



Serial: NPD-NRC-2009-156
July 29, 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
SUPPLEMENT 1 TO RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION LETTER
NO. 020 RELATED TO IDENTIFICATION OF POTENTIAL HAZARDS IN SITE VICINITY**

- Reference:
1. Letter from Brian C. Anderson (NRC) to Garry Miller (PEF), dated March 6, 2009, "Request for Additional Information Letter No. 020 Related to SRP Section 2.2.1-2.2.2 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 6, 2009, "Response to Request for Additional Information Letter No. 020 Related to Identification of Potential Hazards in Site Vicinity," Serial: NPD-NRC-2009-064

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 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 July 29, 2009.

Sincerely,

A handwritten signature in black ink, appearing to read "Garry D. Miller".

Garry D. Miller
General Manager
Nuclear Plant Development

DOG4
NPD

United States Nuclear Regulatory Commission
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Enclosure/Attachment

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

**Levy Nuclear Power Plant Units 1 and 2
Supplement 1 to Response to NRC Request for Additional Information Letter No. 020
Related to SRP Section 2.2.1-2.2.2 for the Combined License Application,
Dated March 6, 2009**

<u>NRC RAI #</u>	<u>Progress Energy RAI #</u>	<u>Progress Energy Response</u>
02.02.01-02.02.02-1	L-0043	April 6, 2009; Serial: NPD-NRC-2009-064
02.02.01-02.02.02-2	L-0190	Revised response enclosed – see following pages
02.02.01-02.02.02-3	L-0045	April 6, 2009; Serial: NPD-NRC-2009-064
02.02.01-02.02.02-4	L-0046	April 6, 2009; Serial: NPD-NRC-2009-064

<u>Attachment</u>	<u>Associated NRC RAI #</u>	<u>Pages Included</u>
FSAR Figure 2.2.1-204 (Rev 1 Draft)	02.02.01-02.02.02-2	3 pages

NRC Letter No.: LEVY-RAI-LTR-020

NRC Letter Date: March 6, 2009

NRC Review of Final Safety Analysis Report

NRC RAI NUMBER: 02.02.01-02.02.02-2

Text of NRC RAI:

RG 1.206 provides guidance regarding the information that is needed to ensure potential hazards in the site vicinity are identified and evaluated to meet the siting criteria in 10 CFR 100.20 and 10 CFR 100.21. The NRC Staff's review of FSAR Sections 2.2.2.7 and 3.5.1.6 indicates that there two 8 mile wide Federal Victor Airways, VR 1006 and V7-521, whose center line are within 4 miles of the LNP site. Therefore, in accordance with the acceptance criteria for FSAR Section 3.5.1.6, the aircraft hazards associated with these Victor Airways should be evaluated and addressed in Section 3.5.1.6. Please provide an evaluation of each, or provide a justification for their exclusion.

PGN RAI ID #: L-0190

PGN Response to NRC RAI:

There are five airways that have the outer boundary within 2 miles of the LNP site:

Airway	Distance to LNP Site from the Airway Centerline
V7-521	4.5 miles
VR 1006	3.1 miles
J119	0 miles
Q110-116-118	0 miles
Q112	0.7 miles

The boundary of each airway is 4 nautical miles from the centerline, thus, each of these airways is within 2 miles of the LNP site. Therefore, in accordance with the acceptance criteria for FSAR Subsection 3.5.1.6, the aircraft hazards evaluation associated with these airways has been conducted.

The evaluation determined that the probability of small aircraft crashing on seismic category I structures (i.e. Containment/Shield Building and Auxiliary Building) is calculated to be 7.011×10^{-6} per year. This crash probability results a core damage frequency (CDF) of 0.410×10^{-12} per year which is much smaller than the CDF acceptance criteria of 1.0×10^{-8} per year. Therefore, small aircraft crash probability is acceptable. The probability of large aircraft crashing on seismic category I structures is calculated as 3.093×10^{-8} per year. This meets the acceptance criteria of 1×10^{-7} per year in Subsection 19.58.2.3.1 of DCD. Therefore, the probability of crash for large aircrafts is acceptable.

Associated LNP COL Application Revisions:

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

1. Add the following sentence as the last paragraph of FSAR Section 2.2.2.7:

“The outer boundaries of five airways are routed within 2 miles of the LNP site: V7-521, VR 1006, J119, Q110-116-118 and Q112 (shown on Figure 2.2.1-204).”

2. Revise FSAR Subsection 3.5.1.6 from:

“Add the following text to the end of DCD Subsection 3.5.1.6.

The LNP 1 and 2 are remote from federal airways, airport approaches, military installations or airspace usage and; therefore, an aircraft hazards analysis is not required. Specifically:

- a. No federal airways, holding patterns, or approaches pass within 3.22 kilometers (2 miles) of the nuclear facility (Subsection 2.2.2.7 and Figure 2.2.1-204),
- b. No airports are located within 8.05 kilometers (5 miles) of the site (Figure 2.2.1-204),
- c. There are no airports with projected operations greater than $193d^2$ (500 d^2) movements per year located within 16.10 kilometers (10 statute miles) and greater than $386d^2$ (1000 d^2) outside 16.10 kilometers (10 statute miles) where d is the distance in kilometers (statute miles) from the site (Subsection 2.2.2.7 and Table 2.2.2-203),
- d. There are no military installations or any airspace usage that might present a hazard to the site within 32.19 kilometers (20 miles) of the site (Section 2.2).”

To read:

“Add the following text to the end of DCD Subsection 3.5.1.6.

The outer boundary of five airways is routed within 2 miles of the LNP site: V7-521, VR 1006, J119, Q110-116-118 and Q112 (shown on Figure 2.2.1-204). Thus, an aircraft hazards evaluation needs to be performed for LNP 1 and 2.

The evaluation determined that the probability of small aircraft crashing on seismic category I structures (i.e. Containment/Shield Building and Auxiliary Building) is calculated to be 7.011×10^{-6} per year. This crash probability results in a core damage frequency (CDF) of 0.410×10^{-12} per year which is much smaller than the current plant CDF acceptance criteria of 1.0×10^{-8} per year. Therefore, small aircraft crash probability is acceptable. The probability of large aircraft crashing on seismic category I structures is calculated as 3.093×10^{-8} per year. This meets the acceptance criteria of 1×10^{-7} per year in Subsection 19.58.2.3.1 of DCD. Therefore, the probability of crash for large aircrafts is acceptable. The acceptance criteria and methodology are discussed below.

Probabilistic Acceptance Criteria

Based on discussion in Subsection 19.58.2.3.1 of the DCD, separate probabilistic acceptance criteria are used for small and large aircrafts. The definition of small and large aircraft is based on documented discussion with Westinghouse.

Small aircraft is an aircraft with less than 30 seats with pay load less than 7500 pounds. All aircraft not meeting the above small aircraft definition are considered as large aircraft.

- Acceptance Criteria for Large Aircraft:

Total probability of crash on Seismic Category I structures must be less than 1×10^{-7} per year.

- Acceptance Criteria for Small Aircraft:

Equation 19.58-1 of the DCD will be applied with the initiating event frequency (IEF) equal to the calculated small aircraft crash probability per year. The small aircraft crash probability is acceptable if the calculated core damage frequency is less than 1.0×10^{-8} per year.

The calculation details for airport and the airways follows:

Calculation for Airways

Item 2 of Section III of SRP 3.5.1.6 (Reference 201) provides an equation to calculate probability of crash from a nearby airway. This equation contains a constant:

C = in-flight crash rate per mile using the airway

For commercial aircraft, a C value of 4×10^{-10} per aircraft mile is provided in Reference 201. However, the reference does not provide C values for other types of aircraft (i.e., military aviation and general aviation). Because of the above unavailability of constant C for all aircraft types and since FAA does not provide clear flight information on specific airways, the Reference 201 equation for airways is not used in this assessment for airways.

Section 5.3.2 of DOE-STD-3014-96 (Reference 202) provides complete equations for calculating probability of aircraft crash from non-airport operations. The procedure is implemented using Tables in Appendix B of Reference 202.

The probability of crash from airways is calculated using the equation below:

$$P_{\text{all_airways}} = \sum_j (N_j \cdot P_j \cdot f_j \cdot A_j) \quad (2)$$

$N_j \cdot P_j$ = expected number of in-flight crashes per year for aircraft type j (occurrence per year)

f_j = conditional probability, given a crash, that the crash occurs within a one-square-mile area surrounding the facility of interest (per square mile)

A_j = impact area of the buildings of facility for aircraft type j (square mile)

Values of $N_j \cdot P_j \cdot f_j$ are provided in Table B-14 of Reference 202 for General aviation and in Table B-15 of Reference 202 for commercial and military aviations. Values of A_j for each aircraft type is the same as that used for airport operations and Equation (1).

When Using Tables B-14 and B-15, the maximum value listed for Savannah River Site and average Continental United States (CONUS) was used. Savannah River Site information is included because Savannah River Site is closest of all sites listed in these tables to LNP site.

Calculated Crash Probability Results

The following aircraft types are considered as "small" aircrafts: air taxi, general aviation and small military. Large aircrafts are considered to be: air carrier and large military aircraft.

With the above identification of large and small aircrafts, the results are:

$$P_{\text{small}} = P_{\text{small airway}}$$

$$P_{\text{small}} = 7.011 \times 10^{-6} \text{ per year}$$

$$P_{\text{large}} = P_{\text{large_airway}}$$

$$P_{\text{large}} = 3.093 \times 10^{-8} \text{ per year}$$

Conclusions from Probability Results

For large aircraft, acceptance criterion is 1×10^{-7} per year. Therefore, large aircraft crash probability of 3.093×10^{-8} is acceptable.

For small aircraft, apply Equation (19.58-1) of the DCD with conditional core damage probability (CCDP) of 5.85×10^{-8} . Plant core damage frequency is:

$$\text{CDF}_{\text{small_aircraft}} = (7.011 \times 10^{-6}) \times (5.85 \times 10^{-8}) = 0.410 \times 10^{-12} \text{ per year}$$

Clearly, the core damage frequency due to small aircraft crash is much smaller than the core damage frequency acceptance criteria of 1.0×10^{-8} per year, and the calculated small aircraft crash probability is acceptable."

3. After FSAR Subsection 3.5.4 add new Subsection 3.5.5:

"3.5.5 REFERENCES

201. NUREG-0800, Standard Review Plan (SRP) 3.5.1.6, "Aircraft Hazards", Rev. 3, March 2007.
202. Department of Energy Standard DOE-STD-3014-96, "Accident Analysis Into Hazardous Facilities", October 1996."

4. Add new FSAR Table 3.5-201 to FSAR Section 3.5:

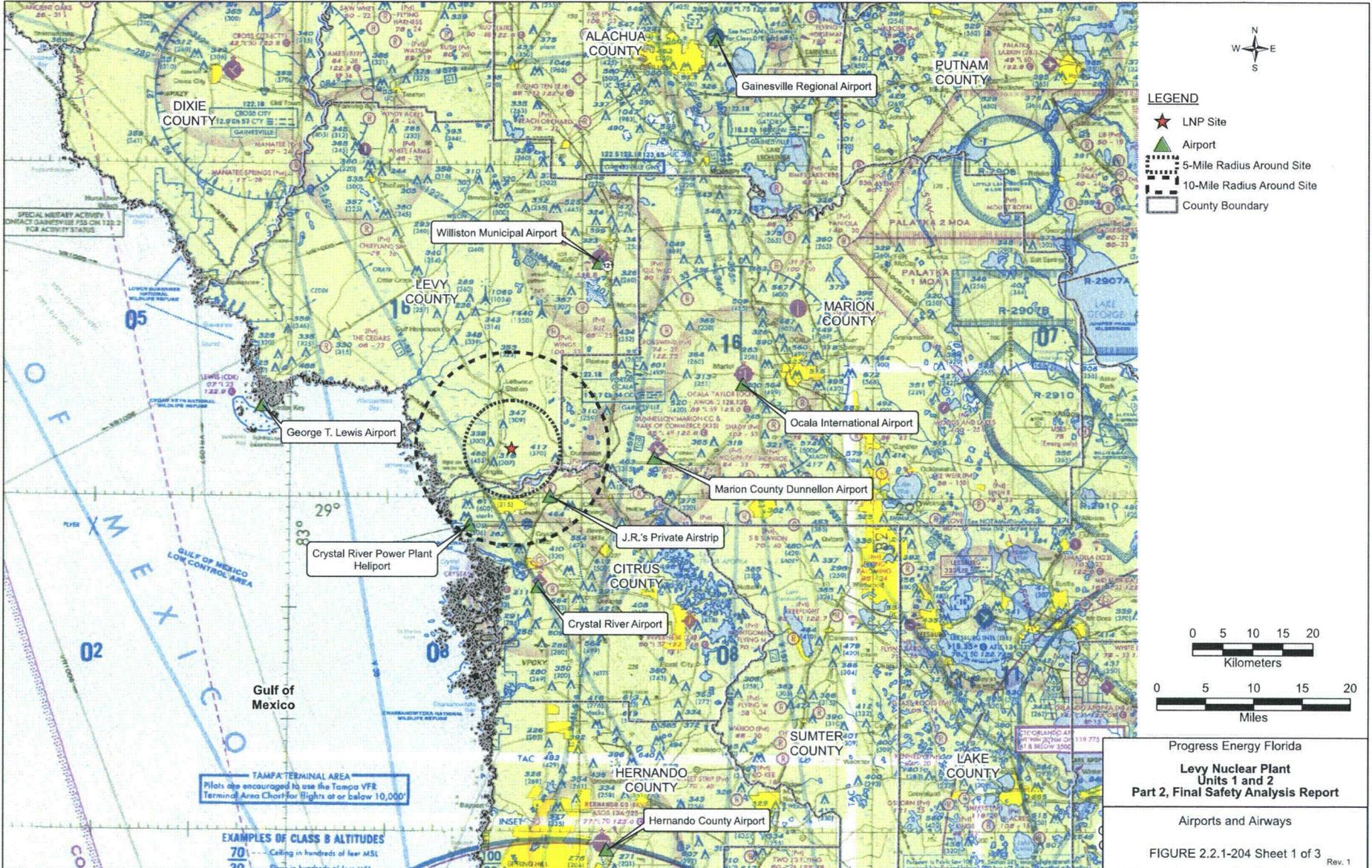
Table 3.5-201
Impact Area for Combined Containment/Shield and Auxiliary Buildings for Different Aircrafts

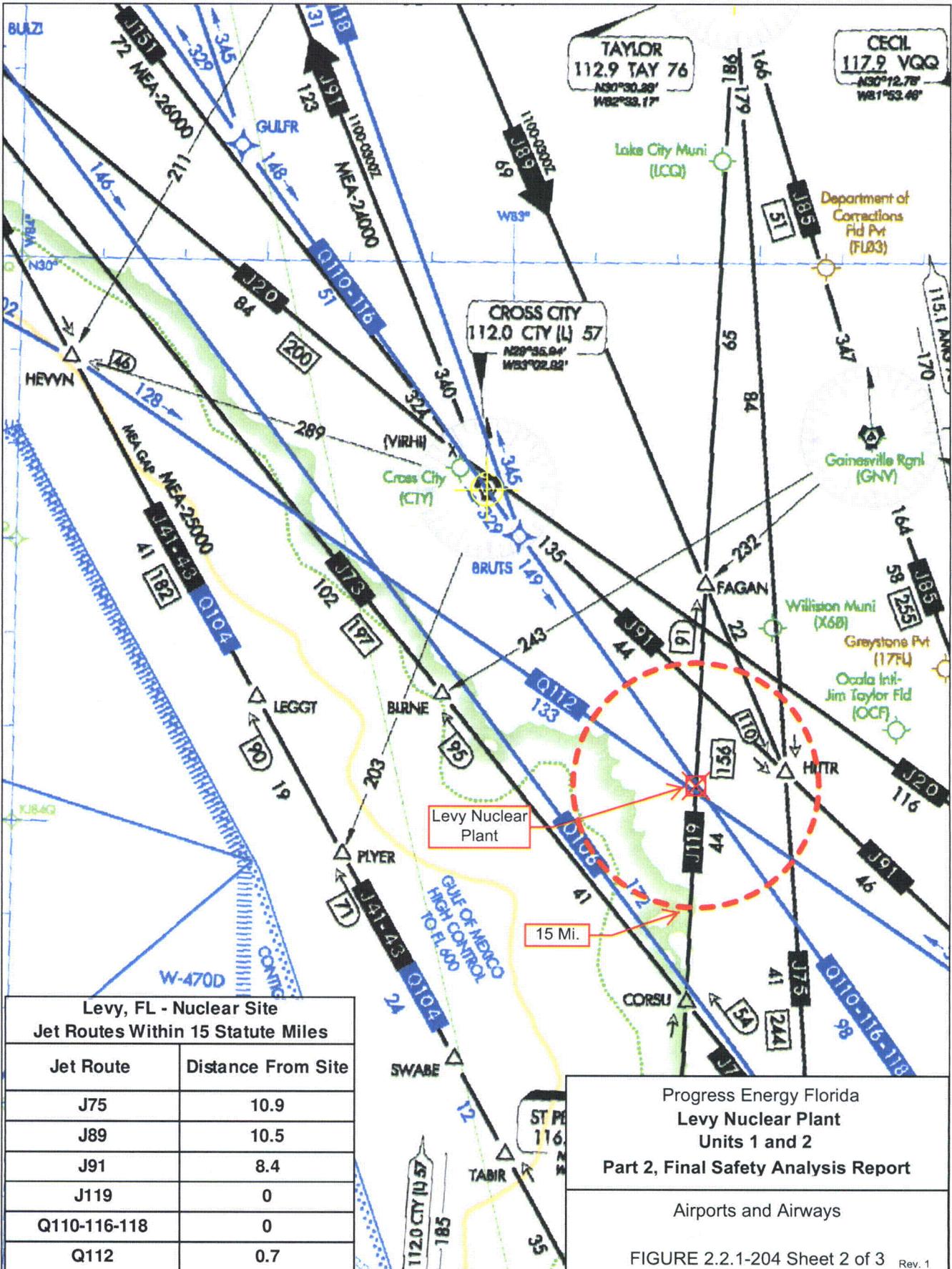
Aircraft Type	A _i (mile ²)	
	Part I	Part II
Air Carrier	0.03415	0.01872
Air Taxi	0.01230	0.01630
General Aviation	0.00984	0.01290
Small Military	0.02035	0.01981
Large Military	0.02364	0.02529

5. Replace FSAR Figure 2.2.1-204, in its entirety, with the version listed under **Attachments/Enclosures** below. A second and third sheet have been added to Figure 2.2.1-204 that indicates the routes of Airways V7-521, J119, Q110-116-118 and Q112.

Attachments/Enclosures:

Revised FSAR Figure 2.2.1-204 (Rev 1 Draft) – Airports and Airways (Sheets 1, 2, and 3)





Levy, FL - Nuclear Site Jet Routes Within 15 Statute Miles	
Jet Route	Distance From Site
J75	10.9
J89	10.5
J91	8.4
J119	0
Q110-116-118	0
Q112	0.7

Progress Energy Florida
 Levy Nuclear Plant
 Units 1 and 2
 Part 2, Final Safety Analysis Report

Airports and Airways

FIGURE 2.2.1-204 Sheet 2 of 3 Rev. 1

