Progress Energy

Serial: NPD-NRC-2009-062
April 6, 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
DOCKET NOS. 52-029 AND 52-030
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 018 RELATED TO SHORT TERM ATMOSPHERIC DISPERSION ESTIMATES FOR ACCIDENT RELEASES

Reference: Letter from Brian C. Anderson (NRC) to Garry Miller (PEF), dated March 6, 2009, "Request for Additional Information Letter No. 018 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 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 6, 2009.

Sincerely,

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 C. 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. 018 Related to SRP Section 2.3.4 for the Combined License Application, dated March 6, 2009

NRC RAI #	Progress Energy RAI #	Progress Energy Response
02.03.04-1	L-0035	Response enclosed – see following pages
02.03.04-2	L-0036	Response enclosed – see following pages
02.03.04-3	L-0037	Response enclosed – see following pages

NRC Letter No.: LEVY-RAI-LTR-018

NRC Letter Date: March 6, 2009

NRC Review of Final Safety Analysis Report

NRC RAI #: 02.03.04-1

Text of NRC RAI:

The staff has found that the Receptor Location directions used for the ARCON96 evaluation and listed in FSAR Table 2.3.4-207 are incorrect. It appears that the plant layout was rotated by 45 degrees in the wrong direction with respect to "plant north" and "true north." The angle of the source to receptor was also measured incorrectly. According to NUREG/CR-6331, "Atmospheric Relative Concentrations in Building Wakes" and Table A-2 of Regulatory Guide 1.194, "Atmospheric Relative Concentrations for Control Room Radiological Habitability Assessments at Nuclear Power Plants," the angle should be measured from the receptor to the release point.

Please update FSAR Tables 2.3.4-206 and 2.3.4-207. Also, make any necessary changes to the discussion in FSAR Section 2.3.4.4 "Control Room Diffusion Estimates."

PGN RAI ID #: L-0035

PGN Response to NRC RAI:

In the current LNP FSAR section 2.3.4.4, the direction for plant north was incorrectly taken as perpendicular to the turbine building with true north being 45 degrees clockwise. The correct orientation is parallel to the turbine building. This resulted in the source to receptor angles input to ARCON96 being off by 90 degrees. Revised LNP FSAR Tables 2.0-202, 2.3.4-206 and 2.3.4-207 are provided below using the updated orientation. The values included herein are consistent with AP1000 DCD Revision 17.

The source to receptor angles were determined correctly using the convention provided on page 16 of NUREG/CR-6331 excerpted as follows:

"The direction from the intake to the source is the last item entered in the Receptor Input form. This direction is used to determine when the wind carries effluents from the release point to the intake. Assuming that the wind directions in the meteorological data file follow the standard convention of recording the direction from which the wind blows, you will enter the proper direction if you imagine that you are standing at the intake facing the release point. If you are looking north, enter north (360°). If you are looking southwest, enter southwest (225°), etc. ARCON96 will transform the wind direction to the transport direction for you."

Associated LNP COL Application Revisions:

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

Replace LNP FSAR Tables 2.0-202, 2.3.4-206 and 2.3.4-207 with the following:

LNP SUP 2.0-1

Table 2.0-202 (Sheet 1 of 2)
Comparison of Predicted LNP Control Room Chi/Q Values with AP1000 DCD Acceptance Criteria

X/Q (sec/m^3) at HVAC Intake for the Identified Release Points[a]

	Plant Vent or PCS Air Diffuser [b]	Plant Vent	PCS Air Diffuser	**Ground Level Containment Release Points**[c,h]	Ground Level Containment Release Points	**PORV and Safety Valve Releases**[d]	PORV and Safety Valve Releases	**Condenser Air Removal Stack**[g]	Condenser Air Removal Stack	**Steam Line Break Releases**	Steam Vent	**Fuel Handling Area**[e]	Fuel Handling Area Blowout Panel	Radwaste Building Truck Staging Area Door
Release Time	**DCD**	LNP	LNP	**DCD**	LNP	**DCD**	LNP	**DCD**	LNP	**DCD**	LNP	**DCD**	LNP	LNP
0 - 2 hours	**3.0E-03**	1.6E-03	1.4E-03	**6.0E-03**	4.3E-03	**2.0E-02**	9.5E-03	**6.0E-03**	1.7E-03	**2.4E-02**	1.0E-02	**6.0E-03**	1.3E-03	9.3E-04
2 - 8 hours	**2.5E-03**	9.2E-04	7.8E-04	**3.6E-03**	3.5E-03	**1.8E-02**	5.6E-03	**4.0E-03**	1.4E-03	**2.0E-02**	5.9E-03	**4.0E-03**	7.4E-04	5.8E-04
8 - 24 hours	**1.0E-03**	4.1E-04	3.6E-04	**1.4E-03**	1.2E-03	**7.0E-03**	2.6E-03	**2.0E-03**	6.4E-04	**7.5E-03**	2.9E-03	**2.0E-03**	3.6E-04	2.9E-04
1 - 4 days	**8.0E-04**	4.0E-04	3.5E-04	**1.8E-03**	1.3E-03	**5.0E-03**	2.0E-03	**1.5E-03**	5.8E-04	**5.5E-03**	2.2E-03	**1.5E-03**	3.1E-04	2.3E-04
4 - 30 days	**6.0E-04**	3.3E-04	2.8E-04	**1.5E-03**	1.0E-03	**4.5E-03**	1.3E-03	**1.0E-03**	5.0E-04	**5.0E-03**	1.5E-03	**1.0E-03**	2.5E-04	1.9E-04

X/Q (sec/m^3) at Annex Building Door for the Identified Release Points[f]

	Plant Vent or PCS Air Diffuser [b]	Plant Vent	PCS Air Diffuser	**Ground Level Containment Release Points**[c]	Ground Level Containment Release Points	**PORV and Safety Valve Releases**[d]	PORV and Safety Valve Releases	**Condenser Air Removal Stack**[g]	Condenser Air Removal Stack	**Steam Line Break Releases**	Steam Vent	**Fuel Handling Area**[e]	Fuel Handling Area Blowout Panel	Radwaste Building Truck Staging Area Door
Release Time	**DCD**	LNP	LNP	**DCD**	LNP	**DCD**	LNP	**DCD**	LNP	**DCD**	LNP	**DCD**	LNP	LNP
0 - 2 hours	**1.0E-03**	3.5E-04	3.7E-04	**1.0E-03**	3.4E-04	**4.0E-03**	7.6E-04	**2.0E-02**	3.1E-03	**4.0E-03**	7.4E-04	**6.0E-03**	3.1E-04	3.0E-04
2 - 8 hours	**7.5E-04**	2.2E-04	2.3E-04	**7.5E-04**	2.8E-04	**3.2E-03**	4.6E-04	**1.8E-02**	1.7E-03	**3.2E-03**	4.4E-04	**4.0E-03**	2.0E-04	2.0E-04
8 - 24 hours	**3.5E-04**	1.1E-04	1.1E-04	**3.5E-04**	1.3E-04	**1.2E-03**	2.2E-04	**7.0E-03**	8.3E-04	**1.2E-03**	2.1E-04	**2.0E-03**	9.8E-05	9.5E-05
1 - 4 days	**2.8E-04**	9.9E-05	1.0E-04	**2.8E-04**	1.2E-04	**1.0E-03**	2.0E-04	**5.0E-03**	6.8E-04	**1.0E-03**	2.0E-04	**1.5E-03**	9.0E-05	8.7E-05
4 - 30 days	**2.5E-04**	8.3E-05	8.6E-05	**2.5E-04**	1.0E-04	**8.0E-04**	1.6E-04	**4.5E-03**	5.2E-04	**8.0E-04**	1.6E-04	**1.0E-03**	7.4E-05	7.1E-05

Table 2.0-202 (Sheet 2 of 2)
Comparison of Predicted LNP Control Room Chi/Q Values with AP1000 DCD Acceptance Criteria

Notes:

a) These dispersion factors are to be used 1) for the time period preceding the isolation of the main control room and actuation of the emergency habitability system, 2) for the time after 72 hours when the compressed air supply in the emergency habitability system would be exhausted and outside air would be drawn into the main control room, and 3) for the determination of control room doses when the non-safety ventilation system is assumed to remain operable such that the emergency habitability system is not actuated.

b) These dispersion factors are used for analysis of the doses due to a postulated small line break outside of containment. The plant vent and PCS air diffuser are potential release paths for other postulated events (loss-of-coolant accident, rod ejection accident, and fuel handling accident inside the containment); however, the values are bounded by the dispersion factors for ground level releases.

c) The listed values represent modeling the containment shell as a diffuse area source and are used for evaluating the doses in the main control room for a loss-of-coolant accident, for the containment leakage of activity following a rod ejection accident, and for a fuel handling accident occurring inside the containment.

d) The listed values bound the dispersion factors for releases from the steam line safety and power-operated relief valves. These dispersion factors would be used for evaluating the doses in the main control room for a steam generator tube rupture, a main steam line break, a locked reactor coolant pump rotor, and for the secondary side release from a rod ejection accident.

e) This release point is included for information only as a potential activity release point. None of the design basis accident radiological consequences analyses model release from this point.

f) The listed values bound the dispersion factors for releases from the fuel storage and handling area. The listed values also bound the dispersion factors for releases from the fuel storage area in the event that spent fuel boiling occurs and the fuel handling area relief panel opens on high temperature. These dispersion factors are used for the fuel handling accident occurring outside containment and for evaluating the impact of releases associated with spent fuel pool boiling.

g) These dispersion factors are to be used when the emergency habitability system is in operation and the only path for outside air to enter the main control room is that due to ingress/egress.

h) The LOCA dose analysis models the ground level containment release point HVAC intake atmospheric dispersion factors. Other analyses model more conservative values.

Chi/Q = atmospheric dilution factor

LNP COL 2.3-4

Table 2.3.4-206 (Sheet 1 of 2)
Comparison of Control Room Atmospheric Dispersion Factors for Accident Analysis for AP1000 DCD and LNP Units 1 and 2

X/Q (sec/m^3) at HVAC Intake for the Identified Release Points[a]

	Plant Vent or PCS Air Diffuser [b]	Plant Vent	PCS Air Diffuser	**Ground Level Containment Release Points**[c,h]	Ground Level Containment Release Points	**PORV and Safety Valve Releases**[d]	PORV and Safety Valve Releases	**Condenser Air Removal Stack**[g]	Condenser Air Removal Stack	**Steam Line Break Releases**	Steam Vent	**Fuel Handling Area**[e]	Fuel Handling Area Blowout Panel	Radwaste Building Truck Staging Area Door
Release Time	**DCD**	LNP	LNP	**DCD**	LNP	**DCD**	LNP	**DCD**	LNP	**DCD**	LNP	**DCD**	LNP	LNP
0 - 2 hours	**3.0E-03**	1.6E-03	1.4E-03	**6.0E-03**	4.3E-03	**2.0E-02**	9.5E-03	**6.0E-03**	1.7E-03	**2.4E-02**	1.0E-02	**6.0E-03**	1.3E-03	9.3E-04
2 - 8 hours	**2.5E-03**	9.2E-04	7.8E-04	**3.6E-03**	3.5E-03	**1.8E-02**	5.6E-03	**4.0E-03**	1.4E-03	**2.0E-02**	5.9E-03	**4.0E-03**	7.4E-04	5.8E-04
8 - 24 hours	**1.0E-03**	4.1E-04	3.6E-04	**1.4E-03**	1.2E-03	**7.0E-03**	2.6E-03	**2.0E-03**	6.4E-04	**7.5E-03**	2.9E-03	**2.0E-03**	3.6E-04	2.9E-04
1 - 4 days	**8.0E-04**	4.0E-04	3.5E-04	**1.8E-03**	1.3E-03	**5.0E-03**	2.0E-03	**1.5E-03**	5.8E-04	**5.5E-03**	2.2E-03	**1.5E-03**	3.1E-04	2.3E-04
4 - 30 days	**6.0E-04**	3.3E-04	2.8E-04	**1.5E-03**	1.0E-03	**4.5E-03**	1.3E-03	**1.0E-03**	5.0E-04	**5.0E-03**	1.5E-03	**1.0E-03**	2.5E-04	1.9E-04

X/Q (sec/m^3) at Annex Building Door for the Identified Release Points[f]

	Plant Vent or PCS Air Diffuser [b]	Plant Vent	PCS Air Diffuser	**Ground Level Containment Release Points**[c]	Ground Level Containment Release Points	**PORV and Safety Valve Releases**[d]	PORV and Safety Valve Releases	**Condenser Air Removal Stack**[g]	Condenser Air Removal Stack	**Steam Line Break Releases**	Steam Vent	**Fuel Handling Area**[e]	Fuel Handling Area Blowout Panel	Radwaste Building Truck Staging Area Door
Release Time	**DCD**	LNP	LNP	**DCD**	LNP	**DCD**	LNP	**DCD**	LNP	**DCD**	LNP	**DCD**	LNP	LNP
0 - 2 hours	**1.0E-03**	3.5E-04	3.7E-04	**1.0E-03**	3.4E-04	**4.0E-03**	7.6E-04	**2.0E-02**	3.1E-03	**4.0E-03**	7.4E-04	**6.0E-03**	3.1E-04	3.0E-04
2 - 8 hours	**7.5E-04**	2.2E-04	2.3E-04	**7.5E-04**	2.8E-04	**3.2E-03**	4.6E-04	**1.8E-02**	1.7E-03	**3.2E-03**	4.4E-04	**4.0E-03**	2.0E-04	2.0E-04
8 - 24 hours	**3.5E-04**	1.1E-04	1.1E-04	**3.5E-04**	1.3E-04	**1.2E-03**	2.2E-04	**7.0E-03**	8.3E-04	**1.2E-03**	2.1E-04	**2.0E-03**	9.8E-05	9.5E-05
1 - 4 days	**2.8E-04**	9.9E-05	1.0E-04	**2.8E-04**	1.2E-04	**1.0E-03**	2.0E-04	**5.0E-03**	6.8E-04	**1.0E-03**	2.0E-04	**1.5E-03**	9.0E-05	8.7E-05
4 - 30 days	**2.5E-04**	8.3E-05	8.6E-05	**2.5E-04**	1.0E-04	**8.0E-04**	1.6E-04	**4.5E-03**	5.2E-04	**8.0E-04**	1.6E-04	**1.0E-03**	7.4E-05	7.1E-05

LNP COL 2.3-4

Table 2.3.4-206 (Sheet 2 of 2)
Comparison of Control Room Atmospheric Dispersion Factors for Accident Analysis for AP1000 DCD and LNP Units 1 and 2

Notes:

a) These dispersion factors are to be used 1) for the time period preceding the isolation of the main control room and actuation of the emergency habitability system, 2) for the time after 72 hours when the compressed air supply in the emergency habitability system would be exhausted and outside air would be drawn into the main control room, and 3) for the determination of control room doses when the non-safety ventilation system is assumed to remain operable such that the emergency habitability system is not actuated.

b) These dispersion factors are used for analysis of the doses due to a postulated small line break outside of containment. The plant vent and PCS air diffuser are potential release paths for other postulated events (loss-of-coolant accident, rod ejection accident, and fuel handling accident inside the containment); however, the values are bounded by the dispersion factors for ground level releases.

c) The listed values represent modeling the containment shell as a diffuse area source and are used for evaluating the doses in the main control room for a loss-of-coolant accident, for the containment leakage of activity following a rod ejection accident, and for a fuel handling accident occurring inside the containment.

d) The listed values bound the dispersion factors for releases from the steam line safety and power-operated relief valves. These dispersion factors would be used for evaluating the doses in the main control room for a steam generator tube rupture, a main steam line break, a locked reactor coolant pump rotor, and for the secondary side release from a rod ejection accident.

e) This release point is included for information only as a potential activity release point. None of the design basis accident radiological consequences analyses model release from this point.

f) The listed values bound the dispersion factors for releases from the fuel storage and handling area. The listed values also bound the dispersion factors for releases from the fuel storage area in the event that spent fuel boiling occurs and the fuel handling area relief panel opens on high temperature. These dispersion factors are used for the fuel handling accident occurring outside containment and for evaluating the impact of releases associated with spent fuel pool boiling.

g) These dispersion factors are to be used when the emergency habitability system is in operation and the only path for outside air to enter the main control room is that due to ingress/egress.

h) The LOCA dose analysis models the ground level containment release point HVAC intake atmospheric dispersion factors. Other analyses model more conservative values.

Chi/Q = atmospheric dilution factor

LNP COL 2.3-4

Table 2.3.4-207
Control Room Release/Receptor Azimuthal Angles for Input to ARCON96

	Receptor Location	
Release Location	**Control Room HVAC Intake (degrees)**	**Annex Building Access (degrees)**
Plant Vent	238	240
PCS Air Diffuser	270	251
Fuel Building Blowout Panel	223	232
Radwaste Building Truck Staging Area Door	214	227
Steam Vent	313	255
PORV/Safety Valves	322	258
Condenser Air Removal Stack	52	290
Containment Shell (Diffuse Area Source)	261	245

Attachments/Enclosures:

None.

NRC Letter No.: LEVY-RAI-LTR-018

NRC Letter Date: March 6, 2009

NRC Review of Final Safety Analysis Report

NRC RAI #: 02.03.04-2

Text of NRC RAI:

Please confirm in FSAR Section 2.3.4.4 that a ground-level release assumption was used for each release / receptor combination.

PGN RAI ID #: L-0036

PGN Response to NRC RAI:

A ground-level release assumption was used for each release / receptor combination in FSAR Section 2.3.4.4.

Associated LNP COL Application Revisions:

No COLA revisions have been identified associated with this response.

Attachments/Enclosures:

None.

NRC Letter No.: LEVY-RAI-LTR-018

NRC Letter Date: March 6, 2009

NRC Review of Final Safety Analysis Report

NRC RAI #: 02.03.04-3

Text of NRC RAI:

Please provide a copy of the PAVAN input files used for the PAVAN calculations so that the staff may conduct a confirmatory analysis.

PGN RAI ID #: L-0037

PGN Response to NRC RAI:

The PAVAN input files were previously provided to the staff electronically via Progress Energy letter NPD-NRC-2008-094 dated December 19, 2008 as "Supplemental Information for Environmental Audit – Calculation Native Files.

Associated LNP COL Application Revisions:

No COLA revisions have been identified associated with this response.

Attachments/Enclosures:

None.