Progress Energy

Serial: NPD-NRC-2010-012
January 27, 2010

10CFR52.79

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
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 078 RELATED TO LONG-TERM ATMOSPHERIC DISPERSION ESTIMATES FOR ROUTINE RELEASES

Reference: Letter from Brian C. Anderson (NRC) to Garry Miller (PEF), dated January 4, 2010, "Request for Additional Information Letter No. 078 Related to SRP Section 2.3.5 for the Levy County Nuclear 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 a change 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 (727) 820-4481.

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

Executed on January 27, 2010.

Sincerely,

John Elnitsky
Vice President
Nuclear Plant Development

Enclosure

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

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Levy Nuclear Plant Units 1 and 2
Response to NRC Request for Additional Information Letter No. 078 Related to SRP Section 2.3.5 for the Combined License Application, dated January 4, 2010

NRC RAI #	Progress Energy RAI #	Progress Energy Response
02.03.05-6	L-0687	Response enclosed – see following pages

NRC Letter No.: LNP-RAI-LTR-078

NRC Letter Date: January 4, 2010

NRC Review of Final Safety Analysis Report

NRC RAI #: 02.03.05-6

Text of NRC RAI:

SRP Section 2.3.5 Acceptance Criteria 2 states, in part, that a discussion of atmospheric diffusion parameters should be substantiated as to their appropriateness for use in estimating the consequences of routine releases from the site boundary to a radius of 50 miles (80 kilometers) from the plant.

Further, RG 1.111 states that if a constant mean wind direction model (such as XOQDOQ) is used, airflow characteristics in the vicinity of the site should be examined to determine the spatial and temporal variations of atmospheric transport and diffusion conditions and the applicability of single station meteorological data to represent conditions between the site and the nearest receptors and conditions out to a distance of 50 miles from the site.

Update FSAR Section 2.3.5 to include a discussion as to why the XOQDOQ straight-line trajectory model is appropriate to use out to a distance of 50 miles (80 kilometers) to estimate the χ/Q and D/Q values. This discussion should include, but not limited to, the possible effects on dispersion due to changes in topography, the potential for land/sea breezes, and the possibility of significant land-water boundary layer effects on airflow.

PGN RAI ID #: L-0687

PGN Response to NRC RAI:

The use of a "straight-line" dispersion model such as the XOQDOQ model is based on the assumption that terrain and meteorological flow conditions will be consistent and homogeneous enough to allow for the uninterrupted transport and dispersion between the location of release and the receptors of interest, in the time frame that the dispersion predictions are being made.

The LNP project site is located in an area that is surrounded by essentially flat terrain for a distance of more than 50 miles (80 kilometers) in all directions. Given the flat terrain surrounding the LNP site, no significant spatial variations in pollutant dispersion or direction are expected to occur as a result of any variations in terrain.

A discussion of the spatial and temporal variations of the meteorological data collected at the LNP site was previously provided in our response to NRC RAI 02.03.05-3 (provided in PGN letter serial # NPD-NRC-2009-063, dated April 6, 2009). The scope of our response to that RAI focused on the proximity of the site to the Gulf of Mexico (which is approximately 12.8 km (7.9 mi.) east of the Gulf of Mexico), and its potential for influencing the meteorology at the site and the surrounding environment. The information provided in the response to NRC RAI 02.03.05-3 resulted in the following conclusions:

1. The influence of the Gulf on parameters such as temperature and vertical temperature difference is not expected to be discernible under most meteorological conditions in the boundary layer monitored by LNP's 60-meter meteorological monitoring tower.

2. There is a strong east-west wind direction component to the predominant wind directions, with approximately 15 percent of wind directions from the W, WSW, and SW sectors and approximately 33 percent of wind directions from the NE, ENE, and E sectors.

3. Nearly 50 percent of the wind directions in the most predominant wind direction sectors occur diurnally on most days and on a regular basis.

4. The diurnal change in wind directions appears to be a thermally driven influence of the Gulf of Mexico, which is typical of a classic "sea breeze" effect.

5. The influence of the Gulf of Mexico on the short- and long-term dispersion estimates in FSAR Subsections 2.3.4 and 2.3.5 can be expected to result in higher predictions of relative concentration (X/Q) and relative deposition (D/Q) than would occur otherwise, primarily due to a high frequency of light wind speeds associated with sea-breeze effects.

The calculations of χ/Q and D/Q as described in FSAR Section 2.3.5.2 were based on the distances from the release point to the receptors of interest. These distances were determined to range as follows, as provided in FSAR Table 2.3.5-201:

Nearest Milk Cow:	8049 meters
Nearest Milk Goat:	3863 – 8049 meters
Nearest Garden:	2576 – 8049 meters
Nearest Meat Animal:	3541 – 8049 meters
Nearest Residence:	2576 – 8049 meters

The distances that were used in the calculations using the XOQDOQ model ranged from a minimum of 2576 meters (1.6 miles) to a maximum of 8049 meters (5 miles). The wind speed associated with the lowest wind speed category used in the analysis was 0.4 meters/second (0.9 miles/hour). Conservatively assuming the use of the lowest wind speed category in the calculation over the entire distance of transport, this would correspond to maximum travel times that would range from approximately 1.8 to 5.5 hours. These travel times are both feasible and consistent with the use of a straight-line trajectory dispersion model in a flow regime where terrain variations are minimal.

Associated LNP COL Application Revisions:

The third paragraph of FSAR Section 2.3.5.2 "Calculations" will be revised to read as follows:

"Based on the location of LNP 1 and LNP 2 with respect to surrounding topography, the atmospheric diffusion parameter, sigma z, is not expected to be significantly influenced by topographical conditions. Therefore, no modifications were made to this atmospheric dispersion parameter. The site is also located approximately 12.8 km (7.9 mi.) from the Gulf of Mexico and the regime of horizontal or vertical dispersion is not expected to be influenced by internal thermal boundary layer effects attributable to the land-sea interface.

The distances that were used in the calculations using the XOQDOQ model ranged from a minimum of 2576 meters (1.6 miles) to a maximum of 8049 meters (5 miles), as described in Table 2.3.5-201. The wind speed associated with the lowest wind speed category used in the analysis was 0.4 meters/second (0.9 miles/hour) as described in Section 2.3.2.1.1. The use of the lowest wind speed category in the calculation over the entire distance of transport

corresponds to maximum travel times in the range of approximately 1.8 to 5.5 hours. While there is a sea-breeze driven diurnal variation in wind directions that is evident in the meteorological observations (with predominant east-west directions), these travel times are both feasible and consistent with the use of the XOQDOQ straight line trajectory dispersion model in this application."

Attachments/Enclosures:

None.