

## SummerRAIsPEm Resource

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**From:** Brian Anderson  
**Sent:** Tuesday, January 06, 2009 2:33 PM  
**To:** SummerRAIsPEm Resource  
**Subject:** REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 013 RELATED TO SRP SECTION 13.3 FOR THE VIRGIL C. SUMMER NUCLEAR STATION UNITS 2 AND 3 COMBINED LICENSE APPLICATION  
**Attachments:** VCS-RAI-LTR-013.doc  
**Importance:** High

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**Subject:** REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 013  
RELATED TO SRP SECTION 13.3 FOR THE VIRGIL C. SUMMER NUCLEAR STATION UNITS  
2 AND 3 COMBINED LICENSE APPLICATION

**Sent Date:** 1/6/2009 2:33:06 PM

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**From:** Brian Anderson

**Created By:** Brian.Anderson@nrc.gov

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January 6, 2009

Mr. Alfred M. Paglia  
Manager, Nuclear Licensing  
MC P40  
South Carolina Electric & Gas Company  
PO Box 88  
Jenkinsville, SC 29065

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 013 RELATED TO  
SRP SECTION 13.3 FOR THE VIRGIL C. SUMMER NUCLEAR STATION  
UNITS 2 AND 3 COMBINED LICENSE APPLICATION

Dear Mr. Paglia:

By letter dated March 27, 2008, South Carolina Electric & Gas Company 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 or you may contact Ravindra Joshi the lead project manager for the Virgil C. Summer Nuclear Station combined license at 301-415-6191.

Sincerely,

**/RA/**

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

Docket Nos. 52-027  
52-028

eRAI Tracking No. 1618

Enclosure:  
Request for Additional Information

CC: see next page

If you have any questions or comments concerning this matter, you may contact me at 301-415-9967 or you may contact Ravindra Joshi the lead project manager for the Virgil C. Summer Nuclear Station combined license at 301-415-6191.

Sincerely,

**/RA/**

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

Docket Nos. 52-027  
52-028

eRAI Tracking No. 1618

Enclosure:  
Request for Additional Information

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DATE	12/02/08	12/02/08	12/08/08	01/06/09

\*Approval captured electronically in the electronic RAI system.

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**Request for Additional Information**  
**Virgil C. Summer Nuclear Station, Units 2 and 3**  
**South Carolina Electric and Gas Company**  
**Docket No. 52-027 and 52-028**  
**SRP Section: 13.03 - Emergency Planning**  
**Application Section: 13.3-2**

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

13.03-2

**ETE-1: Estimated Population Growth**

SRP Chapter 13.3, Acceptance Criterion 11

Basis: Regulatory Guide 1.206, Appendix 4 to NUREG-0654 Section II.A

- A.** Table 1-1, "ETE [Evacuation Time Estimate] Study Comparisons," states the resident population estimated for 2007 is 11,826 people. Estimates made by South Carolina Electric and Gas (SCE&G) in the Environmental Report (ER) Section 2.5.1.1, "Population Data by Sector," and the Final Safety Analysis Report (FSAR) Section 2.1.3.1, "Resident Population within 10 Miles," states the population in 2000 was 12,209 persons (includes 76 transients). This would make the estimate in the ETE for 2007 lower than those in the ER and the FSAR estimated for the year 2000. Clarify which population estimate is correct and provide the correct value in the ETE.
- B.** Section 3, "Demand Estimation," states that population data were extrapolated out to 2014, which is the year that construction will begin, based on SCE&G plans. The estimated population at the start of construction is not provided in the report. Provide the estimated value of the resident, transient, and shadow populations that were extrapolated to 2014.
- C.** Note #1 on the bottom of page 3-4 provides the annual population growth rates for each county from 2000 through 2007 as being; Fairfield-3.33%, Richland-8.0%, Newberry-4.67%, and Lexington-11.87%. According to U.S. Census data, the population growth rate for Fairfield County decreased 0.5% and increased by 12% for Richland County between 2000 and 2007. Clarify what data were used to obtain the growth rates shown in Note #1 on page 3-4.
- D.** Explain the difference between population estimates in county plans and the ETE for the following sections:
1. Section K.5.a, "Evacuation," of the Richland Emergency Response Plan (Sector D-1, 1430 people).
  2. Section L.5.a, "Evacuation," of the Lexington County Radiological Emergency Response Plan (Sector D-2, 1,130 people), and the map of the plume exposure pathway Emergency Planning Zone (EPZ) with populations listed by Sector (same as Protective Action Zones in ETE) in Attachment 12, "Population Distribution." that includes a map of the EPZ with populations listed by Sector (same as PAZs in ETE).
  3. Populations for Sectors A, B, and C, listed in Annex Q to the Fairfield County Emergency Operations Plan, "Fixed Nuclear Facility Radiological Response Plan."
  4. Attachment 4 to Annex Q, "Population Distribution Map, 10-Mile EPZ, VC Summer Nuclear Station."

13.03-3

**ETE-2: Site Location and Emergency Planning Zone**

SRP Chapter 13.3, Requirements A and H; Acceptance Criterion 11

Basis: 10 CFR 50, Appendix E.IV (Introductory Paragraph); Appendix 4 to NUREG-0654 Section I.A.

Figure 1-1, "VC Summer Nuclear Station [VCSNS] Site Location," shows the plant with associated Protective Action Zone (PAZ) boundaries within the plume exposure pathway Emergency Planning Zone (EPZ). The text on page 1-3 states that the figure identifies communities in the area, but only Newberry and Winnsboro are identified on the map. Fairfield County, Lexington County, and Richland County are not labeled. The county boundaries are not clearly defined in Figure 1-2, "VC Summer Link-Node Analysis Network," and Figure 3-1, "VCSNS Protective Action Zones." Information on elevation or land formations other than water body locations is also not provided. Provide a topographical map that includes elevations, surrounding communities, county boundaries, and political boundaries.

13.03-4

**ETE-3: ETE General Assumptions**

SRP Chapter 13.3, Requirements A and H; Acceptance Criterion 11

Basis: 10 CFR 50, Appendix E.IV (Introductory Paragraph); Appendix 4 to NUREG-0654 Sections I.B, Section II.C, Section III.A, IV.A.1

- A. Section 2.3, "Study Assumptions," Assumption #3, states schools may be evacuated prior to notification of the general public. Table 8-5A, "School Evacuation Time Estimates-Good Weather," estimates that it will take on average of 1 hour and 56 minutes to evacuate the schools in the plume exposure pathway Emergency Planning Zone. If the assumption is correct, then the general public would not be notified until 2 hours after the emergency is declared. Provide clarification of Assumption #3.
- B. Section 2.3, "Study Assumptions," Assumption #7 states the number and location of Traffic Control Points (TCPs) depend on personnel resources and region being evacuated. Discuss the impact on evacuation times if all TCPs are not staffed.
- C. Section 2.3, "Study Assumptions," Assumption #8, states that Traffic Control Points should be established outside the EPZ. Describe how the ETE will be affected if these control points are not established.
- D. According to Section 2.3, "Study Assumptions," Assumption #11, rain and ice were used as adverse weather conditions. Section 8.4, "Evacuation Time Estimates for Transit Dependent People," does include additional mobilization time due to adverse weather. Describe how and to what extent mobilization times are affected by adverse weather.

13.03-5

**ETE-4: ETE Methodology**

SRP Chapter 13.3, Requirements A and H; Acceptance Criterion 11

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 2. Are there any other algorithms used to generate input for the models? If so, provide a general description of the algorithms.
- B. Section 4, "Estimation of Highway Capacity," does not describe how values for variables used in the equation were derived. For example, on page 4-2, the variables  $F_1$  and  $F_2$  are defined as the various known factors that influence the turn-movement-specific mean discharge headway  $h_m$ . Discuss whether these various known factors mentioned on page 4-2, which includes items such as lane width, grade, percent heavy vehicles, etc., were based on field observations or measurements.
- C. Section 4, "Estimation of Highway Capacity," states certain intersections will be controlled by traffic control personnel and their direction may supersede traffic control devices.
  - 1. Explain how this may affect the variable in the equation and/or intersection capacity.
  - 2. Explain any effect this may also have on the PC-DYNEV traffic simulation model.

13.03-6

**ETE-5: Demand Estimation, Permanent Residents**

SRP Chapter 13.3, Requirements A and H; Acceptance Criterion 11

Basis: Appendix 4 to NUREG-0654 Section II.A.

Section 2.3, "Study Assumptions," states that 33% of households would await the return of a commuter. Table 6-3, "Percent of Population Groups for Various Scenarios," (page 6-5) indicates that 67% of households have a commuter. Appendix F, "Telephone Survey," indicates that 78% would await the return of a family member prior to evacuating. Clarify which value was used in modeling for the percent of households that would await the return of commuters and make necessary changes.

13.03-7

**ETE-6: Demand Estimation, Transient Populations**

SRP Chapter 13.3, Requirements A and H; Acceptance Criterion 11

Basis: Appendix 4 to NUREG-0654 Sections II.B, II.E, IV.B.5

- A. Information regarding the transient population can be found in Section 3, "Demand Estimation." These values agree with those in Final Safety Analysis Report (FSAR) Section 2.1.3.3.1, "Transient Population within 10 Miles." However, it has been determined that Chapin, South Carolina has a Labor Day Festival which draws a large number of visitors. Peak tourist volumes for this event, and others like it that may occur during the year, are not discussed. Discuss why peak tourist volumes

were not considered for events such as the Chapin South Carolina Labor Day festival.

- B. The text in Section 3, "Demand Estimation," states Figures 3-6, "Employee Population by Sector," and 3-7, "Employee Vehicles by Sector," present non-EPZ resident employee data by sector. Figure 3-6 is not provided. It has been replaced by a duplicate of Figure 3-4, "Transient Population by Sector." Provide Figure 3-6, "Employee Population by Sector."
- C. No information is provided regarding logistics involved in evacuating the Monticello Reservoir area. Discuss the logistics that were considered for evacuating the lake area.
- D. Figure 5-1, "Events and Activities Preceding the Evacuation Trip," shows that transients will be notified, become aware of the incident, and then evacuate the area. The figure suggests that transients would not be returning to their "residence" prior to evacuation. Explain why the possibility for transients returning to a location to gather belongings was not considered in the evacuation time estimate.

13.03-8

**ETE-7: Demand Estimation, Special facility population**

SRP Chapter 13.3, Requirements A and H; Acceptance Criterion 11

Basis: Appendix 4 to NUREG-0654 Sections II.C, II.E, III.A, IV.B.4, IV.B.5

- A. Appendix E, "Special Facility Data," lists seven pre-schools that are located inside the plume exposure pathway Emergency Planning Zone (EPZ). These facilities are not listed in any of the tables in Section 8, "Transit-Dependent and Special Facility Evacuation Time Estimates [ETE]," or discussed in the text. Discuss whether pre-school children have been included in the evacuation estimates.
- B. The locations of the special facilities discussed in the report are not identified on any of the maps that were provided in Section 8, "Transit-Dependent and Special Facility Evacuation Time Estimates," or Appendix E, "Special Facility Data." Provide a map that includes the locations of the special facilities discussed in the report in relation to the site.
- C. The transit-dependent population definition does not include any individuals with special needs that may need assistance during evacuation. Discuss whether the special needs population exists or has been considered.
- D. Section 8, "Transit-Dependent and Special Facility Evacuation Time Estimates," states transit service may be needed for residents, employees, and transients. Clarify whether employees and transients are included in the transit dependent population estimate. If not, provide information regarding how the procedure will be modified to include these two population groups.
- E. Section 8.1, "Transit Dependent People-Demand Estimation," contains an equation used to calculate the number of persons ("P") requiring public transit or ride-share. According to the equation, 58% or 0.58 of households have 2 vehicles. According to Table 8-1, "Transit Population Estimates," 38.5% of households have 2 vehicles. Clarify which value is correct, and make necessary changes to the number of transit dependent-people and resources used to evacuate them.

- F.** Section 8.4, “Evacuation Time Estimates for Transit-Dependent People,” states based on discussions with South Carolina Electric & Gas and county emergency management offices for counties within the EPZ, additional buses will be provided by neighboring cities to aid in evacuation if necessary.
1. Provide information regarding the process used to request additional resources.
  2. Explain how the implementation of this process could affect evacuation times.
- G.** Section 8.4, “Evacuation Time Estimates for Transit-Dependent People,” Activity G-C, states that for the second wave bus evacuation, the bus travel time back to the EPZ (to the start of the route) is estimated to be 15 minutes for good weather and 20 minutes for rain.
1. Clarify whether a time difference associated with other inclement conditions, such as ice, has been considered.
  2. Does this estimate consider the necessary time to get through traffic control points?
- H.** 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. 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.
- I.** Section 8, “Transit-Dependent and Special Facility Evacuation Time Estimates,” states travel time for each pick-up route is expected to be 30 minutes in good weather and 35 minutes in rain. This section does not discuss the amount of times the buses will be stopping, and the duration stopped, on their proposed routes. Locations for the stops are not mentioned in the text or identified in Figure 8-2, “Proposed Transit Dependent Bus Routes.”
1. Provide additional information on bus stop locations.
  2. If stops are predetermined, provide maps that show the bus stop locations, and describe their effect on ETE calculations.
  3. Clarify whether stopping and dwell time were considered in the estimation of the average route time proposed for transit services.
- J.** Table 8-2, “School Population Demand Estimates,” provides the names, enrollment, and number of buses required to evacuate each school. The table shows that 5,388 students and 657 staff will require 95 buses for evacuation. Table 6-4, “Vehicle Estimates by Scenario,” indicates that 200 buses are needed to support evacuation of the schools.
1. Discuss why this value is different than the 95 buses identified in Table 8-2, “School Population Demand Estimates.”
  2. Provide clarification for the column labeled, “Distance.” Is this distance from the plant or EPZ boundary?
- K.** In Table 8-2, “School Population Demand Estimates,” the number of buses required for Mid-Carolina Middle School was calculated assuming 50 students per bus. The number of buses required for Chapin Middle School was calculated assuming 70 students per bus. Explain why the number of children per bus is different between these two middle schools.

- L. Section 8.4, "Evacuation Time Estimates for Transit-Dependent People," states that based on discussions with the county, school evacuation can be accomplished in a single wave, but the number of buses available for school evacuation is never stated in the ETE. Appendix 3 to Annex L, "Transportation Service Resource Newberry County," Newberry County Emergency Operations Plan lists the number of available buses as 98. Appendix 3 to Annex L, "Transportation Service Resources," of the Fairfield County Emergency Operations Plan, lists the transportation resources available for each institution and their capacities. Clarify that there are sufficient resources to evacuate the schools in a single wave.
- M. Tab B of Appendix 9 to Annex Q, "Transportation Resources for Fairfield County Schools," lists the resources required to evacuate schools within the county. McCrorey-Liston Elementary School is listed as requiring 5 buses to evacuate students. The ETE states that the same school will only require 4 buses to evacuate the school. Clarify how many buses will be necessary to evacuate students from McCrorey-Liston Elementary School.

13.03-9

**ETE-8: Demand Estimation, Emergency planning zone**

SRP Chapter 13.3, Requirements A and H; Acceptance Criterion 11

Basis: Appendix 4 to NUREG-0654 Section II.D, Section III.B, IV.B.1

- A. Intentionally left blank.
- B. Table 6-3, "Percent of Population Groups for Various Scenarios," provides an estimate of the percentage of different population groups that are expected to evacuate for each scenario. However, Table 6-3 does not include voluntary evacuees. Clarify how this group has been addressed.
- C. The longest evacuation time in 7-1D, "Time to Clear the Indicated Area of 100 Percent of the Affected Population," is 4.1 hours. However, Distribution # 4 in Section 5 indicates that 260 minutes (4.3 hours) is the time for 100% of the population to prepare to leave home.
  - 1. Discuss how the distribution in Section 5 was derived using the telephone survey information.
  - 2. Since the total evacuation time cannot be less than the mobilization time, discuss the difference between the two times.
- D. Section 7.4, "Guidance on Using ETE [Evacuation Time Estimate] Tables," states that summer implies that public schools are not in session. In contrast, Table 6-3, "Percent of Population Groups Evacuating for Various Scenarios," shows 10% of school buses are used for evacuation in Scenarios 1 and 2. Table 6-4, "Vehicle Estimates by Scenario," also shows 20 school buses are used for evacuation in scenarios 1 and 2. Discuss the use of school buses in Scenarios 1 and 2 as described in Tables 6-3 and 6-4.
- E. Section 7.3, "Evacuation Rates," states there is no significant congestion within the EPZ. However, the last paragraph of Section 7.2, "Patterns of Traffic Congestion During Evacuation," states significant congestion develops along Hwy 215 eastbound, in Scenarios 12, due to the increase in the amount of vehicles during construction. This statement is supported by Figure 7.4, "Congestion Patterns at 2 Hours after the Order to Evacuate (Scenario 12)."

1. Clarify whether congestion is expected to occur during evacuation.
2. Discuss how potential congestion will be managed?
3. What effect, if any, will congestion have on the ETE?

**ETE-9: Intentionally left blank.**

13.03-10

**ETE-10: Traffic Capacity, Evacuation Roadway Network**

SRP Chapter 13.3, Requirements A and H; Acceptance Criterion 11

Basis: Appendix 4 to NUREG-0654 Sections III.A, Section III.B

- A.** Appendix K, "Evacuation Roadway Network Characteristics," contains road characteristics for the links and nodes, but there is no reference tying them to the map in Figure 1-2, "Link-Node Analysis Network." The maps also do not contain sector and quadrant boundaries. Provide an annotated map or maps that include the nodes identified in Appendix K, "Evacuation Roadway Network Characteristics," including sector and quadrant boundaries.
- B.** A traffic management strategy is included in the plan in Section 9, "Traffic Management Strategy." The implementation of this strategy including access control points and traffic control points are included in Appendix G, "Traffic Control." It is not clear how these strategies affect the Evacuation Time Estimate (ETE) or how they are used.
  1. Explain how the ETE modeling addresses the movement of vehicles through traffic control intersections.
  2. Explain how the traffic management strategy affects ETE calculations.
- C.** Section K.5.c.6, "Evacuation," of the Richland Emergency Response Plan states that access to the evacuated area will be stringently enforced by local law enforcement, and only predetermined forms of identification will allow entrance to the evacuated area. In ETE Section 9, "Traffic Management Strategy," states that there may be legitimate reasons for people to reenter the EPZ and they will be flexible. Discuss the impact that reentry into the plume exposure pathway EPZ will have on evacuation time estimates.

13.03-11

**ETE-11: Traffic Capacity, Roadway Segment Characteristics**

SRP Chapter 13.3, Requirements A and H; Acceptance Criterion 11

Basis: Appendix 4 to NUREG-0654 Section III.B

- A.** Appendix K, "Evacuation Roadway Network Characteristics," lists lane widths as 1, 2, or 3 inferring two-lane roads, highways, and freeways. The actual width of the lane is not provided. The field survey does not confirm whether lane widths are greater than or equal to 12 feet, shoulder

widths are wider than or equal to 6 feet, and whether there are other impediments to through traffic as described in Chapter 12 of the Highway Capacity Manual. Provide information regarding lane widths.

- B.** Section 1.3, "Preliminary Activities," states that the characteristics of each section of the highway were recorded during field surveys. These included unusual characteristics, such as narrow bridges, sharp curves, poor pavement, flood warning signs, inadequate delineations, etc. In addition, Section 4, "Estimation of Highway Capacity," states that sections of roadway with adverse geometrics are characterized by lower free-flow speeds and lane capacity.
1. Identify the location and nature of the highway sections with unusual characteristics, and describe how this information was reflected in the Evacuation Time Estimate calculations.
  2. Identify and discuss, with respect to Appendix K, "Evacuation Roadway Network Characteristics," which segments reflect the narrowest roadway sections within the roadway network.
  3. Describe the impact of these narrow road segments on evacuation time estimates.
- C.** Section 4, "Estimation of Highway Capacity," states a value of  $R=0.85$  was employed based on empirical data collected on freeways. Describe the empirical data that supports the value of  $R=0.85$ , including how the value was determined.

13.03-12

**ETE-12: Analysis of Evacuation Times, Report Format**

SRP Chapter 13.3, Requirements A and H; Acceptance Criterion 11

Basis: Appendix 4 to NUREG-0654 Section IV.A.1

- A.** According to Table 6-2, "Evacuation Scenario Definitions," ice was only evaluated for winter, midweek, and midday. Explain why ice conditions were not evaluated for the weekends or for the evening when ice conditions could potentially be worse than they are during the day.
- B.** In Table 7-1A, "Time to Clear Indicated Area of 50 Percent of the Affected Population," and Table 7-1B, "Time to Clear Indicated Area of 90 Percent of the Affected Population," ice only appears to cause a five-minute delay in Regions 12 and 13, respectively. Table 7-1D, "Time to Clear Indicated Area of 100 Percent of the Affected Population," does not appear to show any difference in evacuation time between rain and ice conditions. Explain why only Regions 12 and 13 are affected by ice when evacuating 50% and 90% of the population.
- C.** Tables 8-5A and B, "School Evacuation Time Estimates-Good Weather/Rain," do not contain estimates for evacuation under icy conditions. Tables 8-6A and B, "Transit Dependent Evacuation Time Estimates-Good Weather/Rain," also do not include estimates for ice conditions. Explain why icy conditions were not considered in the estimates provided for schools and transit dependent people in Tables 8-5A/B and 8-6 A/B.

13.03-13

**ETE-13: Analysis of Evacuation Times, Report Format,**

SRP Chapter 13.3, Requirements A and H; Acceptance Criterion 11

Basis: Appendix 4 to NUREG-0654 Sections IV.A.2, Section IV.B.1

- A. The format of the Evacuation Time Estimate (ETE) is similar to that in Appendix 4 of NUREG-0654 but does not provide separate evacuation times for permanent residents and transients. Provide separate evacuation estimates for residents and transients.
- B. In Section 5, "Estimation of Trip Generation Time," the tables included in Distribution No. 2 and Distribution No. 3, include a note, which states: "The survey data was normalized to distribute the "Don't know" response." Explain this note, including the process used to normalize the data.
- C. The assumption for the base case for shadow evacuation is stated as 30% in Section 2.2, "Study Methodological Assumptions," Assumption #5 and Figure 2-1, "Voluntary Evacuation Methodology," but Table 6-3, "Percent of Population Groups for Various Scenarios," shows 33% for all scenarios except 5 and 11. Explain what percentage of shadow residents are expected to evacuate.
- D. Table I-2, "Evacuation Time Estimates for Shadow Sensitivity Study," identifies 6,908 vehicles for the 30% base case for the shadow evacuation, but Table 6-4, "Vehicle Estimate by Scenario," identifies 6,988 vehicles for the 30% shadow evacuation. Explain which value is being used for shadow resident vehicles. Discuss the timing of the traffic loading onto the network for the shadow population identified in Table 6-4.

13.03-14

**ETE-14: Analysis of Evacuation Times, Methodology, Total Evacuation Times**

SRP Chapter 13.3, Requirements A and H; Acceptance Criterion 11

Basis: Appendix 4 to NUREG-0654 Section IV.B.1

- A. Section 5, "Estimation of Trip Generation," states 85% of the population within the plume exposure pathway Emergency Planning Zone (EPZ) will be aware of the accident within 30 minutes. Provide the basis for the statement that 85% of the population within the EPZ will be aware of the accident within 30 minutes.
- B. According to Table 7-1C, "Time to Clear the Indicated Area of 95 Percent of the Affected Population," it takes longer to evacuate 95% of the population from the 2-mile ring during midweek, weekend, good weather (Scenario 5), than all other summer scenarios including the adverse weather conditions for the summer midweek midday adverse condition (Scenario 2). It would appear, from the trip generation data provided in Section 5, "Estimation of Trip Generation Time," that an evening scenario would mobilize more quickly and likely have a lower Evacuation Time Estimate (ETE) for the 95% population. This same effect is shown in Table 7-1B, "Time to Clear the Indicated Area of 90 Percent of the Affected Population," and Table 7-1A, "Time to Clear the Indicated Area of 50 Percent of the Affected Population." Explain the factors that cause the ETE for Scenario 5, in Table 7-1C, to be longer than all other summer scenarios including Scenario 2.

- C. Appendix F, Figure F-11, "Time to Prepare Home for Evacuation," 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 EPZ. Table 7-1D, "Time to Clear the Indicated Area of 100 Percent of the Affected Population," indicates the longest evacuation time is 4 hours and 10 minutes. Explain how the data in Figure F-11 were used in the development of the ETE.
- D. The curves in Figure 5-3, "Comparison of Trip Generation Distributions," appear to end at approximately 97% of population evacuating. Discuss whether these curves are intended to approach 100 %, or whether the elapsed time axis should be extended.

13.03-15

**ETE-15: Analysis of Evacuation Times, Methodology, Traffic Congestion**

SRP Chapter 13.3, Requirements A and H; Acceptance Criterion 11

Basis: Appendix 4 to NUREG-0654 Section IV.B.3

Queuing and delay times are discussed in Appendix C, "Traffic Simulation Model: PC-DYNEV," but queuing locations and estimated delay times are not indicated on the maps in Figures 7-3, "Congestion Patterns at 2 Hours after the Order to Evacuate (Scenario 1)," and Figure 7-4, "Congestion Patterns at 2 Hours after the Order to Evacuate (Scenario 12)." Provide maps that include queuing locations and estimated delay times.

13.03-16

**ETE-16: Other Requirements, Confirmation of Evacuation**

SRP Chapter 13.3, Requirements A and H; Acceptance Criterion 11

Basis: Appendix 4 to NUREG-0654 Section V.A

- A. The time it will take to confirm evacuation is discussed in Section 12, "Confirmation Time." To confirm that the evacuation process is effective, a stratified random sample and a telephone survey are suggested as an alternative for others that may be county specific. Clarify whether there are other confirmation plans being used or whether other counties have agreed to this plan.
- B. The mobilization time for the people that will support the confirmation effort is not discussed. This would include the time and resources needed to obtain the telephone numbers for the plume exposure pathway Emergency Planning Zone (EPZ) that are necessary prior to beginning the telephone survey. Provide information regarding mobilization times for people who will be conducting the evacuation confirmation.