CCNPP3COLA PEmails

From:	Arora, Surinder
Sent:	Friday, September 18, 2009 11:22 AM
То:	Poche, Robert; Jennifer.McQueeney@unistarnuclear.com; michael.stevenson@unistarnuclear.com
Cc:	CCNPP3COL Resource; Weiss, Eric; Williams, Kevin; Colaccino, Joseph; Chowdhury, Prosanta; Biggins, James; Vrahoretis, Susan; Hair, Christopher
Subject: Attachments:	FINAL RAI No. 156 NSIR 3114 FINAL RAI 156 NSIR 3114.doc

Rob,

Attached please find the subject request for additional information (RAI). A draft of this RAI was provided to you on September 2, 2009. No clarification phone call was requested on this RAI.

The schedule we have established for review of your application assumes technically correct and complete responses within 30 days of receipt of RAIs. For any RAIs that cannot be answered within 30 days, it is expected that a schedule date for submitting your technically correct and complete response will be provided to the staff within the 30 day period so that the staff can assess how this information will impact the review schedule.

Your response letter should also include a statement confirming that the response <u>does or does not</u> contain any sensitive or proprietary information.

Thanks

SURINDER ARORA, PE PROJECT MANAGER, Office of New Reactors US Nuclear Regulatory Commission

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Hearing Identifier:	CalvertCliffs_Unit3Cola_Public_EX
Email Number:	868

Mail Envelope Properties (CB87FC66F95637428C5E0D066E756B6FC071420E7F)

Subject:	FINAL RAI No. 156 NSIR 3114
Sent Date:	9/18/2009 11:21:35 AM
Received Date:	9/18/2009 11:21:37 AM
From:	Arora, Surinder

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Post Office:	HQCLSTR01.nrc.gov		
Files MESSAGE FINAL RAI 156 NSIR 3	Size 1373 114.doc	83450	Date & Time 9/18/2009 11:21:37 AM
Options Priority: Return Notification: Reply Requested: Sensitivity: Expiration Date:	Standard No Yes Normal		

Request for Additional Information No. 156 (eRAI 3114)

9/18/2009

Calvert Cliffs Unit 3 UniStar Docket No. 52-016 SRP Section: 13.03 - Emergency Planning Application Section: 13.03

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

13.03-22

ETE-18: Estimated Population Growth

Acceptance Criteria: Requirements A and H; Acceptance Criterion 11 Regulatory Basis: [A] Regulatory Guide 1.206, [B] Appendix 4 to NUREG-0654 Section II.A

- A. The third footnote to Table 6-4, "Vehicle Estimates By Scenario," (Page 6-6) states that "populations" for all scenarios except Scenario 11 have been projected to the year 2008. In Table 3-1, "EPZ Permanent Resident Population," (Page 3-5) the permanent resident population is projected to year 2008. In Section 2.1, "Data Estimates," (Page 2-1) it is stated that "population" estimates have been extrapolated to the year 2008, with no differentiation between the different populations types used in the 2008 ETE study report. However, Table 3-3, "Summary of Transients by Zone," (Page 3-8) and Table 3-4, "Summary of Non-EPZ Employees by Zone," (Page 3-12) do not indicate whether the populations have been extrapolated to the year 2008.
 - 1. Clarify whether all populations used in the evacuation time estimate calculations, except for Scenario 11 which has been extrapolated to year 2013, have been extrapolated to the year 2008.
 - 2. Provide the permanent resident population value extrapolated to the year 2013 that supports Scenario 11, the special event construction scenario and revise the ETE study report to reflect that change.
- B. Section 2.1, "Data Estimates," (Page 2-1) states that county-specific projections are based on the estimates of average annual growth rate for years 2000 and 2010 provided by the Maryland Department of Planning, Planning Data Services. Table 3-1, "EPZ Permanent Resident Population," (Page 3-5), lists the 2000 and 2008 populations for 8 Zones. The data on permanent resident populations for Zones 6, 7, and 8 are also used in Table 2, "Population by Zone," in the 2008 ETE study report addendum (Page Addendum-3), which is Enclosure 3 to the December 2008 applicant letter. The overall population growth from year 2000 to year 2008 is given as 22.3 percent. However, it is not clear how populations sizes for the 8 Zones for the year 2008 is derived from estimates of average annual growth rate for years 2000 and 2010. Clarify how the permanent resident population values for the 8 Zones listed in Table 3-1 on Page 3-5 were determined for the year 2008 when using estimates of average annual growth rate for years 2000 and 2010.

C. In the response to NRC RAI 13.03-1 [ETE-1] on Page 2 and NRC RAI 13.03-2(A) [ETE-2(A)] (Pages 4 and 5) of Enclosure 1 to the December 2008 applicant letter (ML090300691), there is a discussion on the extrapolation of population for Scenario 11 which is the new plant construction special event given in Table 6-4, "Vehicle Estimates by Scenario," (Page 6-6) in the 2008 ETE study report. The footnote to this scenario states that the population was adjusted to a 2013 estimate but does not provide a basis for the adjustment. Adding the number of vehicles for residents with and without commuters from Table 6-4 results in a total of 30,959 vehicles. Assuming the ratio of 1.92 people/vehicle from Table 1-1, "ETE Study Comparisons," (Page 1-9) we can conclude there are assumed to be 59,442 permanent residents in 2013. This computes out to an annual growth rate of 1.0% between years 2008 and 2013. Table 3-1, "EPZ Permanent Resident Population," (Page 3-5) indicates a growth rate of 22.3% in 8 years or 2.79% growth annually. Provide the basis for the low growth rate used to compute the number of residents within the EPZ for Scenario 11 or provide a reference to where the information can be found. Revise the ETE study report to reflect any change made with respect to the low population growth rate.

13.03-23

ETE-20: ETE General Assumptions

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

- A. Discuss the reason for the page numbering within the Addendum in Enclosure 3 to the August 2008 ETE study report changing from "Addendum-[page#]" to "Annex-[page #].
- B. Section 7.1, "Voluntary Evacuation and Shadow Evacuation," (Page 7-1) states the assumption that voluntary and shadow area evacuation will take place over the same timeframe as the evacuation from the impacted evacuation region. The data associated with the three added Regions as described in the August 2008 ETE study report addendum (Page Addendum-3) only includes resident, transient, and employees who reside outside the plume exposure pathway EPZ data. No voluntary or shadow evacuations were considered for these cases. Clarify what the impact would be of including voluntary and shadow evacuations into the added Regions 15 through 17 that are given in the August 2008 addendum to the ETE study report, Enclosure 3 to the December 2008 applicant letter (ML090300691). If a change is made, revise the ETE report to reflect that change.
- C. Page 3-8 states that the data provided for recreational data for Appendix E was provided from the 2002 ETE study report. Discuss why the recreational data in Appendix E used data from the 2002 ETE study report instead of updating to year 2008, or provide a revised ETE report.
- D. In the response to **NRC RAI 13.03-6(A)(1,2) [ETE-6(A)(1,2)]** on Page 18 of Enclosure 1, the applicant states that it is reasonable to expect mobilization times within 2 hours for boaters within the plume exposure pathway EPZ.

- 1. Provide the assumptions on trip generation times (mobilization times) for the times assumed for loading of boats at the boat ramps.
- 2. Discuss whether the trip generation time includes residents returning home to drop off the boat, pack and evacuate, or provide a revised ETE report.
- E. In the response to NRC RAI 13.03-9 [ETE-9] on Page 28 of Enclosure 1 to the December 22, 2008 applicant letter (ML090300691) and the footnote to the table on Page E-12 entitled "Calvert Cliffs EPZ: Marinas," in Appendix E, "Special Facility Data," of the 2008 ETE study report, it is stated that all people visiting the marinas within the plume exposure pathway EPZ are assumed to be plume exposure pathway EPZ residents to avoid the possibility of double counting, and that all visitors to other recreational areas and all people staying overnight at lodging facilities are assumed to be transients. However, these statements conflict with the statement made in Response A.1, 2 to NRC RAI 13.03-6 [ETE-6(A)(1,2)] on Page 18 of Enclosure 1 that all boaters within the plume exposure pathway EPZ are assumed to be either residents or transients who have already been accounted for. Discuss how the assumption related to classifying people visiting the marinas within the plume exposure pathway EPZ as residents only, residents and/or transients, or transients only impact the possibility of double counting and the resultant evacuation time estimate.
- F. In the response to NRC RAI 13.03-6(A)(1,2) [ETE-6(A)(1,2)] on Page 20 of Enclosure 1, the applicant commits to updating the footnote to the table on Page E-12 in Appendix E, "Special Facility Data," of the 2008 ETE study report in a future revision of the CCNPP Unit 3 COLA to reflect their response concerning people visiting marinas within the plume exposure pathway EPZ. Clarify when the 2008 ETE study report will be revised to include the proposed updates to the footnote for the table on Page E-12.

ETE-21: ETE Methodology

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

A. In the response to NRC RAI 13.03-8 [ETE-8] on Page 25 in Enclosure 1, it is stated that the 2008 ETE study report now uses the I-DYNEV system rather than the NETVAC2 computer model and that a discussion of the algorithms within the model and the standard parameters used in the analysis is included. The response discusses the iterative procedure to adjust green times at traffic signals such that competing approaches dissipate at comparable times stating this approach does not optimize, but applies reasonable service through the intersections. However, the evacuation time estimate modeling effort given in the 2008 ETE study report does not rely on traffic control and does not utilize actual green time for signals in place within the plume exposure pathway EPZ. Provide additional information on the algorithms used to calculate evacuation time estimate if green time for signals does not support dissipation of competing approaches at comparable times, and revise the ETE report to reflect any changes.

- B. Subsection "Distribution No. 2, Prepare to Leave Work: Activity 2 ->3," (Page 5-6) indicates 115 minutes elapsed time is needed for 100 percent of the workers to prepare to leave. However, Figure F-10, "Time Required to Prepare to Leave Work/School," in Appendix F on Page F-9 indicates 140 minutes for 100 percent to prepare to leave work/school.
 - 1. Provide the correct value (either 115 or 140 minutes) that was used for time to prepare to leave work/school in the evacuation time estimates calculation, and revise the ETE report to reflect any change.
 - 2. Discuss the effects on the evacuation time estimates if the 115 minute value was used.
- C. Subsection "Distribution No. 3, Travel Home: Activity 3 ->4," (Page 5-7) indicates 120 minutes elapsed time is needed for 100 percent of the workers to prepare to leave. However, Figure F-11, "Work to Home Travel Time," in Appendix F on Page F-9 states that "nearly all" commuters can arrive home after 120 minutes.
 - 1. Clarify whether 120 minutes was assumed in the evacuation time estimate calculations for 100 percent of commuters to reach home.
 - 2. If a value different than 120 minutes was used for travel time from work to home, then provide that value in the ETE study report.

ETE-22: Demand Estimation, Permanent Residents

Acceptance Criteria: Requirements A and H; Acceptance Criterion 11 Regulatory Basis: Appendix 4 to NUREG-0654 Section II.A.

- A. The response to NRC RAI 13.03-2(A)(3) [ETE-2(A)(3)] on Page 5 in Enclosure 1 states that permanent resident population and vehicle estimates for 2008 are presented in Table 3-2, "Permanent Resident Population and Vehicles by Zone," (Page 3-5). Figure F-1, "CCNPP Household Size," (Page F-3) indicates that there are 2.8 people/household and Figure F-2, "CCNPP Vehicle Availability," (Page F-4) in Appendix F, "Telephone Survey," indicates that there are 2.3 vehicles/household. The vehicle values listed in Table 3-2 do not equate to the number of vehicles per zone. For example, Zone 1 has a population of 6,484 people. This value divided by 2.8 people/household results in 2,316 households in Zone 1. By multiplying the 2,316 households by Appendix F's value of 2.3 vehicles/household, the resulting number of vehicles in Zone 1 is 5,327. The values listed in Table 3-2 instead appear to be the number of evacuating vehicles per zone (1.46 evacuating vehicles per household). Clarify whether the 2008 vehicle data given in Table 3-2 are actually the number of evacuating vehicles.
- B. Special Scenario 12 is for a typical summer, weekend, mid-day with good weather during the Air Show at the Patuxent Naval Air Base. Subsection "Airshow at the Naval Air Base," (Page 3-3) states the Air Show as occurring every other year. Response B.1,2,3 to NRC RAI 13.03-6 [ETE-6(B)(1,2,3)] on Page 19 of Enclosure 1 to the December 22, 2008 applicant letter states that the Air Show is a semi-annual event. Clarify whether the Air Show at the Patuxent Naval Air Base occurs twice per year (semi-annual) or every other year (biennial) and revise the ETE study report to reflect the change.

- C. Any of the maps in the 2008 ETE study report depicting the local areas surrounding the CCNPP show that part of the Patuxent Naval Air Base lies within the plume exposure pathway EPZ. The Naval Surface Weapons Center that is located in Zone 3 to the west of the Thomas Johnson Memorial Bridge is included in an Advisory to Evacuate. Therefore, it is unclear why the Patuxent Naval Air Base is not included in the CCNPP ETE study report.
 - 1. Clarify whether permanent residents, transient populations, or employees of the Patuxent Naval Air Base are included in the 2008 ETE analysis.
 - 2. Clarify whether all or part of the Patuxent Naval Air Base is considered to evacuate during a CCNPP Advisory to Evacuate and revise the ETE study report to reflect any change.
- D. Section 7.3, "Evacuation Rates," (Page 7-3) states that it is reasonable to expect some evacuees to delay or lengthen their mobilization activities and evacuate at a later time. The section states that the evacuation time estimates do not account for these 'stragglers'. However, in the "Executive Summary," (Page ES-2) it is stated that the planning basis will yield evacuation time estimate, measured as the elapsed time from the Advisory to Evacuate until the last vehicle exits the impacted region. Also in Subsection "Computation of ETE," in the "Executive Summary," (Page ES-3) it is stated that 100 percent of the people within the impacted region are assumed to evacuate. Section 7.4, "Guidance on Using ETE Tables," (Page 7-4) identifies the contents of Table 7-1D as the elapsed time required for 100 percent of the population within a region to evacuate from that region.
 - 1. If the evacuation time estimate does not account for stragglers, discuss how the planning basis mentioned in the Executive Summary measures the last vehicle exiting the impacted region.
 - 2. Clarify the definition of 100 percent of the public evacuating if the evacuation time estimate does not account for stragglers and revise the ETE study report to include that information.
 - 3. Provide the evacuation time estimate for 100 percent of the evacuating public and revise the ETE study report to reflect any change.

ETE-23: 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. Provide the value assumed for the number of people per transient vehicle evacuating during an emergency or provide a reference to where this information can be found, and revise the ETE study report to reflect any change.

B. As discussed in Subsection "Airshow at the Naval Air Base," (Page 3-3) in Section 3, there are a large number of transients associated with special event Scenario 12, which is the air show at the Patuxent River Naval Air Base. An average occupancy of 2.3 people per vehicle is assumed based on a study developed for a similar event in Seabrook, NH. The overall event results in a loading of 43,480 vehicles on the local roads and highways. This large vehicle influx for this event will affect the people evacuating in an emergency. For this scenario, it is assumed that 75 percent of the residents within the plume exposure pathway EPZ and the shadow area will

attend this event. To avoid double counting of residents, the residents who attend the event are loaded at the base and only the remaining 25 percent are loaded within the plume exposure pathway EPZ and shadow area. No sensitivity study was done in either the 2008 ETE study report or the 2008 ETE study report addendum regarding the effect of the value of the assumed percentages of residents within the plume exposure pathway EPZ and the shadow area who will attend this event. The impact of using a lower percentage value of permanent residents attending the event is not discussed. **Discuss the impact on evacuation time estimates for Scenario 12 on the values assumed for the percentages of residents within the plume exposure pathway EPZ and the shadow area who will attend this event.**

- C. The percentages of employees who evacuate work in the plume exposure pathway EPZ but live outside are given for each of the 12 scenarios in Table 6-3, "Percent of Population Groups Evacuating for Various Scenarios," (Page 6-5). For an evacuation occurring midday, midweek (i.e., Scenarios 1, 2, 6, 7, and 11), different percentages of employees are assumed to evacuate. Scenarios 6 and 7 assume 100 percent evacuation while Scenarios 1, 2, and 11 assume 96 percent. Clarify why Scenarios 6 and 7 in Table 6-3 (Page 6-5) state that a different percentage of employees who live outside of the plume exposure pathway EPZ will evacuate when compared to Scenarios 1, 2, and 11, and revise the ETE study report to reflect any change.
- D. Clarify the percentage of CCNPP employees who live outside of the plume exposure pathway EPZ who would be expected to evacuate or provide a reference to where this information can be found.
- E. Section 8.3, "Special Facility Demand," (Page 8-4) contains a discussion on the use of wheelchair buses and wheelchair vans for wheelchair-bound people, and Table 8-4, "Special Facility Transit Demand," (Page 8-15) cites the needs associated for wheelchair buses and wheelchair vans. Section 8, "Transit-Dependent and Special Facility Evacuation Time Estimates, (Page 8-1) states that transit service may be needed for residents, employees, and transients. It appears that only residents have been factored into those needing transit. Discuss whether employees and transients were considered to need transit service and if that data included in the evacuation time estimates provided. Revise the ETE study report to reflect any change.
- F. The table entitled, "Calvert Cliffs EPZ: Major Employers," (Page E-6) in Appendix E, "Special Facility Data," of the 2008 ETE study report lists the major employers within Calvert County and St. Mary's County. It appears that there are no major employers present in Dorchester County. Clarify whether there are any major employers present in Dorchester County within the plume exposure pathway EPZ, and revise the ETE study report to reflect any change.
- G. In Response G. to NRC RAI 13.03-6 [ETE-6(G)] on Page 20 of Enclosure 1 to the December 22, 2008 applicant letter, the applicant commits to adding the Dominion Cove Point Liquefied Natural Gas (LNG) Shipping Terminal as a major employer in the table entitled, "Calvert Cliffs EPZ: Major Employees," (Page E-6), and updating the employee data in Section 3 of the 2008 ETE study report to include the employee data provided in Response item G. for the Dominion Cove Point LNG Shipping Terminal.

- 1. Clarify when the 2008 ETE study report will be revised to include Dominion Cove Point Liquefied Natural Gas (LNG) Shipping Terminal as a major employer and include the data provided in Response Item G from Enclosure 1 in the employee data in Section 3 of the 2008 ETE report.
- 2. Clarify whether Figure E-1, "Calvert Cliffs Major Employers," (Page E-7) will be updated to include the Dominion Cove Point LNG Shipping Terminal on the map, and revise the ETE study report to reflect any change.
- H. In the table entitled, "Calvert Cliffs: Recreational Areas," in Appendix E (Page E-8) 11 of 19 recreational areas have no population or vehicle information provided (i.e., "N/A"). No additional data on the transient population or vehicles at recreational areas were given in the Enclosure 1 response to NRC RAI 13.03-9 [ETE-9] on Page 28 of the applicant letter dated December 2008 nor were the assumptions used discussed. Discuss the assumptions used for the demand estimate for those recreational areas where population and vehicle data were not available, and revise the ETE study report to reflect any change.

ETE-24: 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. The data for transit-dependant people are summarized in Table 8-1, "Transit Dependent Population Estimates" (Page 8-12) and include school children needs, and uses the assumption that 50 percent of people would ride share. Using the formula on Page 8-3 indicates that 980 people would need 33 buses for evacuation. The second column heading in Table 8-1 is "2007 EPZ Population," the population value given is 55,205. However, Table 3-1, "EPZ Permanent Resident Population," (Page 3-5) indicates that this value is for 2008. Clarify whether the "EPZ Population" value given in Table 8-1 is for year 2007 or year 2008, and revise the ETE study report to reflect any change.
- B. The responses given in Enclosure 1 to NRC RAI 13.03-7(A)(1) [ETE-7(A)(1)] on Page 21 and NRC RAI 13.03-5(A)(4, 5) [ETE-5(A,B)] on Page 15 do not provide a basis for the number of buses available for Calvert and St. Mary's county school population to complete the school evacuations in a single wave.
 - 1. Provide a basis for the number of buses available for the Calvert and St. Mary's county school population, and revise the ETE study report to include this information.
 - 2. If a second wave is needed, discuss the effect on the ETE analysis.
- C. Proposed bus routes are given on a map in Figure 8-2," Proposed Transit Dependent Bus Routes," (Page 8-10). However, there are no route numbers on the routes in Figure 8-2. Provide route numbers for roads shown on the map in Figure 8-2
- D. Special facilities are defined as being comprised of schools, health-support facilities, institutions, and child-care facilities (Page 8-1), and hospitals, correctional institutions, and major employers (Page E-1). The table entitled, "Calvert Cliffs: Day

Care Facilities," on Page E-3 indicates that there are 17 day care facilities. However, enrollment data was available for only one day care center. **Discuss the** assumptions used in determining the demand estimates for day care centers where population data is not available, or provide a revised ETE study report.

E. Response A-2 to NRC RAI 13.03-5 [ETE-5(A-2)] on Page 15 of Enclosure 1 discusses the results of communications with the local counties regarding special transportation for people at home. A new evacuation time estimate of 2 hours and 30 minutes for evacuation of homebound people using ambulances is presented. The applicant commits to adding a new subsection entitled "Evacuation of Homebound Special Needs Population," into a future revision of the CCNPP ETE Study report and CCNPP Unit 3 COLA. Clarify when the 2008 ETE study report will be revised to include the proposed new subsection entitled "Evacuation of Homebound Special Needs Population," along with assumptions and results discussed in Enclosure 1 of the December 2008 applicant submission letter.

13.03-28

ETE-27: 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. Figures 10-2 through 10-4 (Pages 10-3 through 10-5) in the 2008 ETE study report show the evacuation route maps for Zones 1 through 5, 6 and 7, and 8, respectively. While the Zone numbers and the evacuation route numbers are given on these maps, no information on sector or quadrant boundaries is provided in these figures. Provide a map that includes evacuation routes with their route numbers, Zone numbers, sectors, and quadrant boundaries or provide a reference to where this information can be found.
- B. In response to **NRC RAI 13.03-11(D) [ETE-11(D)]** on Page 32 of Enclosure 1 to the December 22, 2008 applicant letter, the applicant commits to providing the following in a future revision of the CCNPP Unit 3 COLA:
 - Adding the table entitled, "Average Delay for Selected Roadways in the CCNPP EPZ," on Page 34 of Enclosure 1 to Section 7.2 of the 2008 ETE study report. Clarify when the 2008 ETE study report will be revised to include the new table of average roadway delays from Page 34 of Enclosure 1 of the December 2008 applicant submission letter (ML090300691).
 - Replacing Figures 7-3 through 7-6 from the 2008 ETE study report (Pages 7-14 through 7-17) with the figures on Pages 35 through 38 in Enclosure 1. Clarify when the 2008 ETE study report will be revised to incorporate the replacements for Figures 7-3 through 7-6 from Enclosure 1 of the December 2008 applicant submission letter (ML090300691).

13.03-29

ETE-28: 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. Figure 1-2, "CCNPP Link-Node Analysis Network," (Page 1-7) shows the 709 links and 409 nodes in the analysis network for CCNPP cited in Table 1-1 on Page 1-9. Appendix K contains a table of evacuation roadway network characteristics, which contains 480 upstream and downstream nodes, length, number of full lanes, saturation flow rate, and free flow speed.
 - 1. Clarify the number of links and nodes included in the CCNPP traffic analysis network or provide a reference to where this information can be found.
 - 2. Provide an annotated map or series of maps that include the nodes identified in Appendix K, "Evacuation Roadway Network Characteristics," and revise the ETE study report to reflect any change.
- B. The nodal network map provided with the submittal (Figure 1-2 on Page 1-7) identifies traffic flowing toward the CCNPP. Specifically, the node string 8400 to 400 to 173 to 171 along Route 265 travels a considerable distance toward the plant.
 Discuss why it is necessary for this area to travel toward the plant during an evacuation rather than west and then northerly on Route 265 to Route 264.
- C. Subsection "Two-Lane Roads," (Page 4-5) in Section 4 states that most sections of two-lane roads within the plume exposure pathway EPZ are classified as Class I with level terrain or rolling terrain, and Class II highways that are mostly within city limits. Subsection "Capacity Estimation Along Sections of Highway," (Page 4-4) indicates that roadways with adverse geometrics are characterized by lower free-flow speeds and lane capacities. However, no data is provided on unusual roadway characteristics such as narrow bridges, sharp curves, poor pavement, flood warning signs, inadequate delineations, etc. Clarify the location and nature of roadway sections with unusual characteristics, and describe how this information was used in the evacuation time estimate calculations. Revise the ETE study report to reflect this information.
- D. Deleted.
- E. Section 4 (Page 4-5) states that the 2 lane roadway capacity is 1700 passenger cars per hour (pc/hr) as identified in (Chapter 20 of) the HCM. The HCM identifies these capacities for 'ideal conditions' such as 12 foot widths and 6 foot shoulders. Clarify whether the field survey confirmed that lane and shoulder widths meet the conditions for 'ideal', and revise the ETE study report to reflect this information.
- F. Section 4 (Page 4-4) states that a reduction factor (R=0.85) was used. Clarify whether the reduction factor on Page 4-4 of the 2008 ETE study report was applied to all roadways. Revise the ETE study report to reflect any change.
- G. In response A.3 to **NRC RAI 13.03-16 [ETE-16(A)(3)]** on Page 54 of Enclosure 1, the applicant states that since the 2008 ETE study report was prepared, a new connector to southbound Route 2/4 in Lusby has been constructed. This new connector could reduce the evacuation time estimates, reduce the number of evacuees traveling north past the CCNPP, and may lead to more consideration of contra-flow of the Thomas Johnson Memorial Bridge. It is also stated that additional sensitivity studies to explore these options by introducing the new connector will be addressed in a future revision of the ETE study report. However, no data on the

stated sensitivity studies were given in the December 2008 Enclosure 1 response (ML090300691). Provide the data associated with sensitivity studies done based on the new connector to southbound Route 2/4 in Lusby and their effect on evacuation routing and evacuation time estimates. Revise the ETE study report to reflect this information.

13.03-30

ETE-29: 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. According to Section 2.3, "Study Assumptions," (Page 2-6) assumption #9, rain was used as the single type of adverse weather condition. Adverse weather scenarios affect roadway capacity and free flow highway speeds but do not affect the time required to mobilize the general population. Rain is expected to reduce highway capacity and traffic free flow speed to 90% of normal conditions. According to Table 6-2,"Evacuation Scenario Definitions," (Page 6-4) rain was only evaluated for midday. Explain why rain conditions were not evaluated for the evening.
- B. In the "RAI Response Introduction," on Page 1 of Enclosure 1, the applicant submitted Enclosure 2, "Calvert Cliffs Nuclear Power Plan, Development of Evacuation Time Estimates," dated April 2008, Enclosure 3, "Addendum to Calvert Cliffs Nuclear Power Plant, Development of Evacuation Time Estimates," dated August 2008, and Enclosure 4, which is a large-scale traffic map of the Calvert Cliffs region as revisions to the former ETE study report. The December 2008 applicant submission letter (ML090300691) stated that a Licensing Basis Document Change Request has been initiated to incorporate these changes (i.e., the revised 2008 ETE study report and 2008 ETE study report addendum) into a future revision of the COLA. Clarify when the COLA will be revised to include April 2008 ETE study report and the August 2008 Addendum as the ETE study report.
- C. In response to NRC RAI 13.03-12(A) [ETE-12(A)] on Pages 39 through 42 of Enclosure 1, the applicant commits to adding two additional scenarios that cover evacuations during snow conditions to a future revision of the CCNPP Unit 3 COLA. The response to NRC RAI 13.03-12(B) [ETE-12(B)] on Page 41 provides information on the trip generation time activities to prepare for adverse weather conditions and confirms that winter adverse weather times will be longer than summer adverse weather times. The assumptions used for these additional scenarios are given in the Enclosure 1 document. Clarify when the 2008 ETE study report will be revised to incorporate the two new snow scenarios and the associated assumptions and data found in Enclosure 1 of the December 2008 applicant submission letter (ML090300691).

13.03-31

ETE-30: 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. Table 1-1, "ETE Study Comparisons," (Page 1-9) provides a summary of the comparison between the previous ETE study and the 2008 version of the ETE study. The text callout for this table in Section 1.4, "Comparison with Prior ETE Study," (Page 1-8) is descriptive of the content of the table. Update Table 1-1 to include new assumptions and conclusions that were provided in Enclosure 1 of the applicant letter dated December 2008 (ML090300691), as appropriate.
- B. Table 6-1, "Description of Evacuation Regions," (Page 6-2) provides data for Regions 1-14. Provide an update to Table 6-1 that includes information on Regions 15 through 17 that was presented in the August 2008 Addendum to the ETE study report from Enclosure 3, and revise the ETE study report to include this information.
- C. In response to NRC RAI 13.03-12(A,B) [ETE-12(A,B)] on Page 39 of Enclosure 1, the applicant commits to replacing Table 5-1 (on Page of the 2008 ETE study report) with the revised Table 5-1 given on Page 43 of Enclosure 1 which contains trip generation time histograms for the newly proposed snow scenarios. Clarify when the 2008 ETE study report will be revised to incorporate the replacement to Table 5-1 that contains trip generation time histograms for the December 2008 applicant submission letter (ML090300691).

ETE-31: 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. In Figure 5-1, "Events and Activities Preceding the Evacuation Trip," (Page 5-5) transients are shown to receive notification, become aware, and evacuate. However, those in hotels may need or desire to return to gather their belongings. **Discuss the effect on the evacuation time estimates if transients return to their hotel to prepare to evacuate.**
- B. "Evacuation of Ambulatory Persons from Special Facilities," of Section 8.4, "Evacuation Time Estimates for Transit Dependent People," states on Page 8.8 that return trips from host schools to the special facility in the plume exposure pathway EPZ take about 15 minutes of additional inbound travel time. However, Table 8-5A, "School Evacuation Time Estimates – Good Weather," (Page 8-16) indicates that many host schools are more than 40 miles from the plume exposure pathway EPZ boundary.
 - 1. Identify the host schools from which these buses will deploy to support the travel time of 15 minutes.
 - 2. Discuss the effect on the evacuation time estimates if the return trip travel time is longer than 15 minutes, and revise the ETE study report to reflect any change.

13.03-33

ETE-32: 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 and Section V.C

- A. Section 7, "General Population Evacuation Time Estimates," (Page 7-1) states that routing vehicles in both directions along Route 2/4 results in a significant decrease in evacuation time estimate. However, Appendix I," Evacuation Sensitivity Studies," states on Page I-3 that the existing emergency plans for CCNPP suggest travel only in the southbound direction along Route 2/4. An explanation of the difference between the sensitivity study and Section 7 ETE values is needed.
 - 1. Explain why the 10-hour and 50-minute ETE values identified in Table I-3, "Evacuation Time Estimates for Modified Routing for Zone 3," are not used as the expected ETE when the sensitivity analysis was developed using the existing emergency management plans.
 - 2. Clarify whether local authorities have agreed to evacuate people northbound and southbound.
- B. In response to NRC RAI 13.03-16(A)(1,2) [ETE-16(A)(1)] on Page 53 of Enclosure 1, the applicant states that the evacuation time estimate calculations do not rely upon traffic control measures in Appendix G. The applicant states that it is conservatively assumed that the capacity estimates given in Appendix K, "Evacuation Roadway Network Characteristics," (Page K-1) are not enhanced or compromised by traffic control points (TCPs). However, there is no statement in the 2008 ETE study report that indicated that the information provided on TCPs and access control points (ACPs) are not used for the evacuation time estimates. Clarify whether the data provided on traffic control points and access control points is used for evacuation time estimate calculations and that information is provided in the ETE study report.
- C. Item #4 in Section 1.1, "Overview of the ETE Update Process," (Page 1-2) and the response to NRC RAI 13.03-17 [ETE-17] on Page 56 of Enclosure 1 to the December 2008 applicant letter (ML090300691) indicates that the traffic management plan has not yet been reviewed by state and local authorities. Clarify when the state and local authorities will review and comment on the CCNPP traffic management plan.
- D. In response to NRC RAI 13.03-4(G)(2,3) [ETE-4(G)(2,3)] on Pages 12 and 13 in Enclosure 1, the applicant states that the timeframe for establishing traffic control points will depend on available personnel resources. However, no information was provided on the availability of personnel to staff the traffic control points. Provide information on the availability of personnel to staff the traffic control points, and revise the ETE study report to reflect this information.

13.03-34

ETE-33: Other Requirements, Confirmation of Evacuation

Acceptance Criteria: Requirements A and H; Acceptance Criterion 11 Regulatory Basis: Appendix 4 to NUREG-0654 Section V.A

A. While Calvert, St. Mary's, and Dorchester Counties may use their own procedures for confirmation of evacuation, an alternative process is provided in Section 12, "Confirmation Time," (Page 12-1). The alternative process uses a stratified random sample and a telephone survey and was projected to take 7.5 hours to complete.

With six people assigned to the task, the estimated timeframe to complete the process is 75 minutes. Use of automated computer controlled dialing equipment is suggested to reduce the manpower requirements. Clarify whether Calvert, St. Mary's, and Dorchester Counties have evacuation confirmation plans and whether the counties have agreed to use the proposed alternative process or their own process. Revise the ETE study report to include this information.