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December 17, 2008

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: Duke Energy Carolinas, LLC
William States Lee III Nuclear Station - Docket Nos. 52-018 and 52-019
AP1000 Combined License Application for the
William States Lee III Nuclear Station Units 1 and 2
Partial Response to Request for Additional Information (RAI No. 50)
Ltr # WLG2008.12-20

Reference: Letter from Brian C. Anderson (NRC) to Peter S. Hastings (Duke Energy),
*Request for Additional Information Letter No. 025 Related to SRP Section
13.3 for the William States Lee III Units 1 and 2 Combined License
Application*, dated September 26, 2008.

This letter provides the Duke Energy response to the Nuclear Regulatory Commission's (NRC) requests for the following additional information (RAI) included in the reference letter:

13.03-12, ETE-12	13.03-67, SITE-14
13.03-25, ETE-25	13.03-68, SITE-15
13.03-45, ETE-45	13.03-69, SITE-16
13.03-52, ETE-52	13.03-70, SITE-17
13.03-57, SITE-4	13.03-71, SITE-18
13.03-65, SITE-12	13.03-72, SITE-19

Responses to the NRC information requests described in the referenced letter are addressed in separate enclosures, which also identify associated changes, when appropriate, that will be made in a future revision of the applicable part of the combined license application.

If you have any questions or need any additional information, please contact Peter S. Hastings at 980-373-7820.

Bryan J. Dolan
Vice President
Nuclear Plant Development

DO93
NRO

Enclosures:

- 1) Duke Energy Response to Request for Additional Information Letter 025, RAI 13.03-12 (ETE-12)
- 2) Duke Energy Response to Request for Additional Information Letter 025, RAI 13.03-25 (ETE-25)
- 3) Duke Energy Response to Request for Additional Information Letter 025, RAI 13.03-45 (ETE-45)
- 4) Duke Energy Response to Request for Additional Information Letter 025, RAI 13.03-52 (ETE-52)
- 5) Duke Energy Response to Request for Additional Information Letter 025, RAI 13.03-57 (SITE-4)
- 6) Duke Energy Response to Request for Additional Information Letter 025, RAI 13.03-65 (SITE-12)
- 7) Duke Energy Response to Request for Additional Information Letter 025, RAI 13.03-67 (SITE-14)
- 8) Duke Energy Response to Request for Additional Information Letter 025, RAI 13.03-68 (SITE-15)
- 9) Duke Energy Response to Request for Additional Information Letter 025, RAI 13.03-69 (SITE-16)
- 10) Duke Energy Response to Request for Additional Information Letter 025, RAI 13.03-70 (SITE-17)
- 11) Duke Energy Response to Request for Additional Information Letter 025, RAI 13.03-71 (SITE-18)
- 12) Duke Energy Response to Request for Additional Information Letter 025, RAI 13.03-72 (SITE-19)

AFFIDAVIT OF BRYAN J. DOLAN

Bryan J. Dolan, being duly sworn, states that he is Vice President, Nuclear Plant Development, Duke Energy Carolinas, LLC, that he is authorized on the part of said Company to sign and file with the U. S. Nuclear Regulatory Commission this supplement to the combined license application for the William States Lee III Nuclear Station and that all the matter and facts set forth herein are true and correct to the best of his knowledge.



Bryan J. Dolan

Subscribed and sworn to me on December 17, 2008



Notary Public

My commission expires: 4/19/2010



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December 17, 2008
Page 4 of 4

xc (w/o enclosures):

Loren Plisco, Deputy Regional Administrator, Region II
Stephanie Coffin, Branch Chief, DNRL

xc (w/enclosures):

Brian Anderson, Project Manager, DNRL
Brian Hughes, Senior Project Manager, DNRL

Lee Nuclear Station Response to Request for Additional Information (RAI)

RAI Letter No. 025

NRC Technical Review Branch: Licensing and Inspection Branch (NSIR/DPR/LIB (EP))

Reference NRC RAI Number(s): 13.03-012

NRC RAI:

ETE-12:

The routes for individuals requiring public transit are identified in Chapter 8, "Transit-Dependent and Special Facility Evacuation Estimates," but there is no mention of how transit dependent individuals get from their residence to these bus routes. Annex Q, "Fixed Nuclear Facility," of the Cherokee County EOP indicates that people may call in for assistance and will be scheduled for pick-up. *"Walk to the nearest public school if it is within one-half mile. If you live over one-half mile from a public school, you should contact the Cherokee County Emergency Management Agency for assistance."* School buses will then be used to transport these individuals to the reception centers.

- a. Discuss if the ETE developed for school in session includes consideration that the same buses will be used to evacuate transit dependent individuals.
- b. If the same buses are used, explain the effect on the ETE for the transit dependent residents under this scenario.
- c. Discuss if the bus routes on Figure 8-2, "Proposed Transit Dependent Bus Routes," pass by schools to pick up residents.
- d. Page 7-4 states that summer implies that school is not in session, but Tables 6-3, "Percent of Population Groups for Various Scenarios," and 6-4, "Vehicle Estimates by Scenario," show 10% of school buses evacuating in Scenarios 1 and 2, and 37 buses on the road for scenarios 1 and 2 (summer mid-week mid-day) and also for scenarios 9 and 10 (winter weekend mid-day). Discuss why 10% of the school buses are planned for use in Scenarios 1 and 2 which are summer and in Scenarios 9 and 10, which are winter weekend. From where are students being evacuated?
- e. Regarding Table 8-7A, "Transit Dependent Evacuation Time Estimates – Good Weather," explain how the inbound bus speed was derived. These buses would be traveling through traffic control points that have been established to prevent pass through traffic. Discuss if this has been considered in the travel speed?
- f. Provide a basis for using 30 minutes for pick up time in Table 8-7A "Transit Dependent Evacuation Time Estimates – Good Weather," and Table 8-7B, "Transit Dependent Evacuation time Estimates – Rain."

Duke Energy Response:

Given that the evacuees in question have no access to private transportation, those who are ambulatory would be expected to walk to the routes as stipulated in the Cherokee County EOP. The bus routes were designed to service the areas with higher population densities (Gaffney,

Blacksburg) within the EPZ, as transit-dependent persons are more likely to be concentrated in those areas. Furthermore, the bus routes were chosen along major routes as most communities having higher significant populations are located within close proximity to the major routes. A map illustrating the schools in the EPZ is included as Attachment 1 to this response. The schools within the EPZ are either directly on the transit routes identified or within a half mile of the routes. Thus, buses could easily travel to the schools and pick up any transit-dependent persons who may be waiting for transportation.

- a. The ETE developed for school in session does include consideration that the same buses will be used to evacuate transit-dependent individuals. This is considered a second-wave evacuation and is discussed in Section 8 of the ETE report and also in the response to Item b of this response.
- b. As stated in Section 8, if there are not sufficient buses to support the evacuation of all school children and all transit-dependent persons in one wave, buses are prioritized for school evacuation. After dropping off school children at the reception centers, the buses will return to the EPZ to perform a "second-wave" evacuation of transit-dependent persons. Thus, the ETE does consider that the same buses are used for both school and transit dependent population evacuation. The effect on the transit-dependent ETE of this process can be seen in Tables 8-7A and B by comparison of the "single wave" ETE to the "second wave" ETE. Based on this comparison reliance on a "second wave" evacuation results in an increase of 1 hour and 50 minutes (Good Weather) and 2 hours (Rain) to the ETE for transit-dependents.

Revisions made to the "second wave" ETE shown in Tables 8-7A and 8-7B are based on adjusted school bus speeds used for the school evacuation time estimates as discussed in the response to RAI 13.3-031; provided in Duke Letter WLG2008.12-01, dated December 9, 2008.

ETE Report (Rev. 1) Section 8, Table 8-7A and Table 8-7B will be revised as shown in Attachments 2, 3 and 4. Changes to the Tables and any associated conforming changes will be made, as necessary, in a future revision to the ETE Report.

- c. As discussed above, the routes were designed to service the higher population density areas in the EPZ along the major roads in the area. As the map provided as Attachment 1 shows, all of the schools in the EPZ are either located along one of these routes or are within ½ mile of the proposed transit dependent bus routes. The ½ mile buffer around each school is color coded to match the color of the bus route being served, as shown in the legend of the map. It is anticipated that some transit-dependent individuals will walk to the bus route and be picked up as the buses traverse these routes; others will walk to a school to await the arrival of a bus. Based on an assumed bus occupancy of 30 transit-dependent persons (see page 8-2 of the ETE Report), a pickup time of 30 minutes is estimated for 30 individual stops to pick up passengers, with an average of one minute of delay associated with each stop (Item f of this response provides additional information). In accordance with the Cherokee County EOP, buses will stop at the schools located near the routes to pick up transit dependent individuals that have congregated at the schools. Travel to the schools from the route will involve at most one-mile of additional travel, round trip. Assuming a speed of 20 mph, the round trip would take approximately 3 minutes to complete.

These school stops will not extend the ETE because the allowance made for picking up passengers (30 minutes) is sufficient to include the additional travel time needed to service those who have congregated at the schools. For example, assume the bus stops at a school and picks up 10 transit-dependent persons. The bus will then make a maximum of 20 more stops before reaching capacity, which would involve an estimated 20 minutes of delay. The 3 minute round trip travel time from the bus route to the school plus the 20 minutes estimated loading time for the 20 individual stops would allow 7 minutes for the bus to decelerate at the school and 10 passengers to board.

- d. For Scenarios 1 and 2, the buses are evacuating summer school students. The percentages in Table 6-3 were discussed with the counties during a progress meeting. Based on data provided by York and Cherokee Counties, the summer school enrollment is assumed to be 10% of the enrollment for the regular school year.

For Scenarios 9 and 10, the buses are evacuating student athletes. Internet searches of South Carolina high school athletics indicate that there are various athletic tournaments held on weekends throughout the school year. It is conservatively assumed that 10% of the normal school buses required during the week are needed under these circumstances. As shown in Table 6-4, there are 48,702 (reference response to RAI 13.3-014) vehicles evacuating for Scenarios 9 and 10, 37 of which are school buses. Thus, the school buses account for less than 0.1% of the total vehicles evacuating and as such will not significantly impact the ETE for these scenarios.

- e. The 3rd bullet on Page 8-7 of the ETE Report (Rev. 1) indicates that the average travel time from the EPZ Boundary to the Reception Center calculated in Table 8-5A was used as the travel time for buses returning to the EPZ to evacuate transit dependents. As stated on the top of page 8-7, assumed bus speeds of 45 mph and 40 mph for good weather and rain, respectively, are used to estimate this travel time. On the return trip, buses are traveling counter to evacuating traffic. Thus, the use of the average travel time to the reception center for the return trip is conservative.

The TCPs are created to facilitate and guide evacuating traffic – not to impede their progress. It is reasonable to expect that incoming buses will have their travel expedited by the personnel at the TCP, rather than hindered. Local officials agreed with this estimate as reflected by their acceptance of the ETE documented by the Certification Letters provided in Appendix 7 of the Lee Emergency Plan.

- f. As documented in Tables 8-7A, a pickup time of 30 minutes is allocated for each route run in good weather. This estimate for pickup time is based on the reasonable assumption that each bus will, on average, contain 30 passengers (page 8-2 of the ETE Report (Rev.1)). It is conservatively assumed that passengers will each be picked up individually which translates into 30 bus stops per run. The delay associated with each stop, which includes slowing, stopping, boarding, seating and then accelerating, is calculated at less than 1 minute. Thus, a total of 30 stops taking 1 minute each yields a total pickup time of 30 minutes. This pick up time was deemed reasonable by the EPZ counties during the ETE review process.

Proposed revisions to the ETE Report require review by State and local governments prior to implementation. The revised ETE will be submitted to State and local governments for final review and approval.

References:

1. Response to RAI 13.3-031, provided in Duke Letter, *Partial Response to Request for Additional Information (RAI No. 50) WLG2008.12.01*, dated December 9, 2008.
2. Response to RAI 13.3-014, provided in Duke Letter, *Partial Response to Request for Additional Information (RAI No. 50) WLG2008.12.01*, dated November 20, 2008.

Associated Revisions to the Lee Nuclear Station Evacuation Time Estimate Report:

1. Revise Chapter 8 of the ETE Report to include the Transit bus routes and school location map shown in Attachment 1.
2. Revise Chapter 8, Table 8-7A and Table 8-7B of ETE Report (Rev. 1) as shown in Attachments 2, 3 and 4.

(Note: The revised times found in column "Arrive at RC" of Tables 8-7A and 8-7B are based on adjusted school bus speeds discussed in the response to RAI 13.3-031 provided in Duke Energy Letter WLG2008.12.01, dated December 9, 2008.)

Associated Revision to the Lee Nuclear Station Final Safety Analysis Report or Emergency Plan:

None

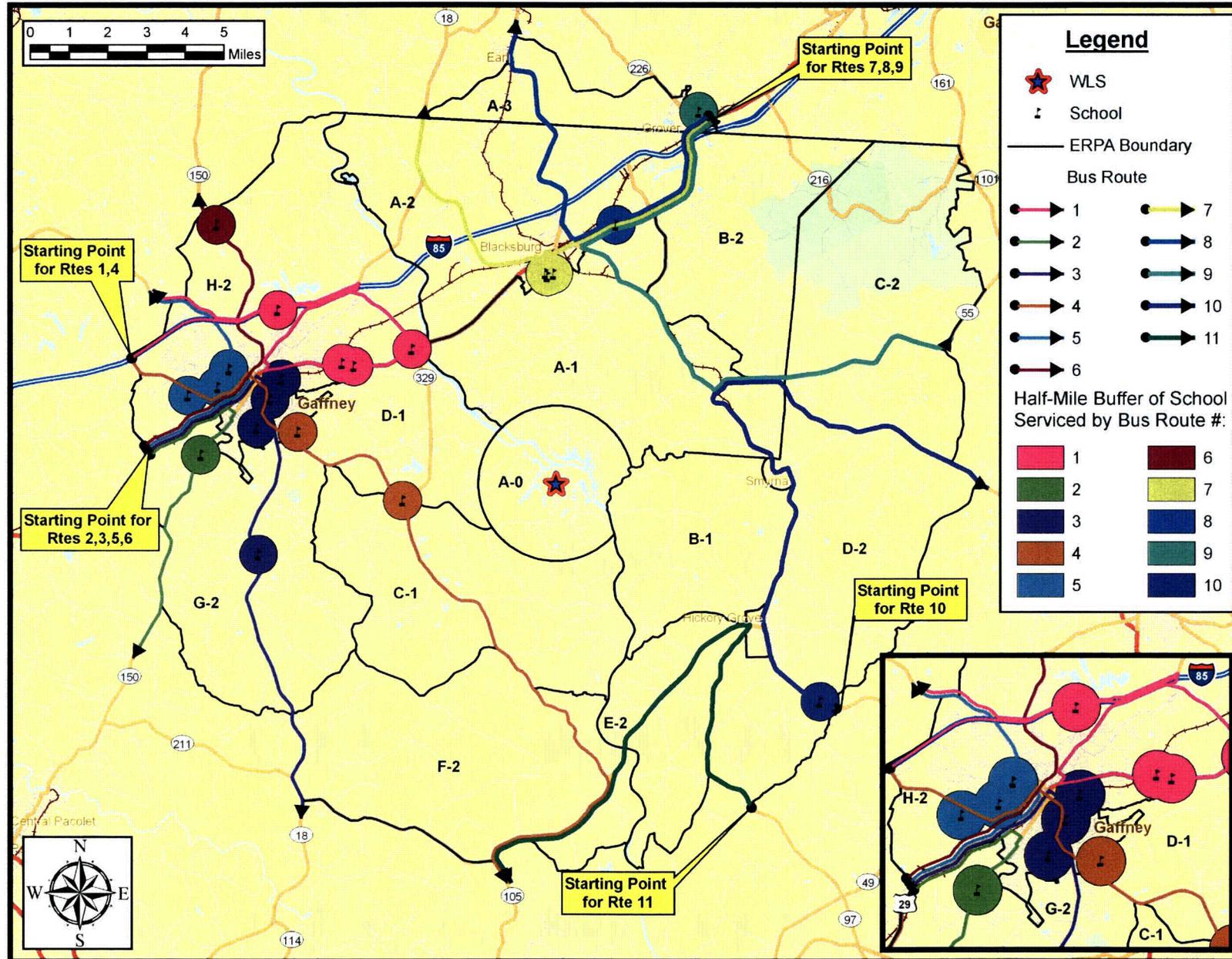
Attachment:

1. Revised Transit bus routes and school location map.
2. Markup of Affected Portion of ETE Report (Rev. 1), Chapter 8.
3. Revised ETE Report (Rev. 1) Table 8-7A.
4. Revised ETE Report (Rev. 1) Table 8-7B.

Lee Nuclear Station Response to Request for Additional Information (RAI)

Attachment 1 to RAI 13.03-012

Transit bus routes and school location map



Lee Nuclear Station Response to Request for Additional Information (RAI)

Attachment 2 to RAI 13.03-012

Markup of Affected Portion of ETE Report (Rev. 1), Chapter 8

8. TRANSIT-DEPENDENT AND SPECIAL FACILITY EVACUATION TIME ESTIMATES

8.4 Evacuation Time Estimates for Transit-Dependent People

Tables 8-5A (good weather) and 8-5B (rain) present the following evacuation time estimates (rounded up to the nearest 5 minutes) for schools in the EPZ: (1) The elapsed time from the Advisory to Evacuate until the bus exits the EPZ; and (2) The elapsed time until the bus reaches the School Reception Center. The evacuation time out of the EPZ can be computed as the sum of travel times associated with Activities A→B→C, C→D, and D→E (For example: 90 min. + 15 + 7 ~~48~~ = ~~1:55~~ 2:35 for Gaffney High School, with good weather rounded up to the nearest 5 minutes). The evacuation time to the School Reception Center is determined by adding the time associated with Activity E→F (discussed below), to this EPZ evacuation time.

Activity: Passengers Leave Bus (F→G)

A bus can empty within 5 minutes. The bus driver takes a 15-minute break.

Activity: Bus Returns to Route for Second Wave Evacuation (G→C)

The buses assigned to return to the EPZ to perform a “second wave” evacuation of transit-dependent evacuees will be those that evacuated the schoolchildren. These buses are assigned since they will be the first buses to complete their evacuation service and are therefore the first to be available for the second wave. The passengers leave the bus, and the bus then travels to its route and proceeds to pick up transit-dependent evacuees along the route. The travel time back to the EPZ is calculated using distances estimated from GIS and the assumed bus travel speeds.

The travel times for Bus Route Number 3 are computed as follows for good weather:

- Bus arrives at reception center at ~~2:20~~ 2:35 in good weather (average of “ETE to RC (min)” column in Table 8-5A).
- Bus discharges passengers (5 minutes) and driver takes a 15-minute rest: 20 minutes.
- Bus returns to EPZ: 24 minutes (average of “Travel time EPZ Bdry to RC” column in Table 8-5A).
- Bus completes pick-ups along route and departs EPZ: 30 minutes + (15.9 miles @ 21.2 mph) = 1:15.
- Bus exits EPZ at time ~~2:20~~ 2:35 + 0:20 + 0:24 + 1:15 = ~~4:20~~ 4:35 (rounded up to nearest 5 minutes) after the Advisory to Evacuate.

The ETE for the completion of the second wave are given in Table 8-7.

Lee Nuclear Station Response to Request for Additional Information (RAI)

Attachment 3 to RAI 13.03-012

Revised ETE Report (Rev. 1), Table 8-7A

Table 8-7A. Transit-Dependent Evacuation Time Estimates - GOOD WEATHER												
Route Number	Single Wave					Second Wave						ETE (hr:min)
	Mobilization (min.)	Route Length (mi.)	Route Travel Time (min.)	Pickup Time (min.)	ETE (hr:min)	Arrive at RC (min.)	Unload (min.)	Driver Rest (min.)	Return to EPZ (min.)	Route Travel Time (min.)	Pickup Time (min.)	
1	90	22.3	63	30	3:05	140 155	5	15	24	63	30	4:404:55
2	90	9.9	28	30	2:30	140 155	5	15	24	28	30	4:054:20
3	90	15.9	45	30	2:45	140 155	5	15	24	45	30	4:204:35
4	90	23.9	68	30	3:10	140 155	5	15	24	68	30	4:455:00
5	90	7.0	20	30	2:20	140 155	5	15	24	20	30	3:554:10
6	90	9.1	26	30	2:30	140 155	5	15	24	26	30	4:004:15
7	90	12.6	36	30	2:40	140 155	5	15	24	36	30	4:104:25
8	90	12.2	34	30	2:35	140 155	5	15	24	34	30	4:104:25
9	90	17.4	49	30	2:50	140 155	5	15	24	49	30	4:254:40
10	90	18.8	53	30	2:55	140 155	5	15	24	53	30	4:304:45
11	90	15.9	45	30	2:45	140 155	5	15	24	45	30	4:204:35
Average for EPZ:					2:45	Average for EPZ:						4:204:35

Lee Nuclear Station Response to Request for Additional Information (RAI)

Attachment 4 to RAI 13.03-012

Revised ETE Report (Rev. 1), Table 8-7B

Table 8-7B. Transit-Dependent Evacuation Time Estimates - RAIN												
Route Number	Single Wave					Second Wave						ETE (hr:min)
	Mobilization (min.)	Route Length (mi.)	Route Travel Time (min.)	Pickup Time (min.)	ETE (hr:min)	Arrive at RC (min.)	Unload (min.)	Driver Rest (min.)	Return to EPZ (min.)	Route Travel Time (min.)	Pickup Time (min.)	
1	100	22.3	66	40	3:30	160 170	5	15	26	66	40	5:155:25
2	100	9.9	29	40	2:50	160 170	5	15	26	29	40	4:354:45
3	100	15.9	47	40	3:10	160 170	5	15	26	47	40	4:555:05
4	100	23.9	70	40	3:30	160 170	5	15	26	70	40	5:205:30
5	100	7.0	21	40	2:45	160 170	5	15	26	21	40	4:304:40
6	100	9.1	27	40	2:50	160 170	5	15	26	27	40	4:354:45
7	100	12.6	37	40	3:00	160 170	5	15	26	37	40	4:454:55
8	100	12.2	36	40	3:00	160 170	5	15	26	36	40	4:454:55
9	100	17.4	51	40	3:15	160 170	5	15	26	51	40	5:005:10
10	100	18.8	55	40	3:15	160 170	5	15	26	55	40	5:055:15
11	100	15.9	47	40	3:10	160 170	5	15	26	47	40	4:555:05
Average for EPZ:					3:05	Average for EPZ:						4:505:05

Lee Nuclear Station Response to Request for Additional Information (RAI)

RAI Letter No. 025

NRC Technical Review Branch: Licensing and Inspection Branch (NSIR/DPR/LIB (EP))

Reference NRC RAI Number(s): 13.03-025

NRC RAI:

ETE-25:

Section 8, "Transit-Dependent and Special Facility Evacuation Time Estimates," covers the transit dependent population and special facilities. This section also includes information on school enrollment at 22 schools, evacuation procedures, and the number of buses required for the evacuation of each school. There are 10 preschools, 2 nursing homes, 1 jail, and one hospital within the EPZ. Table 8-4, "Special Facility Transit Demand," does not include all of the special facilities included in Appendix E, "Special Facility Data," such as the day care centers and the County Corrections Center.

- a. Explain why these facilities are not included in the special facility transit demand analysis.
- b. Explain how the inmates at the correctional center are dealt with.
- c. If necessary, provide information to support the evacuation time for these additional facilities and discuss the effect these may have on the ETEs provided.
- d. Table 8-2, "School Population Demand Estimates," (and Table E-2, "Lee EPZ Schools") lists 22 schools, but there are only 21 school reception areas in Table 8-3, "Assumed School Reception Centers." Where do the 13 buses from Limestone College go?

Duke Energy Response:

- a. Correctional facilities are discussed under Item b of this RAI response; day care centers under Item c of this RAI response; and Limestone College under Item d of this RAI response.
- b. Decisions and actions associated with the evacuation of the Cherokee County Detention Center fall within the authorities and responsibilities of the Cherokee County Sheriff in coordination with the South Carolina Department of Corrections under the direction of the South Carolina Law Enforcement Division (SLED). The Cherokee County Detention Center maintains emergency plans that cover facility evacuation. Personnel and equipment necessary to implement an evacuation of the Cherokee County are coordinated with the State Department of Corrections. These activities are addressed in Annex 13 of the South Carolina Emergency Operations Plan (SCEOP) and Cherokee County Emergency Plan.
- c. Day care centers are private enterprise, state regulated facilities that provide for the supervision and care of local children who are dropped off by a parent or legal guardian and picked up at a later time the same day. South Carolina statute 114-500, "Regulations For the Licensing of Child Care Centers" provides the legal requirements for operation of the facility. Section 114-505 H. (3) of the statute specifies, "The facility shall have an up to date written plan for evacuating in case of fire, a natural disaster, or other threatening situation

that may pose a health or safety hazard.” Specific evacuation processes for each day care center will be specified in these plans.

Under an evacuation advisory, it is likely that the majority of the children will be picked up by their parents and are covered in the general population ETE. For those children not picked up by their parents, state regulation (staff to child ratio requirements) will dictate the numbers of staff that are required to remain with and evacuate with the remaining children; the excess staff are assumed to evacuate using private vehicles.

Surveys conducted during the development of the ETE indicated that many day care centers have a bus or mini-bus. While this transportation may not be capable of servicing all children at these facilities, it can be used to evacuate children not picked up in a timely manner. As an additional measure, day care centers in York County that require transportation support may contact York County Emergency Management who will ensure buses are dispatched to the day care center. It is assumed that the numbers of children that are not picked up by parents will be a small fraction of the normal facility capacity and as such will not have an impact on the number of buses required to facilitate the evacuation of the EPZ.

According to the York County Emergency Management Agency (EMA), day care centers within the Catawba Nuclear Station (CNS) EPZ are required to have an emergency plan in place and are encouraged to maintain parent emergency contact information. To evacuate those children not picked up by parents during the 90 minute mobilization period, the day care center can transport those children to the nearest public elementary school where they can evacuate with the school children. As an additional measure, day care centers requiring transportation support for evacuating any remaining children can contact the York County EMA who would ensure buses are dispatched to the day care center when they become available following evacuation of the school children.

The CNS EPZ has many more day care centers in its EPZ than are in the Lee EPZ, so the day care center evacuation scenario is significantly less complicated due to the fewer number of children who may need to be transported. York County will use the same process to ensure the evacuation of day care centers within the Lee EPZ.

With respect to day care centers located within the Cherokee County EPZ, the ETE has identified an area that may require further development of the emergency plans by Cherokee County. The specific conditions considered in the development of ETE Report (Rev. 1) are expected to change prior to the projected date of facility operation. Since conditions are anticipated to change, specific planning to facilitate evacuation of day care centers in compliance with state regulation is appropriately deferred to a time closer to facility operation when the applicable information will be more accurate. As such, day care evacuation plans specific to the Lee facility will not be fully developed until closer to fuel loading and will be coordinated with the facility emergency plan. When fully developed, these emergency plans will consider changes in day care center attendance, location and transportation options. The effect of the measures implemented by Cherokee County will be considered in a future ETE to determine the adequacy and acceptability with respect to State and local governments and their protective action responsibilities and capabilities.

The plans will be completed to satisfy the regulatory requirements specified in 10 CFR 50.47 (b) and (d) with their adequacy demonstrated during the full participation exercise as required by 10 CFR 50 Appendix E. IV.F.1.a (ii).

As discussed in Item b, personnel and equipment necessary to complete an evacuation of the Cherokee County Detention Center will be coordinated and implemented with the State Department of Corrections. The corrections facility has a capacity of 150 inmates and is located approximately two miles from the EPZ boundary. It is assumed that four buses will be required to evacuate the inmates; given the close proximity to the EPZ boundary the evacuation of the Cherokee County Detention Center is not assumed to affect the overall ETE.

- d. Based on recent survey information, Limestone College has 370 resident students (already counted as part of the permanent resident population) and 370 commuter students. The latter group is estimated as 80% percent (296 students) EPZ residents (already counted), with the remainder (74 students) commuting from outside the EPZ. For ETE purposes, these "student commuters" should be accounted for as "employee commuters." Thirteen buses (equivalent to 26 privately owned vehicles (POV)) were estimated in the ETE as evacuating vehicles.

Most student commuters will likely have access to a POV. Thus, the estimated number of vehicles (26) is low by $(74-26) = 48$ vehicles, assuming no car-pooling. The maximum impact on ETE of the 50th percentile value (assuming these commuters simply walk out of class and start evacuating early in the trip-generation process) can be estimated as follows:

- Assume that all 48 vehicles evacuate on the same lane of roadway.
- Assign a low saturation flow rate of 1500 vehicles per hour per lane.
- Assign a green time ratio (i.e. ratio of time the signal is green to total time) of 0.67 servicing the evacuating traffic. Thus, capacity would be reduced to 1000 vehicles per hour.

Under these circumstances, ETE would increase about 3 minutes ($48 \div 1000 \times 60$). Unless this selected lane is saturated continuously for 2 hours, which is unlikely, this 3-minute increase would not be reflected in the 90th or 95th percentile ETE.

The commuter students will return to their homes, as they reside outside the EPZ. Those who live on campus may return home to be with their families (assuming they live outside the EPZ, but relatively close to Gaffney). Otherwise, they will evacuate to the Spartanburg Reception Center. Table 8-3 has been updated to include Limestone College, and is included as Attachment 1.

A discussion of Limestone College will be added to Page 3-2 of the ETE report. This discussion is included as Attachment 2 to this response. The Table on Page 8-2 of the ETE report has been modified to reflect the current number of students in attendance at Limestone College. The table has been revised as indicated in Attachment 4 of this response. A total of two buses will be sent to Limestone College as a contingency plan for those students who may not have access to a POV. The 74 vehicles for those students commuting into the EPZ to attend Limestone College will be introduced into the I-DYNEV simulation model input stream for future applications; the number of buses needed for Limestone College will be changed to two. The entries for Limestone College in Table 8-2 will be revised accordingly.

as indicated in Attachment 3. A sensitivity study was run for an evacuation of Region R3 (Full EPZ) with Scenario 6 conditions (winter, midweek, midday, good weather) with these revised vehicle estimates; the ETE were unchanged for the 50th, 90th, 95th and 100th percentiles when the additional vehicles associated with the evacuation of Limestone College were included.

Proposed revisions to the ETE Report require review by State and local governments prior to implementation. The revised ETE will be submitted to State and local governments for final review and approval.

Associated Revisions to the Lee Nuclear Station Evacuation Time Estimate Report:

1. ETE Table 8-3 "Assumed School Reception Centers"
2. ETE Section 3 "Demand Estimation."
3. ETE Table 8-2 "School Population Demand Estimates"
4. ETE Report, Page E-2, "Lee EPZ: Schools"

Associated Revision to the Lee Nuclear Station Final Safety Analysis Report or Emergency Plan:

None

Attachments:

1. Revised ETE Report (Rev. 1), Table 8-3
2. Revised ETE Report (Rev. 1), Section 3, Page 3.2
3. Revised ETE Report (Rev. 1), Table 8-2
4. Revised ETE Report (Rev. 1) Appendix E, Page E-2

Lee Nuclear Station Response to Request for Additional Information (RAI)

Attachment 1 to RAI 13.03-025

**Revised ETE Report (Rev. 1) Table 8-3
Assumed School Reception Centers**

Table 8-3. Assumed School Reception Centers	
School	City*
Blacksburg Elementary	GASTONIA
Blacksburg High	
Blacksburg Middle	
Blacksburg Primary	
Hickory Grove-Sharon Elementary	ROCK HILL
Grover Elementary	SHELBY
Alma Elementary	SPARTANBURG
B.D. Lee Elementary	
Cherokee Technology Center	
Corinth Elementary	
Draytonville Elementary	
Ewing Middle	
Gaffney High	
Gaffney Middle	
Granard Middle	
Grassy Pond Elementary	
Heritage Christian School	
Limestone-Central Elementary	
Limestone College	
Luther Vaughn Elementary	
Mary Bramlett Elementary	
Gaffney Christian Academy	

* Reception Centers have not yet been designated for WLS; it is assumed the reception centers are in the center of the city.

Lee Nuclear Station Response to Request for Additional Information (RAI)

Attachment 2 to RAI 13.03-025

**Revised ETE Report (Rev.1) Section 3, Page 3.2
Demand Estimation**

Analysis of the population characteristics of the WLS EPZ indicates the need to identify three distinct groups:

- Permanent residents - people who are year round residents of the EPZ;
- Transients - people who reside outside of the EPZ who enter the area for a specific purpose (shopping, recreation) and then leave the area.
- Employees - people who reside outside of the EPZ and commute to businesses within the EPZ on a daily basis.

Estimates of the population and number of evacuating vehicles for each of the population groups are presented for each ERPA and by polar coordinate representation (population rose). The WLS EPZ has been subdivided into 14 ERPA. The EPZ is shown in Figure 3-1.

Permanent Residents

The primary source for estimating permanent population is the latest U.S. Census data. The average household size (2.62 persons/household) and the number of evacuating vehicles per household (1.44 vehicles/household) were adapted from the telephone survey results.

Enercon Services provided population estimates for 2000 using geographic information systems (GIS) software and Census block data. County projection numbers were obtained for the counties in the EPZ; these numbers were used in a regression analysis with the 2000 Census estimates to estimate the 2007 EPZ population. Table 3-1 shows that the EPZ population has increased 7.4 percent over the last 7 years.

Permanent resident population and vehicle estimates for 2007 are presented in Table 3-2. Figures 3-2 and 3-3 present the permanent resident population and permanent resident vehicle estimates by sector and distance from the WLS. This "rose" was constructed using GIS software.

Limestone College

There are 740 students enrolled at the Gaffney campus of Limestone College for year 2008. Based on data provided by the college, half of the students live on campus, while the other half commute. Of the 370 students who commute, 20% are commuting from outside the EPZ. Therefore, there are 74 students who commute to the college each day during the week. Those students who live on campus have already been accounted for in the permanent resident population estimates. It is assumed that the commuting students travel alone to class each day; therefore, 74 vehicles are used to evacuate those students. It is assumed that 2 buses will be needed to evacuate those students at Limestone College who do not have access to a privately owned vehicle (POV) and will not rideshare with another student who has a POV.

Lee Nuclear Station Response to Request for Additional Information (RAI)

Attachment 3 to RAI 13.03-025

**Revised ETE Report (Rev. 1), Table 8-2
School Population Demand Estimates**

Table 8-2. School Population Demand Estimates							
ERPA	Distance (miles)	Direction	School Name	Municipality	Enrollment	Staff	Bus Runs Req'd
Cherokee County Schools							
Public Schools							
A-2	5.3	N	Blacksburg Middle	Blacksburg	449	20	9
A-2	5.4	N	Blacksburg Elementary	Blacksburg	420	21	6
A-2	5.4	N	Blacksburg High	Blacksburg	544	20	11
A-2	6.8	NNE	Blacksburg Primary	Blacksburg	489	21	7
C-1	3.9	W	Draytonville Elementary	Gaffney	337	18	5
D-1	6.1	WNW	Cherokee Technology Center	Gaffney	625	40	13
G-2	7.9	WSW	Corinth Elementary	Gaffney	404	21	6
G-2	9.2	W	Limestone-Central Elementary	Gaffney	437	21	7
H-2	6.3	WNW	Alma Elementary	Gaffney	206	34	3
H-2	8.9	WNW	B.D. Lee Elementary	Gaffney	424	21	7
H-2	6.8	WNW	Ewing Middle	Gaffney	516	20	11
H-2	9.8	WNW	Gaffney High	Gaffney	1986	30	40
H-2	7.7	WNW	Gaffney Middle	Gaffney	675	20	14
H-2	9.1	WNW	Granard Middle	Gaffney	512	20	11
H-2	11	NW	Grassy Pond Elementary	Gaffney	470	23	7
H-2	7.6	WNW	Mary Bramlett Elementary	Gaffney	309	20	5
H-2	8.5	WNW	Luther Vaughn Elementary	Gaffney	305	20	5
Private Schools							
H-2	5.1	NW	Heritage Christian School	Gaffney	67	12	2
H-2	8.9	WNW	Gaffney Christian Academy	Gaffney	23	3	1
H-2	7.9	W	Limestone College	Gaffney	740	170	2*13
Cherokee County Totals:					9,938	575	172183
Cleveland County Schools							
A-3	10.3	NNE	Grover Elementary	Grover	448	80	7
Cleveland County Totals:					448	80	7
York County Schools							
E-2	8.8	SE	Hickory Grove-Sharon Elementary	Hickory Grove	430	60	7
York County Totals:					430	60	7
EPZ Totals:					10,816	715	186 197

*These buses are needed for those students who do not have access to a privately owned vehicle and will not ride share with another student. See page 3-2 for more information.

Lee Nuclear Station Response to Request for Additional Information (RAI)

Attachment 4 to RAI 13.03-025

**Revised ETE Report (Rev. 1) Appendix E, Page E-2
Lee EPZ Schools**

Duke Letter Dated: December 17, 2008

Lee EPZ: Schools									
ERPA	Distance (miles)	Dir- ection	School Name	Street Address	Municipality	Phone	Enroll- ment	Staff	
CHEROKEE COUNTY									
A-2	5.3	N	Blacksburg Middle	101 London St	Blacksburg	(864) 839-6476	449	20	
A-2	5.4	N	Blacksburg Elementary	402 Hardin St	Blacksburg	(864) 839-2363	420	21	
A-2	5.4	N	Blacksburg High	201 W. Ramseur Dr	Blacksburg	(864) 206-2378	544	20	
A-2	6.8	NNE	Blacksburg Primary	1010 E Cherokee	Blacksburg	(864) 839-1107	489	21	
C-1	3.9	W	Draytonville Elementary	2373 Wilkinsville Hwy	Gaffney	(864) 487-1240	337	18	
D-1	6.1	WNW	Cherokee Technology Center	3206 Cherokee Ave	Gaffney	(864) 206-2576	625	40	
G-2	7.9	WSW	Corinth Elementary	128 Corinth Rd	Gaffney	(864) 489-2163	404	21	
G-2	9.2	W	Limestone-Central Elementary	727 Pacolet Hwy	Gaffney	(864) 487-1249	437	21	
H-2	6.3	WNW	Alma Elementary	213 Alma St	Gaffney	(864) 489-4742	206	34	
H-2	8.9	WNW	B.D. Lee Elementary	401 Overbrook	Gaffney	(864) 489-5748	424	21	
H-2	6.8	WNW	Ewing Middle	171 E Junior High Rd	Gaffney	(864) 489-3176	516	20	
H-2	8.9	WNW	Gaffney Christian Academy	400 Overlook Dr	Gaffney	(864) 485-3135	23	3	
H-2	9.8	WNW	Gaffney High	149 Twin Lake Rd	Gaffney	(864) 206-2000	1,986	30	
H-2	7.7	WNW	Gaffney Middle	805 E Frederick St	Gaffney	(864) 902-3630	675	20	
H-2	9.1	WNW	Granard Middle	815 W Rutledge Ave	Gaffney	(864) 489-6833	512	20	
H-2	11.0	NW	Grassy Pond Elementary	1146 Boiling Springs Hwy	Gaffney	(864) 487-1256	470	23	
H-2	5.1	NW	Heritage Christian School	4279 Cherokee Ave	Gaffney	(864) 489-0788	67	12	
H-2	7.9	W	Limestone College	1115 College Dr	Gaffney	(800) 795-7151	740	170	
H-2	8.5	WNW	Luther Vaughn Elementary	192 Vaughn Rd	Gaffney	(864) 489-2424	305	20	
H-2	7.6	WNW	Mary Bramlett Elementary	301 Spruce St	Gaffney	(864) 489-1236	309	20	
YORK COUNTY									
E-2	8.8	SE	Hickory Grove-Sharon Elementary	4901 Hickory Grove Rd	Hickory Grove	(803) 925-2116	430	60	
CLEVELAND COUNTY									
A-3	10.3	NNE	Grover Elementary	206 Carolina Ave	Grover	(704) 734-5643	448	80	
							Total	10,816	635

Lee Nuclear Station Response to Request for Additional Information (RAI)

RAI Letter No. 025

NRC Technical Review Branch: Licensing and Inspection Branch (NSIR/DPR/LIB (EP))

Reference NRC RAI Number(s): 13.03-045

NRC RAI:

ETE-45:

It appears the analysis may include truncated distributions:

- a. The longest evacuation time for 100% of the ETE is 4 hours 50 minutes in Table 7-1D, "Time to Clear the Indicated Area of 100% of the Affected Population." This is based on the distributions in Section 5. The distribution in Section 5 for "Time to Prepare Home for Evacuation" is 135 minutes; however, Figure F-11, "Time to Prepare Home for Evacuation" in Appendix F, Telephone Survey, indicates that 360 minutes, or 6 hours is the time for 100% of the population to "prepare to evacuate". Explain how the maximum evacuation time for 100% of the public was calculated using the data from Figure F-11.
- b. Table 5-3, "Time Distribution for Employees to Leave Work," identifies 100% of the employees having left at 90 minutes. However, Figure F-9, "Time to Prepare to Leave Work/School," indicates that the tail of the curve may go out to 150 minutes. Explain how 90 minutes was derived for Table 5-3. Discuss any effects on the ETE if the time is 150 minutes as indicated in Appendix F.
- c. Table 5-4, "Time Distribution for Commuters to Return Home," identifies 100% of the population returning home in 75 minutes. However, Appendix F, Telephone Survey," page F-9, states that nearly all individuals travel home in 90 minutes. Figure F-10, "Work to Home Travel Time," indicates that the tail may go out to 150 minutes. Explain if the 100% ETE identified in Table 7-1D, "Time to Clear the Indicated Area of 100% of the Affected Population," includes these tail values or if the tails were truncated for the tables in Section 5.
- d. Table 5-5, "Time Distribution of Population Ready to Evacuate," identifies 100% of the population ready to evacuate in 135 minutes. Appendix F, page F-10, states that 90% are ready in 1.5 hours and that the remaining population (100%) is ready in 3.5 hours. However, the tail in Figure F-11, "Time to Prepare Home for Evacuation," indicates this could take as long as 6 hours. Discuss if the values in Table 5-5 were truncated.
- e. In Figure 5-2, "Evacuation Mobilization Activities," the time to prepare home is identified as approximately 140 minutes, however Appendix F, page F-10, would indicate this should be a minimum of 210 minutes and may be as long as 360 minutes. Explain why Figure 5-2 indicates 140 minutes. If necessary, reconcile Figure 5-2 with the comments above on other tables in Section 5.
- f. If necessary, reconcile Figure 5-3, "Comparison of Trip Generation Distributions" and Table 5-8, "Trip Generation for the EPZ Population," with the comments on other tables in Section 5.

Duke Energy Response:

Guidance provided in NUREG-0654, Appendix 4 states, "evacuation time estimates are ...required for simultaneous evacuation of the entire plume exposure pathway." Additionally, Section 2.2, "Demand Estimation", of NUREG/CR-6863 states, "a small portion of the public refuses to evacuate during some evacuation. For ETE calculations, it should be assumed that the entire population within the assessed area is evacuated." In accordance with this guidance the ETE report includes estimates for 100% of the population within the Emergency Planning Zone (EPZ).

NUREG/CR-6863 also contains the following discussion in Section 3.7.1, "Recommendations to Improve the ETE":

"During an evacuation event, there is a small portion of the population that requires a significantly longer time to evacuate. This segment of the population skews the evacuation time estimate to the high side (e.g., 90% of the population may evacuate in 4 hours and the remaining 10% require an additional 2 hours). Therefore, steps should be taken to first identify this population (i.e., who are the last people to leave the evacuated zone); second, identify the reasons for the increased evacuation time; and finally, identify if practical measures can be implemented in the planning stages to reduce the amount of time required for this population to evacuate in order to reduce the overall ETE."

It is clear from the statements that ETE for 100% of the population account for a small percentage of the population that refuse to leave or take an excessively long time to evacuate. Based on Dotson and Jones (2004) this is an acceptable approach.

- a. The 100th percentile ETE includes the evacuation of all individuals within the EPZ; however, the mobilization time of a few evacuees (typically less than 2 percent) has been advanced such that the ETE is not skewed by the extended mobilization time of the stragglers. For example, in Figure F-11 of the ETE Report, over 90 percent of respondents can complete home preparation within 1½ hours and about 98 percent of respondents can complete home preparation within 2½ hours with the remaining 2 percent requiring up to 3½ additional hours to complete home preparation. The home preparation time of the 2 percent of stragglers was advanced to 2½ hours so that 100 percent of respondents have completed home preparation by that time.

As discussed in Section 7.3 of the ETE report, the flow rate of evacuating vehicles declines rapidly towards the end of the evacuation such that there very few vehicles moving towards the EPZ boundary beyond 4 hours. This is seen by the fact that the curves of Figure 7-7 are essentially horizontal past an ETE of 4 hours (zero slope indicates zero flow rate), for the evacuation of the entire EPZ (Region R03) for Scenario 1. Consequently, the time to evacuate 100% of the population is indistinct and difficult to quantify.

Given these characteristics, and to satisfy the guidance in NUREG/CR-6863, a statistical analysis on the mobilization distributions was performed to quantify a "confidence band" about the distribution. This band serves as the basis for establishing the point in time where the long tail should be truncated by advancing the trip generation times of those who expect their mobilization time to extend well beyond the mobilization time of 99% of their neighbors. Establishing this band also serves to satisfy the guidance presented in NUREG/CR-6863 that practical measures will be identified in the planning stages to reduce

the amount of time required for this population to evacuate. As a result, the mobilization time is estimated to extend over a period of 4 hours, as shown in Table 5-8. Thus, while a small percentage of the population indicated, via the telephone survey, that their mobilization times may extend out as long as six hours, the vehicles for this small segment of the population were loaded onto the evacuation network at four hours to provide a conservative estimate of the vehicle flow within the roadway network.

- b. As shown in Figure F-9, about 99 percent of respondents leave work or school within 90 minutes, with the remaining stragglers requiring another hour. While very few respondents require 150 minutes to leave work or school, it is important to accurately represent the ETE at the 90th and 95th percentiles of the evacuating public.

To that end, truncating the cited distribution at 90 minutes ensures that these ETE of interest (i.e. at the 90th and 95th percentiles) are based on a conservative estimate of traffic demand. That is, advancing the departures of about 1 percent of the population to 90 minutes, from up to 150 minutes, assures that the evacuating traffic demand includes all evacuees over that time frame when congested conditions arise. Utilizing the full 150 minutes for the departure time would not affect the 90th and 95th percentile ETE. However, the 100th percentile ETE would have been extended by about 60 minutes.

As discussed on page 7-2, "Figure 7-6 shows that much of the congestion in the EPZ has eased at 4 hours..." Thus, the ETE for the 100th percentile is dictated by the tail of the trip generation distribution. As a result, advancing the tail of the trip generation distribution as described above only influences the ETE for 100% of the population (see Table 7-1D). This ETE does not include the delay of the few stragglers who complete their mobilization activities at a later time.

- c. The tails of the Tables in Section 5 were truncated by advancing the responsiveness of the small number of stragglers for each activity. See discussion of part b.
- d. The tails of the Tables in Section 5 were truncated by advancing the responsiveness of the small number of stragglers for each activity. See discussion of part b.
- e. The tails of the Tables in Section 5 were truncated by advancing the responsiveness of the small number of stragglers for each activity. See discussion of part b.
- f. Reconciliation of Figure 5-3 and Table 5-8 with the comments on other tables in Section 5 is not necessary based on the discussion provided in parts a through e above.

Associated Revision to the Lee Nuclear Station Evacuation Time Estimate Report:

None

Associated Revision to the Lee Nuclear Station Final Safety Analysis Report or Emergency Plan:

None

Attachments:

None

Lee Nuclear Station Response to Request for Additional Information (RAI)

RAI Letter No. 025

NRC Technical Review Branch: Licensing and Inspection Branch (NSIR/DPR/LIB (EP))

Reference NRC RAI Number(s): 13.03-052

NRC RAI:

ETE-52:

In Appendix E, "Special Facility Data," does the "staff" number include those listed as faculty as well as administrative, custodial, food service and adult volunteers on site during the school day? During an evacuation of special facilities, all adult "staff" should evacuate with the special population on the allocated busses and not permitted to leave on their own. Section 8.2, "School Population-Transit Demand," indicates "Those staff members who do not accompany the students will evacuate in their private vehicles." Is this a policy of the school district or local emergency plans? Review and revise the tables of Appendix E, "Special Facility Data," to include all staff assigned to each school, day care, medical facility and nursing home and the correction facility that would accompany the respective evacuating special population and address if these additional numbers will impact on the numbers of busses required to move this population group.

Duke Energy Response:

Spreadsheets detailing the student enrollment and "staff" for each school were provided by the EPZ counties. "Staff" includes faculty, but does not include administrative, custodial, food service and adult volunteers. Most staff members would be expected to act as "employees" and respond to the emergency by either returning home and preparing to evacuate or, if they live outside the EPZ, evacuating. The suggestion that staff members "not [be] permitted to leave on their own" is not realistic and not supported by guidance. It is expected that at least one staff member will accompany the students on each of the buses. As mentioned in Section 8, school buses are assigned to evacuating schoolchildren as their top priority. Therefore, bus capacity should be reserved for the schoolchildren and one staff member to accompany them.

Day care centers are private enterprise, state regulated facilities that provide for the supervision and care of local children who are dropped off by a parent or legal guardian and picked up at a later time the same day. South Carolina statute 114-500, "Regulations For the Licensing of Child Care Centers" provides the legal requirements for operation of the facility. Section 114-504 specifies staff to child ratio requirements that must be met and specifies that the children must be supervised at all times. Under an evacuation advisory, it is likely that the majority of the children will be picked up by their parents. For those children not picked up by their parents, state regulation (staff to child ratio requirements) will dictate the numbers of staff that are required to remain with and evacuate with the remaining children. It is assumed that the numbers of children that are not picked up by parents will be a small fraction of the normal facility capacity and as such will not have an impact on the number of buses required to facilitate the evacuation of the EPZ.

Section 114-505 H. (3) of the state statute specifies, "The facility shall have an up to date written plan for evacuating in case of fire, a natural disaster, or other threatening situation that may pose a health or safety hazard." Specific evacuation processes for each day care center will be specified in these plans.

Most employees of medical facilities and nursing homes would not evacuate with the special facility residents on the buses, but instead will evacuate in a private vehicle. The addition of these relatively few buses, in comparison to the volume of evacuating traffic, will not impact the ETE of the general population.

Based on the population of the Cherokee County Detention Center, it is assumed that four buses would be required if evacuation is the selected protective action (the facility is located approximately 2 miles from the EPZ boundary). Given the nature of the population being evacuated and the security required to accommodate the evacuation of the detention center, the necessary attending staff members were included in the assumption for the number of buses needed. Most employees of the correctional facility, if not needed for security during transport, will evacuate in private vehicles and as such are already accounted for in the ETE.

Based on these reasonable (and realistic) expectations, the tabulated estimates in Section 8 and in Appendix E require no revision.

References:

South Carolina Department of Social Services, Document No. 2901, Chapter 114, Section 114-500. "Regulations For The Licensing of Child Care Centers"

Associated Revision to the Lee Nuclear Station Evacuation Time Estimate Report:

None

Associated Revision to the Lee Nuclear Station Final Safety Analysis Report or Emergency Plan:

None

Attachments:

None

Lee Nuclear Station Response to Request for Additional Information (RAI)

RAI Letter No. 025

NRC Technical Review Branch: Licensing and Inspection Branch (NSIR/DPR/LIB (EP))

Reference NRC RAI Number(s): 13.03-057

NRC RAI:

SITE-4: Emergency Classification System

Basis: 10 CFR 50.47(b)(4) and Sections IV.B and C. of Appendix E to 10 CFR Part 50.

Reference: NUREG-0654/FEMA-REP-1 Evaluation Criterion D.1

SRP ACCEPTANCE CRITERIA: Requirement 2; Acceptance Criterion 3

- A. Section II.D, "Emergency Classification System," of the Lee Emergency Plan states that the initiating conditions include the conditions provided in NEI 07-01, Rev. 0, "Methodology for Development of Emergency Action Levels, Advanced Passive Light Water Reactors" (NEI 07-01). However, NEI 07-01 was submitted for NRC review and endorsement in March 2008, and currently remains under review by the NRC staff. Emergency Action Levels (EALs) and initiating conditions (ICs), based upon the September 2007 draft of NEI 07-01, are included in the Lee Emergency Plan as Appendix 1, "Emergency Action Levels." Since NEI 07-01 has not been endorsed by the NRC, the staff cannot cross-check EAL Recognition Categories (RCs) and Initiating Conditions (ICs) as referenced. Remove this reference from all submitted emergency planning information, or justify why it should be retained.
- B. The Letters of Certification with state and local governments that are included in Appendix 7, "Certification Letters," of the Lee Emergency Plan state that the signature on the letter indicates that the parties concurred with the emergency classification system, initiating conditions, and emergency action levels for the Lee Nuclear Station. EALs and initiating conditions, based upon the September 2007 draft of NEI 07-01, are included in the Lee Emergency Plan as Appendix 1, "Emergency Action Levels." However, NEI 07-01, "Methodology for Development of Emergency Action Levels, Advanced Passive Light Water Reactors," Rev. 0, has not been endorsed by the NRC. Discuss when the final version of the initial emergency action levels will be discussed with, and agreed upon, with state and local governmental authorities.
- C. Discuss when the content of subsection 5.3, "Site-specific Implementation," in Section 5.0, "Emergency Action Levels," of Appendix 1 to the Lee Emergency Plan will be provided. Will an ITAAC or License Condition be developed to track the submittal of this information?

Duke Energy Response:

- A. Subsection II.D.2 of the Lee Emergency Plan Rev. 0, states, "Duke Energy adopts the methodology provided in NEI 07-01. Because this document has not yet been endorsed by the NRC, EALs contained in this Plan are subject to further review and modification based on the version of NEI 07-01 ultimately endorsed in a future revision to NRC Regulatory Guide 1.101, or other accepted guidance, modified consistent with the improvements to facility design and operation as reflected in the AP1000 Design Control Document (DCD)

(Reference III.A.8).” The September 2007 version of NEI 07-01 was the best and only information regarding AP1000 EALs available to Duke at the time of COL application submittal. Regulatory Guide 1.206, section C.1.13.3 provides, “It is expected that any new application will use an emergency action level (EAL) scheme similar to that described in Revision 4 of Nuclear Energy Institute (NEI) 99-01, “Methodology for Development of Emergency Action Levels,” issued January 2003, which was endorsed in Revision 4 of RG 1.101. However, Revision 4 of NEI 99-01 is not considered to be entirely applicable to advanced LWR designs. Even though the majority of Revision 4 of NEI 99-01 may be applicable to any reactor design and should be used, the unique characteristics of the new reactor should be addressed in the development of EALs specific to the new plant and the site.” NEI 07-01 was developed to satisfy the concern stated in Regulatory Guide 1.206 that NEI 99-01, Rev. 4, did not apply to advanced light water reactor designs. NEI 07-01 specifically applies to the Westinghouse AP1000 and GE Hitachi ESBWR designs. By acknowledging that NEI 07-01 has not yet been endorsed by the NRC and stating that EALs contained in the Lee Emergency Plan are subject to further review and modification based on the version of NEI 07-01 ultimately endorsed, Duke has indicated its intent to update the EALs presented in Section II.D and Appendix 1 after NEI 07-01 has received NRC endorsement. Duke will update the emergency classification system presented in the Lee Emergency Plan to be consistent with the version of NEI 07-01 that is ultimately endorsed by NRC.

- B. Appendix 1 provides details on the emergency classification system, including specific EALs with ICs. Each agency providing a Certification Letter has indicated its concurrence with this emergency classification system, EALs and ICs described in the COL Application Emergency Plan. This is consistent with the requirements of Section IV.B of Appendix E to 10 CFR Part 50 that requires State and local agencies responsible for emergency planning to concur with the emergency classification system, EALs and ICs. When changes are made to the emergency classification system, EALs, and ICs, as might be expected when NEI 07-01 is endorsed by NRC, these changes will be reviewed with the affected offsite agencies and their concurrence appropriately documented to satisfy the pertinent regulatory requirements.
- C. Section 5.3 of Appendix 1 is shown as “Reserved.” Section 2.0 is also “Reserved.” The designation “Reserved” is used to denote possible future use and to preserve formatting used in NEI 07-01. There is no intention to include additional information in Section 5.3, at this time, so neither an ITAAC nor a License Condition is appropriate.

Associated Revision to the Lee Nuclear Station Final Safety Analysis Report or Emergency Plan:

None

Attachments:

None

Lee Nuclear Station Response to Request for Additional Information (RAI)

RAI Letter No. 025

NRC Technical Review Branch: Licensing and Inspection Branch (NSIR/DPR/LIB (EP))

Reference NRC RAI Number(s): 13.03-065

NRC RAI:

SITE-12: Medical Services for Lee Nuclear Station Workers and Contaminated Injured Individuals Basis: 10 CFR 50.47(b)(12); NUREG-0654/FEMA-REP-1; Evaluation Criterion L.1; Evaluation Criterion L.. 2

SRP ACCEPTANCE CRITERIA: Requirement A; Acceptance Criterion 1

Section II.O.1.a "Off-site Emergency Response Training" (page II-64) of the Lee Emergency Plan states that Duke Energy provides or supports training for affected hospital, ambulance/rescue personnel. Periodic drills, exercises, and material support are provided consistent with agreements to be developed with medical support providers. Section II.L.1, "Hospital and Medical Support" (Page II-55) of the Lee Emergency Plan states that an agreement has been established with Piedmont Medical Center to provide medical services for injured personnel. Certification letters are in Appendix 7, "Certification Letters" (page A7-1) of the Lee Emergency Plan. Final agreements letters have not been established. Provide information on when the agreements will be finalized between Duke Energy and the medical support providers.

Duke Energy Response:

The letters of intent provided with Piedmont Medical Center (medical care provider) and Upstate Carolina Medical Center (emergency medical response/transportation) establish specific provisions that will be included in formal letters of agreement. These letters of agreement will be established and incorporated into the Lee Emergency Plan prior to receipt of nuclear fuel at the site.

Associated Revision to the Lee Nuclear Station Final Safety Analysis Report or Emergency Plan:

None

Attachments:

None

Lee Nuclear Station Response to Request for Additional Information (RAI)

RAI Letter No. 025

NRC Technical Review Branch: Licensing and Inspection Branch (NSIR/DPR/LIB (EP))

Reference NRC RAI Number(s): 13.03-067

NRC RAI:

SITE-14: Drill and Exercise Evaluation and Critiques

Basis: 10 CFR 50, Appendix E.IV.F.2.f.; 10 CFR 50, Appendix E.IV.F.2.g; NUREG-0654/FEMA-REP-1; Evaluation Criterion N.1.b. ; Evaluation Criterion N.4; Evaluation Criterion N.5

SRP ACCEPTANCE CRITERIA: Requirements A and B; Acceptance Criteria 1 and 2

Section II.N., "Exercises and Drills" (pages II-60/63), of the Lee Emergency does not contain a statement about remedial exercises being performed if the emergency plan is not satisfactorily tested during the biennial exercise. Discuss remedial exercises.

Duke Energy Response:

In accordance with 10 CFR 50, Appendix E.IV.F.2.f, a remedial exercise will be required if the emergency plan is not satisfactorily tested during the biennial exercise, such that the NRC, in consultation with FEMA, cannot find reasonable assurance that adequate protective measures can be taken in the event of a radiological emergency.

Associated Revision to the Lee Nuclear Station Final Safety Analysis Report or Emergency Plan:

Revise Section II.N of the Lee Emergency Plan to include a discussion on remedial exercises as shown in Attachment 1.

Attachment:

1. Markup of the Affected Portion of the Lee Emergency Plan Section II.N

Lee Nuclear Station Response to Request for Additional Information (RAI)

Attachment 1 to RAI 13.03-67

Markup of the Affected Portion of Lee Emergency Plan Section II.N

N. EXERCISES AND DRILLS

Duke Energy implements a program of periodic drills and exercises to evaluate major portions of emergency response capabilities and to develop and maintain key emergency response skills. Identified deficiencies are corrected.

1. Exercises

a. Exercise Scope and Frequency

Duke Energy conducts emergency exercises in accordance with NRC and FEMA requirements (e.g., 10 CFR 50.47(b)(14), 10 CFR 50 Appendix E.IV.F, and 44 CFR 350.9).

ab. Exercise Scenarios and Participation

Duke Energy conducts exercises on a periodic basis, including biennial exercise required under Appendix E of 10 CFR 50. Exercises shall test the:

- Adequacy of timing and content of implementing procedures and methods
- Emergency equipment and communications networks
- Public notification system

In addition, exercises test the familiarity of emergency organization personnel with their duties.

Exercise scenarios shall be varied in a manner that tests all major elements of the plans and preparedness organizations within a six year period.

At least once every six years, the specific exercise date should be unannounced. At least once every six years, an exercise should be initiated during off-hours (between 6 pm and 4 am on a weekday or during a weekend). Requirements for unannounced and off-hours exercises may be satisfied concurrently.

The unannounced and/or off-hours demonstration may be conducted during or independent of the biennial exercise required by Appendix E of 10 CFR 50.

Appendix 8 of this Plan provides a cross-reference to these provisions in State and Local Plans, as applicable.

c. Remedial Exercises

A remedial exercise is required, if it is determined that the emergency plan was not satisfactorily tested during the biennial exercise such that the NRC cannot find reasonable assurance that adequate protective measures can be taken in the event of a radiological emergency.

Lee Nuclear Station Response to Request for Additional Information (RAI)

RAI Letter No. 025

NRC Technical Review Branch: Licensing and Inspection Branch (NSIR/DPR/LIB (EP))

Reference NRC RAI Number(s): 13.03-68

NRC RAI:

SITE-15: Training Program for Emergency Responders, Instructors and Directors and Coordinators

Basis: 10 CFR 50, Appendix E.IV. F.1.ix; NUREG-0654/FEMA-REP-1, Evaluation Criterion O.3; Evaluation Criterion O.4; Evaluation Criterion O.4.a; Evaluation Criterion O.4.b; Evaluation Criterion O.4.c; Evaluation Criterion O.4.d; Evaluation Criterion O.4.e; Evaluation Criterion O.4.f; Evaluation Criterion O.4.g; Evaluation Criterion O.4.h; Evaluation Criterion O.4.i; Evaluation Criterion O.4.j

SRP ACCEPTANCE CRITERIA: Requirement A; Acceptance Criteria 1 and 2

Section II.O.4.g, "Emergency Response Training and Qualification" (page II-66), of the Lee Emergency Plan states that Duke Energy provides position-specific training for local support services/emergency service personnel. Content of the training program is appropriate for the duties and responsibilities of the assigned position. Section II.O.1.a, "Off-site Emergency Response Training" (page II-64), of the Lee Emergency Plan describes off-site emergency response personnel training. There is no mention of local news media personnel. Discuss training of local news media personnel.

Duke Energy Response:

Section G.5, page II-33 of the COL Emergency Plan discusses training for the news media, stating: "Annually, Duke Energy provides to affected media organizations information regarding the emergency plans, information regarding radiation hazards, and points of contact for release of public information during an emergency."

Associated Revision to the Lee Nuclear Station Final Safety Analysis Report or Emergency Plan:

None

Attachments:

None

Lee Nuclear Station Response to Request for Additional Information (RAI)

RAI Letter No. 025

NRC Technical Review Branch: Licensing and Inspection Branch (NSIR/DPR/LIB (EP))

Reference NRC RAI Number(s): 13.03-069

NRC RAI:

SITE-16: Emergency Preparedness Program Maintenance and Implementing Procedures

Basis: NUREG-0654/FEMA-REP-1; Evaluation Criterion P.7; Evaluation Criterion P.9; Evaluation Criterion P.10

SRP ACCEPTANCE CRITERIA: Requirement A; Acceptance Criterion 1

- A. Appendix 5, "Implementing Procedures" (page A5-2), of the Lee Emergency Plan provides topical listing of Emergency Plan Implementing Procedures (EPIPs) that support the Lee Emergency Plan, however, the Lee Emergency Plan calls out procedures that do not appear to be listed in the topical list. Provide information about procedures that are discussed in the plan, but not listed in Appendix 5.
- B. Section II.P.9, "Emergency Plan Audits" (pages II-69/70), of the Lee Emergency Plan describes Duke Energy's Nuclear Performance Assessment organizations independent audit of the Lee Nuclear Station emergency preparedness program. Frequency of the periodic audits is based on an assessment of performance, but all elements of the Lee Emergency Plan program must be reviewed at least once every 24 months. 10 CFR 50.54(t)(1), states that the independent audit must be conducted at least every 12 months. Discuss the audits being conducted not less than once every 24 months instead of every 12 months.

Duke Energy Response:

- A. Emergency plan implementing procedures (EPIPs) are addressed in FSAR Table 13.4-201 and in Licensing Condition #6, Operational Programs, Part 10, of the COL Application. In accordance with the COL application, detailed EPIPs will be submitted at least 180 days prior to the scheduled date for initial fuel loading which is in compliance with 10 CFR Part 50, Appendix E, Section V. In addition, EPIPs addressing the following specific topics: source term determination, assessment of radioactive release to the environment, assessment of actual and potential radiological hazards through liquid or gaseous releases, and comparison of projected and actual dose rates to protective action guidelines are specifically addressed in EP ITAAC Table 3.8-1 located in Part 10 of the COL Application. These requirements ensure that the procedures necessary for implementation of the Emergency Plan will be adequate and available prior to final approval of the plan.

Appendix 5 of the Emergency Plan currently provides a list of broad topics to be addressed in the Emergency Plan Implementing Procedures (EPIPs). Duke did not intend for this list to be construed as a list of procedure titles or narrow subject areas. Each topical area may include one or more procedures. With regard to the procedures suggested in the Lee Emergency Plan, Duke expects these subjects to be addressed as listed in the following table:

Appendix 5 Topical Area	Procedure Subject
Activation of the Emergency Response Organization	ERO position, title, position functions and major tasks
Emergency Media Relations	Joint Information Center (JIC) Activation procedure
Notifications Associated with Emergency Conditions	Procedure for verifying messages
Maintaining Emergency Preparedness	Monthly station/EOF and state/local warning points
Maintaining Emergency Preparedness	Periodic test of onsite communications systems
Activation of the Emergency Response Organization	Relocation of the OSC
Activation of the Emergency Response Organization	Staffing and activation of emergency response facilities
Emergency Classification	Procedure specifying instrument types and capabilities used to indicate emergency conditions
Topic to be addressed by a Chemistry Department procedure	Procedures for obtaining samples under accident conditions
Plume Tracking and Assessment of Off-Site Radiological Conditions and Core Damage Assessment	Methods for assessing and monitoring actual or potential onsite and offsite consequences
Plume Tracking and Assessment of Off-Site Radiological Conditions and Core Damage Assessment	Procedures for estimating release rates and projected doses when associated instrumentation is inoperable or off-scale
Plume Tracking and Assessment of Off-Site Radiological Conditions	Procedures for field team monitoring activities
Plume Tracking and Assessment of Off-Site Radiological Conditions	Procedures to estimate projected dose rates and doses from measured parameters
Notifications Associated with Emergency Conditions	Procedure for notification of onsite personnel of emergency conditions
Radiation Protection Under Emergency Conditions	Procedure for maintaining dose records
Recovery and Reentry	Procedures for recovery and reentry
Maintaining Emergency Preparedness	Periodic review of the emergency preparedness program
Activation of the Emergency Response Organization	Establishing TSC ventilation

B. Periodic audits will be conducted at 12 month intervals in accordance with 10 CFR 50.54(t)(1)(i) as stated in the first paragraph of Section II.P.9 of the Emergency Plan. This interval may be extended to 24 months, as provided in 10 CFR 50.54(t)(1)(ii), based upon an assessment of Licensee performance indicators. The performance indicators that will be used to extend the periodic audits to 24 months are expected to be consistent with those currently used to assess emergency preparedness program performance, which include first tier indicators, as provided in NEI 99-02, and second tier indicators, which are developed by Duke Emergency Planning. The first tier indicators currently include:

- 1) Drill/Exercise Performance;
- 2) Emergency Organization Drill Participation; and,
- 3) Alert and Notification System Reliability.

The second tier indicators currently include the following:

EP Program Attributes	Business Measures
ERO Readiness	<ul style="list-style-type: none">• Staff Augmentation for 8 quarters• ERO Drill Participation PI at the end of the quarter• ERO depth at end of the quarter
Facilities & Equipment	<ul style="list-style-type: none">• EP Equipment Availability for 4 quarters• ANS Reliability PI for 4 quarters
ERO Performance	<ul style="list-style-type: none">• Drill/Exercise Performance PI for 8 quarters• Licensee Drill/Exercise results for 8 quarters
Offsite EP	<ul style="list-style-type: none">• FEMA Evaluation (Deficiency and ARCA) status for 8 quarters• State & Local agency interface status for 4 quarters
Problem Identification & Resolution	<ul style="list-style-type: none">• Corrective Action Program status for 4 quarters

These business measures are separate and distinct from the NRC Performance Indicators. Although data calculated for the NRC EP Performance Indicators may be used in evaluating the Emergency Planning business measures, the thresholds are different.

Associated Revision to the Lee Nuclear Station Final Safety Analysis Report or Emergency Plan:

None

Attachments:

None

Lee Nuclear Station Response to Request for Additional Information (RAI)

RAI Letter No. 025

NRC Technical Review Branch: Licensing and Inspection Branch (NSIR/DPR/LIB (EP))

Reference NRC RAI Number(s): 13.03-070

NRC RAI:

SITE-17: Plume Exposure EPZ

Basis: 10 CFR 50.33(g), 10 CFR 52.77 and 10 CFR 50.47(c)

SRP ACCEPTANCE CRITERIA: Requirement A; Acceptance Criterion 10

- A. Section C.2, "Emergency Planning Zones," in Part 5, "Emergency Plan," describes plume exposure pathway and ingestion pathway emergency planning zones (EPZs). The plume exposure pathway EPZ consists of an area about 10 miles in radius around the site. Figure I-1, "Plume Exposure Pathway Emergency Planning Zone," provides an illustration of the plume exposure pathway EPZ. The plume exposure pathway EPZ is also described to be the area where the principal sources of incident-related radiation exposures are likely to be whole body gamma radiation exposures and inhalation exposures from the passing radioactive plume. Discuss why the plume exposure pathway description does not include whole body external exposure to gamma radiation from deposited material as specified on page 9 of NUREG-0396/EPA 520/1-78-016, "Planning Basis for the Development of State and local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Reactors."
- B. Section C.2, "Emergency Planning Zones," in Part 5, "Emergency Plan," describes plume exposure pathway and ingestion pathway emergency planning zones (EPZs). Discuss whether the exact sizes and configurations of the EPZs surrounding the plant were determined in relation to the local emergency response needs and capabilities as they are affected by such conditions as demography, topography, land characteristics, access routes, and jurisdictional boundaries.

Duke Energy Response:

- A. The Lee Nuclear Station Plume Exposure Pathway Emergency Planning Zone includes whole body external exposure to gamma radiation from deposited material. The definition of Plume Exposure Pathway EPZ is provided on Lee Emergency Plan page viii as follows:

Plume Exposure Pathway EPZ – An area delineated by an approximate ten-mile radius circle around the station. The principal exposure sources from this pathway are: (a) whole body external exposure to gamma radiation from the plume and from deposited materials and (b) inhalation exposure from the passing radioactive plume. The duration of principal potential exposures could range in length from hours to days. (Source: NUREG-0654, Glossary).

- B. The emergency planning zones were developed in accordance with 10 CFR 50.33(g). Specifically, the exact size and configurations were developed in cooperation with State and county agencies responsible for emergency planning considering local emergency response

needs and capabilities. Factors considered in determining the exact sizes and configurations of the EPZs included demography, topography, land characteristics, access routes, and jurisdictional boundaries. A September 20, 2006 meeting attended by Duke Energy, Department of Homeland Security, applicable state and county agencies discussed the size and configuration of the emergency planning zones. A follow-up meeting held on March 13, 2007 attended by Duke Energy and the applicable state and county agencies reviewed the size and configurations of the emergency planning zones discussed in the September 20, 2006 meeting, resulting in actions items taken from the meeting to finalize the ERPA shapes and distribute to the counties for approval. State officials and local officials in Cherokee (SC), York (SC), and Cleveland (NC) Counties agreed with the EPZs surrounding the plant as reflected by their individual signed certification letters provided in Appendix 7, Certification Letters, of the Emergency Plan.

Associated Revision to the Lee Nuclear Station Final Safety Analysis Report or Emergency Plan:

None

Attachments:

None

Lee Nuclear Station Response to Request for Additional Information (RAI)

RAI Letter No. 025

NRC Technical Review Branch: Licensing and Inspection Branch (NSIR/DPR/LIB (EP))

Reference NRC RAI Number(s): 13.03-071

NRC RAI:

SITE-18: Basis: 10 CFR 50.33(g), 10 CFR 52.77

SRP Acceptance Criteria: Requirements A; Acceptance Criterion 10 and 18

Coordination with Catawba Indian Nation. The Lee Emergency Plan lists coordination with Risk Counties and States of North and South Carolina. Since the Catawba Indian Nation Office of Tribal Government is located in Rock Hill, SC (Within the 50 Mile IPZ) the Tribal Government should be coordinated with as a Sovereign Nation, even if it does not have a direct emergency response roll. Explain measures or show documentation that the Lee Emergency Plan has been coordinated with the Catawba Indian Nation Tribal Government.

Duke Energy Response:

Based on discussions with the York County Director of the Office of Emergency Management, York County maintains responsibility for providing emergency response to all government entities in the county including municipal governments and the Catawba Indian Nation. The attached letter from the York County Emergency Management Director (Attachment 1) states that the York County Office of Emergency Management has the responsibility for emergency planning throughout the county and includes the Catawba Nation in all emergency planning activities.

Associated Revision to the Lee Nuclear Station Final Safety Analysis Report or Emergency Plan:

None

Attachments:

1. Letter from York County Office of Emergency Management

Lee Nuclear Station Response to Request for Additional Information (RAI)

Attachment 1 to RAI 13.03-071

Letter from York County Office of Emergency Management



Office Of Emergency Management

Cotton Howell, Director

Telephone (803)329-7270 Fax (803) 324-7420

Re: Catawba Indian Nation

Public Safety, Police, Fire, EMS and Rescue are provided to the Catawba Indian Nation in accordance with the land settlement approved by congress.

The York County Office of Emergency Management has the responsibility for emergency planning throughout the county and includes the Catawba Nation in all emergency planning activities. The Indian Nation is considered a separate political jurisdiction in the county for emergency planning purposes in a similar manner as municipalities.

A handwritten signature in black ink, appearing to read "Cotton Howell", is written over a light blue horizontal line.

Cotton Howell
October 20, 2008

Lee Nuclear Station Response to Request for Additional Information (RAI)

RAI Letter No. 025

NRC Technical Review Branch: Licensing and Inspection Branch (NSIR/DPR/LIB (EP))

Reference NRC RAI Number(s): 13.03-072

NRC RAI:

SITE-19: Evaluation Against the SRP

Basis: 10 CFR 52.79(a)(41) and 10 CFR 50.34(h)

SRP ACCEPTANCE CRITERIA: Requirement A; Acceptance Criteria 1 and 11

Table 1.9-202, "Conformance with SRP Acceptance Criteria," in Part 2 of the COL Application states that the Section 13.3, "Emergency Planning," is acceptable from a design certification perspective. However, the SRP Acceptance Criteria related to Emergency Planning in Section 13.3 of the NUREG-0800, Standard Review Plan," (SRP) were not evaluated against the content of Part 5, "Emergency Plan," of the COL Application. Provide an evaluation design certification perspective without an evaluation of the Lee Emergency Plan against Revision 3 of the Standard Review Plan dated March 2007. Identify all differences between the Lee Emergency Plan and SRP Chapter 13.3, "Emergency Planning." Where differences exist, discuss how the proposed alternative provides an acceptable method of complying with applicable regulations, or portions of the regulations.

Duke Energy Response:

FSAR Table 1.9-202, Item 13.3 documents conformance to SRP, Rev. 3, 03/2007. Notes (d) and (e) address AP1000 conformance to design aspects of a previous revision of SRP 13.3. Specifically, as indicated in WCAP-15799, SRP 13.3, Rev. 2 (7/81), is not applicable to the AP1000 design. The term, "Acceptable" under "FSAR Position" in Table 1.9-202 indicates acceptable Lee conformance with the plant or site-specific aspects of SRP 13.3, Rev. 3, 03/2007, as indicated by Note (f). There are no exceptions to the SRP Acceptance Criteria.

Associated Revision to the Lee Nuclear Station Final Safety Analysis Report or Emergency Plan:

None

Attachments:

None