Progress Energy

Serial: NPD-NRC-2011-026
March 25, 2011

10 CFR 52.79

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. 098 RELATED TO SHORT TERM ATMOSPHERIC DISPERSION ESTIMATES FOR ACCIDENT RELEASES

Reference: Letter from Brian C. Anderson (NRC) to John Elnitsky (PEF), dated January 26, 2011, "Request for Additional Information Letter No. 098 Related to SRP Section 2.3.4 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 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 (727) 820-4481.

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

Executed on March 25, 2011.

Sincerely,

John Elnitsky
Vice President
New Generation Programs & Projects

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
St. Petersburg, FL 33733

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NRO

Levy Nuclear Plant Units 1 and 2
Response to NRC Request for Additional Information Letter No. 098 Related to SRP Section 2.3.4 for the Combined License Application, dated January 26, 2011

NRC RAI #	Progress Energy RAI #	Progress Energy Response
02.03.04-4	L-0880	Response enclosed – see following pages
02.03.04-5	L-0881	Response enclosed – see following pages

NRC Letter No.: LNP-RAI-LTR-098

NRC Letter Date: January 26, 2011

NRC Review of Final Safety Analysis Report

NRC RAI NUMBER: 02.03.04-4

Text of NRC RAI:

NUREG-0800, Section 2.3.4 and Regulatory Guide 1.145, Revision 1, provide guidance on the methodology that is acceptable to determine the 0.5% maximum sector x/Q and the 5% direction independent x/Q values. These values are discussed in FSAR Section 2.3.4 and are presented in FSAR Table 2.3.4-201. FSAR Table 2.3.4-205 also presents the 50% EAB and LPZ x/Q values.

The staff recognizes that the 50% x/Q values presented in FSAR Table 2.3.4-205 are also included as part of the Environmental Report in ER Table 2.7-57. The 50% x/Q values appear to be included in the FSAR for informational purposes only. They are not used for comparison against any AP1000 site parameter values and they are not used in any dose analyses presented in the FSAR. The staff therefore requests that the discussion of the 50% x/Q values in FSAR Section 2.3.4 and FSAR Table 2.3.1-205 be removed in the next revision of the FSAR, or justify why this information should remain.

PGN RAI ID #: L-0880

PGN Response to NRC RAI:

The 50% χ/Q values in FSAR Chapter 2.3.4 were originally included in the FSAR because they were determined using information developed in the PAVAN calculations for FSAR Chapter 2.3.4. The 50% χ/Q values are not used in the FSAR's evaluations. Therefore, the discussion of the 50% χ/Q values will be removed from FSAR Chapter 2.3.4 including FSAR Table 2.3.4-205.

Associated LNP COL Application Revisions:

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

1. Delete FSAR Chapter 2.3.4.2, 1st paragraph, last sentence. Delete the following text:

   "In addition, 50-percent direction independent values were determined for use in the environmental report evaluations."

2. Delete FSAR Chapter 2.3.4.3, entire 2nd paragraph. Delete the following text:

   "The 50-percent EAB and LPZ Chi/Q values were determined from the PAVAN output and by logarithmic interpolation. The conservative reported 0- to 2-hour 50-percent values at the EAB and LPZ without building wake are 7.81E-05 seconds per cubic meter (sec/m3) and 1.96E-05 sec/m3, respectively. The remaining values for the longer time periods for the LPZ are determined using the 0- to 2-hour 50-percent LPZ value and the LPZ average annual value of 4.79E-07 sec/m3 from the PAVAN output by logarithmic interpolation at the intermediate time periods of 8 hours, 16 hours, 72 hours, and 624 hours. The values are shown in Table 2.3.4-205."

3. Delete FSAR Table 2.3.4-205 in entirety. There is no replacement.

Attachments/Enclosures:

None.

NRC Letter No.: LNP-RAI-LTR-098

NRC Letter Date: January 26, 2011

NRC Review of Final Safety Analysis Report

NRC RAI NUMBER: 02.03.04-5

Text of NRC RAI:

The staff requests that the applicant update the χ/Q analysis in FSAR Section 2.3.4 to follow the guidance provided in RG 1.145, Revision 1, as discussed below, or provide justification as to why this is not necessary.

10 CFR 52.79(a)(1)(vi) requires that offsite radiological consequences of design-basis accidental releases be evaluated in a COL application at the EAB and LPZ. NUREG-0800, Section 2.3.4 and Regulatory Guide 1.145, Revision 1, provide guidance on the methodology that is acceptable for determining the 0.5% maximum sector χ/Q and the 5% direction independent χ/Q values that are used in the EAB and LPZ design-basis accident dose analyses.

The method used by the applicant to determine the EAB and LPZ 0-2 hour maximum sector χ/Q values is in accordance with the guidance provided in Section C.2.1.1 of RG 1.145. That is, the applicant used the PAVAN computer code to (1) plot χ/Q values versus probability of being exceeded in each downwind sector, (2) draw a smooth curve to form an upper bound of the computed points, and (3) select a χ/Q value that is exceeded 0.5 percent of the total number of hours in the data set. However, the minimum wind speed used in the applicant's analysis (1.0 m/s) does not follow the guidance provided in Section C.1.1.1 of RG 1.145, which states that if the meteorological instrumentation conforms to RG 1.23 (i.e., if the wind sensors have a starting threshold less than 0.45 m/s) then calms should be assigned a windspeed equal to the vane or anemometer starting speed, whichever is higher. The applicant's wind instrumentation conforms to this RG 1.23 criterion because FSAR Table 2.3.3-202 shows that the starting threshold for the wind speed and direction sensors less than 0.45 m/s.

The applicant states in its responses to RAIs 02.03.02-1 and 02.03.03-5 that the high frequency of light winds (18.8% calm conditions) recorded at the lower (10-meter) level during the period February 1, 2007 through January 31, 2008 is considered to be valid and representative of the conditions at the project site. RG 1.23 defines starting threshold as the minimum wind speed above which the measuring instrument is performing within its minimum specification. FSAR Table 2.3.3-202 shows that the wind speed instrument accuracy at low wind speeds is ±0.2 m/s. This means the actual wind speed recorded as "calm" conditions by the applicant's wind instrumentation is 0.65 m/s or less. Therefore the staff does not understand the applicant's assumption in generating the EAB and LPZ 0-2 hour χ/Q values that all calm wind observations are assigned a value of 1.0 m/s instead of 0.45 m/s as suggested by RG 1.145.

The staff notes that Regulatory Position C.2.1.1 of RG 1.145, which describes a general method for calculating maximum sector 0.5% X/Q values for the EAB, states that "a smooth curve should be drawn to form an upper bound of the computed points." The staff observes that PAVAN, in its implementation of this guidance, will sometimes generate a smooth curve which, in fact, bounds all computed points, but which also results in a calculation of a 0.5% value which is greater than the X/Q value which would be calculated for the lowest windspeed (e.g., an instrument starting speed of 0.45 m/s) and most stable stability class (i.e., class G). Since this is not realistic, for each sector, it is an acceptable approach to select the smaller of the 0.5% value calculated by PAVAN, or the value which would be calculated for the starting windspeed and G-class stability.

PGN RAI ID #: L-0881

PGN Response to NRC RAI:
An update to the χ/Q analysis in LNP FSAR Section 2.3.4 is provided to address calm conditions as defined in RG 1.145. The update uses meteorology data for the same period from February 1, 2007 to January 31, 2009 as previously used in the FSAR analyses. Changes made in re-analysis of the calms include: (1) use of maximum possible sector-dependent 2 hour χ/Qs instead of extrapolated 0.5% sector-dependent χ/Qs from PAVAN; (2) revision of the joint frequency windspeed distribution to include lower windspeeds to represent calms in accordance with meteorology instrumentation limits; (3) revision to the 2 hour χ/Qs calculated at the EAB and LPZ boundaries; and (4) revision of the LPZ χ/Qs for time intervals.

Sector-Dependent χ/Qs

The Chapter 2.3.4 updated analysis of short-term accident χ/Q uses the maximum possible 2 hour χ/Q in a sector instead of a PAVAN-extrapolated value to determine sector-dependent χ/Qs.

Regulatory Guide 1.145, regulatory positions C 2.1.1 and C 2.2.1, recommend that an ensemble of 2 hour χ/Qs be calculated for each windspeed-stability class combination in a sector. Next, the 2 hour χ/Qs are ordered by frequency of occurrence and a cumulative probability distribution is constructed for the probability of exceeding the χ/Q values in each sector for all time. PAVAN constructs an envelope curve of straight-line segments through the cumulative distribution's points in each sector. The sector envelope tails toward large χ/Q values at essentially negligible probabilities. PAVAN then interpolates or extrapolates on the enveloping curve to obtain the sector's χ/Q that is exceeded 0.5% of all time. This value is then selected by PAVAN as the 0.5% sector-dependent 2 hour χ/Q.

Two problems can occur when estimating the 0.5% sector-dependent χ/Q when a large number of calms exist. First, the enveloping curve may not provide a reasonable estimate of the 0.5% point. The enveloping curve is constructed from straight-line segments between χ/Q's near the end of the curve. However, at this location on the curve the χ/Qs are larger in value (due to the low windspeed and the stable nature of calms) and the associated frequencies are often large (due to the assignment of calms to the lowest windspeed). The envelope can be sensitive to the relatively large frequencies and χ/Q values used to construct the envelope. Second, the 0.5% sector-dependent χ/Q may be determined by extrapolating well beyond the last χ/Q datum on the envelope. In this case, there is no guarantee that the extrapolated χ/Q value is reasonable or valid.

The updated analysis uses the maximum possible sector-dependent 2 hour χ/Q instead of an extrapolated sector-dependent χ/Q value. The maximum possible sector-dependent 2 hour χ/Q typically occurs for calms under very stable (class G) conditions with low windspeeds (0.4 m/s

or less). The maximum possible sector-dependent χ/Q is assigned whenever the PAVAN-extrapolated 0.5% sector-dependent χ/Q is larger than the maximum possible sector-dependent χ/Q and calm conditions are known to occur within the sector. The PAVAN calculated 0.5% sector-dependent value is retained when the value is interpolated from the set of sector χ/Qs because it will be less than the maximum possible sector-dependent χ/Q in the sector.

Direction Independent χ/Qs

Use of the maximum possible sector-dependent χ/Q makes the direction independent dispersion analysis largely moot because this analysis also relies on a χ/Q-probability extrapolation that will exceed the maximum possible χ/Q in the site's sectors.

The 5% direction independent 2 hour χ/Q is bounded by the maximum possible sector-dependent χ/Qs. The direction independent χ/Q evaluation uses the same windspeed-stability class combinations as the sector-dependent calculations. Because of the large frequency of calm conditions, PAVAN will extrapolate to a 5% χ/Q that is greater than the maximum possible sector-dependent χ/Q. However, the 5% direction independent χ/Q must be less than the maximum possible sector-dependent χ/Q, i.e., 5% of the χ/Q distribution has to lie between the direction independent χ/Q and the maximum possible sector-dependent χ/Q. Therefore, the maximum possible sector dependent χ/Q will also bound the direction independent χ/Q values.

Windspeed and Stability Conditions

Calm wind conditions are defined as the hourly average windspeed that is less than the vane or anemometer starting speeds consistent with Regulatory Guide 1.145, regulatory position C 1.1. The starting threshold windspeed is specified by the equipment manufacturer as 0.4 m/s for the Levy site meteorology tower instruments. The windspeed categories and maximum windspeeds within each category used in the updated analysis are:

Windspeed Categories
0.4 m/s
0.5 m/s
1.0 m/s
1.5 m/s
2.0 m/s
3.0 m/s
4.0 m/s
5.0 m/s
6.0 m/s
8.0 m/s
10.0 m/s
15.0 m/s

Calm wind conditions recorded at LNP for the period from February 1, 2007 to January 31, 2009 are tabulated below by stability class. The calm wind directions are assigned in proportion to the directional distribution of non-calm windspeeds less than 1.5 m/s as recommended in Regulatory Guide 1.145, regulatory position C 1.1. The assignment of calms to the joint frequency, windspeed and stability class distribution is made automatically by PAVAN.

Stability Class	No. of Recorded Hours
A	0
B	0
C	1
D	49
E	227
F	643
G	2303

Exclusion Area Boundary χ/Qs

Seven sectors have extrapolated 2 hour sector-dependent χ/Qs that exceed the sector's maximum possible value. These sector-dependent χ/Qs are assigned the value of the maximum possible χ/Q in the sector. This χ/Q value corresponds to a calm condition with stability class G, a windspeed of 0.4 m/s and an EAB radius of 1340 m. Calculations with and without building wake effects were considered.

LNP FSAR Table 2.3.4-203 (Revised) gives the χ/Qs by sector and shows that the maximum possible χ/Q of 5.08 E-04 sec/m^3 is assigned to seven sectors. LNP FSAR Table 2.3.4-201 (Revised) shows that the worst-case sector-dependent χ/Q meets the AP1000 acceptance criteria of 5.1 x 10^{-4} sec/m^3 in DCD Table 15A-5 at the EAB.

Low Population Zone χ/Qs

No building wake effects were accounted for in the predicted LPZ dispersion values. Building wake effects would have a negligible effect on the 2 hour χ/Qs but would decrease the annual average χ/Qs by a small amount (typically 15% at LNP) compared to no building wake credit. Therefore, the no building wake case is considered a bounding assumption for determining the LPZ χ/Qs.

Seven of sixteen of the sector-dependent 2 hour χ/Qs exceed the maximum possible χ/Q of 1.77E-04 sec/m^3. The maximum possible χ/Q is for an LPZ distance of 4830 m with stability class G and 0.4 m/s conditions within these sectors. The 2 hour χ/Qs are adjusted to the maximum possible χ/Q value in these seven sectors.

The annual average χ/Qs at the LPZ are calculated directly from the frequencies, stability classes and windspeeds in PAVAN. There is no extrapolation or envelope fitting, and the sector averages are used from PAVAN without adjustment.

The χ/Qs for the 0-8 hour, 8-24 hour, 24-96 hour and 96-720 hour intervals are re-calculated using the logarithmic interpolation between the sector-dependent 2 hour χ/Qs and annual average (8760 hour) χ/Qs described in Regulatory Guide 1.145, regulatory position C 2.2.1.

The sector-dependent 2 hour χ/Qs and annual average χ/Qs are shown in FSAR Table 2.3.4-204 (Revised). Also shown are revised LPZ interval averaged χ/Qs.

LNP FSAR Table 2.3.4-201 (Revised) shows that the worst-case sector χ/Qs meet the AP1000 acceptance criteria in DCD Table 15A-5 at the LPZ.

Associated LNP COL Application Revisions:

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

1. Revise text in Chapter 2.3.4.1, 1st paragraph. Change text from:

   Conservative estimates of the local atmospheric dilution factors (Chi/Q) for LNP 1 and LNP 2 were made using an atmospheric dispersion model and on-site meteorological data for the period from February 1, 2007, through January 31, 2009. These data were prepared using 11 wind speed categories (including a calm wind category) and these data were formatted for use in NRC's PAVAN dispersion model. The wind speed categories are the same as recommended in NRC Regulatory Guide 1.23, Revision 1, with the exception that the first two non-calm categories (i.e., less than or equal to 0.5 and 0.5 – 1.0 m/s) were combined and assigned to a category of 1.0 – 1.05 m/s, and all wind speeds below the manufacturer's stated instrument threshold wind speed were included in the less than 1.0 m/s wind speed category. This is an exception to NRC Regulatory Guide 1.23, Revision 1, which provides guidance for the use of 11 wind speed categories (plus calms). This change was made in recognition of an unusually high frequency of occurrence of observed light winds at the LNP site. While almost no true "calm" winds were observed (i.e., no detectable wind speed) during the period of record, approximately 19 percent of all observed winds at the lower wind speed sensor were observed to be in the range of greater than 0 to less than 1.0 m/s.

   To Read:

   Conservative estimates of the local atmospheric dilution factors (Chi/Q) for LNP 1 and LNP 2 were made using an atmospheric dispersion model and on site meteorological data for the period from February 1, 2007, through January 31, 2009. These data were prepared using 12 wind speed categories (including a calm wind category) and these data were formatted for use in NRC's PAVAN dispersion model. The wind speed categories are the same as recommended in NRC Regulatory Guide 1.23, Revision 1, except for the addition of a 0.4 m/s category for calms. The 0.4 m/s limit for this category corresponds to the manufacturer's stated instrument threshold wind speed. This is an exception to NRC Regulatory Guide 1.23, Revision 1, which provides guidance for the use of 11 wind speed categories (plus calms). This change was made because of the high frequency of observed light winds at the LNP site and the low starting speed of the instrumentation. While almost no true "calm" winds were observed (i.e., no detectable wind speed) during the period of record, approximately 19 percent of all observed winds were assigned to the lowest wind speed category.

2. Revise text in Chapter 2.3.4.2, 1st paragraph. Delete the last two sentences in the paragraph, which currently read as follows:

   The maximum predicted Chi/Q values were determined in accordance with guidance provided in NRC Regulatory Guide 1.145 for the 0.5 percent maximum sector Chi/Q and the 5 percent direction independent value. In addition, 50 percent direction independent values were determined for use in the environmental report evaluations.

3. Add text to Chapter 2.3.4.2 after 1st paragraph. Add the following:

   The maximum predicted Chi/Q values were determined in accordance with guidance provided in NRC Regulatory Guide 1.145 for the 0.5 percent maximum sector Chi/Q and the 5 percent direction independent Chi/Q. Regulatory Guide 1.145 recommends that the set of 2 hour Chi/Qs be calculated for each windspeed-stability class combination. Next, the set of 2 hour Chi/Qs are ordered by frequency of occurrence and a cumulative probability

distribution is constructed for each sector or for the entire site depending on the analysis. PAVAN, in its implementation of Regulatory Guide 1.145, interpolates or extrapolates the distributions to determine the Chi/Q value that occurs 0.5 percent of all time in each sector. This process can result in unreasonable Chi/Qs when extrapolations are made, especially with a large number of calms.

To establish more representative Chi/Q values, the maximum possible Chi/Q is assigned as the sector value whenever the PAVAN-extrapolated 0.5 percent sector-dependent Chi/Q is larger than the maximum possible Chi/Q. The maximum possible 2 hour Chi/Q is the largest value calculated for the recorded meteorological conditions in the sector. This occurs for calm conditions at very stable, class G, conditions with windspeeds of 0.4 m/s or less. The PAVAN model calculated 0.5 percent sector-dependent value is retained when the value is interpolated from the set of sector Chi/Qs. A 0.5% interpolated Chi/Q value will always be less than the maximum possible Chi/Q in the sector.

A similar analysis is performed at 5-percent for the direction independent Chi/Q around the entire site. However, the maximum possible Chi/Q will also be bounding for the 5-percent direction independent Chi/Q.

4. Revise 4th bulleted text item in Chapter 2.3.4.2. Change text from:

   - Number of Wind Speed Categories: 11 (including calm category)

   To Read:

   - Number of Wind Speed Categories: 12 (including calm category)

5. FSAR Tables 2.3.4-201, 2.3.4-202, 2.3.4-203, and 2.3.4-204 will be replaced with the revised tables shown below.

   Replace FSAR Table 2.3.4-201 with the following:

(REVISED)

Table 2.3.4-201

Predicted LNP 1 and LNP 2 Chi/Q Values Location and Averaging Period	AP1000 DCD Acceptance Criteria Chi/Q	LNP 1 and LNP 2 Maximum Predicted Chi/Q[(a)]
Exclusion Area Boundary		
0 – 2 hr.	$\leq 5.1 \times 10^{-4}$ sec/m^3	5.08×10^{-4} sec/m^3
Low Population Zone		
0 – 8 hr.	$\leq 2.2 \times 10^{-4}$ sec/m^3	9.70×10^{-5} sec/m^3
8 – 24 hr.	$\leq 1.6 \times 10^{-4}$ sec/m^3	7.19×10^{-5} sec/m^3
24 – 96 hr.	$\leq 1.0 \times 10^{-4}$ sec/m^3	3.75×10^{-5} sec/m^3
96 – 720 hr.	$\leq 8.0 \times 10^{-5}$ sec/m^3	1.48×10^{-5} sec/m^3

Notes:

a) Maximum predicted Chi/Q values occurred in the WSW sector for EAB and LPZ.

Chi/Q = atmospheric dilution factor
EAB = exclusion area boundary
LPZ = low population zone
sec/m^3 = second per cubic meter
hr. = hour

Replace LNP FSAR Table 2.3.4-202 (all 7 sheets) with the following:

(REVISED)

Table 2.3.4-202 (Sheet 1 of 7)
Meteorological Input Data for PAVAN Model
Levy Nuclear Plant Meteorological Monitoring Station
Period of Record: February 1, 2007, to January 31, 2009 (Lower Elevation)

Wind Speed (m/s)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
Class A																
≤0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
≤0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
≤1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
≤1.5	0	1	0	2	1	0	1	1	0	1	0	3	2	4	1	0
≤2.0	4	2	2	4	4	0	3	2	3	1	1	5	2	5	6	0
≤3.0	8	22	16	15	18	9	3	4	2	5	20	21	30	12	11	17
≤4.0	8	11	30	34	28	11	3	8	7	6	43	106	98	11	13	19
≤5.0	3	9	11	35	42	13	0	1	3	18	38	77	53	4	6	14
≤6.0	0	0	7	18	19	1	0	0	3	6	11	19	32	2	0	0
≤8.0	0	0	0	4	6	0	0	0	0	1	1	1	10	2	0	0
≤10.0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0
≤15.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(REVISED)

Table 2.3.4-202 (Sheet 2 of 7)
Meteorological Input Data for PAVAN Model
Levy Nuclear Plant Meteorological Monitoring Station
Period of Record: February 1, 2007 to January 31, 2009 (Lower Elevation)

Wind Speed (m/s)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
Class B																
≤0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
≤0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
≤1.0	0	0	2	0	1	0	0	0	0	0	0	1	0	0	0	0
≤1.5	4	4	5	5	2	0	1	2	4	1	0	2	3	1	3	4
≤2.0	3	11	9	12	8	4	2	8	5	2	3	5	5	6	5	8
≤3.0	20	21	41	25	34	16	16	16	2	9	33	39	54	15	24	23
≤4.0	18	21	34	49	59	34	14	6	7	7	34	70	72	5	9	12
≤5.0	6	8	23	25	29	6	2	0	1	10	8	19	32	4	1	5
≤6.0	0	1	10	11	4	3	0	0	2	6	2	3	4	0	0	0
≤8.0	0	0	0	2	0	1	0	0	0	5	0	0	4	2	0	0
≤10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
≤15.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(REVISED)

Table 2.3.4-202 (Sheet 3 of 7)
Meteorological Input Data for PAVAN Model
Levy Nuclear Plant Meteorological Monitoring Station
Period of Record: February 1, 2007 to January 31, 2009 (Lower Elevation)

Wind Speed (m/s)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
Class C																
≤0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
≤0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
≤1.0	3	1	0	0	0	0	1	1	0	0	0	1	1	2	3	2
≤1.5	7	7	6	7	11	3	4	4	6	10	4	6	8	7	7	7
≤2.0	9	22	10	14	18	15	12	8	10	9	11	14	12	11	6	16
≤3.0	30	37	39	53	55	24	23	14	18	16	37	53	77	22	13	22
≤4.0	8	14	43	52	49	24	11	13	10	13	19	53	74	3	3	9
≤5.0	2	8	21	27	29	11	3	2	2	8	11	14	18	1	0	4
≤6.0	0	2	6	7	6	1	0	0	3	10	4	0	3	0	0	1
≤8.0	0	0	0	2	1	0	0	0	0	3	0	1	1	0	0	0
≤10.0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
≤15.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(REVISED)

Table 2.3.4-202 (Sheet 4 of 7)
Meteorological Input Data for PAVAN Model
Levy Nuclear Plant Meteorological Monitoring Station
Period of Record: February 1, 2007 to January 31, 2009 (Lower Elevation)

Wind Speed (m/s)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
Class D																
≤0.4	4	3	4	3	3	2	3	3	3	3	4	4	3	2	3	2
≤0.5	0	1	0	0	3	1	0	1	2	1	3	0	1	1	2	1
≤1.0	23	10	18	16	22	14	13	12	15	17	15	17	10	9	12	8
≤1.5	40	36	39	26	24	22	31	25	30	20	37	37	27	26	34	27
≤2.0	50	54	80	60	73	31	31	21	17	28	42	52	61	35	34	35
≤3.0	102	112	197	196	142	94	51	32	48	59	73	147	198	44	32	54
≤4.0	42	73	127	118	113	46	40	18	22	68	39	95	83	11	24	25
≤5.0	19	30	50	69	52	25	10	8	27	48	27	29	24	12	8	7
≤6.0	0	1	13	20	22	9	1	1	12	27	12	11	18	2	0	3
≤8.0	0	0	1	0	4	1	0	0	4	11	8	9	10	1	0	0
≤10.0	0	0	0	0	0	0	0	0	0	1	1	0	4	0	0	0
≤15.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(REVISED)

Table 2.3.4-202 (Sheet 5 of 7)
Meteorological Input Data for PAVAN Model
Levy Nuclear Plant Meteorological Monitoring Station
Period of Record: February 1, 2007 to January 31, 2009 (Lower Elevation)

Wind Speed (m/s)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
Class E																
≤0.4	8	19	27	29	26	17	15	12	9	7	11	11	10	11	8	6
≤0.5	6	5	5	4	3	2	4	4	4	3	3	2	3	3	5	2
≤1.0	21	60	72	72	62	42	56	53	28	25	34	37	35	52	39	17
≤1.5	34	82	133	147	133	83	53	35	38	26	47	49	39	32	21	27
≤2.0	40	51	127	134	126	58	46	14	38	19	19	31	32	15	28	30
≤3.0	61	82	101	123	131	62	42	17	30	34	9	22	26	12	35	30
≤4.0	8	15	11	17	23	10	3	1	17	6	3	12	7	2	4	8
≤5.0	1	0	3	5	1	3	1	2	6	1	0	3	1	5	1	2
≤6.0	0	0	0	0	0	0	0	0	1	0	0	2	0	0	0	0
≤8.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
≤10.0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
≤15.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(REVISED)

Table 2.3.4-202 (Sheet 6 of 7)
Meteorological Input Data for PAVAN Model
Levy Nuclear Plant Meteorological Monitoring Station
Period of Record: February 1, 2007 to January 31, 2009 (Lower Elevation)

Wind Speed (m/s)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
Class F																
≤0.4	30	38	66	136	117	50	29	25	18	17	20	13	19	23	22	21
≤0.5	5	8	6	18	8	7	8	7	8	8	3	1	4	7	7	1
≤1.0	21	34	74	109	100	40	32	28	16	16	22	14	25	29	20	19
≤1.5	29	26	39	119	103	43	12	10	8	7	11	9	6	5	13	18
≤2.0	15	10	5	31	44	14	3	2	2	0	1	2	2	1	2	10
≤3.0	1	2	0	0	7	1	0	0	1	2	3	1	3	0	1	0
≤4.0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0
≤5.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
≤6.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
≤8.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
≤10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
≤15.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(REVISED)

Table 2.3.4-202 (Sheet 7 of 7)
Meteorological Input Data for PAVAN Model
Levy Nuclear Plant Meteorological Monitoring Station
Period of Record: February 1, 2007 to January 31, 2009 (Lower Elevation)

Wind Speed (m/s)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
Class G																
≤0.4	105	59	180	607	535	213	102	79	62	33	20	20	36	49	118	85
≤0.5	5	1	16	36	34	6	7	7	6	0	3	1	3	5	6	2
≤1.0	19	15	32	107	97	49	22	14	11	9	2	4	5	8	27	16
≤1.5	8	2	7	42	32	10	2	3	2	1	1	1	3	2	3	8
≤2.0	3	0	0	5	3	2	0	0	0	1	0	0	0	0	1	1
≤3.0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
≤4.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
≤5.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
≤6.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
≤8.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
≤10.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
≤15.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Notes:

a) Data representative of hours of occurrence by direction and wind speed category.

b) Clams are distributed into lowest windspeed category by PAVAN for recorded calm hours in stability classes C to G: class C – 1 hr; class D – 49 hr; Class E – 227 hr; class F – 643 h; class G – 2303 hr.

Wind direction: E = east; N = north; S = south; W = west

m/s = meters per second

Replace LNP FSAR Table 2.3.4-203 with the following:

(REVISED)

Table 2.3.4-203
0- to 2-Hour 5th Percentile Exclusion Area Boundary Chi/Q Values for LNP 1 and LNP 2

Downwind Sector [a]	Distance (m)	Distance (ft.)	0-2 hr. Chi/Q with Wake (sec/m^3)	0-2 hr. Chi/Q without Wake sec/m^3)
S	1340	4396	5.08E-04	5.08E-04
SSW	1340	4396	3.67E-04	3.67E-04
SW	1340	4396	5.08E-04	5.08E-04
WSW	1340	4396	5.08E-04	5.08E-04
W	1340	4396	5.08E-04	5.08E-04
WNW	1340	4396	5.08E-04	5.08E-04
NW	1340	4396	5.08E-04	5.08E-04
NNW	1340	4396	4.52E-04	4.52E-04
N	1340	4396	3.27E-04	3.27E-04
NNE	1340	4396	1.52E-04	1.52E-04
NE	1340	4396	1.32E-04	1.32E-04
ENE	1340	4396	1.11E-04	1.11E-04
E	1340	4396	1.87E-04	1.87E-04
ESE	1247	4091	2.97E-04	2.97E-04
SE	1340	4396	5.08E-04	5.08E-04
SSE	1340	4396	4.96E-04	4.96E-04
MAX Chi/Q			5.08E-04	5.08E-04

Notes:

Predictions based on PAVAN model as described in FSAR Subsection 2.3.4.2.

a) Downwind Sector: E = east; N = north; S = south; W = west

Chi/Q = atmospheric dilution factor

ft. = foot
m = meter
sec/m^3 = second per cubic meter

Replace LNP FSAR Table 2.3.4-204 with the following:
(REVISED)

Table 2.3.4-204
0- to 30-Day 5th Percentile Low Population Zone Chi/Q Values for LNP 1 and LNP 2

Downwind Sector	Distance (m)	Distance (mi.)	0-8 hr. Chi/Q without Wake (sec/m^3)	8-24 hr. Chi/Q without Wake (sec/m^3)	1-4 days Chi/Q without Wake (sec/m^3)	4-30 days Chi/Q without Wake (sec/m^3)
S	4830	3	7.41E-05	4.80E-05	1.87E-05	4.83E-06
SSW	4830	3	4.82E-05	3.19E-05	1.30E-05	3.60E-06
SW	4830	3	8.22E-05	5.61E-05	2.44E-05	7.43E-06
WSW	4830	3	9.70E-05	7.19E-05	3.75E-05	1.48E-05
W	4830	3	9.50E-05	6.97E-05	3.56E-05	1.35E-05
WNW	4830	3	8.21E-05	5.60E-05	2.44E-05	7.40E-06
NW	4830	3	7.40E-05	4.79E-05	1.87E-05	4.82E-06
NNW	4830	3	6.21E-05	4.00E-05	1.54E-05	3.89E-06
N	4830	3	4.27E-05	2.79E-05	1.11E-05	2.96E-06
NNE	4830	3	1.99E-05	1.35E-05	5.78E-06	1.71E-06
NE	4830	3	1.67E-05	1.14E-05	4.93E-06	1.49E-06
ENE	4830	3	1.34E-05	9.31E-06	4.20E-06	1.34E-06
E	4830	3	2.41E-05	1.63E-05	6.97E-06	2.06E-06
ESE	4830	3	3.44E-05	2.27E-05	9.28E-06	2.56E-06
SE	4830	3	7.43E-05	4.82E-05	1.89E-05	4.91E-06
SSE	4830	3	6.90E-05	4.39E-05	1.64E-05	3.99E-06

Notes:

Predictions based on PAVAN model as described in FSAR Subsection 2.3.4.2.

Period of Record of meteorological data is from February 1, 2007, to January 31, 2009.

Chi/Qs without wake bound (are greater than or equal to) Chi/Qs with wake allowance.

Downwind sector: E = east; N = north; S = south; W = west

Chi/Q = atmospheric dilution factor

hr. = hour
m = meter
mi. = mile
sec/m^3 = seconds per cubic meter

6. Revise text on FSAR Table 2.0-201, sheet 8 of 9. Change text from:

	AP 1000 DCD Site Parameters	LNP Site Characteristics	LNP Site Characteristics Reference	Bounding Yes/No
Atmospheric Dispersion Values X/Q (f)				
Site Boundary (0-2 hours)_	$\leq 5.1 \times 10^{-4}$ sec/m^3	2.56×10^{-4} sec/m^3	Table 2.3.4-201	Yes
Site Boundary (annual average)	$\leq 2.0 \times 10^{-6}$ sec/m^3	1.52×10^{-6} sec/m^3	Table 2.3.4-205	Yes
Low Population zone boundary				Yes
0-8 hours	$\leq 2.2 \times 10^{-4}$ sec/m^3	4.44×10^{-6} sec/m^3	Table 2.3.4-201	Yes
8-24 hours	$\leq 1.6 \times 10^{-4}$ sec/m^3	3.18×10^{-6} sec/m^3	Table 2.3.4-201	Yes
24-96 hours	$\leq 1.0 \times 10^{-4}$ sec/m^3	1.54×10^{-6} sec/m^3	Table 2.3.4-201	Yes
96-720 hours	$\leq 8.0 \times 10^{-5}$ sec/m^3	5.44×10^{-6} sec/m^3	Table 2.3.4-201	Yes
Population Distribution				
Exclusion area (site)	0.5 miles	The minimum distance from the effluent release boundary to the exclusion area boundary is 1340 m (4396 ft. or 0.83 mi.)	FSAR Subsection 2.1.1.2	Yes

to read:

	AP 1000 DCD Site Parameters	LNP Site Characteristics	LNP Site Characteristics Reference	Bounding Yes/No
Atmospheric Dispersion Values X/Q (f)				
Site Boundary (0-2 hours)_	$\leq 5.1 \times 10^{-4}$ sec/m^3	5.08×10^{-4} sec/m^3	Table 2.3.4-201	Yes
Site Boundary (maximum annual average)	$\leq 2.0 \times 10^{-6}$ sec/m^3	1.90×10^{-6} sec/m^3	Table 2.3.5-201	Yes
Low Population zone boundary				Yes
0-8 hours	$\leq 2.2 \times 10^{-4}$ sec/m^3	9.70×10^{-6} sec/m^3	Table 2.3.4-201	Yes
8-24 hours	$\leq 1.6 \times 10^{-4}$ sec/m^3	7.19×10^{-6} sec/m^3	Table 2.3.4-201	Yes
24-96 hours	$\leq 1.0 \times 10^{-4}$ sec/m^3	3.75×10^{-6} sec/m^3	Table 2.3.4-201	Yes
96-720 hours	$\leq 8.0 \times 10^{-5}$ sec/m^3	1.48×10^{-6} sec/m^3	Table 2.3.4-201	Yes
Population Distribution				
Exclusion area (site)	0.5 miles	The minimum distance from the effluent release boundary to the exclusion area boundary is 1340 m (4396 ft. or 0.83 mi.), except for LNP 1's ESE sector which has a minimum distance of 1247 m (4091 ft. or 0.77 mi.).	FSAR Subsection 2.1.1.2	Yes

7. Revise Note (g) on FSAR Table 2.0-201, sheet 9 of 9. Change text from:

> g) Exclusion area (site) for the LNP is defined as two overlapping circles centered on the reactor building of each unit. The radius of each circle is 1340 m (4396 ft.). The overall shape of the LNP exclusion area boundary is defined by the outermost boundary of each unit's circle. The EAB for LNP 1 was modified in the southeast direction. Atmospheric dilution factor (Chi/Q) calculations support the modification of the EAB to follow the property line in this quadrant.

to read:

> g) Exclusion area (site) for the LNP is defined as two overlapping circles centered on the reactor building of each unit. The radius of each circle is 1340 m (4396 ft.). The overall shape of the LNP exclusion area boundary is defined by the outermost boundary of each unit's circle. The EAB for LNP 1 was modified in the east-southeast direction. Atmospheric dilution factor (Chi/Q) calculations support the modification of the EAB to follow the property line in the east-southeast sector.

Attachments/Enclosures:

None.