

# Pacific Northwest National Laboratory

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Ms. Elinor M. Cunningham, Technical Assistance Project Manager  
Mail Stop T-6 F-29  
Division of New Reactor Licensing  
Office of New Reactors  
US Nuclear Regulatory Commission  
Washington, DC 20555-0001

Dear Ms. Cunningham:

**Subject:** JCN Q-4007, Task 9, Subtask 3, "Technical Assistance in the Review of the Evacuation Time Estimate (ETE) Analysis for the STP COLA"

Enclosed is the Revised Final Technical Evaluation Report for the South Texas Project ETE review (Subtask 3). Minor revisions were made at NRC staff request because a revised version of the ETE Report was provided by the applicant.

If you have any questions or comments, please contact Bruce Napier at 509-375-3896 or Eva Eckert Hickey at 509-375-2065.

Sincerely,



Eva Eckert Hickey  
Staff Scientist  
Radiological Science and Engineering Group  
ENVIRONMENT & ENERGY DIRECTORATE

EFH:ban

Enclosures

Cc: Robert Moody  
Bruce Napier  
Annette Stang

### **13.3.1B.R Evacuation Time Estimate (ETE) Analysis**

The STP Units 3 and 4 Emergency Plan includes an analysis of the time required to evacuate the plume exposure pathway EPZ and to take other protective actions for various sectors and distances within the plume exposure pathway EPZ for transient and permanent populations. The ETE report, "South Texas Project Development of Evacuation Time Estimates," dated September 2007, was included as a separate document in the COL application, but is considered part of the STP Units 3 and 4 Emergency Plan. The ETE report is incorporated into the STP Units 3 and 4 Emergency Plan as Chapter 4, "Evacuation Time Estimate." The ETE report was revised in April 2008 and July 2009 to reflect the information provided in response to the RAIs. The ETE report and the associated RAI responses are the basis for the following discussions and analyses.

#### **13.3.1B.R.1 Regulatory Basis for the ETE Analysis**

NRC staff reviewed the ETE analysis and considered the following regulatory requirements and guidance:

- 10 CFR 52.79(a)(21) refers to Appendix E to 10 CFR 50, Section IV of which, "Content of Emergency Plans," requires the nuclear power reactor operating license applicant to provide an analysis of the time required to evacuate and to take other protective actions for various sectors and distances within the plume exposure pathway EPZ for transient and permanent populations.

The staff evaluated the ETE report against Appendix 4, "Evacuation Time Estimates within the Plume Exposure Pathway Emergency Planning Zone," to NUREG-0654/FEMA-REP-1. Appendix 4 contains detailed guidance that the staff used to determine whether the ETE analysis meets the applicable regulatory requirements in Appendix E to 10 CFR 50.

#### **13.3.1B.R.2 Introductory Materials [10 CFR 50, Appendix E.IV and NUREG-0654, Appendix 4.I]**

##### **13.3.1B.R.2.1 Technical Information in Introductory Materials**

Section 1, "Introduction," of the ETE report provides a basic description of the process used to estimate the ETEs. The report includes a description and a map (Figure 1-1, "Location of the South Texas Project") of the EPZ and surrounding area. NRC staff issued **RAI 13.03-3**, requesting the applicant to provide additional information regarding the lack of political boundaries on the map. The applicant's response explains that the entire STP plume exposure pathway EPZ is within Matagorda County. The staff issued **RAI 13.03-2**, requesting the applicant to provide additional information regarding communities that are not identified on the map. The applicant's response revises and labels Figure 1-1 to reflect the region surrounding the site out to metropolitan Houston and the cities of Matagorda, Palacios, and Bay City.

The major assumptions of the ETE report are in Section 2, "Study Estimates and Assumptions." Population estimates are based on the year 2000 census data and are projected to the year 2007. County-specific projections are based on growth rates that were estimated by comparing the 2000 census data with 2005 census estimates. The population of the region has been decreasing for the past decade (i.e., growth rates have been negative), so the use of the earlier population distribution is actually conservative in that it estimates more people than are currently projected to reside in the area. Estimates of employees who commute into the EPZ to work are

based on employment data obtained from county emergency management officials. Population estimates at special facilities are based on available data from county emergency management offices. Roadway capacity estimates are based on field surveys and the application of the Highway Capacity Manual (HCM 2000, Transportation Research Board, National Research Council, 2000). Population mobilization times are based on a statistical analysis of data acquired from a telephone survey, as is the relationship between resident population and evacuating vehicles (occupancy factors). The transport of those without access to private vehicles is assumed to be on buses. The effect of a voluntary (shadow) evacuation out to 15 miles is considered in the evacuation time calculation. The Matagorda Beach area, just south of the plume exposure pathway EPZ, has only one access road (FM 2031), which cuts through the plume exposure pathway EPZ.

An outline of the approach for estimating the time to evacuate is presented in a link-node map (Figure 1-2, "Link-Node Network") of the evacuation routes that was developed for the analyses. Further details on the methodology are described in Section 3, "Demand Estimation"; Section 4, "Estimates of Highway Capacity"; Section 5, "Estimation of Trip Generation Time"; and Section 6, "Demand Estimation for Evacuation Scenarios"; as well as in Appendix C, "Traffic Simulation Model: IDYNEV"; and Appendix D, "Detailed Description of Study Procedures."

Considerations include a total of 12 "Scenarios" representing different seasons, time of day, day of the week, and the weather. There are studies of two special event scenarios: (1) the construction period of a new nuclear plant, and (2) the assumed evacuation of an extra 5,000 people on Matagorda Beach during a holiday weekend. Additional assumptions reflected in the development of population estimates, include pass-through populations and regional employees, which are discussed in Section 3 and Appendix E, "Special Facility Data." Section 8, "Transit-Dependent and Special Facility Evacuation Time Estimates," discusses the assumptions regarding transit-dependent and special populations. Section 5 of the ETE report describes the development of trip-generation times taken from survey responses.

### **13.3.1B.R.2.2 Technical Evaluation of Introductory Materials**

The ETE report includes a map showing the proposed site and plume exposure pathway EPZ, as well as transportation networks, topographical features, and political boundaries. The boundaries of the EPZ, in addition to the evacuation subareas within the EPZ, are based on factors such as current and projected demography, topography, land characteristics, access routes, and jurisdictional boundaries.

The ETE report describes the method of analyzing the evacuation times and includes a general description of the IDYNEV modeling system with the assumptions used in the evacuation time estimate analysis. The IDYNEV system consists of several submodels—a macroscopic traffic simulation model; an intersection capacity model; and a dynamic, node-centric routing model that adjusts the "base" routing in the event of an imbalance in the levels of congestion on the outbound links. Another model of the IDYNEV System is the traffic assignment and distribution model, which integrates an equilibrium assignment model with a trip distribution algorithm to compute origin-destination volumes and paths of travel designed to minimize travel time.

NRC staff found the clarifications acceptable in the applicant's responses to **RAI 13.03-2** and **13.03-3**, regarding political boundaries and communities. The staff also confirmed that revised Figure 1-1, "Location of South Texas Project," is included in Revision 2 of the ETE report.

### 13.3.1B.R.3 Demand Estimation [10 CFR 50, Appendix E.IV and NUREG-0654, Appendix 4.II]

#### 13.3.1B.R.3.1 Technical Information Related to Demand Estimation

Section 3, "Demand Estimation," of the ETE report estimates the number of people who may need to be evacuated (the "demand estimation"). Population estimates in the ETE report are based on the 2000 Census. The ETE report states that census data show a slightly decreased (0.3 percent) local population between the years 2000 and 2005. The report then conservatively assumed the earlier, larger population for the analyses. NRC staff issued RAI 13.03-1, requesting the applicant to provide additional information regarding differences in the assumptions between the FSAR and the ETE report. The applicant's response notes that the estimates were prepared by separate contractors for areas with slightly different definitions that corresponded within approximately 2 percent, thus providing confidence in the results. Therefore, the staff found this response to RAI 13.03-1 acceptable.

A separate analysis for people without personal vehicles is in Section 8 of the ETE report. The section discusses these permanent residents as well as transient populations, including the employees of two local chemical companies. The report assumes that employees who work within the plume exposure pathway EPZ—but who live outside of the EPZ and commute to jobs within the plume exposure pathway EPZ—will be evacuated with the permanent resident population. The staff issued **RAI 13.03-4(1)**, requesting the applicant to clarify the inconsistent use of the percentages of households with commuters. The applicant's response to RAI 13.03-4(1) includes a revision to Subsection 2.3.3.b of Section 2.3, "Study Assumptions," of the ETE report that states:

70 percent of those households in the EPZ with commuters will await the return of a commuter before beginning their evacuation trip, based upon the telephone survey results.

The NRC staff confirmed that the clarification provided in response to RAI 13.03-4(1) was included in the July 2009 revision of the ETE report.

Other transient groups include visitors to local recreational areas such as beaches and parks. There are only a limited number of "special populations" (i.e., there are only three schools and no hospitals or jails within the plume exposure pathway EPZ). Section 8 includes descriptions of evacuation routes and time estimates for transit-dependent and special facilities. The analyses assumed that vehicles traveling through the plume exposure pathway EPZ (external-external trips) at the time of an accident will continue to enter the plume exposure pathway EPZ during the first 60 minutes. Thereafter, the analysis assumed that no more vehicles will enter, and those that remain will also evacuate with the residents and other transients.

The ETE report includes the following six figures that summarize the various population groups. The figures are in the format suggested in Appendix 4 of NUREG-0654/FEMA-REP-1 and include:

- Figure 3-2, "Permanent Residents by Sector"
- Figure 3-3, "Permanent Resident Vehicles by Sector"
- Figure 3-4, "Transient Population by Sector"
- Figure 3-5, "Transient Vehicles by Sector"
- Figure 3-6, "Non-resident Employee Population by Sector"

- Figure 3-7, "Non-resident Employee Vehicles by Sector."

The staff issued **RAI 13.03-10**, requesting the applicant to provide additional information on subarea descriptions, the allocation of evacuees by scenario, the use of school buses in the summer, the use of "shelter in place," and the application of shadow evacuations. The applicant's response removes the column labeled "Affected Downwind Sectors" in Table 6-1 "Definition of Evacuation Regions," which clarifies the discussion regarding the allocation of evacuees by scenario and the assumptions regarding the number of vehicles (including summer school buses). The applicant also revises the statement regarding "shelter in place" and "shadow populations" to read, "Both voluntary and shadow evacuations are assumed to take place over the same time frame from within the impacted area." The staff found this response to RAI 13.03-10 acceptable.

### **13.3.1B.R.3.2 Technical Evaluation of Information Related to Demand Estimation**

The ETE report estimates the number of people who may need to be evacuated. The three population segments considered are permanent residents, transients, and persons in special facilities. The size of the permanent population is adjusted for growth. The population data are translated into two groups: those using automobiles and those without automobiles. The estimated number of vehicles used by permanent residents is based on an appropriate automobile occupancy factor. In addition, the report determined time estimates for the simultaneous evacuation of the entire plume exposure pathway EPZ.

Estimates of transient populations are based on local data, including peak tourist volumes and employment data. There are also estimates for special facility populations (three schools). The subareas in the ETEs encompass the entire area within the plume exposure EPZ. The maps are generally adequate for that purpose, and the level of detail is approximately the same as USGS quadrant maps. The evacuation assumptions are based on the simultaneous evacuation of inner and outer sectors.

NRC staff found the clarifications and ETE report revisions in the applicant's responses to RAIs 13.03-1, 13.03-4(1), and 13.03-10 acceptable.

### **13.3.1B.R.4 Traffic Capacity [10 CFR 50, Appendix E.IV and NUREG-0654, Appendix 4.III]**

#### **13.3.1B.R.4.1 Technical Information Related to Traffic Capacity**

Section 4 describes highway capacity estimates. The methods used are generally from the Highway Capacity Manual. Appendix K, "Evacuation Roadway Network Characteristics," identifies all evacuation route segments and their characteristics, including capacity. The staff issued **RAIs 13.03-13** and **13.03-14**, requesting the applicant to provide additional descriptions of the road network used for evacuation routes. Specifically, RAI 13.03-13 requested the applicant to clarify the routes shown in the State of Texas Emergency Management Plan (EMP) and to provide a complete link-node map; RAI 13.03-14 requested the application to provide information on highway lane widths. The applicant's response to RAI 13.03-13 includes a scalable electronic link-node map that corrected information regarding the highway network. The applicant's response to RAI 13.03-14 clarifies the locations of adverse highway geometries that could lead to reduced highway capacity and speed. The staff issued **RAI 13.03-5**, requesting the applicant to clarify the description of the evacuation process in Section 7.3,

"Evacuation Rates." The applicant's response replaces the first two sentences of Section 7.3 with:

"While all routes remain available for evacuees, only a few of these routes will be needed towards the end of the evacuation."

The NRC staff verified that the changes proposed in response to RAI 13.03-5 were included in the July 2009 revision of the South Texas Project ETE report.

The staff issued **RAI 13.03-12**, requesting the applicant to provide additional information regarding the efficacy of using traffic control points and access control points to determine evacuation times. The applicant's response notes that although these concepts were discussed, they were not applied to the modeling, so any efforts at traffic control will shorten the estimated evacuation time. However, the applicant also stated in the response that the following text will be added to the first paragraph of Section 7.3:

Figure 7.5 indicates that evacuation is a continuous, dynamic process.

Also in the response to RAI 13.03-12, the applicant stated that annotations of delay times in congested areas shown in Figures 7-3, "Traffic Congestion at 45 Minutes after the Advisory to Evacuate," and 7-4, "Traffic Congestion at 1 Hour and 15 Minutes after the Advisory to Evacuate" would be added to the next revision of the ETE report. The NRC staff confirmed that the proposed changes to the text and to Figures 7-3 and 7-4 in response to RAI 13.03-12 were made in the July 2009 revision of the ETE report.

Section 9, "Traffic Management Strategy," presents a traffic control and management strategy that is designed to expedite the movement of evacuating traffic. The traffic management strategy is based on a field survey of critical locations and consultations with emergency management and enforcement personnel.

Section 10, "Evacuation Routes," illustrates the emergency evacuation routes. Details of the link-node map are in Appendix K, "Evacuation Roadway Network Characteristics." The staff issued RAI 13.03-13, requesting the applicant to provide additional information regarding the transport network. The request included:

- Clarification of differences in the evacuation routes between the ETE report and the State of Texas EMP
- A map (or maps) including the nodes identified in Appendix K
- A roadway map with the sector and quadrant boundaries
- Verification of the map with the node network in Figure 1.2 (that appeared to be missing a segment south and east of the plant and represented a node with inputs from two directions and no output segments)
- Investigation of whether the link-node map used for the routes included the connection at the southeast corner of the MCR
- Confirmation of selected routes

- Clarification of the width used for a “Full Lane” and whether lane widths vary within the EPZ

The applicant’s response explains that the evacuation routes in the ETE Report are somewhat enhanced compared with those in the current Texas EMP. The applicant provides a new scalable electronic map with annotations of sector boundaries, nodes, and links used in the ETE analyses, and corrections of omissions and inappropriate directional indications that reflects the evacuation network as modeled.

#### **13.3.1B.R.4.2 Technical Evaluation of Information Related to Traffic Capacity**

The ETE report provides a complete review of the evacuation road networks that are slightly enhanced compared with those in the older ETE report for STP Units 1 and 2. The report includes analyses of travel times and potential locations for congestion. The evacuation time estimates are not dependent on the establishment of traffic control points and access control points. Therefore, manpower and equipment shortages have no effect on the ETE calculations. The report also describes all evacuation route segments and their characteristics, including capacity, and a traffic control and management strategy that is designed to expedite the movement of evacuating. The traffic management strategy is based on a field survey of critical locations and consultations with emergency management and enforcement personnel.

The ETE report includes assumptions for determining the number of vehicles needed, as well as the methodology for determining the transport-dependent population. The applicant also analyzes travel times and potential locations for serious congestion along the evacuation routes. NRC staff found these revisions to the ETE report in response to RAIs 13.03-11, 13.03-13, and 13.03-14 acceptable.

#### **13.3.1B.R.5 Analysis of Evacuation Times [10 CFR 50, Appendix E.IV and NUREG-0654, Appendix 4.IV]**

##### **13.3.1B.R.5.1 Technical Information Related to Analysis of Evacuation Times**

Sections 4, 5, and 6 of the ETE report describe the methods used to estimate the evacuation times. Section 4 describes estimates of highway capacity, which is discussed in detail in Section 13.3.1C.R.4. Section 5 estimates the distributions of elapsed times associated with mobilization activities undertaken by the public to prepare for the evacuation trip (the “trip generation time”).

Section 6 defines the various evacuation cases used in the time estimates. A case is defined as a combination of a scenario and a region. A scenario is defined as a combination of circumstances that include the time of day, day of the week, the season, and weather conditions. Scenarios define the number of people in each affected population group and the respective mobilization time distributions. A region is defined as a grouping of contiguous evacuation zones that forms either a “keyhole” sector-based area or a circular area within the plume exposure pathway EPZ that is evacuated in response to a radiological emergency. The STP plume exposure pathway EPZ is defined as containing 11 separate evacuation zones that may be combined into regions, with boundaries along major roads or rivers. The boundary definitions are in Appendix L, “Zone Boundaries,” of the ETE report. These boundaries do not bisect any population centers. In addition, these regions approximate (by radius and area) two miles and four 90-degree sectors, five miles and four 90-degree sectors, 10 miles and four 90-degree sectors, and 10 miles with an entire plume exposure pathway EPZ.

Separate maps in Appendix E, "Special Facility Data," indicate recreational areas, schools, and major employers. Information also includes population information by permanent resident, transient, and employee and the respective estimated number of vehicles for each population. Reception Centers are shown on maps in Section 10, "Evacuation Routes." NRC staff issued RAI 13.03-11, requesting the applicant to provide additional information regarding relocation facilities. The applicant responded with a corrected version of Figure 10-2, "Evacuation Route Map (All Zones)," which eliminates the confusion regarding the Reception Centers.

A summary of the evacuation time estimates is in Section 7, "General Population Evacuation Time Estimates," of the ETE report. These results cover 22 regions within the STP EPZ and the 12 evacuation scenarios discussed in Section 6. There are evacuation times for 22 evacuation regions and 12 scenarios in Appendix J, "Evacuation Time Estimates for All Evacuation Regions and Evacuation Time Graphs for Region 3 (R3), for All Scenarios." Results are for 50 percent, 90 percent, 95 percent, and 100 percent of the vehicles and for good and adverse (rainy) weather conditions. There are maximal evacuation times as well as the times that achieve lower percentages. Evacuation times are reported separately for the general population (Section 7 and Appendix J), schools (Section 8), and the transit-dependent population (Section 8). The general population includes both permanent residents and transients. Figures J-1 through 12, "Evacuation Time Estimates - Scenario 1 [through 12] for Region 3 (the entire EPZ)," describe the time distributions for evacuating vehicles. The ETE report uses Figures 7-3, 7-4, and 7-5 to illustrate the patterns of traffic congestion that arise for the case when the entire plume exposure pathway EPZ (Region R3) is advised to evacuate during the summer, weekend, and midday periods under good weather conditions (a case with the maximum number of evacuees because of assumed crowds on the Matagorda Island beaches). The staff issued **RAIs 13.03-12 and 13.03-17(2)**, requesting the applicant to provide additional information regarding travel times and delay durations. The applicant's responses to the RAIs explain that the scenario for evacuating the full EPZ during good weather leads to the largest traffic congestion, which dissipates after approximately 1.5 hours. The applicant also revises the text in Section 7.3, "Evacuation Rates," to indicate that evacuation is a continuous and dynamic process. The applicant has annotated Figure 7-3, "Traffic Congestion at 45 Minutes after the Advisory to Evacuate," and Figure 7-4, "Traffic Congestion at 1.5 Hours after the Advisory to Evacuate," with the delay times along congested areas.

Appendix I, "Evacuation Sensitivity Studies," contains a series of sensitivity tests regarding the sensitivity of the results to trip generation time (directly related to time-dependent traffic loading) and to the amount of shadow evacuations. NRC staff issued RAI 13.03-15, requesting the applicant to provide additional information concerning the possible impacts on evacuation time caused by alternative adverse weather conditions (fog, flooding). The applicant's response states that speed reductions due to fog were approximately the same as those for heavy rain; and speed reductions due to rain were so small, they insignificantly impacted the ETEs rounded to the nearest 5 minutes. The applicant also explains that because highways have been reconstructed to minimize flood hazards, floods are no longer a limiting hazard. In addition, the applicant corrects the information regarding the reduction in evacuation time between normal conditions and adverse conditions for summer weekends at midday in Table 7-1C, "Time to Clear the Indicated Area of 95 percent of the Affected Population." Thus, the staff found the response to RAI 13.03-15 acceptable.

The staff issued **RAI 13.03-16**, requesting the applicant to clarify the assumptions regarding "shadow evacuation," STP plant personnel evacuation, and behavior of commuters. The applicant's response clarifies the assumptions regarding "shadow evacuation," evacuation of STP plant personnel, and behavior of commuters. In addition, the applicant states that

Subsection 2.3.3.b of Section 2.3, "Study Assumptions," will be revised as described in the response to RAI 13.03-4(1), which is discussed in Section 13.3.1B.R.3 of this SER.

Section 8, "Transit-Dependent and Special Facility Evacuation Time Estimates," of the ETE report includes separate calculations for special populations of school children and transit-dependent individuals. Telephone survey results (reported in Appendix F, "Telephone Survey") were used to estimate the portion of the population requiring transit service, including persons in households who do and do not have a vehicle available at the time the evacuation is ordered. The ETE report assumes that half of these people would ride-share with others, but that a residual 89 persons would require approximately 3 buses. Section 8 describes the operations for these buses. The staff issued **RAI 13.03-9**, requesting the applicant to clarify bus boarding and unloading times. The applicant's response describes additional available data indicating that the times selected were conservative. Thus, the staff found the response to RAI 13.03-9 acceptable.

Section 8 also describes proposed routes for transient-dependent and special facility populations. The staff issued **RAI 13.03-6**, **13.03-7**, and **13.03-8**, requesting the applicant to describe assumptions regarding transients and persons in special facilities, including those confined to institutions such as hospitals, nursing homes, and prisons. Specifically, the RAIs requested the applicant to clarify the development of estimates for transient populations, employee and special facility populations, persons requiring public transit, and peak holiday populations. The applicant's response to RAI 13.03-6 states the intent to delete the data for Zone 12 in Table 3-4, "Summary of Non-EPZ Employees by Zone," because there are only 11 zones. The staff verified that the correction described in RAI 13.03-6 was included in the July 2009 revision of the ETE report. The applicant's response to RAI 13.03-7 explains the assumptions about ambulatory transit-dependent individuals who will walk to designated pickup points. There are separate ETE distributions for auto-owning households, school populations, and transit-dependent populations in Sections 7 and 8. Section 8 also includes the development of an estimated time required to evacuate a particular segment of the non-auto-owning population dependent on public transportation, in a manner similar to that used for the auto-owning population.

NRC staff issued **RAI 13.03-7**, requesting the applicant to describe the assumptions underlying the means to be utilized for accommodating special populations with no access to private transport. The applicant's response indicates that sufficient time is included in the ETEs for those populations to walk to transit bus stops. Accordingly, the staff judged the response to RAI 13.03-7 as acceptable.

The applicant's response to RAI 13.03-8 clarifies the numbers of park and beach users assumed for various scenarios, provides justification for the small numbers of users of minor recreational areas, clarifies estimates of the numbers of seasonal residents, explains how resident and non-EPZ-resident employees are treated, and explains the assumptions related to "shadow" populations. Accordingly, the staff judged the response to RAI 13.03-8 as acceptable.

### **13.3.1B.R.5.2 Technical Evaluation of Information Related to Evacuation Times**

A total of 264 ETEs are computed for the evacuation of the general public. Each ETE quantifies the aggregate evacuation time estimated for the population within one of the 22 Evacuation Regions to completely evacuate from that region, under the circumstances defined for 1 of 12 Evacuation Scenarios (22 x 12 = 264). There are separate ETEs calculated for transit-

dependent evacuees, including school children. An acceptable variant of the NUREG-0654 format is used for the presentation of the evacuation times in Appendix J.

Distribution functions for notification of the various categories of evacuees were developed. The distribution functions for the action stages after notification predict what fraction of the population will complete a particular action within a given span of time. There are separate distributions for auto-owning households, school population, and transit-dependent populations. These times are combined to form the trip-generation distributions.

There are separate distributions for auto-owning households, school populations, and transit-dependent populations; there are also calculations for on-road travel and delay times. The process for developing an estimate of the time required to evacuate a particular segment of the non-auto-owning population dependent upon public transportation is similar to that used for the auto-owning population.

The applicant has clarified the following RAIs: 13.03-6(1); 13.03-7; 13.03-8(1)(a, c, and d); 13.03-8(2); 13.03-9; 13.03-12(2); 13.03-12(4); 13.03-12(5); 13.03-15(2)(b); 13.03-16(a, b, and d); 13.03-17(2)(a); 13.03-17(3); 13.03-17(4); 13.03-17(5); 13.03-17(6); and 13.03-17(7). The staff found these clarifications acceptable. The applicant has also provided additional information in response to RAIs 13.03-8(1)(b), 13.03-11, 13.03-15(1), 13.03-17(2)(a), 13.03-17(3), 13.03-17(4), and 13.03-17(6)(e). The staff found the additional data and information from the applicant in response to these RAIs acceptable. In addition, the applicant clarifies and adds textual revisions to the ETE report in response to RAIs 13.03-16(c), 13.03-17(4), and 13.03-17(5). The staff found the clarifications and revisions from the applicant in response to these RAIs acceptable. The applicant also corrects and revises the ETE report in response to RAIs 13.03-12(3), 13.03-15(2)(a), 13.03-12(1), 13.03-17(1), and 13.03-17(2)(b). The staff found the revisions to the ETE report and responses to these RAIs acceptable.

**13.3.1B.R.6 Other Requirements [10 CFR 50, Appendix E.IV and NUREG-0654, Appendix 4.V].**

**13.3.1B.R.6.1 Technical Information Related to Analysis of Other Requirements**

Section 12, "Confirmation Times," of the ETE report suggests a procedure to confirm that the evacuation process is effective, in the sense that the public is complying with the advisory to evacuate. The suggested procedure employs a stratified random sample and a telephone survey. Estimates indicate that this process could be completed within approximately 3 to 4 hours of the advisory to evacuate.

The development of the ETE report was coordinated with emergency planners from the State of Texas and Matagorda County who are involved in emergency response for the site. NRC staff issued RAI 13.03-18(2), requesting the applicant to address the review of the ETE report by state and local organizations involved with emergency response and whether their comments are included in the ETE report. The applicant's response to the RAI states that local organizations involved with the emergency planning effort in Matagorda County have reviewed and commented on the entire ETE report, and their comments that are incorporated into the ETE report were agreed to by the STP, the contractor responsible for preparing the ETE report, and the County Emergency Coordinator.

**13.1B.R.6.2      Technical Evaluation of Information Related to Other Requirements**

The time required for confirmation of evacuation was estimated. In addition, the development of the ETE report was coordinated with emergency planners from the State of Texas and Matagorda County who are involved in emergency response for the site.

The applicant's response to RAI 13.03-18(2) clarifies confirmation times and the involvement of State and local officials to implement the confirmation process. The staff found the applicant's clarifications in response to this RAI acceptable.

**13.3.1B.R.7      Conclusion for "Evacuation Time Estimate (ETE) Analysis"**

On the basis of its review of the report titled "South Texas Project Development of Evacuation Time Estimates" dated July 2009 as described above, the NRC staff concludes that the report is consistent with those portions of Section 13.3 of NUREG-0800 related to ETE analyses. Therefore, the ETE report is acceptable and meets the applicable requirements of 10 CFR Part 50, Appendix E, Section IV.