. Miller (PEF) to U. S. Nuclear Regulatory Commission, dated April 1, 2009, "Response to Request for Additional Information Letter No. 016 Related to General Climate", Serial: NPD-NRC-2009-059

Ladies and Gentlemen:

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

A revised response to one of the NRC questions is addressed in the enclosure. The enclosure also identifies changes that will be made in a future revision of the Levy Nuclear 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 August 19, 2009.

Sincerely,

Garry D. Miller
General Manager
Nuclear Plant Development

Enclosure

cc : U.S. NRC Region II, Regional Administrator
Mr. Brian C. Anderson, U.S. NRC Project Manager

Progress Energy Florida, Inc.
P.O. Box 14042
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NRO

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

NRC RAI #	Progress Energy RAI #	Progress Energy Response
02.03.01-1	L-0047	April 1, 2009; NPD-NRC-2009-059
02.03.01-2	L-0048	April 1, 2009; NPD-NRC-2009-059
02.03.01-3	L-0049	April 1, 2009; NPD-NRC-2009-059
02.03.01-4	L-0050	April 1, 2009; NPD-NRC-2009-059
02.03.01-5	L-0051	April 1, 2009; NPD-NRC-2009-059
02.03.01-6	L-0052	April 1, 2009; NPD-NRC-2009-059
02.03.01-7	L-0053	April 1, 2009; NPD-NRC-2009-059
02.03.01-8	L-0527	Revised response enclosed; see following pages
02.03.01-9	L-0055	April 1, 2009; NPD-NRC-2009-059
02.03.01-10	L-0056	April 1, 2009; NPD-NRC-2009-059
02.03.01-11	L-0057	April 1, 2009; NPD-NRC-2009-059

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

NRC Letter Date: March 4, 2009

NRC Review of Final Safety Analysis Report

NRC RAI NUMBER: 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-0527

PGN Response to NRC RAI:

Progress Energy has revisited the assessment of the operating basis wind speed for the LNP site that was provided in the previous response to FSAR RAI 02.03.01-8 and included as part of FSAR RAI 3.3.1-1. Based on this review, Progress Energy has concluded that a revision to the analysis is justified to better reflect the operating basis wind speed and historical wind speeds associated with hurricane events in the vicinity (i.e., within 100-nautical miles) of the site.

FSAR Subsection 2.3.1.2.2, Tornadoes and Severe Winds, states:

> "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/) 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 recorded during Hurricane Charley on August 13, 2004. This review was performed in addition to the information provided in FSAR Sections 2.3 and 2.4 for the 50-mile Region surrounding the LNP site, as described in FSAR Table 2.4.5-201.

The maximum published 3-second gust wind speed and the maximum sustained hurricane wind speed represent wind speeds that have been recorded in the region, as opposed to projected maximum statistical values (based on climatological records) for the 50-year and 100-year return periods.

AP1000 DCD Rev. 17, Subsection 3.3.1.1 "Design Wind Velocity" provides the following explanation for the design basis wind speed:

> "The design wind is specified as a basic wind speed of 145 mph with an annual probability of occurrence of 0.02 based on the most severe location identified in Reference 1 (ASCE 7-98, "Minimum Design Loads for Buildings and Other Structures). This wind speed is the 3 second gust speed at 33 feet above the ground in open terrain (ASCE 7-98, Exposure C). The basic wind speed of 145 mph is the 3 second gust speed that has become the basis of wind design codes since 1995. It corresponds to the 110 mph fastest mile wind used as the basis for the AP600 design in accordance with the 1988 edition of Reference 1.
>
> Higher winds with a probability of occurrence of 0.01 are used in the design of seismic Category I structures by using an importance factor of 1.15. This is obtained by classifying the AP1000 seismic Category I structures as essential facilities and using the design provisions for Category IV of Reference 1."

The AP1000 DCD Rev. 17 provides the site characteristic Operating Basis Wind Speed as a 3-second gust as defined in the ASCE 7-98 reference document. Section 3.3.1.1 "Design Wind Velocity" of the DCD specifically states that the design wind speed for the AP1000 is based on the 50-year recurrent wind speed (non-safety) and the 100-year recurrent wind speed (safety) that is provided in the reference document. It is noted that ASCE has issued a more current design standard (that is not referenced in DCD Rev. 17), which contains the same definition and essentially the same methodology and basic wind speed data. The ASCE "basic" wind speed for the LNP site was estimated from a plot of basic wind speeds provided in Figure 6-1B

of ASCE 7-05. Using the same methodology that is described in AP1000 DCD Rev. 17 (i.e., using Figure 6-1B of the more current ASCE reference document) the LNP site characteristic basic wind speed for the 50-year return period (probability of occurrence of 0.02) is 120 mph. A review of the information provided in Figure 6-1B in the ASCE 7-05 and 7-98 reference documents indicates that the ASCE estimated basic wind speed at the LNP site is the same in both versions of the document. The ASCE 50-year recurrent wind speed (120 mph) is bounded by the DCD design value of 145 mph. A 1.07 scaling factor was also used to factor this number to a 100-year recurrence value (probability of occurrence of 0.01) of 128 mph, which is also bounded by the DCD Operating Basis Wind Speed. The site characteristic basic wind speed (50-year and 100-year return values) are reported as the "Wind Speed: Operating Basis" parameter in FSAR Subsection 2.0, Table 2.0-201.

Progress Energy acknowledges NRC's suggestion that maximum observed wind speeds from historical storms be used to characterize the Operating Basis Wind Speed (with adjustments to reflect peak gusts and reductions as the storm moves inland); however, this is not the intent of the guidance provided in the DCD and the associated ASCE reference document. To be consistent with the DCD design criteria, the estimates of the Operating Basis Wind Speed in LNP FSAR Section 2.3.1.2 were based on the ASCE reference document methodology and guidance, rather than an observed wind speed associated with an individual storm event. The ASCE guidance is intended to be representative of the most severe of the natural phenomena that have been historically reported for the site and surrounding area, based on more than 150 years of climatological records that include hurricane tracks and maximum reported wind speeds. The use of the ASCE guidance is intended to contain sufficient margin to ensure the safety of the plant during operation. Evidence of this margin of safety is based on the maximum wind speeds associated with storm events that have been observed to pass within 100-nautical miles of the site (as opposed to storms passing within 50-miles as described in FSAR Table 2.3.4-201). Only one storm meeting these criteria has been recorded (i.e., 2004 Hurricane Charley), with a maximum wind speed of 144 mph, which is bounded by the DCD design parameter.

FSAR Subsections 2.0, 2.3.1.2.2 and 2.3.1.2.4 will be updated to include this information in a future revision to the document.

Associated LNP COL Application Revisions:

The following changes will be made to the LNP FSAR in a future revision:

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:

> 120 mph (3-second gust, 50-year recurrence) (importance factor 1.0 [non-safety]; exposure C; topographic factor 1.0)

128 mph (3-second gust, 100-year recurrence) (importance factor 1.15 [safety]; exposure C; topographic factor 1.0)

The following text at the end of the last 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 change will be made to the text in the last paragraph at the end of ER Section 2.7.3.2 in a future revision.

The following text will be inserted at the end of FSAR Subsection 2.3.1.2.2:

> The DCD defines the site characteristic "basic" wind speed as a basic wind speed of 145 mph based on the most severe location identified in ASCE 7-98, "Minimum Design Loads for Buildings and Other Structures." This wind speed is the 3 second gust speed at 33 feet above the ground in open terrain (ASCE 7-98, Exposure C). The ASCE "basic" wind speed is estimated from a plot of basic wind speeds provided as Figure 6-1B of the ASCE 7-05 document (i.e., a more recent version of ASCE 7-98). By following the procedure described in the DCD (i.e., using Figure 6-1B of the ASCE 7-05 reference document) the LNP site characteristic basic wind speed is 120 mph. The ASCE 50-year recurrent wind speed of 120 mph is bounded by the DCD design value of 145 mph. A 1.07 scaling factor was also used to factor this number to a 100-year recurrence value (probability of occurrence of 0.01) of 128 mph, which is also bounded by the DCD design value.

No revision is required for the ER.

The following paragraph 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/) 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 same change will be made to ER Subsection 2.7.3.4 in a future revision.

Attachments/Enclosures:

None.