PMLevyCOLPEm Resource

From: Brian Anderson
Sent: Friday, May 08, 2009 1:19 PM
To: robert.kitchen@pgnmail.com; david.waters@pgnmail.com; tillie.wilkins@pgnmail.com; PMLevyCOLPEm Resource
Cc: Brian Anderson
Subject: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 028 RELATED TO SRP SECTION 13.3 FOR THE LEVY COUNTY UNITS 1 AND 2 COMBINED LICENSE APPLICATION
Attachments: LNP RAI 028 - ML091280228.pdf

Importance: High

Attached is RAI Letter No. 028 related to SRP Section 13.3 for the Levy County Units 1 and 2 combined license application. The ADAMS Accession number is ML091280228.

Brian Anderson
301-415-9967
Lead Project Manager, AP1000 Projects Branch 1
Office of New Reactors
U.S. Nuclear Regulatory Commission

Hearing Identifier: Levy_County_COL_Public
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Subject: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 028 RELATED TO SRP SECTION 13.3 FOR THE LEVY COUNTY UNITS 1 AND 2 COMBINED LICENSE APPLICATION
Sent Date: 5/8/2009 1:18:46 PM
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LNP RAI 028 - ML091280228.pdf	196671	

Options
Priority: High
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received:

LevyCountyRAIsPEm Resource

From: Brian Anderson
Sent: Friday, May 08, 2009 11:19 AM
To: LevyCountyRAIsPEm Resource
Subject: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 028 RELATED TO SRP SECTION 13.3 FOR THE LEVY COUNTY UNITS 1 AND 2 COMBINED LICENSE APPLICATION
Attachments: LNP-RAI-LTR-028.doc

Importance: High

Hearing Identifier: Levy_County_COL_eRAIs
Email Number: 29

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Subject: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 028 RELATED TO SRP SECTION 13.3 FOR THE LEVY COUNTY UNITS 1 AND 2 COMBINED LICENSE APPLICATION
Sent Date: 5/8/2009 11:18:58 AM
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From: Brian Anderson

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MESSAGE	3	5/8/2009 11:18:59 AM
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May 8, 2009

Mr. Garry Miller
General Manager, Nuclear Plant Development
Progress Energy Florida, Inc.
PO Box 1551
411 Fayetteville Street Mall
Raleigh, NC 27602

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 028 RELATED TO SRP SECTION 13.3 FOR THE LEVY COUNTY NUCLEAR PLANT, UNITS 1 and 2 COMBINED LICENSE APPLICATION

Dear Mr. Miller:

By letter dated July 28, 2008, as supplemented by a letter dated September 12, 2008, Progress Energy Florida, Inc. submitted its application to the U. S. Nuclear Regulatory Commission (NRC) for a combined license (COL) for two AP1000 advanced passive pressurized water reactors pursuant to 10 CFR Part 52. The NRC staff is performing a detailed review of this application to enable the staff to reach a conclusion on the safety of the proposed application.

The NRC staff has identified that additional information is needed to continue portions of the review. The staff's request for additional information (RAI) is contained in the enclosure to this letter.

To support the review schedule, you are requested to respond within 30 days of the date of this letter. If changes are needed to the final safety analysis report, the staff requests that the RAI response include the proposed wording changes.

If you have any questions or comments concerning this matter, you may contact me at 301-415-9967.

Sincerely,

/**RA**/

Brian C. Anderson, Lead Project Manager
AP1000 Projects Branch 1
Division of New Reactor Licensing
Office of New Reactors

Docket Nos. 52-029
52-030

eRAI Tracking No. 2251

Enclosure:
Request for Additional Information

If you have any questions or comments concerning this matter, you may contact me at 301-415-9967.

Sincerely,

/**RA**/

Brian C. Anderson, Lead Project Manager
AP1000 Projects Branch 1
Division of New Reactor Licensing
Office of New Reactors

Docket Nos. 52-029
52-030

eRAI Tracking No. 2251

Enclosure:
Request for Additional Information

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NRO-002

OFFICE	LIB/BC	NWE1/PM	OGC	NWE1/L-PM
NAME	KWilliams *	BAnderson *	JMartin*	BAnderson*
DATE	03/19/09	03/20/09	04/16/09	05/08/09

*Approval captured electronically in the electronic RAI system.

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Request for Additional Information
Levy County, Units 1 and 2
Progress Energy Florida, Inc.
Docket No. 52-029 and 52-030
SRP Section: 13.03 - Emergency Planning
Application Section: Part 5 - Emergency Plan - Supplemental

QUESTIONS for Licensing and Inspection Branch (NSIR/DPR/LIB) (EP)

13.03-2

ETE-1: Site Location and Emergency Planning Zone
Acceptance Criteria: Requirements A and H; Acceptance Criterion 11
Regulatory Basis: Appendix 4 to NUREG-0654 Section I.A.

A. Figure 1-1, "Levy Nuclear Plant Site Location," (Page 1-4) shows the LNP with the 2-, 5-, and 10-mile rings within the plume exposure pathway EPZ. Communities and county boundaries within the 2-, 5-, and 10-mile rings are not clearly labeled. Provide maps that include surrounding communities, county boundaries, and political boundaries.

13.03-3

ETE-2: ETE General Assumptions
Acceptance Criteria: Requirements A and H; Acceptance Criterion 11
Regulatory Basis: Appendix 4 to NUREG-0654 Sections I.B, Section II.C, Section III.A, IV.A.1

A. Section 2.1, "Data Estimates", (Page 2-1) assumption #5 states that the relationship between the resident population and evacuating vehicles is developed from the telephone survey. Appendix F, "Telephone Survey," Section 2, "Survey Instrument and Sampling Plan," states that a sample size of 550 completed survey forms would provide an acceptable sampling error and sampling would be performed within the plume exposure pathway EPZ using zip codes. Table F-1, "Survey Sampling Plan," (Page F-2) identifies the required sample size for each zip code within the EPZ totaling 550, while also providing the overall total of the population size as 34,880 based on census data from the year 2000. Table 3-1, "EPZ Permanent Resident Population," indicates the 2007 resident population is 22,758.

1. Provide the actual number of completed survey forms and sampling error used throughout the Telephone Survey or describe why they are not necessary.
2. Clarify whether or not completed survey forms received included populations within the associated zip codes, outside of the plume exposure pathway EPZ.
3. Clarify what population size was used as a basis for the telephone sampling plan and whether or not the population size used had an effect on the evacuation time estimates, if different from the 22,758 population size found on Page 3-4.

B. Section 2.1, "Data Estimates", (Page 2-1) assumption #7 states that the ETEs are presented for the evacuation of the 100th percentile. The evacuation times provided in Section 7, "General Population Evacuation Time Estimates (ETE)," indicate ETEs of about 5 hours for the general population, whereas the telephone survey results in Figure F-11, "Time to Prepare Home for

Evacuation," (page F-10) indicate that it may take as long as 6 hours for the general public to prepare to evacuate. Clarify the inconsistency in the time it takes to evacuate 100 percent of the general population.

C. Section 2.3, "Study Assumptions," (Page 2-4) assumption #7 states that the number and location of Traffic Control Points (TCPs) depends on available personnel resources and the region being evacuated.

1. Provide information regarding changes that would have to be implemented due to lack of resources or regions being evacuated.
2. Clarify whether there is an effect on the ETE if these traffic control points are not established.

D. Section 2.3, "Study Assumptions," assumption #10, (Page 2-5) indicates that there is assumed to be no effect on mobilization time due to rain. However, Section 8.4, "Evacuation Time Estimates for Transit Dependent People," (Page 8-5) indicates that time is increased for activities during mobilization, such as "Activity: Mobilize Drivers", where mobilization time is "slightly longer – 100 minutes- when raining," versus 90 minutes for normal weather. Clarify why there is an effect on mobilization time for schools and special facilities, but not for the general public.

E. Section 8.4, "Evacuation Time Estimates for Transit-Dependent People", Table 8-5A, "School Evacuation Time Estimates – Good Weather," (Page 8-13) indicates students are loaded in 5 minutes. For Dunnellon Middle School, there are 1,100 students and 22 buses required. The logistics of such a movement indicate that a five minute loading time would be challenging. Provide additional detail regarding the assumptions used to support boarding 1,100 students in five minutes.

F. Section 8.4, "Evacuation Time Estimates for Transit-Dependent People", (Page 8-8) indicates that for wheelchair bus runs, wheelchair vans and buses are often scarce and regular buses may be used. Wheelchairs would be stacked in the back and evacuees would sit in the front of the bus. Discuss the assumptions related to bus capacity when using this approach for wheelchair-bound passengers.

G. Section 1.3, "Preliminary Activities," subsection, "Field Surveys of the Highway Network," states that in developing the ETE analysis for the LNP site, the entire highway system within the EPZ and for some distance outside of the EPZ was driven, and characteristics of each section of highway were recorded. These characteristics included "unusual characteristics" such as narrow bridges, sharp curves, poor pavement, flood warning signs, inadequate delineations, etc. Explain the significance of these identified unusual characteristics, and how they impact the proposed LNP site. In addition, address whether or not these, or any other, unusual characteristics unique to the proposed LNP site could pose a significant impediment to the development of the LNP emergency plan.

13.03-4

ETE-3: ETE Methodology
Acceptance Criteria: Requirements A and H; Acceptance Criterion 11
Regulatory Basis: Appendix 4 to NUREG-0654 Section I.C.

A. Section 4,"Estimation of Highway Capacity," describes the process used to determine the capacity of the roadways on the network. The algorithm for intersections is provided along with a description

of variables on pages 4-1 and 4-2. Provide a general description of other important algorithms used to generate input for the PC-DYNEV traffic simulation model.

B. Section 4 (Page 4-1) states that certain intersections will be controlled by traffic control personnel during an evacuation. Their direction may supersede traffic control devices.

1. Discuss how this may affect the variables in the equation and/or intersection capacity.
2. Explain any effect it may also have on the PC-DYNEV traffic simulation model.

C. The equation for the capacity of an approach to intersections in Section 4 (Page 4-1) does not include parameter values for variables used in this equation.

1. Provide the values, or range of possible values, for the parameters in the equation, where applicable, including "Mean Duration of Green Time" and "Mean Queue Discharge".
2. Clarify whether these values are estimated or field verified.
3. Discuss how this equation is applied to staffed intersections where traffic control is in place.

D. Describe how the values for each variable in Section 4 were derived. For example, on Page 4-2, the variables F_1 and F_2 are only defined as the various known factors that influence the turn-movement-specific mean discharge headway h_m.

E. Section 1.1, "Overview of the ETE Determination Process," (Pages 1-2 and 1-3) Item 7, fifth bullet item, states that the traffic management strategy is represented in the modeling. Discuss the level of detail to which the traffic management strategy is represented in the modeling.

13.03-5

ETE-4: Demand Estimation, Permanent Residents
Acceptance Criteria: Requirements A and H; Acceptance Criterion 11
Regulatory Basis: Appendix 4 to NUREG-0654 Section II.A.

A. Section 3, "Demand Estimation," (Page 3-2) provides a description of estimations used for the permanent resident population, household, and vehicles. The average number of evacuating vehicles per household adapted from the telephone survey is assumed to be 1.32 vehicles per household (Table 1-1, Page 1-9). However, Figure F-2, "Household Vehicle Availability," (Page F-4) indicates that there are 1.82 vehicles per household, and subsection "Evacuation Response," (Page F-7) indicates an average of 1.37 vehicles per household.

1. Clarify which value for the number of vehicles per household is correct and used in the calculation.
2. Clarify whether the data presented in Table 3-2, "Permanent Resident Population and Vehicles by Protective Action Zone (PAZ)," (Page 3-4) and in Figure 3-3, "Permanent Resident Vehicles by Sector," (Page 3-6) will need to be updated if the number of vehicles per household value is changed.

B. Appendix F, "Telephone Survey," Table F-1, "Survey Sampling Plan," (page F-2) lists the population total for the five zip codes areas as 34,880. These zip codes cover part of Levy, Citrus, and Marion counties. The U.S. Census data for 2007 identifies the projected population estimates in these respective counties as 39,065, 140,169, and 324,875.

1. Clarify how the population values per zip code were determined for Table F-1.
2. Provide the EPZ population for each listed zip code, or justify why it is not needed.

C. Column 2 of Table 6-3, "Percent of Population Groups Evacuating for Various Scenarios," (Page 6-5) is labeled "Residents with Commuters in Household." However, the definition of this column below the table indicates that the values are the percentages of households that await the return of a commuter. There are two different parameters: Figure F-6, "Levy EPZ Commuters," (Page F-6) identifies 0.70 commuters per household and subsection, "Evacuation Response," on Page F-7 states that 59% of households await the return of a commuter.

1. Clarify the values used in Column 2 of Table 6-3.
2. Discuss how the percentages in Table 6-3 were developed.

D. Table 6-4, "Vehicle Estimates by Scenario," (Page 6-6) presents vehicle estimates for each of the 11 scenarios. In Scenario 11, the total vehicle estimate is 41,898, which indicates a growth of greater than 60% with no additional transit buses or external traffic projected.

1. Clarify if Table 6-4 represents an evacuation of Region R03.
2. Discuss the county-specific growth rates used to obtain the permanent resident population and shadow population expanded to the year 2017 for Scenario 11.
3. Clarify how the values for residents with commuters, residents without commuters, and shadow were developed for Scenario 11 in Table 6-4.
4. Explain why no additional transit buses or external traffic would be anticipated if a 60% growth increase is expected.

13.03-6

ETE-5: Demand Estimation, Transient Populations
Acceptance Criteria: Requirements A and H; Acceptance Criterion 11
Regulatory Basis: Appendix 4 to NUREG-0654 Sections II.B, II.E, IV.B.5

A. Information regarding the transient population is found in Section 3, "Demand Estimation," (Page 3-7). A total of 1,416 people and 889 vehicles are estimated to be present in the plume exposure pathway EPZ at peak season mainly in and around Lake Rousseau and the Gulf of Mexico. Appendix E, "Special Facility Data," identifies 11 recreational areas and 6 lodging areas with expected occupancy. When added together, the total number of persons is 1,417 and the total number of vehicles is 889. Verify that the correct value has been used for the transient population.

B. Information regarding the logistics involved in evacuating the lake area or the gulf coast areas has not been provided. Provide clarification on logistics for evacuating the lake and gulf coast areas.

C. Mobilization of the permanent resident, transient, and employee population is discussed in Section 5, "Estimation of Trip Generation Time." Figure 5-1(b), (Page 5-3) shows that transients will be: 1. Notified, 2. Become aware of the incident, and then 3. Begin evacuation trip. The figure suggests that transients would not be returning to their "residence" prior to an evacuation. Explain why the possibility for transients to return to a location to gather belongings was not considered in the evacuation time estimate.

D. Section 8, "Transit-Dependent and Special Facility Evacuation Times," (page 8-1) states transit

service may be needed for residents, employees, and transients. Discuss whether employees and transients have been factored into this need for transit service.

E. The Levy Nuclear Plant (LNP) is not listed as a major employer on Page 3-10. It is listed as a major employer on Page E-4 in Appendix E. Clarify the inconsistency. Discuss the effects on the Evacuation Time Estimate (ETE) if LNP employees are included in the calculation.

F. It is not likely that 100% of the employees of Crystal River Nuclear Power Plant (CRNPP) would evacuate during an emergency. Clarify the actual percentage of CRNPP employees that might be expected to evacuate.

G. Appendix E, "Special Facilities Data," (Page E-4) states that the Seven Rivers Regional Medical Center employs 190 people.

1. Clarify why this facility is not considered a major employer.
2. Discuss the affect on the ETE from additional vehicle demand due to these employees.

13.03-7

ETE-6: Demand Estimation, Special facility population
Acceptance Criteria: Requirements A and H; Acceptance Criterion 11
Regulatory Basis: Appendix 4 to NUREG-0654 Sections II.C, II.E, III.A, IV.B.4, IV.B.5

A. Subsection "Emergency Medical Services (EMS) Vehicles," in Section 8, "Transit Dependent and Special Facility Evacuation Time Estimates [ETEs]," (Page 8-8) states that a conservative loading time of 30 minutes is used. Table 8-4, "Special Facility Transit Demand," (Page 8-12) indicates there are 20 bedridden persons who reside in special facilities. This equates to 1.5 minutes per person to load. However, a 5-minute loading time per wheelchair-bound person is assumed in the estimate for non-ambulatory residents evacuating special facilities. Explain why it is reasonable to assume that non-ambulatory individuals may be loaded in 1.5 minutes.

B. In Appendix E, "Special Facility Data," the Levy plume exposure pathway EPZ Lodging table is presented twice, once on Page E-2 and then again on Page E-8. Discuss why the Levy EPZ Lodging table is presented twice.

C. Section 8,"Transit-Dependent and Special Facility Evacuation Time Estimates," discusses evacuation plans for schools, residents without vehicles, and special care facilities. There is one youth correctional facility (Page E-4) and five day care facilities (Page E-2) that are located inside the EPZ. These facilities are not listed in any of the tables in Section 8, "Transit-Dependent and Special Facility Evacuation Time Estimates," or discussed in the text. Clarify whether or not pre-school children and the youth in the correctional facilities have been included in the ETE.

D. Section 8,"Transit-Dependent and Special Facility Evacuation Time Estimates," includes a definition for the transit-dependent population, however does not include any individuals with special needs. Estimates have been made for those needing aid that are located at one of the three specified special care/medical centers, however there could be other people, elderly or medically incapable, that are not residents of the facility that may need special aid to evacuate. Clarify whether this transit-dependent special needs population exists and whether it was consided in the ETE.

E. Section 8.4,"Evacuation Time Estimates for Transit-Dependent People," (Page 8-4) states that the available resources are said to be sufficient in each county to evacuate the population in one wave, if all drivers are available. This section also states that based on discussions with the county, evacuation of schools can be done in a single wave, but the number of buses available for school evacuation is never stated in the ETE.

1. Clarify whether there are enough drivers and resources available to support a single run.
2. Clarify the impact on transit services if Crystal River Nuclear Plant had an evacuation at the same time as Levy Nuclear Plant.

F. An estimate has been provided for a second wave in case there is a lack of resources or inefficiency that would require buses to return to the plume exposure pathway EPZ to aid in evacuation. Section 8.4,"Evacuation Time Estimates for Transit-Dependent People," Activity G-C (Page 8-7), states for the second wave bus evacuation, the bus travel time back to the EPZ (to the start of the route) is estimated to be 20 minutes for good weather and 25 minutes for rain. Clarify whether this estimate considers the necessary time to transverse traffic control points.

G. Mobilization times in Section 5, "Estimation of Trip Generation Times," do not include information on transit dependent people getting to bus routes or waiting for buses. It is also does not explain how local authorities will inform the transit dependent people of the time which buses should be expected to arrive. Explain how transit dependent individuals are expected to get from their residences to the bus routes, and whether this time was factored into the ETE.

H. Figure 8-2, "Proposed Transit Dependent Bus Routes," (Page 8-15) does not include the number or location of the bus stops along the various routes.

1. Provide additional information on bus stops, specifically whether or not the buses will make random stops or if the stops are predetermined.
2. If stops are predetermined, provide maps that show the bus stop locations, and describe the effect on ETE calculations.

I. In Section 8, "Transit-Dependent and Special Facility Evacuation Time Estimates," there is no discussion on the number of times the buses will be stopping or the duration stopped on their proposed routes and what affect this will have on the evacuation times. If the buses are constantly stopping to pickup people, the average speeds for the buses during the evacuation scenarios will also need to be reexamined. Clarify whether stopping and dwell time were considered in the estimation of the average route time proposed for transit services.

J. According to Page 8-1, it takes 90 minutes to mobilize bus drivers and get the buses to their proper locations. This estimate is said to be based on "experience" at other rural plants. Provide information on the "experience" used to establish the mobilization time of 90 minutes for buses.

K. In Section 8.4,"Evacuation Time Estimates for Transit-Dependent People," (Page 8-5) it is assumed that it will take 5 minutes to load buses for schools and public transportation in Activity C-D which references HCM 2000. Discuss the assumptions related to the estimated time to load buses for evacuation.

L. The relocation centers that will be used for the evacuation of transit-dependent people are listed in Table 8-3,"School Relocation Schools," (Page 8-11). Discuss why these locations are not indentified on the map in Figure 8-2,"Proposed Transit Dependent Bus Routes," (Page 8-15).

13.03-8

ETE-7: Demand Estimation, Emergency planning zone (EPZ)
Acceptance Criteria: Requirements A and H; Acceptance Criterion 11
Regulatory Basis: Appendix 4 to NUREG-0654 Section II.D, Section III.B, IV.B.1

A. Section 3, "Demand Estimation," (Page 3-2) states that the plume exposure pathway EPZ is subdivided into 8 Protective Action Zones (PAZs). Figure 3.1, "Levy Nuclear Plant Protective Action Zones," (Page 3-3) shows the location of the 8 PAZs within the plume exposure pathway EPZ and the surrounding counties. In Figure 7-2, "Levy Nuclear Plant Shadow Evacuation Region," (Page 7-13), Lake Rousseau is shown as part of the shadow evacuation region. Clarify why the lake is in the shadow evacuation region and not one of the PAZs.

B. Table 6-2,"Evacuation Scenario Definitions," (Page 6-4) provides a description of the timeframes evaluated for each evacuation scenario. Scenario 11 is described as occurring in the winter, on a weekend, midday, with good weather and new plant construction. Clarify why a scenario, such as Scenario 7, was not chosen to be midweek with rain and new plant construction to provide a worst-case estimate.

C. Table 6-3,"Percent of Population Groups for Various Scenarios," (Page 6-5) provides an estimate of the percentage of different population groups that are expected to evacuate for each scenario, including the shadow population identified in Section 2.2,"Study Methodological Assumptions" (Page 2-2). Explain where voluntary evacuees are included in Table 6-3.

D. Section 7.4,"Guidance on Using ETE Tables," (Page 7-4) states that schools are not in session. In contrast, Table 6-3, "Percent of Population Groups Evacuating for Various Scenarios," (Page 6-5) and Table 6-4, "Vehicle Estimates by Scenario," shows that 10% of school buses are used for evacuation in scenarios 1 and 2. Clarify the apparent inconsistency and discuss whether or not school bus use accounts for summer school.

13.03-9

ETE-8: Demand Estimation, Emergency Planning Zone and Sub-Areas
Acceptance Criteria: Requirements A and H; Acceptance Criterion 11
Regulatory Basis: Appendix 4 to NUREG-0654 Section II.E.

A. The physical boundaries of the PAZs are described in Appendix L,"Protective Action Zone Boundaries." All zones are bound by major roads, county lines, city/town boundaries, lakes, rivers, or Crystal River Nuclear Plant PAZ boundaries. The Dunnellon and Citrus Springs communities appear to be bisected by PAZs C4 and M9 according to Figure 3-1, "Levy Nuclear Plant Protective Action Zones," (Page 3-3). Clarify whether a densely populated area has been bisected by this boundary. If so, provide a resolution for the boundary for these zones.

B. The shadow population consists of people that reside outside of the plume exposure pathway EPZ between 10 and 15 miles from the site. They are assumed to evacuate voluntarily and simultaneously with affected regions at a rate of 30% of the population. A map of the shadow region can be found in Figure 7-2, "Levy Nuclear Plant Shadow Evacuation Region" (Page 7-13).

1. Provide the population size for the shadow population.
2. Explain why the shadow population also appears to include the waterway in the plume exposure pathway EPZ in Figure 7-2.

13.03-10

ETE-9: Traffic Capacity, Evacuation Roadway Network
Acceptance Criteria: Requirements A and H; Acceptance Criterion 11
Regulatory Basis: Appendix 4 to NUREG-0654 Sections III.A, Section III.B

A. Provide route and highway numbers for evacuation routes identified by the evacuation roadway network, as described in Section 10, "Evacuation Routes."

13.03-11

ETE-10: Traffic Capacity, Roadway Segment Characteristics
Acceptance Criteria: Requirements A and H; Acceptance Criterion 11
Regulatory Basis: Appendix 4 to NUREG-0654 Section III.B

A. Appendix K, "Evacuation Roadway Network Characteristics," only lists the number of full lanes as 1, 2, or 3.

1. Provide information related to lane width, or justify why it is not needed.
2. Discuss whether actual lane width, as measured in the field survey, is used.

B. Evacuation routes are analyzed using the IDYNEV models. Classification of the roadways within the EPZ is described in Section 4,"Estimation of Highway Capacity." Section 1.3, Preliminary Activities," (Page 1-5) states that during field surveys of the highway network (both within and outside the EPZ), characteristics of each section of the highway was recorded. These included unusual characteristics, such as narrow bridges, sharp curves, poor pavement, flood warning signs, inadequate delineations, etc.

1. Clarify the location and nature of the highway sections with unusual characteristics, and describe how this information was reflected in the ETE calculations.
2. For Appendix K, "Evacuation Roadway Network Characteristics," provide the value that was used for the "Full Lane" lane width.
3. Identify where the narrowest roadway sections exist within the roadway network and discuss how this was factored into the calculations.

C. Section 4 (Page 4-5) states that the 2 lane roadway capacity is 1,700 passenger cars per hour (pc/hr) as identified in Chapter 20 of the HCM. However, the HCM identifies these capacities for 'ideal conditions' such as 12 foot widths and 6 foot shoulders.

1. Clarify whether the field survey confirmed that lane and shoulder widths meet the conditions for 'ideal'.
2. Discuss the operational considerations applied to the roadway capacity estimate including time spent following other vehicles.

3. If necessary, explain the affect on the ETE if the capacity is determined to be lower than the value used.

D. Section 4 (Page 4-4) states that a reduction factor (R=0.85) was used.

1. Clarify whether this reduction factor was applied to all roadways, including freeways.
2. Provide additional information, such as a reference, for the basis of this empirical data.

E. Section 8.4, "Evacuation Time Estimates for Transit Dependent People," provides an average speed output of 53.9 mph on Page 8-6, 53.8 mph on Page 8-7, and 51.3 mph on Page 8-8 for average roadway speeds at various times in the evacuation.

1. Explain how the average speed can exceed 50 mph when more than 70% of the roadway segments in Appendix K have free flow speeds between 30 and 50 mph.
2. Discuss the impact on the average evacuation travel speeds if an evacuation occurred at the same time at Crystal River Nuclear Plant.

13.03-12

ETE-11: Analysis of Evacuation Times, Report Format
Acceptance Criteria: Requirements A and H; Acceptance Criterion 11
Regulatory Basis: Appendix 4 to NUREG-0654 Section IV.A.1

A. In Table 7-1A, "Time to Clear Indicated Area of 50 Percent of the Affected Population," (Page 7-7) rain only appears to cause a five-minute delay in most regions. Tables 7-1B through 7-1D, (Pages 7-8 through 7-10) do not appear to show any difference in evacuation time between rain conditions, except for Region R03 for the time to clear 90 percent of the affected population, winter weekend, midday (Table 7-1B). Explain why only region R03 is affected by rain when evacuating 90%, 95%, or 100% of the population.

13.03-13

ETE-12: Analysis of Evacuation Times, Report Format,
Acceptance Criteria: Requirements A and H; Acceptance Criterion 11
Regulatory Basis: Appendix 4 to NUREG-0654 Sections IV.A.2, Section IV.B.1

A. A railroad is shown on Figure 3-1 "Levy Nuclear Pant Protective Action Zones," Page 3-3. Discuss any assumptions related to how rail traffic may affect the evacuation time estimate.

B. With respect to the shadow evacuation values used in Table 6-4, "Vehicle Estimates by Scenario", (Page 6-6) provide the assumptions with regard to trip generation times and loading of the transportation network.

C. Regarding Table 7-1D, "Time to Clear the Indicated Area of 100 Percent of the Affected Population," (Page 7-10) clarify how the evacuation time of 5 hours 10 minutes for R03 for Scenario 11 which has 41,898 vehicles, can be the same for all other scenarios, some of which have as few as 23,834 vehicles.

D. Table 7-1D, "Time to Clear the Indicated Area of 100 Percent of the Affected Population" lists the

ETE for the 5- and 10-mile rings at 5:10 (5 hours and 10 minutes). According to data provided in the report, only 19% of the plume exposure pathway EPZ population lives within the 5-mile ring. Additionally, one would have to travel a farther distance to exit the 10 mile region compared to the 5-mile ring. Discuss why the time to clear 100% of the indicated area for the 5 mile ring, is the same as the time listed for the entire plume exposure pathway EPZ.

E. Information on trip generation times for different subpopulations can be found in Section 5, "Estimation of Trip Generation Time." In Section 5, the time tables included in Distribution No. 2 and Distribution No. 3 (on Pages 5-6 and 5-7, respectively) include a NOTE, which says 'The survey data was normalized to distribute the "Don't know" response.' Discuss this note, including the process used to normalize the data.

F. Section 6, "Demand Estimation for Evacuation Scenarios," provides a description of evacuation regions and a map of the PAZs. Page I-2 identifies 8,856 vehicles as the 30% base case for the shadow evacuation, but Table 6-4, "Vehicle Estimate by Scenario," (Page 6-6) identifies from 8,898 to 14,743 vehicles for the 30% shadow evacuation.

1. Explain which value is being used for shadow resident vehicles.
2. Discuss the timing of the traffic loading onto the network for the shadow population identified in Table 6-4, "Vehicle Estimates by Scenario."
3. Clarify the impact on traffic timing and traffic loading if Crystal River Nuclear Plant had an evacuation at the same time as LNP.

13.03-14

ETE-13: Analysis of Evacuation Times, Methodology, Total Evacuation Times
Acceptance Criteria: Requirements A and H; Acceptance Criterion 11
Regulatory Basis: Appendix 4 to NUREG-0654 Section IV.B.1

A. Page ES-3 states that evacuation trips were generated at locations called zonal centroids. Provide a map which identifies where these zonal centroids were located in the model.

B. Section 4, "Estimation of Highway Capacity," (page 4-1) describes the modeling of intersections and states that control at critical intersections will often be provided by traffic control personnel.

1. Clarify how traffic control, which may supersede traffic control devices, affects the modeling parameters used in the calculations.
2. Clarify any assumptions on traffic speed, service flow, capacity, and queue discharge through a staffed intersection.
3. Clarify the impact on traffic timing and traffic loading if Crystal River Nuclear Plant had an evacuation at the same time as LNP.

C. In the last row of the table on page 5-3, the event sequence for the "Prepare to leave for evacuation trip" is identified as 2, 4→5. This implies that after Awareness (Step 2), residents Arrive Home (Step 4). Clarify whether an activity Depart place of work (Step 3) should also be included in this sequence.

D. Section 5, "Estimation of Trip Generation Times," provides the process used to develop an estimation of trip generation time of mobilization for different subgroups of the population by summing time distribution for events. As mentioned in Section 3, under "Transient Population"

(Page 3-7), the transient population includes boaters and divers that may be on Lake Rousseau and on the Gulf of Mexico. Provide trip generation time elements for the transient population.

E. Section 5, Page 5-4 states that 85% of the population within the plume exposure pathway EPZ will become aware of the accident within 30 minutes. Provide the basis for this statement.

F. Figure F-11, "Time to Prepare Home for Evacuation," (Page F-10) indicates that as much as 360 minutes, or 6 hours, are required for the maximum time needed for the last individuals to prepare to evacuate. They must then travel out of the plume exposure pathway EPZ. Table 7-1D, "Time to Clear the Indicated Area of 100 Percent of the Affected Population," (Page 7-10) indicates the longest evacuation time is 5 hours and 10 minutes. Clarify how the data in Figure F-11 was used in the development of the Evacuation Time Estimate.

13.03-15

ETE-14: Analysis of Evacuation Times, Methodology, Traffic Congestion
Acceptance Criteria: Requirements A and H; Acceptance Criterion 11
Regulatory Basis: Appendix 4 to NUREG-0654 Section IV.B.3

A. The longest evacuation time for 100% of the Evacuation Time Estimate (ETE) is 5 hours and 10 minutes in Table 7-1D, "Time to Clear the Indicated Area of 100% of the Affected Population". .

1. Section 5, Distribution #2," Prepare to Leave Work," (Page 5-6) indicates that 100% prepare to leave in 100 minutes. Discuss how the 100 minute value was derived when Appendix F, "Telephone Survey", states on Page F-8 that this activity is completed in approximately 120 minutes and shows a curve extending to 150 minutes.

2. Section 5, Distribution #3, "Travel Home," (Page 5-7) shows that 100 percent of the population has traveled home in 120 minutes. Clarify how the 120 minutes was derived when Figure F-10, "Work to Home Travel," (Page F-9) indicates that less than 100% have traveled home in 120 minutes, and the curve for this figure projects to 150 minutes.

3. Figure F-11, "Time to Prepare Home for Evacuation," (Page F-10) indicates that it takes as long as 360 minutes to prepare to evacuate. Distribution # 4, "Prepare to leave Home," (Page 5-8) indicates that 100% of the people are prepared to leave home in 210 minutes.

    a. Discuss the differences in the data between Appendix F and Section 5.
    b. Clarify the statement under Distribution #4 (Page 5-8), "These data are provided directly from the survey."

4. If necessary, reconcile Figure 5-2, "Evacuation Mobilization Activities," and Figure 5-3, "Comparison of Trip Generation Distributions," with the comments on use of telephone survey data.

B. Clarify why Figure 7-7, "Evacuation Time Estimates Winter, Weekend, Midday, Good Weather (Scenario 8)," was not projected to include 100% of the population.

C. Table 8-1, "Transit Dependent Population Estimates," states that the survey percent of households with commuters is 45%. However, if you take 0.7 commuters per household (Figure F-6, Page F-6) multiplied by 10,150 households, that would result in 7105 commuters in the ETE,

which is 31% of the population (22,758 from Page 8-10). Clarify how a value of 45% was derived in Table 8-1.

D. Provide queuing locations and estimated delay times on the maps in Figures 7-3, “Congestion Patterns at 1 Hour after the Order to Evacuate (Scenario 8),” through Figure 7-6,”Congestion Patterns at 2 Hours 30 Minutes after the Order to Evacuate (Scenario 8).”

E. In Section 8-1, “Transit Dependent People-Demand Estimates” (Page 8-2) clarify how a 50% increase in demand for buses could still be accommodated if buses are assumed to be at 68% capacity.

13.03-16

ETE-15: Other Requirements, Draft Review
Acceptance Criteria: Requirements A and H; Acceptance Criterion 11
Regulatory Basis: Appendix 4 to NUREG-0654 Section V.C

A. In the “Executive Summary,” (page ES-1) it states that the survey instrument was reviewed and modified by State and county personnel prior to the survey. The “Executive Summary,” (page ES-4) states that the traffic management plan was also reviewed with State and local law enforcement personnel. The “Introduction” (Page 1-1) states that directors and staff members of the Levy County, Marion County, and Citrus County emergency management agencies, local and state law enforcement, and planning agencies provided valued guidance and information contained in this report. Provide information on State and local emergency planning agency consultations and comments.