11. RADIOACTIVE EFFLUENT DOSE CONSEQUENCES FROM NORMAL OPERATIONS

The U.S. Nuclear Regulatory Commission (NRC) staff reviewed the information on radiological effluents and solid radioactive waste provided in Section 3.2 of the site safety analysis report (SSAR) submitted by Systems Energy Resources, Inc. (SERI or the applicant), as part of the early site permit (ESP) application for the Grand Gulf Nuclear Station (GGNS) site, as well as Sections 3.5 and 5.4 of the associated environmental report (ER), to determine whether site characteristics are such that the radiation dose to members of the public would be within regulatory requirements.

11.1 Technical Information in the Application

The applicant provided information on the radioactive gaseous and liquid effluents and solid radioactive waste material that would be generated as a normal byproduct of nuclear power operations. These radioactive materials will be collected, processed, stored, and discharged in a controlled manner to the local environment or transported off site for long-term storage or disposal. The proposed facility will have the ability to handle these radiological effluents and solid waste materials in a manner that minimizes radioactive releases to the environment and maintains exposure to the public and plant personnel during normal plant operation and maintenance at levels that are as low as reasonably achievable (ALARA).

11.2 Regulatory Evaluation

The NRC regulations require that applicants for an ESP address the characteristics of the proposed site that could affect the radiation dose to a member of the public from radiological effluents. The applicant provided a comprehensive listing of NRC regulations applicable to its ESP SSAR and ER in SSAR Section 3.2 and ER Sections 3.5 and 5.4, respectively. These sections contain information that adequately addresses anticipated radiological effluents according to Title 10, Section 52.17(a)(1)(iv), of the *Code of Federal Regulations* (10 CFR 52.17(a)(1)(iv)). Specifically, 10 CFR 52.17(a)(1)(iv) states that an ESP application should describe the anticipated maximum levels of radiological effluents that each facility will produce. Furthermore, 10 CFR 100.21(c)(1) requires that radiological effluent release limits associated with normal operation from the type of facility proposed for the site be met for any individual located off site. The staff reviewed this portion of the application for conformance with the applicable regulations.

11.3 Technical Evaluation

During normal operation, small quantities of radiological materials are expected to be released to the environment through gaseous and liquid effluents from the plant.

11.3.1 Gaseous Effluents

The gaseous waste management system will control, collect, process, store, and dispose of radioactive gases during plant operation, including startup, normal operation, shutdown, refueling, and anticipated operational occurrences. Routine radioactive gaseous effluents are

released to the environment through the waste gas processing systems, which will minimize these releases to the environment. Radioactive gases that may be present in the plant buildings as a result of leakage from systems will also be monitored and released through the building ventilation systems. The applicant will control and monitor the release of these effluents from the facility so that they comply with the regulatory limits in 10 CFR Part 20, "Standards for Protection Against Radiation." It will maintain these effluents at ALARA levels in accordance with Appendix I, "Numerical Guides for Design Objectives and Limiting Conditions for Operation to Meet the Criterion 'As Low as is Reasonably Achievable' for Radioactive Material in Light-Water-Cooled Nuclear Power Reactor Effluents," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities."

In SSAR Table 1.3-2, SERI estimated the bounding quantity of radioactive gaseous effluents that may be released from the gaseous waste management and the building ventilation systems. The applicant determined the gaseous radioactive effluent concentrations based on a composite of the highest activity content of the individual isotopes it anticipated would be released from the alternative reactor designs under consideration.

The applicant also provided bounding gaseous effluent release data to support its compliance with the gaseous effluent release concentration limits in Table 2 of Appendix B, "Annual Limits on Intakes (ALIs) and Derived Air Concentrations (DACs) of Radionuclides for Occupational Exposure; Effluent Concentrations; Concentrations for Release to Sewerage," to 10 CFR Part 20.

The applicant calculated the estimated dose to a hypothetical maximally exposed member of the public from the gaseous effluents using radiological exposure models based on Regulatory Guide (RG) 1.111, "Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water-Cooled Reactors," and the GASPAR II program (NUREG/CR-4653, "GASPAR II—Technical Reference and User Guide," issued March 1987). The applicant evaluated several exposure pathways, including direct radiation from immersion in the gaseous effluent cloud and from particulates deposited on the ground, inhalation of gases and particulates, ingestion of milk contaminated through the grass-cow-milk pathway, and ingestion of foods contaminated by gases and particulates. The calculated gaseous pathway total body dose to a maximally exposed individual at the nearest site boundary is 0.0084 milliSievert per year (mSv/yr) (0.844 millirem per year (mrem/yr)).

11.3.2 Liquid Effluents

The liquid waste management system will control, collect, process, store, and dispose of, as required, potentially radioactive liquids during plant operation, including startup, normal operation, shutdown, refueling, and anticipated operational occurrences. The applicant will typically operate the system in a manner that minimizes the release of radioactivity into the environment. Normal liquid effluents will discharge through the existing discharge mechanism of GGNS Unit 1.

Currently, the GGNS facility routinely discharges radioactive liquid wastes into the Mississippi River. The applicant expects its ESP facility to continue this practice. The applicant has given a bounding assessment to demonstrate its capability to comply with the regulatory requirements in 10 CFR Part 20 and Appendix I to 10 CFR Part 50.

In ER Table 3.0.8, SERI provided the bounding annual average quantity of radioactive liquid effluents that may be released from the ESP facility. This quantity represents the highest activity content of the individual isotopes from the alternative reactor designs under consideration. These data show that the bounding liquid effluent release concentrations will fall within the liquid effluent release concentration limits in Table 2 of Appendix B to 10 CFR Part 20.

The applicant calculated the estimated dose to a hypothetical maximally exposed member of the public from the liquid effluents using radiological exposure models based on RG 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I," issued October 1977, and the LADTAP II program (NUREG/CR-4013, "LADTAP II—Technical Reference and User Guide," issued April 1986). The applicant evaluated several exposure pathways, including eating fish or invertebrates caught near the point of discharge, using the shoreline for activities (e.g., sunbathing or fishing), and swimming and boating on the Mississippi River near the point of discharge. The calculated liquid pathway total body dose to a maximally exposed individual at the nearest site boundary is 0.0217 mSv/yr (2.17 mrem/yr).

11.3.3 Solid Waste

The solid waste management system of the ESP facility will control, collect, handle, process, package, and temporarily store the wet and dry solid radioactive waste materials generated during normal plant operations before shipping them off site. The solid waste materials may consist of filters; demineralizer resins; waste evaporator bottoms; paper; rags; contaminated clothing, tools, and equipment; and laboratory solid wastes. The applicant will periodically ship solid radioactive waste material from the ESP site to the permanent waste disposal facility.

In ER Table 3.0-3, SERI estimated that it will generate an average of 18,646 cubic feet (ft^3) of radioactive waste each year. The applicant estimated the maximum curie content of the waste at 5400 curies. The applicant will package and ship the waste in accordance with the applicable regulations in 10 CFR Part 71, "Packaging and Transportation of Radioactive Material," and 49 CFR Part 173, "Shippers—General Requirements for Shipments and Packagings."

Consistent with the requirements of Subpart B, "Evaluation Factors for Stationary Power Reactor Site Applications on or After January 10, 1997" of 10 CFR Part 100 and Subpart A, "Early Site Permits," of 10 CFR Part 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants," SERI did not provide details regarding the solid waste management system. The NRC will evaluate solid waste management at the construction permit or combined license (COL) stage.

11.3.4 Conclusions

The applicant provided adequate information to give reasonable assurance that it will control, monitor, and maintain radioactive gaseous and liquid effluents from the ESP facility within the regulatory limits specified in 10 CFR Part 20, 10 CFR Part 71, and 49 CFR Part 173, as well as maintain them at ALARA levels, in accordance with the effluent design objectives contained in Appendix I to 10 CFR Part 50. A COL applicant that references an ESP for the site should

verify that the calculated radiological doses to members of the public from radioactive gaseous and liquid effluents for any facility to be built on the site are bounded by the radiological doses included in the SSAR for the ESP application and reviewed by the NRC staff as described above. In addition, detailed information on the solid waste management system used to process the radioactive gaseous and liquid effluents will be required. This is **COL Action Item 11.1-1.**

Based upon these considerations, the staff concludes that radiological doses to members of the public from radioactive gaseous and liquid effluents resulting from the normal operation of one or more new nuclear power plants that might be constructed on the proposed ESP site do not present an undue risk to the health and safety of the public. Therefore, the staff concludes, with respect to radiological effluent release dose consequences from normal operations, that the proposed site is acceptable for constructing a plant falling within the applicant's plant parameter envelope (PPE), and that the site meets the relevant requirements of 10 CFR Part 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants," and 10 CFR Part 100, "Reactor Site Criteria."

13. CONDUCT OF OPERATIONS

13.3 Emergency Planning

The U.S. Nuclear Regulatory Commission (NRC) evaluates emergency plans for nuclear power reactors to determine whether there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. An early site permit (ESP) application, pursuant to Title 10, Section 52.17(b), of the *Code of Federal Regulations* (10 CFR 52.17(b)), must identify any physical characteristics unique to the proposed site that could pose a significant impediment to the development of emergency plans. The application must also describe the contacts and arrangements that the applicant has made with Federal, State, and local government agencies with emergency response planning responsibilities. In addition, the application may propose major features of the emergency plans, as described in Supplement 2 to NUREG-0654/FEMA-REP-1, Revision 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants—Criteria for Emergency Planning in an Early Site Permit Application—Draft Report for Comment" (hereafter referred to as Supplement 2), issued April 1996, or may propose complete and integrated emergency plans.

In Part 4, "Emergency Plan Information," of its Grand Gulf ESP application, System Energy Resources, Inc. (SERI), presents the major features of its proposed emergency plan pursuant to 10 CFR 52.17(b)(2)(i). Because the proposed ESP site footprint consists of a portion of the existing Grand Gulf Nuclear Station (GGNS) site and is located immediately adjacent to GGNS Unit 1, very little distinction exists between the GGNS site and the ESP site for the purposes of emergency planning. The ESP application takes advantage of the emergency planning resources, capabilities, and organization that currently exist at the GGNS Unit 1 site. In Part 1, "Administrative Information," of the ESP application, the applicant indicated that it did not intend to develop a complete and integrated emergency plan until it is necessary to do so, such as at the combined license (COL) phase.

In Section 1.0, "Planning Standards and Evaluation," of Part 4, the applicant noted that it had developed the current emergency plans supporting GGNS Unit 1 to be consistent with the emergency response plans of the affected States (Mississippi and Louisiana) and localities. The ESP application incorporates by reference the following versions of the State and local plans:

- Louisiana Peacetime Radiological Response Plan (LPRRP), Revision 9, issued December 2000
- LPRRP Supplement II, "Fixed Nuclear Facilities to Louisiana Emergency Operations Plan," Attachment 2, "Grand Gulf Nuclear Station," Revision 9, issued December 2000
- LPRRP Supplement II, Attachment 2, Enclosure I, "Tensas Parish Radiological Emergency Response Plan," Revision 9, issued January 2000
- Mississippi Radiological Emergency Preparedness Plan (MREPP), Volume III to the Mississippi Comprehensive Emergency Management Plan, Revision 6, issued July 2001

- Port Gibson/Claiborne County Radiological Emergency Preparedness Plan (PGCCREPP), Revision 5, issued August 2003

The NRC staff, in consultation with the Federal Emergency Management Agency (FEMA), has reviewed the following documents submitted by the ESP applicant, and generally available reference materials, in accordance with Review Standard (RS)-002, "Processing Applications for Early Site Permits:"

- proposed major features plan (Part 4, "Emergency Planning Information," of the ESP application for the Grand Gulf ESP site), Revision 2, dated October 3, 2005

- proposed major features plan (Part 4, "Emergency Planning Information," of the ESP application for the Grand Gulf ESP site), Revision 1, dated July 4, 2005, and supplement, dated September 16, 2005

- proposed major features plan (Part 4, "Emergency Planning Information," of the ESP application for the Grand Gulf ESP site), Revision 0, dated October 23, 2003, and Draft Revision 2, dated January 25, 2005

- applicable portions of the State and local emergency plans given above

- Appendix E, "Evacuation Time Estimates (ETE) for the Grand Gulf Nuclear Plume Exposure Pathway Emergency Planning Zone," to the Grand Gulf Nuclear Station Emergency Plan, issued March 1986, hereafter referred to as the 1986 ETE

- "Evaluation of Existing Evacuation Time Estimates and Analysis of Potential Impediments to Protective Actions, Grand Gulf Nuclear Station," issued May 2003, hereafter referred to as the 2003 ETE study

- "Evaluation of Existing Evacuation Time Estimates and Analysis of Potential Impediments to Protective Actions, Grand Gulf Nuclear Station," Revision 1, issued January 2005, hereafter referred to as Revision 1 to the 2003 ETE study

- SERI responses to the NRC's requests for additional information (RAIs) (Letter 4, dated October 19, 2004, and Letter 6, dated January 25, 2005)

- SERI responses to the NRC's RAIs to resolve the Grand Gulf Early Site Permit Draft Safety Evaluation Report Open Items, dated June 21, 2005

In addition, clarification was provided by the licensee for the existing GGNS unit in the following documents:

- "Grand Gulf Emergency Plan Clarification Related to Early Site Permit Review; Grand Gulf Nuclear Station, Unit 1; Docket No. 50-416; License No. NPF-29," dated September 15, 2005

- "Response to Grand Gulf Early Site Permit Draft Safety Evaluation Report Open Items 13.3-2 and 13.3-4 Discussion; Grand Gulf Nuclear Station, Unit 1; Docket No. 50-416; License No. NPF-29," dated June 28, 2005

Because the applicant has elected to present and seek NRC acceptance of the major features of the emergency plans, the staff's evaluation addresses, in order, the three aspects of such a submission. The following identifies each aspect and the section of this safety evaluation report (SER) that discusses each aspect:

(1) identify physical characteristics that could pose a significant impediment to the development of emergency plans (SER Section 13.3.1, "Significant Impediments to the Development of Emergency Plans")

(2) describe contacts and arrangements made with Federal, State, and local governmental agencies with emergency planning responsibilities (SER Section 13.3.2, "Contacts and Arrangements with Local, State, and Federal Agencies")

(3) propose major features of the emergency plans (SER Section 13.3.3, "Major Features of the Emergency Plans")

The applicant identified Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," as applicable to the major features it proposed. Appendix E, however, applies to the "major features" option of 10 CFR 52.17(b)(2) only to the extent that it requires a description of the "essential elements of advanced planning that have been considered" (see Section III of Appendix E). The staff has approved the applicant's identification of Appendix E as one of the regulatory requirements applicable to the staff's review of the major features proposed by the applicant. The staff's findings, set forth throughout Section 13.3.3 of this SER, are limited to those particular portions of Appendix E that the staff considered during its review of a particular major feature. More important, any staff finding that a proposed major feature complies with a particular requirement of Appendix E is limited to the description of the major feature approved by the staff in this SER.

Notwithstanding any staff approval of a proposed major feature in this SER, the staff will review all features of the emergency plan requiring description pursuant to Appendix E, but which are not described in the ESP application, in the context of a COL or operating license (OL) application. The staff will review the complete and integrated emergency plans submitted in the COL or OL application to determine whether they comply with such requirements, as well as with the requirements of 10 CFR 50.47, "Emergency Plans."

The staff's evaluation of the proposed major features of the applicant's emergency plan parallels the major features and planning standards in Supplement 2.

13.3.1 Significant Impediments to the Development of Emergency Plans

13.3.1.1 Technical Information in the Application

The applicant provided a preliminary analysis of the time required to evacuate transient and permanent populations from various sectors and distances within the 10-mile plume exposure pathway emergency planning zone (EPZ) in Section 2.2, "Evacuation Time Estimate Preliminary Analysis," of Part 4. In Section 2.2.1, "Introduction," of Part 4, the applicant

indicated that a detailed ETE performed in March 1986 for the plume exposure pathway EPZ shows that the maximum evacuation time for the affected area is approximately 3 hours. Summaries of the 1986 ETE appear in Appendix D, "Evacuation Time Estimate," to Attachment 2 to LPRRP Supplement II; MREPP Annex F, "Evacuation"; and Appendix 6, "GGNS Evacuation Time Estimate Study," to PGCCREPP Annex F. In Section 2.2.1 of Part 4, the applicant further noted that a detailed evaluation of the original 1986 ETE undertaken in May 2003 more fully considered the impact of historical population growth and transportation system improvements.

In Section 2.2.2, "Methodology," of Part 4, the applicant stated the following:

> The 2003 ETE evaluation (May 2003 ETE Study) examined evacuation time estimates as determined in 1986 for the GGNS EPZ and evaluated those estimates through: (1) an evaluation of the current population in the GGNS EPZ, using 2000 U.S. Census data and projected 2002 population estimates; (2) an evaluation of the current roadway network in and around the GGNS EPZ; (3) and evaluation of other impediments (e.g., new population growth, new shopping centers, new large employers) in or near the EPZ; and (4) interviews with State and local emergency management and transportation officials, as well as verification of all of the above through a site visit to the GGNS EPZ.

In Section 2.2.4.4, "Results of ETE Evaluation," of Part 4, the applicant stated that the 2003 ETE study concludes that the maximum evacuation time for the affected area of approximately 3 hours, given in the 1986 ETE, remains valid. In addition, the applicant concluded that no physical characteristics unique to the site exist that could pose a significant impediment to the development of emergency plans and implementation of protective actions for the areas surrounding the proposed new facility. These conclusions are consistent with Section 6.0, "Summary and Conclusions," of the 2003 ETE study, which stated the following:

> The Emergency Management Directors and Highway Foremen in both Tensas Parish in Louisiana and in Claiborne County in Mississippi all agree that the 1986 ETE, which demonstrates that the entire EPZ can be evacuated in any time of day or weather condition in less than three hours, is still valid, and may now be overstated because of declining populations in some areas and substantial road upgrades along the major evacuation routes.

In its response to RAI Letter 6, the applicant the applicant provided the following changes:

- The applicant revised Section 2.2.3.7, "Plume Exposure EPZ Peak Population," of Part 4 to include a table, entitled "Comparison of Peak Plume Exposure Pathway EPZ Populations 1986–2002," and to address the limiting plume exposure pathway EPZ peak population (for ETE purposes) as the daytime population estimated at 20,505, which is an increase of 11.1 percent since the 1986 ETE. Because of several minor adjustments, a slight net increase will occur from 20,369 persons to 20,505 persons. (According to the response to RAI 13.3-45, the applicant made the adjustments primarily because of its responses to RAI questions (i.e., 13.3-78d and 13.3-78k) and the deletion of population because of the closure of a small hospital within the EPZ.)

- The applicant revised Figure 1.1, “Grand Gulf Nuclear Station Emergency Planning Zone,” of the 2003 ETE study and Figure 2-6, “Evacuation Area Population Distribution,” of Part 4 to be consistent and reflect the same total rollup evacuation sums for all population segments in a given protective action area (PAA).

- The applicant revised Table 3-4, “GGNS Population Summary by Evacuation Area and Vehicle Demand,” of the 2003 ETE study to list the rollup evacuee sums for each PAA to allow for a convenient comparison with the subject figures.

In its response to RAI 13.2-45, the applicant further stated that the corrections to these figures do not impact the 2003 ETE study, its results, or its conclusions.

In Section 2.1.1, “Location and Physical Characteristics,” of Part 4, the applicant indicated that the proposed new facility will be located on the site of the existing GGNS Unit 1. Figure 2-1, “Site Layout,” of Part 4 reflects the property boundary for the proposed new facility, which encompasses approximately 2100 acres of land from the GGNS site. No railroads, navigable waterways, or industrial, commercial, institutional, or residential structures exist within or traverse the proposed new facility’s exclusion area, with one county road (Ball Hill Road) crossing the exclusion area for the proposed facility. Figure 2-3, “Site Layout,” of Part 4 outlined the boundary line of the plant exclusion area. In RAI 13.3-1, the staff requested that the applicant clarify inconsistencies in figure titles and referenced notes. In response, the applicant amended Figures 2-1 and 2-3 to clarify their titles and content and deleted associated notes in Part 4 of the application.

Section 2.1.5.1, “Plume Exposure Pathway EPZ Description,” of Part 4 further noted that the plume exposure pathway EPZ for the proposed new facility will be identical to that for the existing GGNS Unit 1. Figure 2-6 of Part 4 illustrated the plume exposure pathway EPZ, which is divided into 16 PAAs. In addition, Section 2.2.4.2, “Protective Action Area Description,” of Part 4 described these PAAs, based on major roadways, political boundaries, and topography.

In Table 2-2, “Evacuation Route Roadway Capacities,” of Part 4, the applicant summarized the roadway capacities for each PAA, which it took from Section 4.0, “Evaluation of GGNS EPZ Roadways,” of the 2003 ETE study. According to Section 2.2.2 of Part 4, data regarding roadways were collected from the Mississippi Department of Transportation (DOT) Web site, interviews with Mississippi and Louisiana DOT supervisors, and direct observation of each major road. The 1986 ETE also evaluated and described the roadway network in Section 4.0, “Evacuation Roadway Network,” and listed the complete network in Section 10, “Roadway Network Definition and Capacities.” Section 6.0 of the 2003 ETE study outlined the various improvements made to certain main evacuation routes (e.g., U.S. Route 61 in Mississippi enlarged from two lanes to a 4-lane freeway, Route 65 in Louisiana widened, Highway 18 in Claiborne County repaved and brought up to State DOT standards, and Route 552 south out of Alcorn State University (ASU) widened to a four-lane freeway).

In RAI 13.3-74a, the staff asked the applicant to clarify whether it based the boundaries of the EPZ and evacuation PAAs, used in Section 2.2 of Part 4, on projected demography, topography, land characteristics, access routes, and jurisdictional boundaries over the ESP period (e.g., 20 years). In response, the applicant stated that the GGNS site and associated plume exposure pathway EPZ are located in regions of Louisiana and Mississippi that are generally rural, with relatively low population densities. Part 3, “Environmental Report (ER),” to

the Grand Gulf ESP application projected population estimates for the States of Louisiana and Mississippi, including for 2030, which could be used to represent projected populations at the expiration of the ESP (i.e., more than 20 years from the present). Data in Table 2.5-1, "Projected Population Distribution, 0-10 Miles," of Part 3 projected that population within the 10-mile radius will grow only modestly by 2030 (i.e., approximately 7 percent). This growth rate projection can generally be applied to the plume exposure pathway EPZ, which is slightly larger than the 10-mile radius in some areas. In its response, the applicant stated the following:

> It is expected that officials responsible for monitoring roadway conditions, capacity, use, and projected needs would be reviewing the parameters on a periodic basis to consider and pursue improvements as a matter of prudent highway management. Thus, other improvements to the evacuation roadway network could be expected from now through the life of the Permit (i.e., approximately 2030). For example, the Mississippi Department of Transportation (MDOT) plans improvements to U.S. Highway 61 south (as was done for the highway north of Port Gibson, MS to Vicksburg, MS). Based on the current MDOT schedule, improvements to Highway 61 south making it a 4-lane freeway, are expected to be completed in 2006. Thus, by the time a fully integrated plan was developed and implemented, it is not expected that the major road networks used for evacuation would present a physical characteristic that would be a significant impediment to implementing a fully integrated emergency plan at COL.

In summary, the applicant concluded that, given the current socioeconomic status, in concert with the projected population growth through 2030, it did not expect changes in demography, topography, land characteristics (and use), road networks, and jurisdictional boundaries to impact the plume exposure pathway EPZ and PAA boundaries as defined for GGNS Unit 1 and as proposed in Part 4 for the new facility.

The following sections of the 1986 ETE provided assumptions for determining the number of vehicles:

- Section 3.2, "Permanent Residents"
- Section 3.3, "Transient Populations"
- Section 3.4, "Special Facilities Population"

The general ETE assumptions were revised by the applicant in Section 2.0, "Assumptions Used," of Revision 1 to the 2003 ETE study and Section 2.2.4.1, "Assumptions," of Revision 2 to Part 4 to included the following:

- The applicant revised Assumption 2.10 regarding population to include outage numbers for weeknight and weekend estimates and added an explanatory note.

- The applicant revised Assumption 2.11 to indicate that the 25-percent decrease in traffic capacity includes reductions in average speed and roadway capacity during inclement weather. For an EPZ more prone to adverse weather, such as a New England utility subject to severe ice and snow storms, a 25-percent reduction in roadway capacity and travel speed could be taken. In the case of GGNS, a total reduction of 25 percent in traffic capacity based on reduced speed and roadway capacity is appropriate.

- The applicant modified Assumption 2.14 to indicate that buses will be used to transport special populations from facilities, such as hospitals, nursing homes, and jails and added an explanatory note.

- The applicant modified Assumption 2.15 to include minor clarifications.

Table 5-1, "Summary of Evacuation Time Estimate Assumptions and Differences 1986 to 2002," of Part 4 compared the population differences and associated changes in vehicle loading on the evacuation network from 1986 to 2003 and described the net effect on the 1986 ETE.

Figure 2-4, "Permanent Resident Population Distribution in GGNS Plume Exposure EPZ," of Part 4 provided the permanent resident population for the plume exposure pathway EPZ, based on concentric circles drawn in 1-mile increments out to 10 miles and divided into 22.5-degree sectors. The following sections of Part 4 provided population descriptions:

- Section 2.2.3.3, "Transient Population"
- Section 2.2.3.6, "Public Facilities and Institutions"
- Section 2.2.3.7

Table 2-1, "Plume Exposure EPZ Public Facilities and Institutions—Peak Populations," of Part 4 showed a further breakdown of peak populations in facilities and institutions (i.e., schools, daycare centers, employers, special facilities) within the plume exposure pathway EPZ. According to Section 2.2.3.7 of Revision 2 to Part 4, the peak weekday population grew an estimated 11.1 percent (18,449 to 20,505 people) since the 1986 ETE, with most of this population growth seen in the Port Gibson area and at ASU. The applicant also indicated that a decrease in the peak workforce transient population from a weekday population of 1814 to 1116 resulted from the decreased number of workers at GGNS since 1986. In RAI 13.3-74b, the staff asked the applicant to clarify whether it considered the projected increase in site population because of a proposed new reactor(s) in its preliminary analysis with respect to vehicle queuing. In response, the applicant stated that it did not consider the projected workforce to be a significant concern in future planning because of the much improved capacity of the major evacuation route (i.e., U.S. Highway 61). In its response, the applicant also noted the following:

> However, it is recognized that the total evacuation workforce population for the impacted area, PAA1, would increase. The primary evacuation routing would be from the GGNS site, over the Grand Gulf Road to the east to Highway 61, and then north toward Vicksburg (2003 ETE Study, Table 4-1). As a practical matter, the 1986 ETE actually used a workforce population much larger than the current workforce. Thus, as shown in the 2003 ETE Study, Table 5-1 for PAA1, the difference between PAA vehicle demand decreased from 1986 to 2002 by 500 vehicles. Based on bounding projections for the proposed new facility, the workforce could be as high as 1160 persons (Environmental Report, Table 3.0-1, Item 17.5). Without offering an exact assessment, it can be concluded that the increase in some additional 1200 persons is generally offset by the decrease in vehicle loading from 1986 to 2002. Thus, the overall impact to 1986 conclusions regarding evacuation time would be generally unchanged. Given this quantitative assessment, it is further concluded that the evacuation of the total workforce, including the proposed new facility, would not pose a physical

> characteristic that would be a significant impediment to developing a fully integrated emergency plan.

In RAI 13.3-73, the staff asked the applicant to discuss other factors, in addition to evacuation, such as the availability of adequate shelter facilities, in consideration of local building practices and land use (e.g., outdoor recreational facilities, including camps, beaches, and hunting and fishing areas), for temporary population areas listed in Section 2.2.3.3 of Part 4 and any related significant impediments to the development of emergency plans. In response, the applicant stated that State and local (offsite) plans have been developed and implemented to meet emergency planning requirements for the operating unit at GGNS. The applicant further noted that, given the existence of fully approved, exercised, implemented, and periodically updated State and local plans, a presumption exists concerning the current adequacy of these plans and their effectiveness in providing required protective actions, including evacuation and shelter. The applicant also stated the following:

> No specific review of shelter capacity was undertaken as part of the 2003 ETE Study. By virtue of a presumption of current adequacy, there was no reason to question adequacy of current shelter capacity. Population growth has been determined to be modest (from 1986 to the current time frame). Projections to the end of the requested permit life continue to show modest population growth. State/local officials have indicated their overall willingness to cooperate with the applicant in developing any expansion of current plans. They have also indicated that they are not aware of significant impediments to the development of these plans. This provides sufficient basis for concluding that shelter capacity and other factors, besides evacuation, would not be significant impediments to developing emergency plans to support a proposed new facility at the GGNS site.

13.3.1.2 Regulatory Evaluation

In Section 1.1, “Introduction,” of Part 4, the applicant stated that it developed the major features of an emergency plan to comply with 10 CFR 52.17, “Contents of Applications,” using the guidance in Supplement 2.

In its review of the application, the staff considered the regulatory requirements in 10 CFR 52.17(b)(1), which mandate that the ESP applicant identify physical characteristics unique to the proposed site, such as egress limitations from the area surrounding the site, that could pose a significant impediment to the development of emergency plans. The staff further considered 10 CFR 52.18, “Standards for Review of Applications,” which requires consultation with FEMA to determine whether the information required of the applicant by 10 CFR 52.17(b)(1) demonstrates that no significant impediment to the development of emergency plans exists. Supplement 2 and RS-002 provide guidance concerning the review and evaluation of emergency planning information included in an ESP application.

Supplement 2 defines a significant impediment as a physical characteristic or combination of physical characteristics that would pose major difficulties for an evacuation or the taking of other protective actions. Such unique physical characteristics may be identified by performing a preliminary analysis of the time required to evacuate various sectors and distances within the plume exposure pathway EPZ for transient and permanent populations, noting major difficulties

for an evacuation (e.g., significant traffic-related delays), or the taking of other protective actions.

According to RS-002, the applicant should address factors such as the availability of adequate shelter facilities, local building practices and land use (e.g., outdoor recreation facilities, including camps, beaches, hunting or fishing areas), and the presence of large institutional or other special needs populations (e.g., schools, hospitals, nursing homes, prisons) when identifying significant impediments to the development of emergency plans. Any ETE or other identification of physical impediments should include the latest population census numbers and the most recent local conditions. In addition, the applicant should describe the proposed means for resolving any impediments identified.

13.3.1.3 Technical Evaluation

In Section 2.1.1 of Part 4, the applicant stated that the proposed new facility will be located on the site of the existing GGNS Unit 1. In Section 2.1.5.1 of Part 4, the applicant noted that the plume exposure pathway EPZ for the proposed new facility will be identical to that for the existing GGNS Unit 1. Since the existing GGNS Unit 1 and ESP sites are essentially the same, the staff finds that the use of the ETE for the GGNS site, as cited in the application, is acceptable and applicable to the proposed site based on the guidance in RS-002.

The 1986 ETE in Appendix E, "Evacuation Time Estimates for the Grand Gulf Nuclear Station Plume Exposure Pathway Emergency Planning Zone," to the emergency plan for GGNS Unit 1 detailed the plume exposure pathway EPZ and determined that the maximum evacuation time for the affected area is approximately 3 hours. In addition, as documented in the addendum to Appendix E, a door-to-door demographic survey in the station's plume exposure pathway EPZ conducted in August 1992 indicated a negligible increase in the permanent population of 0.54 percent (47 people). As such, the addendum concluded that the population change should have no discernible effect on the emergency plan, and that the population figures listed in the 1986 ETE remain valid.

In support of the ESP application, the applicant provided a preliminary analysis of the time required to evacuate transient and permanent populations from various sectors and distances within the 10-mile plume exposure pathway EPZ in Section 2.2 of Part 4. The applicant based this preliminary analysis, performed in May 2003, on the 2003 ETE study, which is a detailed evaluation of the original ETE to more fully consider the impact of the historical population growth and transportation system improvements. The 2003 ETE study showed that, in spite of an increase of 10.4 percent in the plume exposure pathway EPZ population, substantial improvements to major evacuation roadways have added even more surplus capacity since the 1986 ETE. The evaluation is consistent with the guidance for updating ETEs contained in NUREG/CR-4831, "State of the Art Methods for the Development of Evacuation Time Estimate Studies," issued in 1992, which stated the following:

> As a general rule, a 10 percent increase in population indicates a need to check evacuation times. An initial assessment would involve determining whether growth had taken place in areas constrained by roadway capacity. If the possibility exists for increased evacuation times, a detailed analysis is necessary.

The 2003 ETE study met the intent of this initial assessment and concluded that, while EPZ population increased by 10.4 percent, the time estimates in the 1986 ETE remain valid and, in some cases, may now actually overstate actual evacuation times because of substantial improvements to major evacuation roadways since 1986.

The applicant submitted Revision 1 to the 2003 ETE study on January 25, 2005, in response to the NRC's RAI Letter 6, dated August 13, 2004. Revision 1 to the 2003 ETE study updated the EPZ population increase (from 1986 to 2002) to 11.1 percent. In Section 2.2.4.4 of Revision 2 to Part 4, the applicant stated that Revision 1 to the 2003 ETE study concluded that the maximum evacuation time for the affected area of approximately 3 hours in the 1986 ETE remains valid. In addition, the applicant concluded that no physical characteristics unique to the site exist that could pose a significant impediment to the development of emergency plans and implementation of protective actions for the areas surrounding the proposed new facility. These conclusions are consistent with Section 6.0 of Revision 1 to the 2003 ETE study. Based on the general guidance for updating ETEs contained in NUREG/CR-4831, the staff concludes that the ETE is up to date for ESP purposes based on the guidance in RS-002.

The staff notes that the proposed ESP site is adjacent to GGNS Unit 1, which is an operating nuclear power plant with integrated onsite and offsite radiological emergency plans. This demonstrates that no significant impediments exist to the development of an emergency plan for the proposed ESP site.

Given the current socioeconomic status, in concert with the modest population growth projected through 2030 (based on projections in Part 3 of the Grand Gulf ESP application) and both ongoing and scheduled improvements to major roadways currently used for evacuation, the staff agrees with the applicant that changes in demography, topography, land characteristics (and use), road networks, and jurisdictional boundaries are not expected to impact the plume exposure pathway EPZ and PAA boundaries as defined for GGNS Unit 1 and as proposed in Part 4 for the new facility.

The staff finds that the applicant's responses to RAIs 13.3-1, 13.3-56, and 13.3-74, and associated revisions provided in Revision 2 to Part 4 of the application, are acceptable. Based on the changes to the assumptions and data inputs implemented under Revision 1 to the 2003 ETE study and Revision 2 to Part 4, the staff considers the ETE preliminary analysis, contained in Section 2.2 of Part 4, and Revision 1 to the 2003 ETE study to be up to date for ESP purposes, based on current population distributions and roadway improvements, using the guidance in Appendix 4 to NUREG-0654/FEMA-REP-1. The study's use of updated evacuee population, vehicle loading, and roadway networks is acceptable and appropriate for the purposes of identifying physical characteristics that may pose a significant impediment to developing expanded emergency plans to support the proposed new facility.

13.3.1.4 Conclusions

As discussed above, the applicant has shown through use of the ETE that no physical characteristics unique to the proposed ESP site could pose a significant impediment to the development of emergency plans. Based on its review as set forth above, the staff concludes that the information the applicant provided is consistent with the guidelines in RS-002 and Supplement 2. Therefore, the information is acceptable and meets the requirements of 10 CFR 52.17(b)(1) and 10 CFR 52.18.

13.3.2 Contacts and Arrangements with Local, State, and Federal Agencies

13.3.2.1 Technical Information in the Application

Section 3.1, "Assignment of Responsibility/Organization Control," and Section 3.3.2, "Coordination with Governmental Agencies," of Part 4 described the roles of various Federal, State, and local government agencies.

In Section 3.17, "Contacts and Arrangements," the applicant stated that the following agencies provided letters indicating their support for emergency preparedness efforts for the proposed new facility:

- U.S. Department of Energy (DOE)
- U.S. Coast Guard (USCG)
- State of Mississippi
- State of Louisiana
- City of Port Gibson, Mississippi
- Claiborne County Civil Defense
- Tensas Parish Emergency Preparedness
- Port Gibson Police Department
- Claiborne County Sheriff's Department
- Claiborne County Fire Department
- Louisiana Office of Emergency Preparedness (LOEP)

However, correspondence contained in Appendix A, "Agency Letters of Agreement," to Part 4 is not consistent with the listing in Section 3.17 to Part 4. In RAI 13.3-9, the staff asked the applicant to provide an updated listing in Section 3.17 of Federal, State, and local governmental agencies with emergency planning responsibilities. The staff also asked the applicant to provide letters of agreement (LOAs) for those agencies not currently included in Appendix A, where statutory authority is not identified, which reflect the use of the proposed site for the possible construction of a new reactor(s). In response, the applicant stated the following:

> Section 3.17 provides a listing of organizations with which the applicant has established a letter of agreement related to emergency planning for the proposed new facility. The agencies represented in Section 3.17 were selected based on the agreements established in the GGNS Unit 1 Emergency Plan. The listing in Section 3.17 is not intended to be an exhaustive listing of all Federal, State, and local agencies having responsibility for emergency planning and response activities. The applicant expects Federal agencies, including the U.S. Army Corps of Engineers and National Weather Service, to respond in accordance with the Federal Radiological Emergency Response Plan. The applicant expects State and local agencies to respond in accordance with the respective Mississippi and Louisiana plans, which have been incorporated by reference in Section 1.1. The letters of agreement included in Appendix A reflect the willingness of the responsible authorities in the affected States to enter into discussions that may lead to extending the scope of their plans to the proposed

new unit. These revised plans would establish the responsibilities of the affected State and local agencies.

It is noted that Section 3.17 includes the U.S. Coast Guard and the City of Port Gibson; yet, no letters of agreement are included in Appendix A. The U.S. Coast Guard no longer provides an explicit letter regarding emergency support. The City of Port Gibson was included in Section 3.17 listing in error.

In Revision 2 to Part 4, the applicant amended Section 3.17 to delete references to USCG and the City of Port Gibson and to insert a reference to Claiborne County Hospital.

Each LOA in Appendix A to Part 4 used a standard format, which provides for the clear acknowledgment of the impact of the proposed new facility, including the following:

- names and locations of organizations contacted, including titles/positions
- possible future construction of one or more additional units at the existing GGNS site
- potential impact on existing responsibilities as outlined in the GGNS emergency plan and a statement from both parties of their willingness to enter into discussions to address future emergency preparedness needs based on construction at the GGNS site

Each LOA also included a statement that the signer is not aware of significant impediments to the development and implementation of the site's emergency plans that could include a future nuclear facility (or facilities).

Section 3.3.2.1, "Mississippi Emergency Management Agency and Mississippi State Department of Health/Division of Radiological Health," of Part 4 noted that the letter from the Governor of Mississippi serves as a commitment from all State agencies to perform their actions delineated in the State plan as required by Mississippi law. The executive director signed the letter in Appendix A to Part 4 from the State of Mississippi, rather than the Governor, as stated by the applicant in Section 3.3.2.1. In RAI 13.3-11, the staff asked the applicant to clarify this discrepancy. In response, the applicant stated that the LOA in Appendix A concerns the State's commitment to coordinate with the licensee in developing emergency plans to address the addition of new operating units at the GGNS site. As such, the applicant indicated that the executive director is the appropriate authority for the commitment to participate in emergency planning activities, and therefore, signed this LOA. In Revision 2 to Part 4, the applicant amended Section 3.17 to reflect a LOA with the Mississippi Emergency Management Agency (MEMA) and amended Section 3.3.2.1 to state the following and clarify the nature of the letter:

The Governor of Mississippi, who bears authority for directing the emergency actions of the affected State agencies, has formally committed the affected State agencies to implement the Mississippi Radiological Emergency Plan, as required by Mississippi law.

13.3.2.2 Regulatory Evaluation

In Section 1.1 of Part 4, the applicant stated that it used the guidance in Supplement 2 to develop the major features of an emergency plan to comply with 10 CFR 52.17.

In its review of the application, the staff considered the regulatory requirements in 10 CFR 52.17(b)(3), which mandate, in part, that an ESP application describe the contacts and arrangements made with Federal, State, and local government agencies with emergency planning responsibilities. Supplement 2 and RS-002 provide guidance concerning the review and evaluation of emergency planning information included in an ESP application.

Supplement 2 states that the description of contacts and arrangements should include the name and location of the organization contacted, the title and/or position of the person(s) reached, and the role of the organization in emergency planning. The evaluation criteria in Section V of Supplement 2 provide additional guidance, which applies to the submission of emergency plans under the major features option of 10 CFR 52.17(b)(2)(i).

According to RS-002, for an operating reactor site, the ESP submission should clearly indicate the impact of applying an existing emergency preparedness program element to the expanded use of the site, including addressing any necessary changes to the program in support of a new reactor(s). For example, LOAs reflecting contacts and arrangements made with State and local government agencies with emergency planning responsibilities might need revision to reflect the anticipated presence of an additional reactor(s) at the site. Such revised LOAs should reflect any impact the additional reactor(s) would have on the agencies' emergency response planning responsibilities and should include the agencies' acknowledgment of the proposed expanded responsibilities. The use of separate correspondence would also be acceptable. If the applicant cannot make arrangements with Federal, State, or local governmental agencies with emergency response planning responsibilities, for whatever reason, the applicant should discuss its efforts to make such arrangements, along with a description of any compensatory measures it has taken or plans to take because of the lack of such arrangements.

13.3.2.3 Technical Evaluation

The applicant provided recent LOAs that established contacts with Federal, State, and local governmental agencies with emergency planning responsibilities and address their receipt and understanding of the ESP application for the Grand Gulf site. The staff finds that the LOAs provided in Appendix A to Part 4 are acceptable. These LOAs described the names and locations of the organizations contacted and the titles and/or positions of the persons reached, referenced Appendix D, "Letters of Agreement," to the existing emergency plan for GGNS Unit 1 for a description of the arrangements with the respective government agencies, and provided a statement of their willingness to enter into discussions to address future emergency preparedness needs based on construction of the proposed new facility. Sections 3.1 and 3.3.2 of Part 4 further described contacts and arrangements for support that are relevant to the ESP application.

The staff finds that the applicant's responses to RAIs 13.3-9 and 13.3-11, and associated revisions provided in Revision 2 to Part 4 of the application, are acceptable.

13.3.2.4 Conclusions

As discussed above, the applicant has provided an acceptable description of contacts and arrangements made with Federal, State, and local governmental agencies with emergency response planning responsibilities. Based on its review as described above, the staff concludes that the information the applicant provided is consistent with the guidelines in RS-002 and Supplement 2. Therefore, the information is acceptable and meets the requirements of 10 CFR 52.17(b)(3).

13.3.3 Major Features of the Emergency Plans

13.3.3.1 Emergency Planning Zones

13.3.3.1.1 Technical Information in the Application

Section 2.1.1 of Part 4 indicated that the proposed new facility will be built on the site of the existing GGNS, which is located in Claiborne County in southwestern Mississippi. In Section 2.1.5, "Emergency Planning Zones," of Part 4, the applicant described the establishment of plume exposure pathway and ingestion pathway EPZs, with radii of approximately 10 and 50 miles, respectively. The applicant provided the exact size and description of the plume exposure pathway EPZ in Section 2.1.5.1 and Figure 2-6 of Part 4. The applicant also indicated that the plume exposure pathway EPZ boundary for the proposed new facility will be identical to that for the existing GGNS Unit 1, which encompasses portions of Claiborne County, Mississippi, and Tensas Parish, Louisiana. Furthermore, because of their proximity to the 10-mile radius from the proposed new facility, the applicant indicated that it included the towns of Newellton and St. Joseph in Tensas Parish, Louisiana, and the campus of ASU in Mississippi in the plume exposure pathway EPZ. A small portion of Warren County, Mississippi, is located within the plume exposure pathway EPZ to the north of Claiborne County, but no permanent, transient, or special facility populations are associated with this small section of Warren County.

For the purpose of evacuation planning, Section 2.2.4.2 of Part 4 described the plume exposure pathway EPZ in terms of distinct PAAs (subareas)—1, 2A, 2B, 3A, 3B, 4A, 4B, 5A, 5B, 6, 7, 8, 9, 10, and 11. Figure 2-6 also illustrated these PAAs but identifies PAA 12 as well. In RAI 13.3-2, the staff asked the applicant to clarify this discrepancy between Section 2.2.4.2 and Figure 2-6. In response, the applicant stated that it unintentionally omitted the description of PAA 12. In Revision 2 to Part 4, the applicant amended Section 2.2.4.2 to identify 16 distinct PAAs, consistent with the existing emergency plan for GGNS Unit 1 and the 1986 ETE.

While the descriptions of PAA boundaries remain unchanged from that contained in Appendix E to the existing emergency plan for GGNS Unit 1, the illustration for PAA 11 contained in Figure 2-6 of Part 4 differed from that given in the existing emergency plan. In RAI 13.3-3, the staff asked the applicant to explain this difference. In response, the applicant stated that Figure 2-6 provides information on population by PAA, which was redrawn for the ESP application based on Figure 2-4, "Ten-Mile Emergency Planning Zone," in the existing emergency plan for GGNS Unit 1. The applicant also indicated that, although these figures have small differences in the plume exposure pathway EPZ boundary, these discrepancies are not considered significant.

In Section 2.1.5.2, “Ingestion Pathway EPZ Description,” of Part 4, the applicant noted that only those counties in Mississippi within the 50-mile EPZ are listed. However, the table below this statement also listed affected parishes in Louisiana. In RAI 13.3-4, the staff asked the applicant to resolve this discrepancy. In response, the applicant stated that the political jurisdictions in the ingestion pathway EPZ include both counties in the State of Mississippi and parishes in the State of Louisiana. In Revision 2 to Part 4, the applicant amended Section 2.1.5.2 to reference both the counties in Mississippi and parishes in Louisiana within the 50-mile EPZ. Additionally, in RAI 13.3-5, the staff asked the applicant to explain the inclusion of Sharkey County in the 50-mile EPZ for the proposed new facility, which the applicant listed in the 50-mile EPZ description contained in Section 2.1.5.2 to Part 4 but did not reference in Section 2.2.3, “Emergency Planning Zones,” of the existing emergency plan for GGNS Unit 1. In response, the applicant stated that the existing ingestion pathway EPZ for GGNS Unit 1 includes a small portion of Sharkey County.

The existing GGNS 10- and 50-mile EPZs are described in the following State and local plans:

- MREPP Basic Plan—Section V.B, “Emergency Planning Zones”; Appendix 1, “Protective Action Areas for Claiborne County,” to Annex F; and Appendix 1, “GGNS 10-Mile (Plume Exposure Pathway) EPZ,” and Appendix 2, “GGNS 50-Mile (Ingestion Pathway) EPZ,” to Annex O

- PGCCREPP Basic Plan—Section V.B, “Emergency Planning Zones” and Appendix 4, “GGNS 10-Mile EPZ,” and Appendix 5, “GGNS 50-Mile EPZ,” to Annex O

- LPRRP Supplement II, Attachment 2—Tab A of Chapter 4, “Parish and County Listing for the Ingestion Exposure Pathway (50-Mile) EPZ”; Appendix B, “Plume Exposure Pathway (10-Mile) EPZ Maps”; and Appendix C, “Ingestion Exposure Pathway (50-Mile) EPZ Map”

In general, the applicant’s description of the plume exposure (10-mile) EPZ in Section 2.1.5 of Part 4 is consistent with that in the State and local plans, as described above. However, the MREPP Basic Plan—Section V.B.1, “Plume Exposure Pathway,” and PGCCREPP Basic Plan—Section V.B.1, “Plume Exposure Pathway,” also stated that the plume exposure pathway EPZ includes a small portion of Jefferson County. While the 10-mile EPZ approaches the county line, it did not cross over the Claiborne-Jefferson County line. In addition, Jefferson County is currently not included in the planning basis for EPZ evacuation, nor included in the protective action areas defined in the MREPP and PGCCRERP Basic Plans and Section 2.2.4.2 and Table 2-2 to Part 4 of the application. This inconsistency will be addressed as part of the periodic review and revision to existing State and local plans.

The 50-mile EPZ as described in the State and local plans, as set forth above, is consistent with Section 2.1.5 of Part 4.

13.3.3.1.2 Regulatory Evaluation

In Section 1.1 of Part 4, the applicant stated that it developed the major features of an emergency plan to comply with 10 CFR 52.17 using the guidance in Supplement 2.

In its review of the application, the staff considered the regulatory requirements in 10 CFR 52.17(b)(2)(i) and 10 CFR 52.18. In addition, the staff considered the regulatory requirements in 10 CFR 50.33(g), 10 CFR 50.47(c)(2), and Sections I, III, and IV of Appendix E to 10 CFR Part 50 in its review of the size and configuration of the EPZs. Under 10 CFR 52.17(b)(2)(i), an applicant for an ESP may propose the major features of an emergency plan for NRC review and approval, in consultation with FEMA, in the absence of complete and integrated emergency plans. Under 10 CFR 52.18, after consultation with FEMA, the NRC will determine whether the major features of an emergency plan submitted under 10 CFR 52.17(b)(2)(i) are acceptable. Supplement 2 and RS-002 provide guidance concerning the review and evaluation of emergency planning information given in an ESP application. Supplement 2 also provides specific evaluation criteria for the major features of emergency plans, including those which apply in determining the size and configuration of the EPZs.

Section III.A of Supplement 2 states that an ESP applicant choosing the option of proposing major features of the emergency plans should give special emphasis to the exact size of the EPZs. Generally, the plume exposure pathway and ingestion pathway EPZs consist of an area about 10 miles and 50 miles in radius, respectively. The applicant should determine the exact size and configuration of the EPZs with respect to local emergency response needs and capabilities, since conditions such as demography, topography, land characteristics, access routes, and jurisdictional boundaries can affect the EPZs.

13.3.3.1.3 Technical Evaluation

Section 2.1.1 of Part 4 stated that the proposed new facility will be located on the site of the existing GGNS. Thus, the proposed new facility will use the existing GGNS 10-mile and 50-mile EPZs. Section 2.1.5.1 indicates that the plume exposure pathway EPZ boundary for the proposed new facility will be identical to that for the existing GGNS Unit 1. The size and configuration of the plume exposure pathway EPZ and PAAs were compared to, and are consistent with, those contained in the existing GGNS Unit 1 emergency plan, the 2003 ETE study, and the Louisiana and Mississippi State and local emergency plans. However, the MREPP Basic Plan—Section V.B.1 and PGCCREPP Basic Plan—Section V.B.1 also stated that the plume exposure pathway EPZ included a small portion of Jefferson County. This small portion of Jefferson County is currently not included in the GGNS planning basis for EPZ evacuation, nor is it included in the protective action areas defined in the MREPP and PGCCRERP Basic Plans and Part 4 of the application. This is considered a minor discrepancy in the existing GGNS, State, and local emergency plans and is being addressed outside the ESP process.

Section 2.1.5.2 of Part 4 identified the Mississippi counties and Louisiana parishes within the 50-mile EPZ for both GGNS Unit 1 and the proposed new facility. This description is consistent with the Louisiana and Mississippi State and local emergency plans.

The staff finds that the applicant's responses to RAIs 13.3-2 and 13.3-4, and associated revisions provided in Revision 2 to Part 4 of the application, are acceptable. The staff also finds that the size and configuration of the plume exposure pathway EPZ reflect local emergency response needs and capabilities, including conditions such as demography, topography, land characteristics, access routes, and jurisdictional boundaries. As such, the staff finds that use of the existing GGNS 10-mile and 50-mile EPZs for the ESP site is appropriate and acceptable.

13.3.3.1.4 Conclusions

As discussed above, the applicant has proposed a plume exposure pathway (10-mile) EPZ and an ingestion pathway (50-mile) EPZ, both of which reflect local emergency response needs and capabilities. The staff also noted that the proposed ESP site currently has an operating reactor with integrated onsite and offsite radiological emergency plans and that the proposed new facility will use the existing GGNS 10-mile and 50-mile EPZs (operating plant). Based on its review, the staff concludes that the proposed major feature, which addresses the size and configuration of the EPZs, is consistent with the guidelines in RS-002 and Supplement 2. Therefore, this major feature is acceptable and meets the requirements of 10 CFR 50.33(g), 10 CFR 50.47(c)(2), 10 CFR 52.17(b)(2)(i), 10 CFR 52.18, and Sections I, III, and IV of Appendix E to 10 CFR Part 50, insofar as it describes the essential elements of advanced planning that have been considered for the emergency planning zones, as set forth above.

13.3.3.2 Assignment of Responsibility (Organization Control) (Major Feature A)

13.3.3.2.1 Technical Information in the Application

The applicant described Federal, State, local, and private sector organizations intended to be part of the overall response organization for the EPZ.

Section 3.1 of Part 4 listed the various Federal, State, and parish/county agencies with responsibilities in support of the proposed new facility in the event of a significant radiological emergency. Section 3.3, "Emergency Response Support and Resources," of Part 4 identified additional local services and Federal and private sector support, as well as the coordination of government agencies. In RAI 13.3-6, the staff asked the applicant to describe in Section 3.3 the Federal organizations identified in other sections of Part 4 to the application as supporting licensee response efforts (i.e., the National Weather Service (NWS), U.S. Army Corps of Engineers, and U.S. Environmental Protection Agency (EPA)). In response, the applicant stated that Sections 3.1.2 and 3.3 described support provided by Federal agencies, addressing Supplement 2 criteria. In Revision 2 to Part 4 of the application, the applicant amended Section 3.1.2, "Federal Agencies," to indicate that it expected Federal agencies to respond in accordance with the Federal Radiological Emergency Response Plan (FRERP). The applicant also inserted Section 3.3.2.8, "Other Federal Agencies," of Part 4, which stated the following:

> Other Federal agencies may provide back-up support for emergency response efforts. For example, should there be a failure of the primary and secondary meteorological stations, the tertiary means of obtaining wind speed and direction data would be through the National Weather Service or the U.S. Army Corps of Engineers, Waterways Experiment Station in Vicksburg, MS. EPA Region IV may provide a mobile environmental sample laboratory.

Section 3.1.1, “State and Local Governmental Agencies,” of Part 4 further indicated that the applicant did not expect that the addition of the proposed new facility will affect these roles and responsibilities defined in various emergency plans currently supporting GGNS Unit 1. In RAI 13.3-8, the staff asked the applicant to identify other Federal, State, and local organizations supporting overall licensee response activities within the ingestion pathway EPZ. The staff also asked the applicant to describe the contacts and arrangements pertaining to the concept of operations developed between Federal, State, and local agencies and other support organizations having an emergency response role within the ingestion pathway EPZ. In response, the applicant stated that the MREPP and LPRRP establish the responsibilities of State and local organizations supporting overall licensee activities within the ingestion pathway EPZ, including the concept of operations. The applicant also indicated that Section 1.1 of Part 4 incorporates these plans by reference. In addition, the FRERP established the responsibilities of Federal organizations, including the concept of operations.

Section 3.3.2.3, “Port Gibson/Claiborne County Civil Defense,” of Part 4 referred to the Port Gibson/Claiborne County Civil Defense (PGCCCD) Office, which appeared to be inconsistent with Section 3.1.1.5, “County and Parish Emergency Services,” Section 3.17, and Appendix A to Part 4 that referred only to the Claiborne County Civil Defense Agency. In RAI 13.3-12, the staff asked the applicant to clarify this discrepancy. In response, the applicant stated that the affected organization, located in Port Gibson, Mississippi, is known as the PGCCCD Office. In Revision 2 to Part 4, the applicant amended Section 3.3.2.3 to clarify that these multiple terms refer to a single organization.

Section 3.3.3, “Other Organizations,” of Part 4 identified the Institute of Nuclear Power Operations (INPO) as a private sector organization that will provide emergency assistance in the location of sources of manpower and equipment, analysis of operational aspects, and help in organizing industry experts to advise on technical matters. In RAI 13.3-7, the staff asked the applicant to describe in Section 3.3 the contacts and arrangements with other private sector organizations (e.g., utilities) that are expected to support licensee response activities within the plume exposure pathway (10-mile) and ingestion pathway (50-mile) EPZs, including identifying radiological laboratories and their general capabilities during an emergency. In addition, the staff asked the applicant to describe the contacts and arrangements made with these organizations. In response, the applicant stated that it expected to finalize arrangements with the nuclear steam supply system (NSSS) vendor, similar to routine operational and emergency support for the operating unit, before or at the time of COL issuance. With regard to contacts and arrangements (LOAs), the applicant further stated that the affected organizations are private support organizations and, therefore, outside the scope of the 10 CFR 52.17(b)(3) requirement to describe contacts and arrangements with Federal, State, and local agencies with emergency planning responsibilities. In Revision 2 to Part 4, the applicant amended Section 3.3.3 to describe the following expected support from the NSSS supplier and radiological laboratories:

> *Nuclear Steam System Supplier*
> GGNS Unit 1 maintains an arrangement with the supplier of its nuclear steam supply system (NSSS) to provide technical support under both routine and emergency conditions. The applicant expects that similar arrangements would be made with the NSSS supplier for the proposed new facility.

Private Sector Radiological Laboratories

The required capabilities of commercial radiological laboratories may be affected by the technology of the selected plant design. The applicant expects that suitable commercial arrangements would be made with one or more private sector radiological laboratories at the time of, or before, issuance of the combined operating license for the proposed new facility.

Section IV, "Organization and Responsibilities," of the MREPP Basic Plan identified the Federal, State, local, and volunteer organizations with primary and support responsibilities for radiological emergency response in the State of Mississippi. Section IV.A, "Claiborne County," and Section IV.B, "City of Port Gibson," of the PGCCREPP Basic Plan identified governmental organizations with emergency response functions, and Section IV.C, "Volunteer Organizations," lists volunteer organizations that support local response efforts.

Section VI, "Continuity of Government," of the Louisiana Emergency Operations Plan (LEOP) identified the numerous State agencies with primary and support responsibilities in an emergency response in the State of Louisiana. Section 6 of Executive Order MJF 2001, contained in the LEOP following the table of contents, and Section 6.c, "Radiological, Federal Agencies," of LEOP Annex P listed the Federal agencies that would be involved in a radiological emergency. Attachment 4V, "Volunteer Organizations," to the LEOP described the role of volunteer organizations. The LEOP annexes described the emergency responsibilities, participants, and specific volunteer organizations.

Section IV, "Concept of Operations," and Section VI, "Responsibilities of Department of State Government," of the LPRRP Basic Plan identified the State agencies responsible for radiological emergency response. Figure 2, "Primary State and Direction and Control Elements for Radiological Emergencies," in Section VI of the LPRRP Basic Plan listed the specific primary and support responsibilities for each State agency, and the attachments to the LPRRP detailed the specific functions. Section VII, "Support and Resources," of the LPRRP Basic Plan listed the Federal, State, nongovernment, cooperating State, and local organizations. Section C, "Direction and Control," of Enclosure I to Attachment 2 to LPRRP Supplement II identified the local governments (Tensas Parish and the municipalities of St. Joseph and Newellton) as responsible for radiological emergency response.

The applicant described the functions and responsibilities for major elements of emergency response. Section VI.A, "Direction and Control, General," as well as Section II.C, "Responsibilities," Appendix 1, "State Command and Control/Coordination Chart," and Appendix 2, "State Functional Matrix," to Annex A of the MREPP Basic Plan described State and local functions and responsibilities for major elements of emergency response in the State of Mississippi. The Governor has overall responsibility for direction and control to ensure the protection of health and welfare, including implementing protective action recommendations (PARs) and evacuation orders. Sections IV and VI.A of the MREPP Basic Plan indicated that MEMA coordinates State-level emergency operations for the Governor. Annex A, "Direction and Control," to the MREPP described the emergency response responsibilities of MEMA during a radiological emergency. Section IV of the MREPP Basic Plan further identified the Mississippi State Department of Health/Division of Radiological Health (MSDH/DRH) as the lead technical responder in the event of a radiological emergency. Appendix 2 to MREPP

Annex A also identified the primary and support functions of MSDH/DRH, as well as the functions of other State, local, and private organizations involved in radiological response. Section VI, "Direction and Control," of the MREPP Basic Plan discussed the functions of each State, local, and private organization.

The PGCCCD director, at the direction of county and Port Gibson elected officials, was responsible for alert and notification, evacuation, transportation, and special needs populations, according to Appendix 3, "Local Functional Matrix," to Section IX to the PGCCREPP Basic Plan and Appendix 3, "Claiborne County Emergency Operations Center (EOC) First Responding Personnel and Designated Alternates," to PGCCREPP Annex A. Appendix 3 to Annex A also included a matrix of Claiborne County organizations and their emergency functions.

The following LEOP sections described State and local functions and responsibilities for the major elements of emergency response:

- LEOP Section V.A, "Direction and Control," delegates responsibility to direct State-level emergency operations.

- LEOP Attachment 4A, "Louisiana Office of Emergency Preparedness," describes the primary emergency response functions relevant to a radiological emergency.

- LEOP Annex P, "Radiological," identifies the Louisiana Department of Environmental Quality (LDEQ) as having the lead technical response role in the event of a radiological emergency.

- LEOP Attachment 4H, "Department of Environmental Quality," describes the emergency response functions of LDEQ relevant to a radiological emergency.

- LEOP Attachment 4, "Organizational Functions," in its entirety, details the primary and support functions of each Federal and State agency and private organization.

- LEOP annexes, in general, specify organizational responsibility by emergency response function.

Section VI of the LPRRP Basic Plan identified the respective State agencies responsible for radiological emergency response. Figure 2 in Section VI of the LPRRP Basic Plan listed the specific primary and support responsibilities for each State agency.

Section D, "Organization and Responsibilities," of Enclosure I to Attachment 2 to LPRRP Supplement II identified Tensas Parish as responsible for local direction and control, alert and notification, emergency communications, public education, protective response, radiological exposure control, emergency medical services, traffic control, and reentry and recovery. Section D.1.b, "Local Government, Municipal Governments," stated that the municipalities of St. Joseph and Newellton support parish emergency operations.

The applicant described the legal basis for State and local authorities for the major elements of emergency response (as identified above). In the State of Mississippi, the MREPP Promulgation Statement and Section IX, "Plan Development and Maintenance, Authorities and

References," of the Basic Plan provided the following legal citations to support the State's general emergency response activities:

- Constitution of Mississippi
- Title 33, Chapter 15, Mississippi Code of 1972
- Emergency Management Law of 1980, Section 33-15, Mississippi Code 1972, Annotated
- Radiation Protection Law of 1978, Section 45-14, Mississippi Code 1972, Annotated
- Executive Order 653 (November 16, 1990)

Appendix 1, "Authorities and References," to Section IX of the PGCCREPP Basic Plan cited the Port Gibson/Claiborne County Joint Ordinance/Resolution, dated April 3, 1978, as the authority for local government emergency response.

Section 3.3.2.2, "Louisiana Department of Environmental Quality/Louisiana Office of Emergency Preparedness," of Part 4 indicated that, under Act 97 of 1983 (L.R.S. 30:2001 et seq.), also known as the Louisiana Environmental Quality Act, and specifically L.R.S. 30:2109, the secretary of LDEQ has the authority to develop and implement a State-wide radiological emergency preparedness plan and to coordinate the development of specific emergency plans for nuclear power facilities. The LPRRP referred to Act 97 of 1983 (L.R.S. 30:2109) as the Louisiana Environmental Affairs Act, as opposed to the Louisiana Environmental Quality Act.

Section IX, "Authorities and References," of the LEOP provided the legal citations to support the State's general emergency response activities (Chapter B), and it cited Federal authorities (Chapter A), local authorities (Chapter C), and authorities to support volunteer organizations (Chapter D). Act 114, the Emergency Interim Local Executive Succession Act of 1963, authorized the emergency planning and response activities of Tensas Parish.

Section I.B, "Introduction, Authority," of the LPRRP Basic Plan cited the following State laws:

- Louisiana Environmental Affairs Act, LA. R.S. 30:1051 et seq.
- Louisiana Disaster Act of 1974, LA. R.S. 29:701 et seq.
- Executive Reorganization Act, LA. R.S. 36:358(E) and 408(F)

Section I.A, "Authority," of Attachment 2 to LPRRP Supplement II stated that the authority for parish planning for an emergency response is consistent with and pursuant to provisions of the Tensas Parish Police Jury Ordinances for Emergency Preparedness. Section B, "Authority," of Enclosure I to Attachment 2 to LPRRP Supplement II also indicated that the authority for the development of the parish plan is consistent with the Tensas Parish Police Jury Ordinance for Emergency Preparedness. In RAI 13.3-60, the staff asked the applicant to identify the legal basis (e.g., reference specific acts, codes, or statutes) for Louisiana parishes and municipalities, including the towns of St. Joseph and Newellton, which are not provided in Attachment 2 to LPRRP Supplement II. In response, the applicant stated that issues related to State and local plans discussed in RAI 13.3-60 should be deferred to the COL review.

Section 3.3 and Appendix A to Part 4 described the contacts and arrangements made by the applicant with Federal, State, and local government agencies with emergency planning responsibilities.

In the State of Mississippi, Appendix 1, “Letters of Agreement,” to MREPP Annex M cited LOAs between MEMA and Entergy, River Region Health Systems, Vicksburg Fire Department Emergency Medical Services, Riverland Medical Center, and American Medical Response. Annex M, “Letters of Agreement,” to the PGCCREPP provided the LOAs between Claiborne County and other organizations.

In the State of Louisiana, the LEOP did not describe specific contacts pertaining to the concept of operations developed between Federal, State, and local agencies and other support organizations. The LEOP did, however, detail relationships between Federal, State, local, and private organizations with responsibilities for emergency response. The LEOP and LPRRP described the relationships that are specific to radiological emergencies at fixed nuclear facilities and GGNS, respectively. Enclosure I to Attachment 2 fo LPRRP Supplement II described the relationship between the parish and local governments, and between the parish and LOEP and other State government agencies. Appendix I-1, “List of Letters of Agreement,” to Enclosure I of Attachment 2 to LPRRP Supplement II cited LOAs between the parish and nongovernment providers of reception and care services, emergency broadcasting, emergency transportation, emergency medical services, and telephone service.

13.3.3.2.2 Regulatory Evaluation

Part 1 of the ESP application stated that the emergency planning information in Part 4 identifies the major features of an emergency plan, which will be developed consistent with the requirements of 10 CFR 52.17(b)(2)(i), using guidance provided in NUREG-0654/FEMA-REP-1 and Supplement 2. In Section 1.1 of Part 4, the applicant indicated that it developed the major features of an emergency plan to comply with 10 CFR 52.17 using the guidance in Supplement 2.

In its review of the application, the staff considered the regulatory requirements in 10 CFR 52.17(b)(2)(i), 10 CFR 52.18, and Sections III and IV.A of Appendix E to 10 CFR Part 50. Under 10 CFR 52.17(b)(2)(i), an applicant for an ESP may propose the major features of an emergency plan for NRC review and approval, in consultation with FEMA, in the absence of complete and integrated emergency plans. Under 10 CFR 52.18, after consultation with FEMA, the NRC will determine whether the major features of emergency plans submitted under 10 CFR 52.17(b)(2)(i) are acceptable. Supplement 2 and RS-002 provide guidance concerning the review and evaluation of emergency planning information given in an ESP application. Supplement 2 also provides specific evaluation criteria for the major features of emergency plans, including those which apply to major feature A, “Assignment of Responsibility—Organization Control.”

Major feature A calls for the applicant to identify emergency response organizations (EROs), including the functions and responsibilities for the major elements of response and the legal basis for State and local authorities. The application should also describe contacts and arrangements between agencies and other support organizations having a response role within the EPZs and include any written LOAs.

13.3.3.2.3 Technical Evaluation

The staff finds that the applicant's responses to RAIs 13.3-6, 13.3-7, 13.3-8, and 13.3-12 are adequate. As such, the staff finds that Revision 2 to Part 4 of the application, the MREPP, PGCCREPP, LEOP, LPRRP, and Enclosure I to Attachment 2 to LPRRP Supplement II are adequate, since they identified the Federal, State, local, and private sector organizations (as well as utilities) that are intended to be part of the overall response organization for EPZs.

The MREPP, PGCCREPP, LEOP, LPRRP, and Enclosure I of Attachment 2 to LPRRP Supplement II identified the functions and responsibilities for the major elements of emergency response, such as command and control, alerting and notification, communications, public information, accident assessment, public health and sanitation, social services, fire and rescue, traffic control, emergency medical services, law enforcement, transportation, protective response, and radiological exposure control.

The staff reviewed Part 4, the MREPP, PGCCREPP, LEOP, and Enclosure I of Attachment 2 to LPRRP Supplement II and finds that they identified (by reference to specific acts, codes, or statutes) the legal basis for State, local, and private sector organizations that are part of the overall organization for the EPZs to carry out their identified functions and responsibilities. In RAI 13.3-60, the staff asked the applicant to specifically address the legal basis for Louisiana parishes and municipalities, including the towns of St. Joseph and Newellton. Upon further review, the staff finds that the existing documents referenced above address RAI 13.3-60 because the proposed ESP site currently has an operating reactor with integrated offsite radiological emergency plans that FEMA has determined to provide reasonable assurance of a proper response in the event of an emergency. As such, the applicant's response to RAI 13.3-60 is acceptable.

Revision 2 to Part 4 of the application, the MREPP, LEOP, and Enclosure I of Attachment 2 to LPRRP Supplement II described contacts and arrangements pertaining to the concept of operations developed between Federal, State, and local agencies, and other support organizations having an emergency response role within the EPZs, and contained or referenced LOAs as appropriate. Sections 13.3.2, 13.3.3.4, "Emergency Response Support and Resources," 13.3.3.7, "Emergency Communications," 13.3.3.10, "Accident Assessment," and 13.3.3.13, "Medical and Public Health Support," of this SER described the contacts and arrangements pertaining to the concept of operations developed between Federal, State, and local agencies and other support organizations having an emergency response role within the EPZs.

13.3.3.2.4 Conclusions

As discussed above, the applicant has identified the EROs, including the functions and responsibilities for major elements of response, and the legal bases for State and local authorities. In addition, the applicant has described contacts and arrangements among the agencies and other support organizations having a response role within the EPZ. Based on its review, the staff concludes that proposed major feature A is consistent with the guidelines in RS-002 and Supplement 2. Therefore, this feature is acceptable and meets the requirements of 10 CFR 52.17(b)(2)(i), 10 CFR 52.18, and Sections III and IV.A of Appendix E to 10 CFR Part 50, insofar as it describes the essential elements of advanced planning that have been considered for organization control, as set forth above.

13.3.3.3 Onsite Emergency Organizations (Major Feature B)

13.3.3.3.1 Technical Information in the Application

The applicant described the interfaces between and among the onsite functional areas of emergency activities, local services support, and State and local government response organizations. Sections 3.2.1, "Onsite Emergency Organization," and 3.2.2, "Offsite Emergency Organization," of Part 4 outlined the basic framework and disciplines that comprise the applicant's onsite and offsite emergency organizations. Section 3.3 described the support from local service organizations and the coordination between State and county/parish agencies. In addition, Figure 3-1, "Interrelationships of Emergency Response Organizations," illustrated an overview of interrelationships between the applicant's emergency response facilities, field monitoring teams, and Entergy corporate, Federal support, and State and local EOCs. In RAI 13.3-13, the staff asked the applicant to identify in Figure 3-1 the interfaces between and among it and local support services responding to or assisting the proposed reactor(s). In RAI 13.3-14, the staff asked the applicant to identify the interfaces between and among its proposed emergency response facilities and State and local government response organizations for onsite major functional areas of emergency activities. In Revision 2 to Part 4, the applicant amended Figure 3-1 to identify these interfaces.

Section 3.2.1.1, "Emergency Director," of Part 4 assigned the responsibility for interfacing with Federal, State, and local agencies for protective actions, requesting additional resources/assistance, and updating the applicant's emergency directory concerning pertinent facts and developments. In Section 3.2.1.1, the applicant designated specific offsite interface responsibilities that it will transfer to its offsite emergency coordinator once the emergency operations facility (EOF) is operational.

Section 3.3.1, "Local Services Support," of Part 4 showed the services that local agencies will provide for handling emergencies and described the arrangements for supplying these services:

> The potential nature of some emergencies may warrant the utilization of offsite individuals, organizations, and agencies. As a result, local support service arrangements will be made with offsite groups to provide aid in the event of an emergency situation at the proposed new facility. Support services encompasses such things as medical assistance, fire control, evacuation, ambulance services, and law enforcement. Since it is imperative that the availability of these support agencies be on short notice, written agreement will be entered into with the organizations. The agencies, in letters of support provided in Appendix A, have established their commitment to enter into discussions that may lead to agreements to provide emergency preparedness and response support for the proposed new facility.

Section 3.3.1.2, "Fire Support," identified the Claiborne County Fire Department as the primary provider of fire support 24 hours per day. The applicant also indicated that the Claiborne County Fire Department has an informal pact with the Port Gibson Fire Department to furnish each other with firefighting personnel, resources, and facilities. The applicant noted that in all cases the Claiborne County Fire Department Fire Chief will direct all offsite firefighting personnel. Appendix A to Part 4 provided an LOA for the Claiborne County Fire Department, indicating its support for emergency preparedness efforts associated with the proposed new

facility. In RAI 13.3-15, the staff asked the applicant to describe the support from the Port Gibson Fire Department provided as part of the informal pact with the Claiborne County Fire Department and to state whether the Port Gibson Fire Department will receive training according to Section 3.15, "Radiological Emergency Response Training," of Part 4 to respond to emergencies at the proposed reactor site. In addition, the staff asked the applicant to clarify whether agreements with offsite fire support organizations are adequate to provide coverage 24 hours per day, 7 days per week, and 365 days per year. In response, the applicant stated that the informal pact consists of an undocumented agreement established to ensure mutual support for firefighting activities. Both fire departments will offer training as discussed in Section 3.15 and are currently available to support activities 24 hours per day, 7 days per week for GGNS Unit 1. In Revision 2 to Part 4, the applicant amended Section 3.3.1.2 to clarify the nature of the informal pact and the fire departments' capabilities to provide continuous support to the facility:

> The Claiborne County Fire Department has an informal aid pact with the Port Gibson Fire Department, which is also available on a 24 hour per day, seven day per week basis. This pact consists of a verbal agreement to furnish each other with fire fighting personnel, resources, and facilities and to render such fire protection services which may be necessary to suppress any fire or disaster which goes beyond the control of either of the agencies.

Section 3.3.1.3, "Law Enforcement Agencies," of Part 4 indicated that a radiological emergency at the proposed new facility may require that the local law enforcement agencies be activated to assist in the emergency effort. The applicant also noted that the Claiborne County Sheriff's Department and the Port Gibson Police Department will be called on to provide support, consistent with the LOAs currently in place for GGNS Unit 1. Such support included controlling matters of civil disorder, directing communications, furnishing personnel and equipment in accordance with security plans, securing access into areas affected by the emergency, and directing area evacuation. Appendix A to Part 4 provided letters from both organizations indicating their support for emergency preparedness efforts associated with the proposed new facility.

Section 3.3.1.1 of Part 4 referenced Section 3.12, "Medical and Public Health Support," which indicated that regional ambulance service will normally provide transportation for injured persons to the medical facility. In RAI 13.3-16, the staff asked the applicant to describe (1) the contacts and arrangements made with the regional ambulance service to transport contaminated persons with injuries to the designated primary and backup hospitals and (2) the service's ability to provide coverage for the proposed new reactor(s) 24 hours per day, 7 days per week, and 365 days per year. In response, the applicant stated that the affected ambulance services currently provide coverage 24 hours per day and 7 days per week for GGNS Unit 1. Should a new facility be constructed, the applicant expected that the existing arrangements would be expanded to provide the same degree of support for the new facility. According to the applicant, the affected organizations are private sector organizations and, therefore, outside the scope of the 10 CFR 52.17(b)(3) requirement to describe contacts and arrangements with Federal, State, and local agencies with emergency response planning responsibilities. In Revision 2 to Part 4, the applicant amended Section 3.12 to include the following:

> In certain instances, medical emergencies may require the transport of an injured person from the station to an offsite medical facility. Transportation of injured persons to the medical facility normally will be provided by regional ambulance service. These services have the capability to provide support on a 24 hour per day, seven day per week basis. In the event that these services are unavailable, provisions will be in place to transport injured persons in company-owned or private vehicles. Ambulances will be equipped with radios to maintain communications with the medical facility. The applicant expects that similar arrangements will be made for support for the proposed new facility.

In Section 3.12, the applicant stated that Claiborne County Hospital serves as the primary medical unit for the transport of injured personnel, with or without contamination. The backup facilities, Vicksburg Medical Center and Parkview Regional Medical Center, have the same emergency medical capabilities as Claiborne County Hospital. In addition, the applicant indicated that it has an agreement with the Ochsner Clinic to provide services if the medical treatment of injured and/or contaminated personnel requires assistance or medical expertise beyond the capabilities of the local facilities. Appendix A to Part 4 provided an LOA for the Claiborne County Hospital, which indicated its support for emergency preparedness efforts associated with the proposed new facility. In RAI 13.3-17, the staff asked the applicant to provide LOAs with Vicksburg Medical Center, Parkview Regional Medical Center, and the Ochsner Clinic documenting their commitment to enter into discussions that may lead to agreements to provide emergency preparedness and response support for the proposed reactor(s). In addition, the staff asked the applicant to describe the ability to provide coverage 24 hours per day, 7 days per week, and 365 days per year. In response, the applicant stated that Vicksburg Regional Medical Center and Parkview Regional Medical Center have merged to form River Region Medical Center. The applicant also noted that the affected hospitals currently provide coverage 24 hours per day, 7 days per week for GGNS Unit 1. Should a new facility be constructed, the applicant expected that the arrangements would be expanded to provide this same degree of support to the new facility. Since the affected organizations are private sector organizations, the applicant considered them to be outside the scope of the 10 CFR 52.17(b)(3) requirement to describe contacts and arrangements with Federal, State, and local agencies with emergency planning responsibilities. In Revision 2 to Part 4, the applicant amended Section 3.12 to state the following:

> Both of the back-up medical facilities, River Region Medical Center and The Oschner Clinic, have the ability to provide support of a 24 hour per day, seven day per week basis. The applicant expects that similar arrangements for primary and back-up medical facilities will be made for the proposed new facility. Training for both primary and back-up medical facilities will be offered as described in Section 3.15.

13.3.3.3.2 Regulatory Evaluation

Part 1 of the ESP application stated that the emergency planning information in Part 4 identifies the major features of an emergency plan, which will be developed consistent with the requirements of 10 CFR 52.17(b)(2)(i), using guidance provided in NUREG-0654/FEMA-REP-1 and Supplement 2.

In its review of the application, the staff considered the regulatory requirements in 10 CFR 52.17(b)(2)(i), 10 CFR 52.18, and Sections III and IV.A of Appendix E to 10 CFR Part 50. Under 10 CFR 52.17(b)(2)(i), an applicant for an ESP may propose the major features of the emergency plans for NRC review and approval, in consultation with FEMA, in the absence of complete and integrated emergency plans. Under 10 CFR 52.18, after consultation with FEMA, the NRC will determine whether the major features of emergency plans submitted under 10 CFR 52.17(b)(2)(i) are acceptable. Supplement 2 and RS-002 provide guidance concerning the review and evaluation of emergency planning information given in an ESP application. Supplement 2 also provides specific evaluation criteria for major features of emergency plans, including those which apply to major feature B, "Onsite Emergency Organizations."

Major feature B calls for the applicant to identify interfaces between and among the onsite functional areas of emergency activities, local services support, and State and local government response organizations, including the services to be provided by local agencies.

13.3.3.3.3 Technical Evaluation

In its responses to RAIs 13.3-13 and 13.3-14, the applicant amended Figure 3-1 in Revision 2 to Part 4 of the application to illustrate the interfaces identified in Sections 3.2.1 and 3.2.2. The staff finds that the applicant's responses to RAIs 13.3-13 and 13.3-14 are acceptable. As discussed above, Sections 3.2.1 and 3.2.2 of Revision 2 to Part 4 of the application identified the interfaces between and among the onsite functional areas of emergency activities, local services support, and State and local government response organizations.

The staff finds that the applicant's responses to RAIs 13.3-15, 13.3-16, and 13.3-17, which were implemented in Revision 2 to Part 4 of the application, are acceptable. Revision 2 to Part 4 of the application identified the services that local agencies (e.g., police, ambulance, medical, hospital, and firefighting organizations) will provide for handling emergencies.

The applicant also described the arrangements involving these services in Part 4 to the application, and provided LOAs with local government agencies. The applicant further indicated in its responses to RAIs 13.3-16, and 13.3-17 that LOAs with private sector organizations are outside the scope of the 10 CFR 52.17(b)(3) requirement and will be provided at the COL stage. The staff finds that the applicant's responses to RAIs 13.3-16 and 13.3-17 are consistent with the requirements of 10 CFR 52.17(b)(3), and therefore, are acceptable.

13.3.3.3.4 Conclusions

As discussed above, the applicant has identified the interfaces between and among the onsite functional areas of emergency activity, local services support, and State and local government response organizations for the ESP site. In addition, the applicant has identified the services and described the arrangements to be provided by various local agencies, and has provided adequate letters of agreement. Based on its review, the staff concludes that proposed major feature B is consistent with the guidelines in RS-002 and Supplement 2. Therefore, this feature is acceptable and meets the requirements of 10 CFR 52.17(b)(2)(i), 10 CFR 52.18, and Sections III and IV.A of Appendix E to 10 CFR Part 50, insofar as it describes the essential elements of advanced planning that have been considered for the onsite ERO as described above.

13.3.3.4 Emergency Response Support and Resources (Major Feature C)

13.3.3.4.1 Technical Information in the Application

The applicant described the provisions for requesting Federal assistance through the FRERP. Section 3.1.2.1, "Department of Energy," of Part 4 stated that the FRERP establishes the responsibilities of affected Federal agencies during an emergency at the proposed new facility. The applicant also indicated that the notification and support of certain Federal agencies, in addition to State and local agencies, may be necessary in the event of a significant radiological emergency.

Section 3.3.2.5, "Nuclear Regulatory Commission," of Part 4 described NRC response activities, including the NRC initial response site team, and outlined activation times for the NRC Operations Center. Section 3.3.2.6, "Department of Energy," of Part 4 described DOE response activities and references the Radiological Assistance Plan and Interagency Radiological Assistance Plan. Section 3.3.2.6 of Part 4 also referred to the assistance provided by DOE through specialized radiation monitoring equipment and in the radiological monitoring of food, water, livestock, and agricultural products. In addition, Section 3.9.2, "Field Monitoring," of Part 4 discussed mobile laboratory capabilities available from the applicable DOE and EPA regions. In RAI 13.3-10, the staff asked the applicant to explain its reason for detailing NRC and DOE response capabilities and times in the plan instead of referencing the FRERP. In Revision 2 to Part 4, contained in the applicant's response to RAI Letter 6, the applicant amended Sections 3.3.2.5 and 3.3.2.6 to reflect NRC and DOE response activities under the FRERP.

Section 3.9.1, "Meteorological Data," of Part 4 identified NWS and U.S. Army Corp of Engineers as sources of alternate meteorological data in the event of a concurrent failure of both the applicant's primary and secondary meteorological systems.

Section 3.3.2.7, "U.S. Coast Guard," of Part 4 described the jurisdictional control by USCG over traffic on the Mississippi River. The applicant further indicated that MEMA will notify USCG for emergencies requiring traffic exclusion.

Section 3.2.1.1 of Part 4 identified the emergency director as responsible for requesting assistance from Federal and State agencies, if required. The applicant noted that the offsite emergency coordinator will assume this responsibility once the EOF is declared operational. The applicant indicated in Section 3.2.2.4, "Additional Offsite Personnel," that emergency organization personnel will be assigned to coordinate requests for offsite assistance and serve in a technical and operational liaison capacity, if requested.

Section IV.A.1, "State, Governor's Office," and Appendix 6, "Radiological Emergency Preparedness Support and Resources," to Section IX of the MREPP Basic Plan, and Section II.E.2, "Federal Radiological Emergency Response Plan (FRERP)," of Annex D to the MREPP, indicated that the Governor of Mississippi has the ultimate authority to request Federal assistance and that either the Governor or MEMA has the authority to request, through FEMA Region IV, activation of the FRERP. Appendix 6 to the MREPP Basic Plan also assigned to MSDH/DRH the role of requesting Federal technical support. Section II.E.2 of MREPP Annex D described the respective roles for activation of the FRERP by MEMA and MSDH/DRH, as well as available Federal support.

Section IV, “Organization and Assignment of Responsibilities,” of LEOP described the role of FEMA in coordinating disaster relief. The State-Federal connectivity guide in the LEOP diagramed the connections between State and Federal response agencies. Section 6.c of LEOP Annex P listed the Federal agencies with responsibilities for radiological response.

Section V, “Direction and Control,” of LPRRP indicated that the secretary of LDEQ, or, if the secretary is not available, the official designee, is authorized to request technical assistance from the NRC, DOE, EPA, or other Federal agencies in the event of a radiological emergency at a fixed nuclear facility in the State of Louisiana.

The applicant described radiological laboratories and their general capabilities and expected availability to provide radiological monitoring and analysis during an emergency. In Section 3.9.2 of Part 4, the applicant indicated that the new facility will have isotopic analysis capability for onsite radiological analysis. In addition, MSDH may deploy mobile laboratory facilities in the vicinity of the proposed facility within 2 to 4 hours in support of environmental monitoring during a site area emergency or general emergency. In Section 3.9.2, the applicant also stated that additional mobile laboratories with similar capabilities are available from DOE (Region III) and EPA (Region IV), with estimated response times of 12 hours and 9 hours, respectively. In RAI 13.3-7, the staff asked the applicant to identify whether private sector organizations will provide additional radiological laboratory and analysis capabilities during an emergency (e.g., analysis of reactor coolant and other inplant media samples collected, and field monitoring team airborne and environmental samples collected). In response, the applicant stated that it expected to finalize arrangements with the NSSS supplier, similar to routine operational and emergency support for the operating unit, before or at the time of COL issuance. In Revision 2 to Part 4, the applicant amended Section 3.3.3 to describe the expected support from the NSSS supplier and radiological laboratories:

> *Private Sector Radiological Laboratories*
> The required capabilities of commercial radiological laboratories may be affected by the technology of the selected plant design. The applicant expects that suitable commercial arrangements would be made with one or more private sector radiological laboratories at the time of, or before, issuance of the combined operating license for the proposed new facility.

Section II.B.3.e, “State Government, Emergency Environmental Sampling,” of MREPP Annex D described the sampling of various media and agricultural commodities by MSDH/DRH. Section II.B.3.f, “State Government, Sample Analysis,” of MREPP Annex D also discussed sample analysis in either the fixed MSDH/DRH laboratory or at the Mobile Environmental Emergency Response Lab (MEERL), as well as the capabilities of other fixed and mobile laboratories. The MREPP indicated that if MEERL sample analysis capabilities are exceeded, the radiological accident assessment officer at the State emergency operations center (SEOC) will arrange for additional capability with the NRC, DOE, or EPA.

Section VI.B.5, “Louisiana Department of Environmental Quality,” of the LPRRP Basic Plan indicated that LDEQ will conduct offsite field monitoring and environmental sampling analysis. In addition, Tab 3, “Field Monitoring Team Operational Methods, Procedures, and Equipment,” of LPRRP Chapter 6 generally described the field monitoring activities of LDEQ, and Table 1, “Sampling and Monitoring Equipment,” in Tab 3 describes the environmental laboratory equipment and capabilities of LDEQ. Section VII.B, “State and Local,” of LPRRP also indicated

that the Louisiana State University (LSU), Department of Physics, Nuclear Science Laboratory may provide laboratory support and sample analysis during the accident assessment and for postaccident analysis. In addition, Section VII.B stated that the Southern Mutual Radiation Assistance Plan (SMRAP) will provide manpower for field and laboratory analysis activities.

The applicant described nuclear and other facilities and organizations that it can rely on for assistance in an emergency. Section 3.3.3 of Part 4 identified INPO as a private sector organization that will provide requested emergency assistance to locate sources of manpower and equipment, analysis of operational aspects, and organization of industry experts to advise on technical matters. In RAI 13.3-7, the staff asked the applicant to identify other private sector organizations (e.g., architect engineer, owners group, Entergy) expected to assist in an emergency. In addition, the staff asked the applicant to describe the contacts and arrangements made with these organizations. In response, the applicant stated that it expected to finalize arrangements with the NSSS supplier, similar to routine operational and emergency support for the operating unit, before or at the time of COL issuance. With regard to contacts and arrangements (LOAs), the applicant indicated that the affected organizations are private support organizations and, therefore, outside the scope of the 10 CFR 52.17(b)(3) requirement to describe contacts and arrangements with Federal, State, and local agencies with emergency planning responsibilities.

Section II.E, "Additional Assessment and Monitoring Support," of MREPP Annex D described the Federal nontechnical support available to the State of Mississippi through FEMA, technical support through DOE, and the use of the FRERP to access Federal support. Section II.E also noted that the SMRAP will provide manpower to field sampling and laboratory analysis activities in response to a radiological emergency. Appendix 2 to Annex A of the MREPP presented specific emergency support functions expected from Federal, State, and local organizations and GGNS.

Section IV.C of the PGCCREPP Basic Plan described the roles of the American Red Cross and Christian Volunteers in supporting the county in an emergency. In addition, Section IV, "Organization and Responsibilities," of the PGCCREPP Basic Plan listed all Federal, State, and local organizations that will play an active role in an emergency. Appendix 3 to Section IX of the PGCCREPP Basic Plan provided this information in a matrix.

The LEOP described the potential roles for volunteer organizations to undertake specific emergency response actions with given functions, such as communications and warning (Annex A), damage assessment (Annex B), emergency direction and control (Annex D), engineering and traffic management (Annex F), law enforcement/security (Annex J), mass feeding (Annex L), medical and public health/sanitation (Annex M), shelter operation and control (Annex R), and traffic control/evacuation routes (Annex S).

Section VII of the LPRRP Basic Plan identified Federal support through the FRERP, as well as State and local support, including: the analysis of samples by LSU and State participation in the SMRAP to provide manpower for field and laboratory analysis activities. Various local community services and other public and private resources are also available, including hospitals, nursing homes, emergency medical services, transportation companies, and schools. Chapter 14, "Agreements," of the LPRRP briefly described the agreements.

Section D of Enclosure I to Attachment 2 to LPRRP Supplement II listed the parish and participating municipality emergency response agencies, as well as the State and private agency organizations, which will play an active role in an emergency. Figure D-2, "Emergency Function and Responsibility Chart," of Enclosure I provided this information in a matrix. Appendix I-1 to Enclosure I listed nongovernmental agencies that have agreed to assist in emergency response.

The applicant described the contacts and arrangements made with the Federal, State, and local response organizations listed above and other organizations identified in the application in Section 3.3 and Appendix A to Part 4. Section 3.9.1 also discussed the contacts and arrangements between the applicant, NWS, and U.S. Army Corp of Engineers.

Appendix 6 to Section IX of the MREPP Basic Plan discussed the arrangements with the Federal agencies, States (through SMRAP), and local agencies that will provide a range of support. Section II.E of MREPP Annex D described the arrangements for implementing the SMRAP and accessing assistance through the FRERP and the Federal Radiological Monitoring and Assessment Center. Section IV.C, "Volunteer," of the MREPP Basic Plan further described the role for the Salvation Army, American Red Cross, and Radio Amateur Civil Emergency Service (RACES).

Annex M to the PGCCREPP included copies of the letters that specify the arrangements between the PGCCCD Council and five other Mississippi counties, city/county governing bodies, department heads, and responding agencies with the Pattison/Hermanville Fire Stations. Section IV.C of the PGCCREPP Basic Plan listed support activities for the American Red Cross and Christian Volunteers. Similarly, the Salvation Army will assist with mass feeding, according to Appendix 9, "Emergency Human Services," to PGCCREPP Annex F.

Although the LEOP did describe contacts, it detailed the relationships among Federal, State, local, and private response organizations (e.g., LEOP Annex P). Section VII of the LPRRP Basic Plan described the resources and support from Federal, State, and local organizations. In addition, Chapter 14 of the LPRRP Basic Plan generally described these arrangements. Tab 1, "Letters of Agreement," of Chapter 14 of the LPRRP Basic Plan listed the organizations with which the State of Louisiana has LOAs.

Enclosure I to Attachment 2 to LPRRP Supplement II identified the arrangements between the parish and local governments, and between the parish, LOEP, and other State government agencies. Appendix I-1 to Enclosure I listed the LOAs between the parish and nongovernment providers of reception and care services, emergency broadcast, emergency transportation, emergency medical services, and telephone service.

13.3.3.4.2 Regulatory Evaluation

Part 1 of the ESP application stated that the emergency planning information in Part 4 identifies the major features of an emergency plan, which will be developed consistent with the requirements of 10 CFR 52.17(b)(2)(i), using guidance provided in NUREG-0654/FEMA-REP-1 and Supplement 2.

In its review of the application, the staff considered the regulatory requirements in 10 CFR 52.17(b)(2)(i), 10 CFR 52.18, and Sections III, IV.A, IV.B, IV.C, IV.D, and IV.E of Appendix E to 10 CFR Part 50. Under 10 CFR 52.17(b)(2)(i), an applicant for an ESP may propose the major features of the emergency plans for NRC review and approval, in consultation with FEMA, in the absence of complete and integrated emergency plans. Under 10 CFR 52.18, after consultation with FEMA, the NRC will determine whether the major features of emergency plans submitted under 10 CFR 52.17(b)(2)(i) are acceptable. Supplement 2 and RS-002 provide guidance concerning the review and evaluation of emergency planning information given in an ESP application. Supplement 2 also provides specific evaluation criteria for major features of emergency plans, including those which apply to major feature C, "Emergency Response Support and Resources."

Major feature C calls for the applicant to describe the contacts and arrangements for requesting Federal assistance, as well as assistance from radiological laboratories and nuclear or other facilities and organizations. The application should also identify the general capabilities and expected availability of radiological monitoring and analysis services.

13.3.3.4.3 Technical Evaluation

The staff finds that the applicant's response to RAIs 13.3-10, which was implemented in Revision 2 to Part 4 of the application, is acceptable. The Federal government maintains an indepth capability to assist licensees, States, and local governments. Revision 2 to Part 4 of the application, the LPRRP, LEOP, and MREPP addressed provisions by the applicant and State governmental authorities for requesting Federal assistance.

The staff finds that the applicant's response to RAIs 13.3-7, which was implemented in Revision 2 to Part 4 of the application, is acceptable. Revision 2 to Part 4 of the application, the MREPP, and LPRRP identified radiological laboratories, their general capabilities, and their expected availability to provide radiological monitoring and analysis services during an emergency. In addition, Revision 2 to Part 4 of the application, the MREPP, PGCCREPP, LEOP, LPRRP, and Enclosure I to Attachment 2 to LPRRP Supplement II identified nuclear and other facilities and organizations that can be relied on for assistance in an emergency.

Revision 2 to Part 4 of the application, the MREPP, PGCCREPP, LPRRP, and Enclosure I to Attachment 2 to LPRRP Supplement II provided the contacts and arrangements made with response organizations, as discussed above.

13.3.3.4.4 Conclusions

As discussed above, the applicant has described provisions for requesting Federal assistance and identified nuclear and other facilities and organizations that it can rely on for assistance in an emergency, including the general capabilities and availability of radiological laboratories. In addition, the applicant has described the contacts and arrangements made with the various response organizations. Based on its review, the staff concludes that proposed major feature C is consistent with the guidelines in RS-002 and Supplement 2. Therefore, this feature is acceptable and meets the requirements of 10 CFR 52.17(b)(2)(i), 10 CFR 52.18, and Sections III, IV.A, IV.B, IV.C, IV.D, and IV.E of Appendix E to 10 CFR Part 50, insofar as it describes the essential elements of advanced planning that have been considered for emergency planning support and resources, as set forth above.

13.3.3.5 Emergency Classification System (Major Feature D)

13.3.3.5.1 Technical Information in the Application

In Section 3.4, "Emergency Classification System," of Part 4, the applicant established a classification scheme consistent with Section IV.C of Appendix E to 10 CFR Part 50 and Appendix 1 to NUREG-0654/FEMA-REP-1, including notification of (1) an unusual event, (2) alert, (3) site area emergency, and (4) general emergency. Section 3.4 also provides descriptions and general response actions for each emergency class. In RAI 13.3-18, the staff asked the applicant to compare the class descriptions and licensee actions in Section 3.4 with those listed in Appendix 1 to NUREG-0654/FEMA-REP-1 and justify any deviations from the guidance. In Revision 2 to Part 4, the applicant amended Section 3.4 and deleted the class descriptions and general response actions for each emergency class to instead reflect the intent to establish an emergency classification scheme consistent with NUREG-0654/FEMA-REP-1 or Regulatory Guide (RG) 1.101, Revision 4, "Emergency Planning and Preparedness for Nuclear Power Reactors" issued July 2003, as appropriate.

In Section 3.4 of Part 4, the applicant stated that the emergency action levels (EALs) will comprise a combination of plant parameters (such as instrument readings and system status) that can give a relatively quick indication to station operating staff of the accident situation. In RAI 13.3-19, the staff asked the applicant to clarify that the EALs will also be based on onsite and offsite monitoring, in accordance with Section IV.B of Appendix E to 10 CFR Part 50. In Revision 2 to Part 4, the applicant amended Section 3.4 to reflect its intent to establish an emergency classification scheme consistent with NUREG-0654/FEMA-REP-1 or RG 1.101, as appropriate, and to confirm that these schemes include onsite and offsite monitoring results as the bases for emergency classification.

In addition, Section 3.4 of Part 4 noted that, to the extent appropriate, the applicant will develop EALs from guidance provided in Appendix 1 to NUREG-0654/FEMA-REP-1. In RAI 13.3-20, the staff asked the applicant to clarify its basis for not naming Revision 4 to RG 1.101, which identifies and approves the use of acceptable alternate EAL schemes. In Revision 2 to Part 4, the applicant amended Section 3.4 to state the following:

> To the extent appropriate, the EALs will be developed from guidance provided in Appendix 1 to NUREG-0654 or Regulatory Guide 1.101, "Emergency Preparedness for Nuclear Power Reactors" (Reference 1), as appropriate. Should NUREG-0654 and Regulatory Guide 1.101 be determined to be inappropriate due to the technology of the proposed plant design, then the EALs will be developed consistent with applicable guidance, with appropriate technical bases provided for any deviations.

In Section 3.4 of Part 4, the applicant also indicated that the emergency director may declare an unusual event based on other plant conditions and the potential for the degradation of these conditions. In RAI 13.3-21, the staff asked the applicant to clarify its basis for not addressing discretionary judgment for alert, site area emergency, and general emergency classifications in accordance with Appendix 1 to NUREG-0654/FEMA-REP-1 or acceptable alternatives under RG 1.101, Revision 4. In Revision 2 to Part 4, the applicant amended Section 3.4 to state the following:

> The EALs, while comprehensive, are not meant to be all inclusive. The Emergency Director may declare any class of emergency based on the Director's assessment of plant conditions and consideration of the facility's emergency action levels.

The applicant described an emergency classification scheme established by State and local governmental agencies. Section V.C, "Emergency Classification Levels," of the MREPP and PGCCREPP Basic Plans defined the emergency classification levels used by both the State of Mississippi and local jurisdictions. The four classifications, including the associated definitions, are consistent with the emergency classification scheme in Appendix 1 to NUREG-0654/FEMA-REP-1 and that listed by the applicant in Section 3.4 of Part 4.

Tab 1, "Emergency Classes and Guidelines," of LPRRP Chapter 1 identified the State and local emergency classification system to be used in the event of an emergency at GGNS. Chapter 1, "Emergency Classification System," of Attachment 2 to LPRRP Supplement II also described the emergency classification scheme and definitions. The LPRRP provided the four classifications, including the associated definitions, that are consistent with the emergency classification scheme in Appendix 1 of NUREG-0654/FEMA-REP-1 and that listed by the applicant in Section 3.4 of Part 4.

13.3.3.5.2 Regulatory Evaluation

Part 1 of the ESP application stated that the emergency planning information in Part 4 identifies the major features of an emergency plan, which the applicant will develop consistent with the requirements of 10 CFR 52.17(b)(2)(i), using guidance provided in NUREG-0654/ FEMA-REP-1 and Supplement 2.

In its review of the application, the staff considered the regulatory requirements in 10 CFR 52.17(b)(2)(i), 10 CFR 52.18, and Sections III and IV.C of Appendix E to 10 CFR Part 50. Under 10 CFR 52.17(b)(2)(i), an applicant for an ESP may propose the major features of the emergency plans for NRC review and approval, in consultation with FEMA, in the absence of complete and integrated emergency plans. Under 10 CFR 52.18, after consultation with FEMA, the NRC will determine whether the major features of emergency plans submitted under 10 CFR 52.17(b)(2)(i) are acceptable. Supplement 2 and RS-002 provide guidance concerning the review and evaluation of emergency planning information given in an ESP application. Supplement 2 also provides specific evaluation criteria for major features of emergency plans, including those which apply to major feature D, "Emergency Classification System."

Major feature D calls for the applicant to establish a standard emergency classification scheme that is consistent with Appendix 1 to NUREG-0654/FEMA-REP-1. Major feature D also calls for the State and local organizations to establish an emergency classification scheme that is consistent with that proposed by the applicant.

13.3.3.5.3 Technical Evaluation

In response to RAIs 13.3-18, 13.3-19, 13.3-20, and 13.3-21, the applicant amended Section 3.4 in Revision 2 to Part 4 of the application to accomplish the following:

- Reflect the intent to establish an emergency classification scheme consistent with NUREG-0654/FEMA-REP-1 or RG 1.101, as appropriate, and to have these schemes include onsite and offsite monitoring results as bases for emergency classification, and

- Clarify that the emergency director will have the authority to declare any of the listed emergency classifications, based on his or her assessment of conditions and consideration of the facility's EALs.

The staff finds that the applicant's responses to RAIs 13.3-18, 13.3-19, 13.3-20, and 13.3-21, which were implemented in Revision 2 to Part 4 of the application, are acceptable. As such, the standard emergency classification scheme, specified by the applicant in Revision 2 to Part 4 of the application, is consistent with that set forth in Appendix 1 to NUREG-0654/FEMA-REP-1. The staff also finds that the standard classification scheme established by the State and local emergency response organizations in the MREPP, PGCCREPP, LPRPP, and Attachment 2 to LPRPP Supplement 2 are consistent with that proposed by the applicant.

13.3.3.5.4 Conclusions

As discussed above, the applicant has specified a standard emergency classification scheme, which is consistent with that set forth in Appendix 1 to NUREG-0654/FEMA-REP-1 and with those established by the State and local EROs. Based on its review, the staff concludes that proposed major feature D is consistent with the guidelines in RS-002 and Supplement 2. Therefore, this feature is acceptable and meets the requirements of 10 CFR 52.17(b)(2)(i), 10 CFR 52.18, and Sections III and IV.C of Appendix E to 10 CFR Part 50, insofar as it describes the essential elements of advanced planning that have been considered for the emergency classification scheme, as set forth above.

13.3.3.6 Notification Methods and Procedures (Major Feature E)

13.3.3.6.1 Technical Information in the Application

The applicant described the basis for the notification of response organizations. Section 3.2.1.1 of Part 4 indicated that the shift manager will act as emergency director upon declaration of an emergency, notify and recommend protective actions to authorities responsible for offsite measures, and inform offsite support officials of pertinent facts and developments. The applicant stated that, once the EOF is declared operational, the offsite emergency coordinator will relieve the shift manager of these offsite communication responsibilities.

Section 3.5.1, "Basis for Notification of Response Organizations," of Part 4 indicated that the shift manager will ensure that at least one of the following agencies is notified within 15 minutes of an emergency declaration:

- primary

  - Mississippi Highway Patrol
  - Louisiana Office of Emergency Preparedness
  - Claiborne County Sheriff's Department
  - Tensas Parish Sheriff's Department
  - City of Port Gibson Police Department

- secondary

  - Mississippi Emergency Management Agency
  - Louisiana Department of Environmental Quality
  - Claiborne County Civil Defense

The respective offsite radiological emergency response plans for the States of Mississippi and Louisiana and Claiborne County required the licensee to notify each of the States and counties/parishes at risk within 15 minutes of event classification. In RAI 13.3-22, the staff asked the applicant to clarify the requirements for the notification of the States of Louisiana and Mississippi and counties/parishes at risk, consistent with respective offsite radiological emergency response plans. In Revision 2 to Part 4, the applicant amended Section 3.5.1 to state the following:

> Where both a primary and secondary contact are listed, only one contact (primary or secondary) is required.
>
> | Primary | Secondary |
> |---|---|
> | MS Emergency Management Agency | MS Hwy Patrol |
> | LA Office of Homeland Security and Emergency Preparedness | LA Dept of Environmental Quality |
> | Claiborne County Sheriff's Dept | Claiborne County Civil Defense |
> | Tensas Parish Sheriffs Dept | |
> | Port Gibson Police Dept | |

In Section 3.6, "Emergency Communications," of Part 4, the applicant stated that it will provide for State representatives to call and verify the authenticity of the accident and obtain additional information. In RAI 13.3-23, the staff asked the applicant to clarify the requirements for local agencies to call and verify the authenticity of the accident under their respective emergency plans. In Revision 2 to Part 4, the applicant amended Section 3.6 to clarify that it has provided for both State and local authorities to call the facility to authenticate emergency messages and to obtain additional information.

Section V.E, "Notification," of the MREPP Basic Plan summarized the State of Mississippi's process for notifying State and local organizations in response to a radiological emergency. Section V.E, "Notification," of the PGCCREPP Basic Plan also described notification and

response procedures for the at-risk county and municipalities based on the emergency class declared by GGNS.

Annex A, “Communications and Warning,” of the LOEP contained the procedures for communications and warnings for all disasters and emergencies in the State of Louisiana. Chapter 2, “Accident Notification,” of the LPRRP described the procedures for notification based on the four emergency classes, consistent with NUREG-0654/FEMA-REP-1 for fixed nuclear facility accidents. Section E, “Notification and Activation,” to Enclosure I of Attachment 2 to LPRRP Supplement II also described the notification and response procedures for the at-risk parish and municipalities based on the emergency class.

The applicant described the method(s) for alerting, notifying, and mobilizing emergency response personnel. In Section 3.5.1 of Part 4, the applicant indicated that the licensee emergency organization personnel will be notified of the emergency and their expected responses through one or more of the communication systems described in Section 3.11, “Radiological Exposure Control,” of Part 4, rather than in Section 3.6 of Part 4. In RAI 13.3-24, the staff asked the applicant to clarify the apparent discrepancy. In Revision 2 to Part 4, the applicant amended Section 3.5.1 to reference Section 3.6.

In Section 3.6.2.2, “Notification of Facility Personnel,” of Part 4, the applicant further indicated that the facility will use a computerized notification system to alert emergency response personnel upon declaration of an emergency and that site telephones will serve as a backup to this system.

In the State of Mississippi, Section V.E of the MREPP Basic Plan indicated that, at the alert classification, MEMA will notify offsite response agencies and activate the SEOC. All State agencies will put their personnel and equipment required for further response on standby. Appendix 5, “MEMA Standard Operating Procedures for a Fixed Nuclear Facility Emergency,” to MREPP Annex A also described the process for alerting and activating emergency response personnel.

Section V.E of the PGCCREPP Basic Plan generally described the procedure to be used by Claiborne County for notifying and mobilizing emergency personnel. Appendix 1, “Claiborne County EOC Standard Operating Procedures,” to PGCCREPP Annex A also detailed the contacts the County makes to alert and mobilize emergency personnel.

In the State of Louisiana, LEOP Section III.C, “Emergency Action Levels,” generally described the procedures that the State agencies use to mobilize and activate emergency response personnel for the various emergency classes. The LDEQ Radiological Emergency Response Operational Procedure 2, “Notification and Headquarters Activation,” described the mobilization of LDEQ personnel. Section IV.A, “Responsibilities of Departments of State Government, Common Responsibilities,” of the LPRRP Basic Plan also required each State agency with a response role to develop internal procedures for notifying and mobilizing State emergency personnel assigned emergency functions.

Section F, “Emergency Communications,” of Enclosure I to Attachment 2 to LPRRP Supplement II described the various communications systems to be used by Tensas Parish for communications with principal organizations and emergency personnel. Section F provided

specific mobilization and activation procedures for the parish and municipalities within the plume exposure pathway EPZ.

The applicant described the administrative and physical means for notifying and promptly instructing the public within the plume exposure pathway EPZ. Section 3.5.3, "Notification of the Public Within the Plume EPZ," of Part 4 stated the following:

> An Alert Notification System will be provided that meets the design objectives of NUREG-0654, Appendix 3. Because of the close physical proximity and common EPZ boundaries, the proposed new facility is expected to share the system used for GGNS. The current system consists of 43 sirens located in Claiborne County and Tensas Parish. Institutions located in the Plume Exposure EPZ will be supplied with tone activated receivers which supplement the siren system. PGCCCD and Tensas Parish Emergency Preparedness will be responsible for activating the portion of the system within their respective jurisdictions. Additional alert notification details will be addressed in local and State emergency plans, the GGNS Emergency Public Information publication, and the Alert Notification System Final Report. The Alert Notification System (ANS) will also provide information concerning protective measures to transient population.

In RAI 13.3-25, the staff asked the applicant to describe the capabilities of the ANS (sirens) to provide this function (i.e., public address capability). In Revision 2 to Part 4, the applicant amended Section 3.5.3 to state the following:

> Following activation of the Alert Notification System, information concerning protective measures will be provided via State and local emergency communication systems and commercial broadcast media. See also, Section 3.7.1 regarding additional measures taken to provide emergency information to the transient population.

In the State of Mississippi, Section VI.D, "Alert Notification System," of the MREPP Basic Plan described the ANS operation and its use in informing the public of emergencies at GGNS. Section VI.D specifies that, in the event of an initial notification of a general emergency classification, the MEMA public information officer will prepare and release an emergency alert system (EAS) message directing the public to take required protective actions. Section VI.D of the MREPP Basic Plan also stated the following:

> An alert and notification system is in place in accordance with FEMA-REP-10. In the State of Mississippi, the system consists of 30 fixed rotating sirens located within the 10-mile EPZ in Claiborne County. Businesses, schools, hospitals and other facilities that contain large numbers of people located within the 10-mile EPZ are supplied with tone-activated receivers (tone alerts). These tone alerts supplement the siren system. Two additional receivers are located in a high noise area and are equipped with visual alarms. Claiborne County has 50 tone-alert receivers. Claiborne County is responsible for the activation of their sirens and tone-alert receivers. Route alerting supplements these systems, as necessary. (See Annex C, Appendix 4.)

> The ANS system and procedures provide the State of Mississippi the capability for transmitting both an alert signal and an informational or instructional message, via the Emergency Alert System (EAS), to essentially 100% of the population within 15 minutes of a protective action decision.

Section VI.I, "Public Information," to the MREPP Basic Plan, and Section III, "Radiological Emergency," MREPP Annex J, discussed the State's responsibility for the activation of the EAS. Appendix 3, "GGNS ANS Coordination Flow Chart," to MREPP Annex C also described the process for siren activation and the EAS message broadcast over EAS radio stations.

Section VI.H, "Direction and Control, Public Information," of the PGCCREPP Basic Plan described Claiborne County's coordination of EAS messages with the SEOC and the Joint Public Information Center. Section VI.D, "Alert Notification System," of the PGCCREPP Basic Plan also discussed the ANS and the county's procedures for operating the ANS upon instruction from MEMA.

In the State of Louisiana, LEOP Annex O, "Pubic Information," identified the use of the ANS to inform the public. Chapter 4, "Public Alert/Notification," of the LPRRP described the system for alerting and notifying the public in the event of an accident at GGNS. Chapter 4 also described the State, parish, and utility components of the public alert/notification system, the development and use of messages, and system coverage.

Section F.7, "Alert Notification System," of Enclosure I to Attachment 2 to LPRRP Supplement II provided the Tensas Parish procedures for operating the ANS and addresses the use of mobile units with public address systems for backup public notification. Section E.5, "Notification of the Public," of Enclosure I further indicated that Tensas Parish will coordinate the preparation of messages to be sent out over the EAS with LOEP and that USCG will notify ships along the Mississippi River.

13.3.3.6.2 Regulatory Evaluation

Part 1 of the ESP application stated that the emergency planning information in Part 4 identifies the major features of an emergency plan, which will be developed consistent with the requirements of 10 CFR 52.17(b)(2)(i), using guidance provided in NUREG-0654/FEMA-REP-1 and Supplement 2.

In its review of the application, the staff considered the regulatory requirements in 10 CFR 52.17(b)(2)(i), 10 CFR 52.18, and Sections III and IV.D of Appendix E to 10 CFR Part 50. Under 10 CFR 52.17(b)(2)(i), an applicant for an ESP may propose the major features of the emergency plans for NRC review and approval, in consultation with FEMA, in the absence of complete and integrated emergency plans. Under 10 CFR 52.18, after consultation with FEMA, the NRC will determine whether the major features of emergency plans submitted under 10 CFR 52.17(b)(2)(i) are acceptable. Supplement 2 and RS-002 provide guidance concerning the review and evaluation of emergency planning information given in an ESP application. Supplement 2 also provides specific evaluation criteria for major features of emergency plans, including those which apply to major feature E, "Notification Methods and Procedures."

Major feature E calls for the applicant to describe the mutually agreeable bases for notifying response organizations, consistent with the emergency classification scheme in Appendix 1 to NUREG-0654/FEMA-REP-1, including the method for alerting, notifying, and mobilizing personnel. The application should also describe the administrative and physical means for notifying and promptly instructing the public within the plume exposure pathway EPZ.

13.3.3.6.3 Technical Evaluation

The staff finds that the applicant's responses to RAIs 13.3-22 and 13.3-23, which were implemented in Revision 2 to Part 4 of the application, are acceptable. Revision 2 to Part 4 of the application, the MREPP, PGCCREPP, LEOP, LPRRP, and Enclosure I to Attachment 2 to LPRRP Supplement 2 described a mutually agreeable basis for the notification of response organizations, consistent with the emergency classification scheme.

The staff finds that the applicant's response to RAI 13.3-24, which was implemented in Revision 2 to Part 4 of the application, is acceptable. Revision 2 to Part 4 of the application, the MREPP, PGCCREPP, LEOP, LPRRP, and Enclosure I to Attachment 2 to LPRRP Supplement II described a method for alerting, notifying, and mobilizing emergency response personnel.

In addition, the staff finds that the applicant's response to RAI 13.3-25, which was implemented in Revision 2 to Part 4 of the application, is acceptable. Revision 2 to Part 4 of the application, the MREPP, PGCCREPP, LEOP, LPRRP, and Enclosure I to Attachment 2 to LPRRP Supplement II described the administrative and physical means for notifying and promptly instructing the public within the plume exposure pathway EPZ.

13.3.3.6.4 Conclusions

As discussed above, the applicant has described the mutually agreeable basis for notifying response organizations, which is consistent with that set forth in Appendix 1 to NUREG-0654/FEMA-REP-1, and includes the method for alerting, notifying, and mobilizing personnel. In addition, the applicant has described the administrative and physical means for notifying and promptly instructing the public within the plume exposure pathway EPZ. Based on its review, the staff concludes that proposed major feature E is consistent with the guidelines in RS-002 and Supplement 2. Therefore, this feature is acceptable and meets the requirements of 10 CFR 52.17(b)(2)(i), 10 CFR 52.18, and Sections III and IV.D of Appendix E to 10 CFR Part 50, insofar as it describes the essential elements of advanced planning that have been considered for notification and procedures, as set forth above.

13.3.3.7 Emergency Communications (Major Feature F)

13.3.3.7.1 Technical Information in the Application

Section 3.6.1.1, "Facility Telephone System," of Part 4 indicated that the applicant will maintain a high-reliability telephone system at the proposed new facility to provide telephone communications with licensee management and operating and support organizations. The applicant further noted that the plant telephone system provides communications among the control room, technical support center (TSC), operations support center (OSC), EOF, news/information centers, and the public.

The applicant also described provisions for communications with contiguous State and local governments within the EPZ. Section 3.6.2.1, "Dedicated Telephone Lines," of Part 4 indicated that the applicant will establish dedicated telephone links to provide a continuous (24-hour) means of communication between the applicant and contiguous State and local governments within the plume exposure pathway EPZ. The applicant will use the Operational Hotline for initial notification and ongoing communications for the duration of the emergency. Use of the Operational Hotline will activate the emergency response network by notifying each location simultaneously. The ultrahigh frequency (UHF) radio system will serve as an alternate means of communication to notify offsite authorities of an emergency. In RAI 13.3-26, the staff asked the applicant to explain the differences, if any, between the Operational Hotline and the emergency response network. In response, the applicant stated that the Operational Hotline is a communications system used to allow the simultaneous notification of State and local agencies. The emergency response network, in practice, refers to the affected emergency response organizations.

Section VI.C, "Communications," of the MREPP Basic Plan stated that the Operational Hotline serves as the primary means of communication for the State of Mississippi with GGNS. The MREPP further indicated that telephones provide the primary point-to-point communications for State and local response organizations. Communications with field monitoring teams will occur through a satellite network, which is a combination satellite/radio system. The MREPP Annex B, "Communications," and Annex C, "Alert and Notification," provided details about the primary and backup systems.

Section VI.C, "Direction and Control, Communications," of the PGCCREPP Basic Plan described the various communications systems, including the Operational Hotline, commercial telephone, and radio for field units, that Claiborne County will use for communicating with principal organizations and emergency personnel and as backup communication. The PGCCREPP Annex B, "Communications," detailed communication procedures for coordinating with county and municipal organizations.

Chapter 3, "Communications," of the LPRRP described the State of Louisiana's concept of operations for notification and the exchange of information, with the GGNS dedicated line as the primary communication system and commercial telephone and radio as backup systems. The LPRRP also indicated that radio and satellite radio systems are a backup for interstate communications.

Section F to Enclosure I of Attachment 2 to LPRRP Supplement II described the various communication systems including the Operational Hotline, radio, commercial telephone, and pagers, that Tensas Parish will use for communicating with principal organizations and emergency personnel.

The applicant also described the provisions for communications with Federal emergency response organizations, as needed. Section 3.5.1 of Part 4 indicated that the applicant will notify the NRC, as the lead Federal response agency, immediately after the appropriate State and local agencies, and not later than 1 hour after the declaration of one of the emergency classes. Section 3.6.2.1 of Part 4 established the NRC Emergency Telephone System as the applicant's intended means of providing direct communication with the NRC Operations Center.

The applicant also described the purpose and locations of the various circuits and links provided by the NRC Emergency Telephone System, including the emergency notification system (ENS), health physics network, and NRC counterpart links. In RAI 13.3-27, the staff asked the applicant to describe the location of the protective measures counterpart link drop in its emergency facilities, consistent with the description provided for other circuits. In response, the applicant stated that Supplement 2 guidance did not request a detailed description of the locations of NRC telecommunication system circuits and lines. Thus, the applicant deleted the locations for the various NRC telecommunications circuits in Revision 2 to Part 4 of its application.

The applicant also described the Emergency Response Data System (ERDS) in Section 3.6.2.1 of Part 4. It indicated that it will activate the ERDS, which will be available in the control room, at an alert or higher declaration. In RAI 13.3-28, the staff asked the applicant to clarify the requirement to activate the ERDS within 1 hour of a declaration with a classification of an alert or higher in accordance with 10 CFR 50.72(a)(4). In response, the applicant stated that the guidance in Supplement 2 did not request a detailed description of the ERDS and its activation. Thus, the applicant deleted the discussion of ERDS activation in Revision 2 to Part 4 of the application.

Annex B of the MREPP described the use of various systems by the State of Mississippi to communicate with Federal, State, and local response organizations. Appendix 1, "Communications at SEOC," to MREPP Annex B included a table listing the communication capabilities and the coverage area of the SEOC. Section IV.E, "Federal," of the PGCCREPP Basic Plan indicated that a request to MEMA will gain access to Federal resources.

Section VII, "Administration and Logistics," of the LEOP indicated that a system of emergency communications exists between Federal, State, local, and private organizations for the coordination and direction of emergency/disaster relief efforts. The LEOP further indicated that this system comprises internal, external, and support communications, located in most cases within a local sheriff's office and otherwise in an EOC.

Section III.B, "Direction and Control," of LPRRP Chapter 3 indicated that the LOEP will use the national communication system, referred to as NACOM, to work with FEMA (Region IV) for the coordination of Federal support for protective response operations in the event of an accident. The LPRRP further stated that the national warning system, referred to as NAWAS, will serve as a backup for Federal/State communications.

The applicant also described the provisions for alerting and activating emergency personnel in each response organization. In Section 3.5.2, "Mobilization of Emergency Response Personnel," of Part 4, the applicant stated the following:

> If an Unusual Event has been declared, those members of the operating shift needed to handle the emergency would be activated. If the Emergency Director feels that there is a reasonable possibility of escalation of the emergency to a higher classification, applicable portions of the Emergency Organization would be activated.

> If an Alert has been declared, the appropriate portions of the Emergency Organizations will be activated. If a Site Area Emergency or General Emergency has been declared, the entire Emergency Organizations will be activated.

However, in Sections 3.8.1, "Technical Support Center (TSC)," 3.8.2, "Operations Support Center (OSC)," and 3.8.3, "Emergency Operations Facility (EOF)," of Part 4, the applicant indicated that the TSC, OSC, and EOF will be activated at an alert, site area emergency, or general emergency classification. In RAI 13.3-29, the staff asked the applicant to clarify this discrepancy. In Revision 2 to Part 4, the applicant amended Section 3.5.2 to indicate that the entire emergency organization will be activated at the declaration of an alert, site area emergency, or general emergency.

In Section 3.6.2.2 of Part 4, the applicant discussed the use of a computerized system to notify facility emergency response personnel. Site telephones were used as a backup to this system.

Appendix 6, "Fixed Nuclear Facility Incident Notification Procedures," to MREPP Annex C contained detailed procedures for alerting and notifying agency emergency personnel in the State of Mississippi. According to these procedures, MEMA communications personnel or the MEMA operations officer will call the listed agencies and relay emergency notification messages received from GGNS by the Operational Hotline using call lists and instructions provided for each emergency class.

Appendix 1, "Port Gibson/Claiborne County EOC Activation Chart by Emergency Classification Level," to PGCCREPP Annex C provided for the receipt of the notification of emergency classification from GGNS via the Operational Hotline. The appendix also gave a matrix of officials and response organizations to be notified.

Attachment 4 to the LEOP specified the responsibilities of State agencies and directs individual agencies in the State of Louisiana to provide for the alerting and notification of their emergency personnel. The LDEQ emergency personnel are alerted by pager, the State's 800-megahertz band radio (when in official vehicles), or commercial telephone, in accordance with LDEQ Radiological Emergency Response Operational Procedure 2. Section III.A, "Notification and Exchange of Information," of LPRRP Chapter 3 indicated that dedicated telephone lines are the primary means of notifying and mobilizing State and local emergency response personnel. Commercial telephone or radio systems served as backup.

Section E of Enclosure I to Attachment 2 to LPRRP Supplement II stated that Tensas Parish receives an initial notification from GGNS via the Operational Hotline. Subsequently, the alert/notification call system of the response agency will call emergency response personnel to duty.

The applicant also described the communications arrangements for fixed and mobile support facilities. Section 3.12 of Part 4 indicated that the regional ambulance service will transport injured persons to an offsite medical facility. Ambulances will be equipped with radios to maintain communications with the medical facility. In RAI 13.3-30, the staff asked the applicant to describe its arrangements to communicate with the medical facility and request ambulance support. In Revision 2 to Part 4, the applicant amended Section 3.12 to state the following:

> Communications with both primary and backup medical facilities, including requests for ambulance support, are provided by the commercial telephone system. Backup communications are provided by the UHF radio system.

Appendix 10, "Medical and Public Health Services," to MREPP Annex F listed the ambulance services and medical facilities in the State of Mississippi that will transport and treat injured individuals who are radiologically contaminated. The MSDH/DRH will advise agencies with the responsibility for transporting injured individuals with radiological contamination and decontaminating transportation providers and equipment. Appendix 1 and Appendix 2, "Mobile Communication Links," to MREPP Annex B described the means for communicating with fixed installations and mobile units, but did not identify hospitals and ambulance services. Instead, Appendix 1, "Communications at Port Gibson/Claiborne County EOC," to PGCCREPP Annex B described the use of radio as a means of EOC communication with the statewide hospital network. Appendix 5, "Claiborne County EOC Notification/Staffing List," to Annex C included a representative from Claiborne County Hospital on the EOC roster. In RAI 13.3-61 and subsequently Open Item 13.3-1a, the staff asked the applicant to clarify communications arrangements with fixed and mobile medical support for the State of Mississippi and with mobile medical support for Claiborne County. In response, the applicant stated that SERI believed it had provided sufficient information regarding emergency plans in accordance with 10 CFR 52.17, and that this issue would be more appropriately addressed in the context of full and integrated emergency plans, which would be submitted with a COL application, rather than this ESP application.

Annex M, "Medical and Public Health/Sanitation," to the LEOP assigned primary responsibility for emergency medical and hospital services in the State of Louisiana to the Department of Health and Hospitals representative at the SEOC, who coordinates support for the local communities. Section III.D, "Medical Support," of LPRRP Chapter 3 stated that existing fixed and mobile medical facilities will use local emergency medical communications systems. Arrangements will be established to provide for a coordinated communications system in support of a medical emergency.

Section F.4, "Medical Support Facilities Communication Systems," of Enclosure I to Attachment 2 to LPRRP Supplement II described a coordinated communications link, consisting of either fixed/mobile radios or commercial telephones, between the Tensas Parish EOC, Riverland Hospital, and American Medical Response ambulances.

13.3.3.7.2 Regulatory Evaluation

Part 1 of the ESP application stated that the emergency planning information in Part 4 identifies the major features of an emergency plan, which will be developed consistent with the requirements of 10 CFR 52.17(b)(2)(i), using guidance provided in NUREG-0654/FEMA-REP-1 and Supplement 2.

In its review of the application, the staff considered the regulatory requirements in 10 CFR 52.17(b)(2)(i), 10 CFR 52.18, and Sections III, IV.D, and IV.E of Appendix E to 10 CFR Part 50. Under 10 CFR 52.17(b)(2)(i), an applicant for an ESP may propose the major features of the emergency plans for NRC review and approval, in consultation with FEMA, in the absence of complete and integrated emergency plans. Under 10 CFR 52.18, after consultation with FEMA, the NRC will determine whether the major features of an emergency plan submitted

under 10 CFR 52.17(b)(2)(i) are acceptable. Supplement 2 and RS-002 provide guidance concerning the review and evaluation of emergency planning information given in an ESP application. Supplement 2 also provides specific evaluation criteria for major features of emergency plans, including those which apply to major feature F, "Emergency Communications."

Major feature F calls for the applicant to identify communication provisions with State and local governments within the EPZs, with Federal EROs, and with fixed and mobile medical support facilities. The application should also describe provisions for alerting and activating emergency personnel.

13.3.3.7.3 Technical Evaluation

The staff finds that the applicant's responses to RAIs 13.3-26, 13.3-27, and 13.3-29, which were implemented in Revision 2 to Part 4 of the application, are acceptable. As such, the communications plans for emergencies described in Revision 2 to Part 4 of the application, the MREPP, PGCCREPP, LEOP, LPRRP, and Enclosure I to Attachment 2 to LPRRP Supplement II described provisions for the following:

- communications with contiguous State and local governments within the EPZ
- communications with Federal emergency response organizations
- alerting and activating emergency personnel

In the response to RAI 13.3-28, the applicant indicated that an appropriate description of the NRC ERDS and requirements for its activation, in accordance with Section VI of Appendix E to 10 CFR Part 50, will be provided at the COL stage as part of the applicant's complete and integrated plan. The staff finds that the applicant's response to RAI 13.3-28 is acceptable.

Revision 2 to Part 4 of the application, the LEOP, LPRRP, and Enclosure I to Attachment 2 to LPRRP Supplement II described the communications arrangements for fixed and mobile medical support facilities between the applicant and the State of Louisiana, Tensas Parish. The staff finds that the applicant's response to RAI 13.3-30, which further clarifies the applicant's communication arrangements with the designated medical facilities and for requesting ambulance support, is acceptable. In RAI 13.3-61, the staff also asked for further information related to communications arrangements with fixed and mobile medical support for the State of Mississippi and with mobile medical support in Claiborne County. The staff identified consideration of this information as Open Item 13.3-1a in the draft SER. The staff reviewed the applicant's response, and finds it acceptable for an ESP application, except to the extent that the arrangements would need to be expanded to incorporate relevant aspects of a proposed new reactor design in a COL or OL application. The staff will determine the adequacy of such incorporation during a COL or OL review. Therefore, Open Item 13.3-1a is resolved.

13.3.3.7.4 Conclusions

As discussed above, the applicant has identified communications provisions with State and local governments within the EPZs, with Federal EROs, and with fixed and mobile medical support facilities. In addition, the applicant has described provisions for alerting and activating emergency personnel. Based on its review, the staff concludes that the proposed major feature F is consistent with the guidelines in RS-002 and Supplement 2. Therefore, this feature

is acceptable and meets the requirements of 10 CFR 52.17(b)(2)(i), 10 CFR 52.18, and Sections III, IV.D, and IV.E of Appendix E to 10 CFR Part 50, insofar as it describes the essential elements of advanced planning that have been considered for emergency communications, as set forth above.

13.3.3.8 Public Education and Information (Major Feature G)

13.3.3.8.1 Technical Information in the Application

The applicant described the program to coordinate the dissemination of information to the public. Section 3.7.1, "Provision of Information to the General Public," of Part 4 of the application indicated that, in conjunction with State and local agencies, the proposed new facility will provide written information addressing emergency preparedness to members of the general public who reside within the plume exposure pathway EPZ. Section 3.7.1 also noted that this information will include the following, which will be disseminated through an emergency public information publication mailed annually to residents within the 10-mile EPZ:

- educational information on radiation
- personnel to contact for further information
- protective measures (e.g., evacuation routes, relocation centers, and shelter)
- respiratory protection and radioprotective drugs
- special needs of the handicapped

According to the applicant, the public education and information program will provide the permanent and transient adult population within the plume exposure pathway EPZ with an adequate opportunity to become aware of the above information on an annual basis. In RAI 13.3-31, the staff asked the applicant to clarify that the information on the special needs of the transient population will be disseminated periodically to members of the general public. In Revision 2 to Part 4, the applicant amended Section 3.7.1 to state that it will provide the following written information to members of the general public residing within the plume exposure pathway EPZ:

> Information addressing provisions for protecting the special needs population, including information on a process for registering the locations of the special needs population.

In RAI 13.3-32, the staff asked the applicant to describe the means for providing information to the transient population. In Revision 2 to Part 4, the applicant amended Section 3.7.1 to state the following:

> Appropriate information, such as evacuation routes, will be provided to the transient population through media that are likely to be available to this population group, such as postings in public places and notices in telephone books (commonly distributed to temporary lodging facilities). During an emergency, additional information will be made available through public emergency information systems, such as commercial broadcast media.

Section III.A, "Concept of Operation, Non-Emergency," of MREPP Annex J and Section III.A, "Concept of Operation, Non-Emergency," of PGCCREPP Annex J described the program for

distributing information in the State of Mississippi to educate the general public, including information concerning the nature of the radiation hazard, procedures for the notification of a radiological emergency, evacuation routes and assembly points, and other protective measures such as sheltering, the use of thyroid-blocking agents, and respiratory protection.

Appendix 8, "Special Needs Population," of PGCCREPP Annex F described the provisions made for the physically impaired to move outside an affected area without special assistance. In RAI 13.3-62 and subsequently Open Item 13.3-1b, the staff asked the applicant to clarify the mechanism for the periodic dissemination of information regarding the special needs of the handicapped to the general public in the State of Mississippi. In response, the applicant stated that SERI believed it had provided sufficient information regarding emergency plans in accordance with 10 CFR 52.17, and that this issue would be more appropriately addressed in the context of full and integrated emergency plans, which would be submitted with a COL application, rather than this ESP application.

Section III.A of MREPP Annex J also indicated that the nuclear facility operator was responsible for making available for distribution literature on public actions in the event of an emergency. Section III.A also stated that written materials are distributed annually to all residents, businesses, and transient populations within the 10-mile EPZ. In addition, the information is published in calendars and posters and as an advertisement in a two-county telephone book, according to Section III.A of PGCCREPP Annex J. In RAI 13.3-72 and subsequently Open Item 13.3-2, the staff asked the applicant to clarify its responsibility to make information available to offsite authorities for distribution consistent with MREPP Annex J. In response, the applicant stated that SERI believed it had provided sufficient information regarding emergency plans in accordance with 10 CFR 52.17, and that this issue would be more appropriately addressed in the context of full and integrated emergency plans, which would be submitted with a COL application, rather than this ESP application.

Chapter 2, "Public Education and Information," of Attachment 2 to LPRRP Supplement II included information regarding the public education and information program in the State of Louisiana. It provided educational information on radiation; points of contact for additional information; emergency planning zones; PAAs, protective measures such as evacuation routes, reception centers, sheltering, and respiratory protection; transportation availability; and the special needs of the handicapped. The program description did include information on radioprotective drugs because the State of Louisiana did not recommend their use for the general public. Public information is distributed in an information brochure mailed to individual residences and commercial businesses throughout the 10-mile EPZ. Emergency information for the transient population is placed in buildings, visitor centers, and retail outlets in the 10-mile EPZ.

The applicant described the program for periodically updating the news media. Section 3.7.2, "News Media Information," of Part 4 indicated that the proposed new facility will maintain a news media emergency information program, which will (1) include details on arrangements for the timely exchange of information among designated spokespersons and news media representatives, and (2) provide for an annual training session to acquaint the news media with the procedure for obtaining information during an emergency, as well as information about overall emergency preparedness for the proposed new facility. In RAI 13.3-33, the staff asked the applicant to describe the method by which the periodic training offered to news media

representatives will address information concerning radiation. In Revision 2 to Part 4, the applicant amended Section 3.7.2 to state the following:

> The News Media Emergency Information Program will include a training program that will provide information concerning radiation, emergency plans, and points of contact for release of public information during an emergency.

Section III.A, "Concept of Operations, Non-Emergency," of MREPP Annex J stated that the GGNS emergency preparedness staff contacts the various news media outlets in the State of Mississippi, both verbally and through mailings, to provide points of contact for public information in an emergency and to discuss radiological emergency planning in general. In addition, Section III.A of PGCCREPP Annex J indicated that sessions will be conducted to discuss radiation in general.

Chapter 2 of Attachment 2 to LPRRP Supplement II indicated that LDEQ, LOEP, Tensas Parish, and Entergy Operations, Inc., will conduct an annual program to acquaint the news media in the State of Louisiana with the emergency plan, radiation information, and points/places of contact for the release of public information.

13.3.3.8.2 Regulatory Evaluation

Part 1 of the ESP application stated that the emergency planning information in Part 4 identifies the major features of an emergency plan, which will be developed consistent with the requirements of 10 CFR 52.17(b)(2)(i), using guidance provided in NUREG-0654/FEMA-REP-1 and Supplement 2.

In its review of the application, the staff considered the regulatory requirements in 10 CFR 52.17(b)(2)(i), 10 CFR 52.18, and Sections III, IV.A, IV.D, IV.E, and IV.F of Appendix E to 10 CFR Part 50. Under 10 CFR 52.17(b)(2)(i), an applicant for an ESP may propose the major features of the emergency plans for NRC review and approval, in consultation with FEMA, in the absence of complete and integrated emergency plans. Under 10 CFR 52.18, after consultation with FEMA, the NRC will determine whether the major features of an emergency plan submitted under 10 CFR 52.17(b)(2)(i) are acceptable. Supplement 2 and RS-002 provide guidance concerning the review and evaluation of emergency planning information given in an ESP application. Supplement 2 also provides specific evaluation criteria for major features of emergency plans, including those which apply to major feature G, "Public Education and Information."

Major feature G calls for the applicant to describe a program to provide information to the public and news media on a periodic basis. The program should address how the applicant will notify the public, including the actions the public should take in an emergency, and the applicant's means for acquainting the news media with emergency information.

13.3.3.8.3 Technical Evaluation

Revision 2 to Part 4 of the application, the MREPP, PGCCREPP, and Attachment 2 to LPRRP Supplement II described a program for the coordinated dissemination of information to the public on a periodic basis. The staff finds that the applicant's responses to RAIs 13.3-31 and

13.3-32, which further clarified in Part 4 of the application how information will be disseminated to the special needs and transient populations, are acceptable.

In RAI 13.3-62, the staff asked for further information related to the MREPP and PGCCREPP on the mechanism for the periodic dissemination of information regarding the special needs for the handicapped in the State of Mississippi. The staff identified consideration of this information as Open Item 13.3-1b in the draft SER. The staff reviewed the applicant's response, and finds it acceptable for an ESP application, except to the extent that the description would need to be expanded to incorporate relevant aspects of a proposed new reactor design in a COL or OL application. The staff will determine the adequacy of such incorporation in this area during a COL or OL review. Therefore, Open Item 13.3-1b is resolved.

In RAI 13.3-72, the staff also asked the applicant for further information to clarify its responsibility to make information available to offsite authorities for distribution consistent with MREPP Annex J. The staff identified consideration of this information as Open Item 13.3-2 in the draft SER. The staff reviewed the applicant's response, and finds that the level of detail contained in Revision 2 to Part 4 of the application is acceptable for an ESP application. Therefore, Open Item 13.3-2 is resolved.

The staff finds that the applicant's response to RAI 13.3-33, which was implemented in Revision 2 to Part 4 of the application, is acceptable. Revision 2 to Part 4 of the application, the MREPP, PGCCREPP, and Attachment 2 to LPRRP Supplement II described a program for periodically acquainting the news media with emergency plans, information concerning radiation, and points of contact for the release of public information in an emergency.

13.3.3.8.4 Conclusions

As discussed above, the applicant has described a program to provide information to the public and news media on a periodic basis and which addresses public notification and emergency actions. Based on its review, the staff concludes that the proposed major feature G is consistent with the guidelines in RS-002 and Supplement 2. Therefore, this feature is acceptable and meets the requirements of 10 CFR 52.17(b)(2)(i), 10 CFR 52.18, and Sections III. IV.B, IV.D, IV.E, and IV.F of Appendix E to 10 CFR Part 50, insofar as it describes the essential elements of advanced planning that have been considered for public education and information, as set forth above.

13.3.3.9 Emergency Facilities and Equipment (Major Feature H)

13.3.3.9.1 Technical Information in the Application

Section 3.8.1 of Part 4 provided the following description of the TSC:

> The TSC will provide an area outside the Control Room that can accommodate management, engineering personnel and the NRC acting in support of the command and control function during emergency conditions and the emergency recovery operations. Personnel staffing the TSC assist in accident assessment and will provide advice to the Control Room and communication with the EOF, the Control Room, OSC and offsite support agencies. The TSC will be habitable

> to the same degree as the Control Room for all postulated accident conditions. The TSC may be activated at any time, and will be activated at an Alert, Site Area Emergency, or General Emergency. Once activated, the TSC will become operational as soon as possible. During emergencies, the TSC will provide for the classification, accident assessment, notification, and dose assessment functions if these functions are unavailable at the EOF.

Section 3.8.2 of Part 4 provided the following description of the OSC :

> The OSC will provide an area for operations, maintenance, health physics, chemistry, and operations personnel to assemble and be assigned to duties in support of emergency response activities. The OSC will be activated at the declaration of an Alert, Site Area Emergency, and General Emergency.

Section 3.8.3 provided the following description of the EOF and the ability to provide information to Federal, State, and local authorities:

> The EOF provides a location from which evaluation and coordination of all Licensee activities related to an emergency will be carried out. The facility will provide information to other offsite groups, assess the impact of the emergency offsite and provide the necessary support to assist the Emergency Organization.
>
> The EOF will be staffed by key technical personnel of the Emergency Organization. Space and communications will be provided for Federal, State and local representatives. The EOF also will provide a base of operation for Offsite Monitoring Teams and be the central point for the receipt of field monitoring data.
>
> The EOF may be activated at any time, and will be activated at an Alert, Site Area Emergency, and General Emergency declaration. Once activated, the EOF will become operational as soon as possible (without delay) after declaration of these emergency classifications.

Although Section 3.8, “Emergency Facilities and Equipment,” of Part 4 indicated that the ESP site may share the emergency response facilities for the existing GGNS Unit 1, the applicant did not describe the existing emergency facilities in sufficient detail consistent with the guidance contained in NUREG-0696, “Functional Criteria for Emergency Response Facilities—Final Report,” issued in February 1981. In RAI 13.3-34, the staff asked the applicant to discuss the extent to which it intended the ESP application to address Evaluation Criteria H.1 and H.2 of Supplement 2 for the TSC, OSC, and EOF and to clarify its decision to use the existing facilities that support GGNS Unit 1. In response, the applicant stated*:*

> Therefore, although NUREG-0696 (cross-referenced in NUREG-0654 Supplement 2, Criteria H.1 and H.2) was used as a reference when preparing Part 4 of the application, the applicant does not believe it is appropriate to provide additional information regarding adherence to the guidance provided in NUREG-0696 at the ESP application stage of facility development. No evaluation or decision has been made as to whether the existing Unit 1 OSC and EOF facilities could or would be shared. The TSC facility will not be shared;

current Part 52 design certifications would also need to be incorporated as appropriate.

The applicant also described the EOCs for each State and local organization.

Section IV.A.2, “State, MEMA,” of the MREPP Basic Plan authorized MEMA to activate and staff the SEOC. MREPP Annex A describes the concept of operations for directing the SEOC response, its staffing, and its location. In Section 3.8.5, “Mississippi State EOC,” of Part 4, the applicant further indicated that the State EOC is currently located in the MEMA building in Jackson, approximately 75 miles from the site, and has supplies and equipment to support state emergency operation activities, including communications links with other EOCs.

Section II, “Concept of Operation,” of PGCCREPP Annex A described the location and operation of the EOC in directing county and municipality emergency response functions, as well as staffing and responsibilities for performing EOC functions. In Section 3.8.4, “Claiborne County EOC,” of Part 4, the applicant further noted that the Claiborne County EOC, currently located at the PGCCCD office in Port Gibson, Mississippi, will be equipped to communicate with the control room, TSC, EOF, the Jackson SEOC, and State supporting agencies.

Section V of the LEOP described the SEOC and its use in directing and controlling response functions. Annex D, “Emergency Direction and Control,” of the LEOP described the role of LOEP in coordinating and directing the SEOC response. In addition, LPRRP Section IV covered SEOC activation, staffing, and operations. Implementing procedures cover the details of SEOC operation. In Section 3.8.7, “Louisiana State EOC,” of Part 4, the applicant further indicated that the Louisiana EOC is located in Baton Rouge, approximately 125 miles from the site, and has equipment and supplies to support state emergency operation activities, including communications links with other emergency centers.

Section C of Enclosure I to Attachment 2 to LPRRP Supplement II described the location, staffing, and responsibilities of the Tensas Parish EOC, where parish and municipality emergency response functions take place. In Section 3.8.6, “Tensas Parish EOC,” of Part 4, the applicant stated that the Tensas Parish EOC is currently located adjacent to the Tensas Parish Sheriff’s Office and is equipped to communicate with the TSC, control room, EOF, Mississippi SEOC, Baton Rouge SEOC, and Louisiana State supporting agencies.

13.3.3.9.2 Regulatory Evaluation

Part 1 of the ESP application stated that the emergency planning information in Part 4 identifies the major features of an emergency plan, which will be developed consistent with the requirements of 10 CFR 52.17(b)(2)(i), using the guidance provided in NUREG-0654/FEMA-REP-1 and Supplement 2.

In its review of the application, the staff considered the regulatory requirements in 10 CFR 52.17(b)(2)(i), 10 CFR 52.18, and Sections III, IV.B, and IV.E of Appendix E to 10 CFR Part 50. Under 10 CFR 52.17(b)(2)(i), an applicant for an ESP may propose the major features of the emergency plans for NRC review and approval, in consultation with FEMA, in the absence of complete and integrated emergency plans. Under 10 CFR 52.18, after consultation with FEMA, the NRC will determine whether the major features of an emergency plan submitted under 10 CFR 52.17(b)(2)(i) are acceptable. Supplement 2 and RS-002 provide

guidance concerning the review and evaluation of emergency planning information given in an ESP application. Supplement 2 also provides specific evaluation criteria for major features of emergency plans, including those which apply to major feature H, "Emergency Facilities and Equipment."

Major feature H calls for the applicant to describe the TSC, onsite OSC, and EOF, in accordance with NUREG-0696. The following are the general guidance criteria from NUREG-0696 for these facilities:

- The TSC is an onsite facility located close to the control room that must provide plant management and technical support to the reactor operating personnel located in the control room during emergency conditions. It must have technical data displays and plant records available to assist in the detailed analysis and diagnosis of abnormal plant conditions and any significant release of radioactivity to the environment. The TSC shall be the primary communications center for the plant during an emergency.

- The OSC is an onsite assembly area separate from the control room and the TSC where licensee operations support personnel shall report in an emergency. There shall be direct communications between the OSC and the control room, and between the OSC and the TSC, so that the personnel reporting to the OSC can be assigned to duties in support of emergency operations.

- The EOF is a near-site support facility for the management of overall licensee emergency response (including coordination with Federal, State, and local officials), coordination of radiological and environmental assessments, and determination of recommended public protective actions. The EOF shall have appropriate technical data displays and plant records to assist in the diagnosis of plant conditions to evaluate the potential or actual release of radioactive materials to the environment.

In addition, major feature H calls for the application to describe an EOC for each offsite organization, for use in directing and controlling response functions.

13.3.3.9.3 Technical Evaluation

In Sections 3.8.1, 3.8.2, and 3.8.3 of Part 4, the applicant described in general the function, activation, and staffing of these facilities. In its response to RAI 13.3-34, the applicant stated that it has not made an evaluation or decision as to whether the existing Unit 1 OSC and EOF facilities could or would be shared, and that Part 52 design certifications, which establish the TSC design criteria, would need to be incorporated as appropriate. Thus, the applicant stated it did not believe that it was appropriate to provide additional information regarding NUREG-0696 adherence at the ESP application stage. The staff identified in Open Item 13.3-3 the need for this information related to the OSC, TSC, and EOF.

In its submittal dated June 21, 2005, the applicant stated that it considered the remaining open questions regarding the OSC, TSC, and EOF to be more appropriately addressed in the context of full and integrated emergency plans, which would be submitted with a COL application, rather than the ESP application. For the staff to determine the acceptability of major feature H, the applicant needs to address specifically the adequacy of the facilities and related equipment in support of emergency response in terms of their location, size, structure, habitability,

communications, staffing, training, radiation monitoring, instrumentation, data system equipment, power supplies, technical data and data systems, and record availability and management.

The staff finds that Part 4 of the application, the MREPP, PGCCREPP, LEOP, and Enclosure I to Attachment 2 of LPRRP Supplement II described the EOCs for the States of Mississippi and Louisiana, Claiborne County, and Tensas Parish for use in directing and controlling response actions.

13.3.3.9.4 Conclusions

As discussed above, the applicant has not described in sufficient detail the emergency facilities and related equipment for the TSC, OSC, and EOF, consistent with the guidance in RS-002 and Supplement 2 (Evaluation Criteria H.1 and H.2). Therefore, the staff concludes that the proposed major feature H is unacceptable.

13.3.3.10 Accident Assessment (Major Feature I)

13.3.3.10.1 Technical Information in the Application

The applicant described the contacts and arrangements made with offsite organizations for acquiring and evaluating meteorological information.

In Section 3.9.1 of Part 4, the applicant stated the following:

> The proposed new facility will rely on the existing GGNS Unit 1 facility meteorological data system, which includes an onsite meteorological tower, located approximately 5,300 feet northwest of the facility, or if deemed necessary due to site-specific factors, a similar system. The facility also utilizes a back-up meteorological system which provides meteorological information to the Control Room, if primary meteorological system fails. In the unlikely event that both the primary and backup meteorological systems were inoperable, the tertiary means of obtaining wind speed and direction data would be through the National Weather Service or the U.S. Army Corps of Engineers, Waterway Experiment Station in Vicksburg, MS.
>
> Meteorological data obtained from the site instrumentation, National Weather Service, or U.S. Army Corps of Engineers may be communicated to affected states using the communication systems described in Section 3.7.

In addition, the applicant described the contacts and arrangements for field monitoring within the plume exposure EPZ in Section 3.9.2:

> The environmental monitoring program for the proposed new facility would provide for: (1) gathering of data on environmental radiation levels and the Station's degree of influence on these levels; (2) checks for specific radioisotopes to detect their introduction into the surroundings; and (3) a background for a continually developing program of radiological assessment.

> Ambient radiation will be measured by thermoluminescent dosimeters (TLDs) or other appropriate exposure integrating devices. These devices will be installed at various onsite and offsite locations....
>
> ...The offsite radiation monitoring teams will have the capability to determine the extent of the radiological hazard in the environment. Environmental air samplers and portable equipment will be available for the following assessments in the field within the Plume Exposure EPZ:
>
> - Beta-gamma radiation from the plume and/or ground contamination,
> - Iodine concentration and assessment of inhalation and thyroid dose by using air samplers with iodine-specific cartridges and portable and fixed analyzers, and
> - Water sampling for later analysis to assess contamination due to liquid release pathways can also be done by offsite monitoring teams.
>
> Transportation for the offsite monitoring teams will be available using site vehicles, with normal deployment expected to be within approximately 90 minutes following notification.

In RAI 13.3-35, the staff asked the applicant to explain the intent of its statement, "the Station's degree of influence on these levels," in relation to its environmental monitoring program described in Section 3.9.2 of Part 4. In response, the applicant noted that it had intended this statement to reflect that the environmental monitoring program provides data that may be used to determine if the plant effluents have any detectable effect on radiation levels present in the environment.

In RAI 13.3-36, the staff asked the applicant to describe its capability to sample environmental media, besides water. In Revision 2 to Part 4, the applicant amended Section 3.9.2 to state the following:

> The offsite radiation monitoring teams will have the capability to determine the extent of the radiological hazard in the environment, including collection of air, water, soil, and vegetation samples.

Section II.B.3, "Operational Procedures, State Government," of MREPP Annex D, described field monitoring within the portion of the plume exposure pathway EPZ located in the State of Mississippi. Radiological emergency response team (RERT) members perform accident assessment activities and field sampling. The team for field monitoring and plume tracking activities primarily comprises personnel from MSDH/DRH and MDOT. Various state agencies provide support functions when requested by the RERT. Per Section II.B.2, "Operational Procedures, Local Government," of Annex D to the MREPP and PGCCREPP, local governments have no accident assessment function and rely on offsite radiological monitoring provided by GGNS before the arrival of MSDH/DRH RERT members.

Tab 3 of LPRRP Chapter 6 described field monitoring team methods, procedures, and equipment, and Tab 4, "LDEQ Fixed Nuclear Facility Monitoring Program," of LPRRP Chapter 6

described the emergency sample program for the ingestion pathway EPZ. The LDEQ emergency response teams are dispatched when plant conditions deteriorate such that they may jeopardize the health or safety of the public. The LDEQ was responsible for radiological monitoring, sample collection, and analyses and will supply and maintain its own specialized equipment and modes of transportation. Section IV.3, "Accident Assessment," of Attachment 2 to LPRRP Supplement II assigned responsibility solely to LDEQ. It indicates that Tensas Parish has no responsibility in accident assessment but is expected to carry out protective response measures based on recommendations from LDEQ.

The applicant also discussed contacts and arrangements to locate and track an airborne radioactive plume, using Federal and/or State resources. Section 3.9.2 of Part 4 of the application stated that, when necessary, special aerial radiological surveys and meteorological services available through arrangements with DOE may augment the proposed new facility's field monitoring activities. Section 13.3.3.4.1, "Technical Information in the Application," of this SER also described the mobile laboratory capabilities available through MSDH, DOE (Region III), and EPA (Region IV). In RAI 13.3-36, the staff asked the applicant to clarify whether the site will rely on MSDH environmental monitoring and analysis capabilities for environmental samples collected by the applicant and to describe the environmental monitoring capability of the State of Louisiana. In Revision 2 to Part 4, the applicant amended Section 3.9.2 to state the following:

> Environmental samples collected by applicant personnel may be analyzed either in the applicant's facility, by the State of Mississippi State Department of Health Mobile Laboratory, or in commercial laboratory facilities.

In Revision 2 to Part 4, the applicant also amended Section 3.9.2 to clarify responsibility for environmental monitoring in the State of Louisiana.

Section II.E to MREPP Annex D described the plume tracking resources available in the State of Mississippi through the SMRAP and Federal resources, including those of DOE, available through the FRERP.

Section III.A.2.d, "Concept of Operations," of LPRRP Chapter 6 indicated that LDEQ, through its Radiological Emergency Planning and Response Unit, will address the need for any additional equipment or personnel for sampling and monitoring operations in the State of Louisiana. According to LPRRP Section VII.A, "Support and Resources, Federal," Federal agency support provided under the FRERP, primarily through DOE, may include offsite radiological condition assessment and radiological monitoring.

13.3.3.10.2 Regulatory Evaluation

Part 1 of the ESP application stated that the emergency planning information in Part 4 identifies the major features of an emergency plan, which will be developed consistent with the requirements of 10 CFR 52.17(b)(2)(i), using guidance provided in NUREG-0654/FEMA-REP-1 and Supplement 2.

In its review of the application, the staff considered the regulatory requirements in 10 CFR 52.17(b)(2)(i), 10 CFR 52.18, and Sections III, IV.A, IV.B, IV.C, IV.D, and IV.E of

Appendix E to 10 CFR Part 50. Under 10 CFR 52.17(b)(2)(i), an applicant for an ESP may propose the major features of the emergency plans for NRC review and approval, in consultation with FEMA, in the absence of complete and integrated emergency plans. Under 10 CFR 52.18, after consultation with FEMA, the NRC will determine whether the major features of an emergency plan submitted under 10 CFR 52.17(b)(2)(i) are acceptable. Supplement 2 and RS-002 provide guidance concerning the review and evaluation of emergency planning information given in an ESP application. Supplement 2 also provides specific evaluation criteria for major features of emergency plans, including those which apply to major feature I, "Accident Assessment."

Major feature I calls for the applicant to describe the methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition. The applicant should also describe the capability and resources associated with acquiring meteorological information and performing field monitoring and contacts and arrangements with offsite organizations (including Federal and State resources).

13.3.3.10.3 Technical Evaluation

The applicant described the contacts and arrangements made with offsite organizations for acquiring and evaluating meteorological information in Part 4 of the application. The applicant also described its plan for making suitable meteorological data available to the affected States.

The staff finds that the applicant's responses to RAIs 13.3-35 and 13.3-36, which were implemented in Revision 2 to Part 4 of the application, are acceptable. Revision 2 to Part 4 of the application, the MREPP, PGCCREPP, LPRRP, and Attachment 2 to LPRRP Supplement II described the contacts and arrangements made for field monitoring within the plume exposure pathway. In addition, Revision 2 to Part 4 of the application, the MREPP, and LPRRP described the contacts and arrangements to locate and track the airborne radioactive plume, using Federal and/or State resources.

13.3.3.10.4 Conclusions

Based on its review, the staff concludes that proposed major feature I is consistent with the guidelines in RS-002 and Supplement 2. Therefore, this feature is acceptable and meets the requirements of 10 CFR 52.17(b)(2)(i), 10 CFR 52.18, and Sections III, IV.A, IV.B, IV.C, IV.D, and IV.E of Appendix E to 10 CFR Part 50, insofar as it describes the essential elements of advanced planning that have been considered for accident assessment, as set forth above.

13.3.3.11 Protective Response (Major Feature J)

13.3.3.11.1 Technical Information in the Application

The applicant described the evacuation routes and transportation for onsite individuals to a suitable location. Section 3.10.1, "Evacuation of Onsite Personnel," of Part 4 indicated that, should evacuation of onsite personnel be necessary, predetermined evacuation routes will be established, and onsite personnel may be evacuated to designated offsite locations to facilitate personnel accountability and radiological monitoring activities. Site personnel will receive training on site evacuation routes, be escorted by a trained person, or receive a map that gives instructions and routes away from the site. Appendix 5, "Reception Center and Shelter Facility

Operations," to MREPP Annex F stated that GGNS personnel will proceed to Warren County Reception Center for monitoring and registration should the evacuation traffic control management plan be activated and the reception center opened.

In addition, Section 3.10.1 of Part 4 noted that the evacuation announcement will specify site evacuation instructions and routes. Provisions will be made for considering weather conditions, traffic, or radiological impediments to evacuation. Such a practice is consistent with Section II.J, "GGNS Onsite Evacuation," of MREPP Annex F, which stated that GGNS onsite personnel could be ordered to evacuate and follow prescribed routes out of the area, as outlined in the GGNS emergency plan.

In Part 4, the applicant stated that Figure 3-1 illustrated these routes. Figure 3-2, "Designated Evacuation Routings Within the EPZ," of Part 4 depicted designated evacuation routes for the general public but did not specifically address the evacuation of onsite individuals to designated offsite locations. In RAI 13.3-37, the staff asked the applicant to describe the evacuation routes for onsite individuals to designated offsite locations, consistent with MREPP Annex F. In addition, the staff asked the applicant to describe provisions (alternatives) to be considered for a site evacuation, based on inclement weather, high traffic density, and specific radiological conditions. In Revision 2 to Part 4, the applicant amended Section 3.10.1 to state the following:

> Should evacuation of onsite personnel be necessary, pre-determined evacuation routes will be established and evacuating personnel will be directed to the preferred route based on an evaluation of conditions existing at the time of the evacuation. Onsite personnel may be evacuated to designated offsite locations to facilitate personnel accountability and radiological monitoring activities. If it is necessary to conduct a site evacuation during a release, such that a likelihood exists for radioactive contamination of evacuating personnel or vehicles, then site evacuees will be directed to report to a State reception center for monitoring and, if needed, decontamination.
>
> As an alternative to site evacuation, site personnel may be directed to assemble in a safe onsite location by a member of the emergency response organization. The assembly location will be selected based on an assessment of conditions, such as meteorological, traffic, and operational conditions, at the time of the assembly.

The applicant also indicated that nonessential personnel will be expected to evacuate the property in the same vehicles used for initial access. In RAI 13.3-38, the staff asked the applicant to describe measures for the evacuation of any onsite individuals who might not have their personal vehicles available on site. In response, the applicant stated that any onsite individuals without access to the vehicle in which they arrived will obtain rides with evacuating personnel who do have vehicles.

The applicant described its mechanism for recommending protective actions to the appropriate State and local authorities. Section 3.10.2, "Offsite Areas," of Part 4 stated that the proposed new facility will provide PARs to the State and local civil defense agencies. These agencies will implement protective actions within the plume exposure pathway EPZ. The minimum standard PAR for a general emergency classification will call for the evacuation of the 2-mile radius and 5 miles downwind and for sheltering the remainder of the plume exposure pathway EPZ.

Section 3.10.2 also indicates that evacuation will be recommended for those within 5–10 miles downwind if dose projections or actual field measurements correspond to radiation levels to the public that exceed the EPA protective action guides (PAGs). In RAI 13.3-40, the staff asked the applicant to describe the use of sheltering versus evacuation to meet the requirements of 10 CFR 50.47(b)(10). In response, the applicant stated that it will develop PARs consistent with EPA-400-R-92-001, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents," issued May 1992, which addresses both sheltering and evacuation, in accordance with Section 3.10.2.

In addition, the staff asked the applicant in RAI 13.3-41 to describe the use, including for prophylaxis, of potassium iodide (KI) as a supplement to evacuation/sheltering in considering a range of protective actions to comply with 10 CFR 50.47(b)(10). In Revision 2 to Part 4, the applicant amended Section 3.10.2 to state the following:

> If the committed dose equivalent to the thyroid of any member of the public is projected to exceed 5 rem, the Emergency Director may recommend to State and local officials that they consider distribution of radio protective drugs to members of the public, including those members of the affected population who may be confined to various institutions.

In RAI 13.3-39, the staff asked the applicant to clarify whether the term "EPA PAG" refers to the guidance specifically contained in EPA-400-R-92-001. In Revision 2 to Part 4, the applicant amended Section 3.10.2 to include the reference to EPA-400-R-92-001 guidance.

The applicant described the time estimates for evacuation within the plume exposure EPZ. In Section 2.2 of Part 4, the applicant provided a preliminary analysis of the time required to evacuate transient and permanent populations from various sectors and distances within the 10-mile plume exposure pathway EPZ. The applicant indicated in Section 2.2.1 of Part 4 that a detailed ETE for the plume exposure pathway EPZ performed in March 1986 shows a maximum evacuation time for the affected area of approximately 3 hours. In May 2003, a detailed evaluation of the original 1986 ETE more fully considered the impact of the historical population growth and transportation system improvements.

In Section 2.2.2 of Part 4, the applicant stated the following:

> The 2003 ETE evaluation *(2003 ETE study)* examined evacuation time estimates as determined in 1986 for the GGNS EPZ and evaluated those estimates through: (1) an evaluation of the current population in the GGNS EPZ, using 2000 US Census data and projected 2002 population estimates; (2) an evaluation of the current roadway network in and around the GGNS EPZ; (3) and evaluation of other impediments (e.g., new population growth, new shopping centers, new large employers) in or near the EPZ; and (4) interviews with State and local emergency management and transportation officials, as well as verification of all of the above through a site visit to the GGNS EPZ.

In Section 2.2.4.4 of Part 4, the applicant noted that the 2003 ETE study concludes that the maximum evacuation time for the affected area of approximately 3 hours in the 1986 ETE remains valid. In addition, no physical characteristics unique to the site could pose a significant impediment to the development of emergency plans and implementation of protective actions

for the areas surrounding the proposed new facility. This conclusion is consistent with Section 6.0 of the May 2003 evaluation study.

In its response to RAI Letter 6, the applicant provided Revision 1 to the 2003 ETE study, and incorporated associated changes in Revision 2 to Part 4 of the application. The revisions included the following changes:

- The applicant revised Section 2.2.3.7 of Part 4 to include a table, entitled "Comparison of Peak Plume Exposure Pathway EPZ Populations 1986–2002," to address the limiting plume exposure pathway EPZ peak population (for ETE purposes) as the daytime population estimated at 20,505, an increase of 11.1 percent since the 1986 ETE. Because of several minor adjustments, the net value will increase slightly from 20,369 to 20,505 persons. (According to the applicant's response to RAI 13.3-45, the adjustments primarily result from its answers to the RAI questions (i.e., 13.3-78d and k) and the loss of population after the closure of a small hospital within the EPZ.)

- The applicant revised Figure 1.1 of the 2003 ETE study and Figure 2-6 in Part 4 of the application to be consistent and reflect the same total rollup evacuation sums for all population segments in a given PAA.

- The applicant revised Table 3-4 of the 2003 ETE study to provide a listing of the rollup evacuee sums for each PAA to allow for a convenient comparison with the subject figures.

According to the applicant's response to RAI 13.3-45, the corrections to these figures do not impact the 2003 ETE study, its results, or its conclusions.

13.3.3.11.1.1 Site Location and Emergency Planning Zones. Section 1.2, "The Grand Gulf Site and Environs," of the 2003 ETE study provided a general description of the physical area surrounding the existing GGNS Unit 1 site. Section 2.1.1 of Part 4 of the application described in detail the location and physical characteristics for the proposed new reactor(s), which would be located on the existing GGNS Unit 1 site. Figures 2-1, "Property Boundary," and 2-3, "GGNS Unit 1 and Proposed New Facility Exclusion Area Boundaries," in Revision 2 to Part 4 illustrated the site layout, exclusion area, and property line boundaries for the proposed new reactor(s).

Figure 2.4 in Part 4 depicted the plume exposure pathway EPZ, the EPZ boundaries, and topographical features surrounding the existing GGNS, consistent with Section 1.2, "Site Location and Emergency Planning Zone (EPZ)," of the 1986 ETE. Figure 1.1 of the 2003 ETE study also illustrated the plume exposure pathway EPZ, including the transportation network, PAAs, and 22.5-degree sectors at 2, 5, and 10 miles. In addition, Figure 2, "GGNS Plume Exposure Pathway EPZ," of the 1986 ETE showed the plume exposure pathway EPZ. In RAI 13.3-84, the staff asked the applicant to provide a figure(s) for the plume exposure pathway (10-mile) EPZ with discernible prominent topographical features, political boundaries, and road segment numbers. In response, the applicant stated the following:

> Figure 2-6 presents the plume exposure pathway EPZ illustrating prominent topographical features, i.e., the Mississippi River and other important bodies of water that contribute to jurisdictions and roadway layouts. The figure also

includes major roadways involved in evacuation, defines the boundaries of the various protective action areas, and State, county, and parish boundaries. "Road segments," which would be components of a more detailed ETE, analysis were not defined or used in the 2003 ETE Study, given the purpose and nature of the Study.

13.3.3.11.1.2 General Assumptions. Regarding the preparation of time estimates for evacuation within the plume exposure pathway EPZ, Section 2.2.1 of Part 4 indicated that a detailed ETE was performed in 1986 and, in 2003, a detailed evaluation of the original ETE more fully considered the impact of the historical population growth and transportation system improvements. According to Section 2.2.4.4 of Part 4, the 2003 ETE study concluded that the radiological response plans for the States of Louisiana and Mississippi, Claiborne County, and Tensas Parish are more than adequate to address a nuclear emergency at GGNS that requires public protective actions.

In RAI 13.3-95, the staff asked the applicant to clarify if this evaluation considers the impact of the estimated increase in plume exposure pathway population between the 1986 and 2003 ETE studies on offsite response capabilities (e.g., monitoring/decontamination and congregate care center capacity). In response, the applicant stated that, because of the presence onsite of an existing operating unit with fully implemented emergency plans (and supporting offsite plans), a presumption of adequacy exists regarding the effectiveness of current emergency plans and protective actions. This assumption provided an adequate basis for concluding at the ESP stage that the applicant has considered the essential elements of advance planning and made provisions to cope with emergency situations. The applicant did not specifically review shelter adequacy in the 2003 ETE study. However, the overall increase in evacuee population is modest and did not represent a physical characteristic that could significantly impede the development of expanded emergency plans to support the proposed new facility.

Sections 1.3, "Sources of Data and General Assumptions," and 1.4, "Summary of Methodology," described the general assumptions and methodology, respectively, of the 1986 ETE analysis. In the 2003 ETE study, the applicant considered the assumptions from the 1986 ETE to be acceptable, with the addition of Assumption 2.15 regarding the ASU population. The general assumptions identified in Section 2.0 of the 2003 ETE study, Revision 1, and Section 2.2.4.1 of Part 4 are the same, except for the following differences:

- The applicant revised Assumption 2.10 to include outage population numbers for weeknight and weekend estimates and added an explanatory note.

- The applicant revised Assumption 2.11 to indicate that the 25-percent decrease in traffic capacity includes reductions in average speed and roadway capacity during inclement weather. For an EPZ more prone to adverse weather, such as a New England utility subject to severe ice and snow storms, a 25-percent reduction in roadway capacity and travel speed could be taken. In the case of GGNS, a total reduction of 25 percent in traffic capacity based on reduced speed and roadway capacity is appropriate.

- The applicant modified Assumption 2.14 to indicate that buses will be used to transport special populations from facilities such as hospitals, nursing homes, and jails and added an explanatory note.

- The applicant modified Assumption 2.15 to include minor clarifications.

Roadway capacities were calculated using the computer model NETVAC. Assumption 2.11 in the 2003 ETE study, Revision 1, and Section 1.4 of the 1986 ETE stated that roadways will operate at 75 percent of their normal capacity during adverse weather conditions, which is consistent with the Highway Capacity Manual. In RAI 13.3-94, the staff asked the applicant to clarify the effect of adverse weather conditions on traffic speeds and their impact on overall evacuation estimates. In response, the applicant stated the following:

> The applicant believes that the concepts of roadway capacity and traffic speed are closely linked (i.e., any change in traffic speed is reflected in changes in roadway capacity). NUREG/CR-4831 indicates that rain may reduce traffic capacity by 10–20%, but provides no detailed information regarding additional impact on evacuation times due to reduced traffic speed. NUREG/CR-4831 suggests that adverse weather may reduce traffic capacity by 10–25%.
>
> The guidance provided in NUREG/CR-4831 is applicable to a broad range of conditions that may affect domestic nuclear plants, including significant icing, snowfall and other winter weather conditions, some of which are not expected to apply to the GGNS site. These winter weather conditions (in more northern climates) may affect evacuation route capacities and speeds by limiting access to travel lanes and road shoulders. However, such effects [are] not expected as a result of the rains that are common to the GGNS area. Even though these winter weather effects are not expected at the GGNS site, the applicant assumed a 25% reduction in roadway capacity for the 2003 ETE Study. This 25% roadway capacity reduction, compared to the guidance provided by NUREG/CR-4831, is conservative by a factor of 1.25–2.5. As a result, the applicant believes that the 25% reduction in roadway capacity is appropriate for the GGNS area and that the 2003 ETE Study provides a conservative estimation of the effects of adverse weather on evacuation times. As discussed in Section 6.0 of the 2003 ETE Study, the results of the 1986 ETE remain valid and in some cases may overstate actual evacuation times.

Section 3.1, “General Methodology,” of the 1986 ETE referenced the methodology and assumptions regarding population estimates and automobile occupancy rates. Population estimates were based on surveys of residents and emergency preparedness officials.

Assumption 2.6 in the 2003 ETE study, Revision 1, and Section 2.2.4.1 of Part 4 indicated that law enforcement officers will control traffic at key intersections. In RAI 13.3-82, the staff asked the applicant to clarify the modeling of this practice in NETVAC. In response, the applicant stated the following:

> As discussed in the response to RAI 13.3-77, per the goals (and constraints) of the 2003 ETE Study, there was no attempt to update (or review) the modeling used in the 1986 ETE. Assumption 2.6 was considered realistic and appropriate for the 2003 ETE Study since the current State emergency plans provide for traffic control. The presence or absence of traffic control points was not explicitly considered in the 2003 ETE Study. However, broadly speaking, the use of effective traffic control would be expected to improve evacuation performance.

> Thus, the 2003 ETE Study is considered to provide a conservative update of the previously-estimated evacuation times.

Assumption 2.13 in the 2003 ETE study estimated an occupancy of two persons per vehicle for GGNS employees and three persons per vehicle for ASU students. Assumption 2.15 indicated that most students and residents at ASU have their own vehicles. In addition, the 2003 ETE study included an assumption of 60 schoolchildren per bus but did not describe the assumptions for jails, nursing homes, or hospitals. In RAI 13.3-81, the staff asked the applicant to provide the basis for these occupancy rates, as well as vehicle occupancy factors for special facilities. In response, the applicant stated the following:

> Because the 2003 ETE Study was used to validate the results of the 1986 ETE, the assumptions used in the 2003 ETE Study, including vehicle occupancy factors, are essentially identical to those used in the 1986 ETE.
>
> In the revised 2003 ETE Study, clarifications have been included with the assumptions to address GGNS staffing levels, adverse weather conditions, and non-auto owning residents. For evacuation of special facilities, a vehicle occupancy factor of 3 persons per vehicle was assumed, consistent with the 1986 ETE. This rate was applied to persons in jails, nursing homes, and hospitals.

In response to RAI 13.3-81, the applicant made appropriate revisions to Assumptions 2.10, 2.11, and 2.14 in Revision 1 to the 2003 ETE study, and Section 2.2.4.1 in Revision 2 to Part 4 of the application.

13.3.3.11.1.3 Methodology. Section 1.4 of the 1986 ETE described the methodology used for the analysis, which is based on a time-distribution approach and uses the NETVAC computer model. The 2003 ETE study examined changes in population and the roadway system since 1986 and made a qualitative determination of their impact on the 1986 ETE. However, the 2003 ETE study did not rerun the computer model.

Section 1.5, “Conditions Modeled,” of the 1986 ETE noted that the analysis modeled weekday fair weather, weekday adverse weather, nighttime fair weather, and weekend-day fair weather. The applicant further indicated that it did not model the weekend case for adverse weather (assumed to be a thunderstorm) because recreational facilities would not be at peak capacity under such conditions, identified as sudden rainstorms in Section 1.3 of the 1986 ETE. In RAI 13.3-83, the staff asked the applicant to clarify the reason that adverse weather conditions would apply for weekday but not weekend-day cases. In response, the applicant stated the following:

> The basis for the assumptions regarding adverse weather conditions in the 1986 ETE is not clear. However, the peak EPZ population and evacuation traffic flow for both the 1986 ETE and 2003 ETE Study were determined to occur on weekdays. The peak weekday evacuation population (sum of all population segments) is over 5,000 greater than the peak weekend scenario.

> As summarized in Study Table 3-1, the same permanent population is applied to each scenario. In each case, for other population segments, the population value for the weekday scenario is limiting. The primary component that decreases for the weekend scenario is in special facilities which largely reflects the elimination of weekday school attendance.
>
> The adverse weather condition (reduced roadway capacity to 75% per Section 2.2.4.1 and 2003 ETE Study Assumption 2.11) was applied to the limiting evacuation traffic scenario in the 2003 ETE Study, i.e., weekday. Given the substantial difference (>5000 persons) between the peak weekday and peak weekend populations, there is no need to explicitly consider the impact of adverse weather on a weekend evacuation.

In RAI 13.3-86, the staff asked the applicant to clarify the evacuation route characteristics and modeling of traffic control measures to support the NETVAC model results. In response, the applicant stated the following:

> [N]o attempt was made to evaluate the specific method, modeling, etc. used internally to the 1986 ETE, in particular the detailed input of road network characteristics or modeling of traffic control. However, in support of the 2003 ETE Study, an appropriately thorough drive-through review of each principal evacuation route was made, noting route characteristics such as number of lanes, traffic signals and signs, road conditions, etc. This was performed with a site Emergency Preparedness staff person knowledgeable in emergency planning. The results were considered both quantitatively and qualitatively. It was quantitative in applying standard road capacity values, based on professional judgement, to a given set of road characteristics. It was qualitative in the final assessment as to how the evacuation performance might compare with 1986 ETE results. As a general conclusion, it is believed that the road networks have much improved over that observed and modeled in 1986. This was confirmed in informal discussions with local officials, knowledgeable on evacuation and emergency planning matters.

In addition, RAI 13.3-87 asked the applicant to provide the site-specific information used to develop trip generation times, according to the guidance in NUREG/CR-4831, as a basis for the time distributions. In response, the applicant stated the following:

> The 1986 Evacuation Time Estimate was performed before the publication of NUREG/CR-4831 and therefore is not fully consistent with that NUREG. While the 1986 ETE does not use the term “trip generation time,” Section 1.1 of the 1986 ETE indicates that the time estimates include times required for public notification, preparation and mobilization, and actual movement out of the EPZ under various areas, times, and weather conditions. These concepts appear to be consistent with those concepts included in the NUREG/CR-4831 discussion of trip generation times. Section 3.1 of the 1986 ETE indicates that the double-counting of some segments of the population (e.g., permanent residents who are using recreational facilities) is intentionally included to simulate traffic friction on the roadway network due to individuals returning home prior to the actual evacuation.

> The actual time distributions used in the 1986 ETE are discussed in Section 5.2–5.4 of the 1986 ETE. Section 1.3 of the 1986 ETE indicates that the assumed times were developed based on a review of site-specific EPZ characteristics and discussions with local emergency preparedness officials and that these officials concurred with the assumed notification, mobilization, and preparation times.
>
> [T]he 2003 ETE Study's method was a comparative analysis of vehicle loading from the 1986 ETE to that determined in the 2003 ETE Study, followed by an assessment of how the loading would likely be handled by current evacuation roadway networks. The Study, therefore, did not specifically evaluate trip generation times. However, this method was considered adequate for the purposes of the 2003 ETE Study.

13.3.3.11.1.4 Demand Estimation/Permanent Residents. Section 3.2 and Figure 5, "Permanent Population Distribution Within the Grand Gulf EPZ," of the 1986 ETE estimated the permanent resident population within the plume exposure pathway EPZ as 8702 people. The 2003 ETE study, Revision 1, and Section 2.2.3.7 of Revision 2 to Part 4 of the application listed the permanent resident population as 9846 based on a 2002 population estimate. In RAI 13.3-76, the staff asked the applicant to describe the methodology used to calculate the 2002 permanent population estimate. In response, the applicant stated the following:

> As described in Section 2.2.3, population data were primarily based on the 2000 U.S. Census. As noted in this section, LandView software was used to apply and translate Census data (using Census "block points") to develop permanent population data in each required area segment. Additional discussion on the use of LandView 5 is provided in the SSAR and ER sections on population assessment. The standard presentation of permanent population information, using 1 mile segments through each 22.5 degree arc centered on the 16 cardinal points, is provided in Figure 2-4. This is described in Section 2.2.3.1. As described in this section, this presentation of resident population within the plume exposure pathway was based on the 2000 Census (not a projection to 2002). (The 2002 projection was applied only to the broader ingestion pathway EPZ, as described in Section 2.2.3.2 and is illustrated in Figure 2-5.)
>
> The primary use of permanent population data within the plume exposure EPZ is to support protective action planning. For this purpose, the GGNS Unit 1 E-Plan divides this EPZ into Protective Action Areas (PAA). The same PAAs are proposed for use for the new facility and are described in Section 2.2.4.2 of the Application. As discussed in Footnote 1 to the methodology discussion in Section 2.2.2, the permanent resident portion of the plume exposure population was based on the 2000 Census due to the complex geometries of the plume exposure pathway EPZ. The complexities in this case related not only to the expanded areas outside 10 miles (to address Alcorn State University and the communities of St. Joseph and Newellton, LA) but also the challenging translation of Census block data into the boundaries of each PAA which are generally defined by road and/or topographic features.

> This region of Mississippi and Louisiana experienced modest growth in population (Section 2.2.1). Therefore, as noted in Footnote 1, the difference between 2000 and 2002 would not be expected to significantly impact the outcome of the 2003 ETE Study. Population projections for 0 to 10 miles and for 10 to 50 miles from the site are provided in ER Tables 2.5-1 and 2.5-6, respectively. From this data, the net projected growth rate for nearly 3 decades up to 2030 for the permanent population within 50 miles is approximately 7%. This confirms that the 2000 to 2002 differences would be relatively small. The use of 2000 Census data information for permanent population estimates is considered adequate and appropriate for the purposes of the 2003 ETE Study.

The 1986 and the 2003 ETE studies did not divide the permanent population into auto-owning versus transport-dependent groups. In RAI 13.3-89, the staff asked the applicant to provide information on its determination of the transport-dependent population and of the number of vehicles that would be needed for that segment of the population. In response, the applicant stated the following:

> Sections 1.3 and 3.2 of the 1986 ETE indicate that the transport-dependent population was identified through a comprehensive demographic survey of Claiborne County and Tensas Parish.
>
> While the current state and local plans establish provisions for identifying the numbers and locations of transport-dependent individuals and for evacuating these individuals, for vehicle loading purposes, the 2003 ETE Study assumed that all of the transport-dependent persons living outside of special facilities would be transported in privately-owned vehicles. With regard to the number of vehicles, the transport-dependent population was combined with the auto-owning population and the same vehicle loading rate was used, that is, 2.5 persons per household (Note 2 to Table 3-4); 1 vehicle per household (Assumption 2.12); thus, 2.5 persons per vehicle. Because some portion of the transport-dependent population is likely to be transported in higher-capacity vehicles, this provides a conservative estimation of the impact of vehicle loading and evacuation times.

Section 3.2 of the 1986 ETE indicated that the 1985 Claiborne County and Tensas Parish demographic surveys identify the number of permanent population households having access to at least one automobile. The 1986 ETE estimated the number of vehicles at one vehicle per household for the auto-owning population, with an auto-occupancy factor of 2.5 persons per vehicle in Claiborne County, and a transport-dependent auto-occupancy rate of 25 people per bus in Tensas Parish. Note 2 in Table 3-4, "GGNS Population Summary by Evacuation Area and Vehicle Demand 2002," of the 2003 ETE study stated that one vehicle will evacuate for each household, and each household has 2.5 people. Therefore, for every 100 persons, 25 vehicles will evacuate. In RAI 13.3-88, the staff asked the applicant to clarify its estimation of vehicles based on the permanent population and the data used in the initial NETVAC model. In response, the applicant stated the following:

> The second part of Note 2 on Table 3-4 (Study), which discusses the use of 25 vehicles for every 100 people is incorrect and, as the Staff notes, should have indicated a requirement of 40 vehicles (per 100 persons of permanent population evacuated).

This is a typographical error in the note. The rate of 2.5 persons per household and, thus, 40 vehicles per 100 persons in the permanent population evacuated, was actually used in the Study. The note will be corrected; however, the change has no impact on vehicle loads presented in Table 3-4 (Study).

The applicant amended Note 2 in Table 3-4 as stated above in Revision 1 to the 2003 ETE study.

13.3.3.11.1.5 Demand Estimation/Transient Population. Section 3.3 of the 1986 ETE described the transient population within the plume exposure pathway EPZ in terms of employee workforce and recreational groups and estimates the population as 1814 employees (weekday) and 2728 recreational (weekend) visitors in Table 1, "Transient (Employee Work Force) Population," and Table 2, "Transient (Recreational) Population," respectively. In RAI 13.3-78, Items a through m, the staff asked the applicant to respond to the following apparent inconsistencies in the transient population between Part 4 of the application and the 2003 ETE study:

- Table 3-3, "Special Facilities and Transient Populations 1986–2002," of the 2003 ETE study states that the county hospital has a population of 56 on weekdays and 32 on weeknights and weekends. In RAI 13.3-78a, the staff asked the applicant to verify the figures for weeknights and weekends. In response, the applicant stated that PGCCCD officials provided the Claiborne County Hospital population figures to GGNS Unit 1 emergency preparedness personnel. Table 2-1 in Part 4 reflects only the peak population of 56, which is consistent with Table 3-3 in the 2003 ETE study.

- In RAI 13.3-78b, the staff asked the applicant to describe its method for determining the Young Men's Christian Association (YMCA) population estimates in the 2003 ETE study. In response, the applicant stated that it established these estimates based on communications with YMCA camp officials in November 2002.
- In RAI 13.3-78c, the staff asked the applicant to clarify a discrepancy between Section 2.2.3.3 of Part 4, which lists 800 campers from late May to the end of August, and the 2003 ETE study, which lists 120 campers per weekday/weekend/weeknight. In response, the applicant stated that the numbers provided for the YMCA camper population do not contradict one another. The figure of 800 campers covers the entire period from May through August. The figure of 120 campers is an estimate of peak population for any single day during this period.

- In RAI 13.3-78d, the staff asked the applicant to clarify its rationale for the nonconservative population estimate in the 2003 ETE study, which uses 250 visitors per day at the Grand Gulf Military Park, rather than the 250–300 visitors per day identified in Section 2.2.3.3 of Part 4. In response, the applicant stated that, although 300 people may visit each day, not all these visitors would realistically be present at the same time. The applicant amended Table 3-3 in Revision 1 to the 2003 ETE study to conservatively estimate a figure of 300 visitors and carried this change forward into the ensuing tables and related figures. However, the applicant indicated that this slight increase in total evacuee population (0.25 percent) does not impact the overall study conclusions for the affected PAA.

- In RAI 13.3-78e, the staff asked the applicant to provide information on its derivation of the estimated population of 225 visitors per day for Lake Bruin State Park in Table 3-3 of the 2003 ETE study. In response, the applicant stated that Lake Bruin State Park officials provided the estimate of 225 visitors per day based on their knowledge of park usage.

- In RAI 13.3-78f, the staff asked the applicant to provide its rationale for the population decrease at the Lake Bruin Country Club, as shown in Table 3-3 of the 2003 ETE study. In response, the applicant stated that country club officials supplied the Lake Bruin Country Club population. The applicant did not know the reasons for this decrease in club population between 1986 and 2002.

- In RAI 13.3-78g, the staff asked the applicant to provide information on the decrease in the number of people in the hunting/fishing camps from 1986 to 2002 shown in the 2003 ETE study. In response, the applicant stated that cognizant State officials provided the updated (2002) figures for the usage of hunting/fishing camps. The applicant did not know the reason for the decrease in camp usage.

- Section 2.2.3.3 of Part 4 of the application states that as many as 250 people fish on the weekends and 500–600 people hunt for deer on opening day. The application does not specify totals for other types of hunting (upland game and waterfowl). If opening day is on a November weekend, up to 600 deer hunters, 250 fishermen, and an unspecified number of small game/bird hunters could be present. Therefore, the staff believes that the estimate of 875 people in the original 1986 ETE is more realistic. In RAI 13.3-78h, the staff asked the applicant to provide information on its derivation of the figure of 600 for the estimate used in the 2003 ETE study. In response, the applicant stated the following:

  > The figure provided for the population of hunters was derived through conversations with Mississippi state officials. There is significant redundancy in the figures for the hunting and fishing population (i.e., the figure of 600 deer hunters includes some number of those persons who occupy the hunting and fishing camps). The text related to fishermen indicates that this peak population occurs during the April through September period, while the peak period for the hunting population occurs in the November through January period; therefore, it is unlikely that there will be peak populations of both fishermen and hunters at the same time. Note that the figures provided in Section 2.2.3.3 for hunting clubs include primarily, but not exclusively, deer and duck hunters. Therefore, at least part of the population of waterfowl and upland game hunters has been included. Given the fact that there is likely to be significant overlap between the deer, waterfowl, and upland game and bird hunting populations and that many members of these groups are also included in the permanent resident population, the applicant believes that the evaluation includes sufficient redundancy in population estimates to provide a conservative validation of the original 1986 ETE.

> Even if one assumes a total transient hunting and fishing population of 850 to 1,000, this would add only 125–200 vehicles to the total evacuation vehicle demand (see Table 3-3 of the 2003 ETE Study). Due to the significant overcapacity built into the evacuation roadway network, there would be no significant change to the estimated evacuation times and no impact on the study's conclusion that there are no significant impediments to the development of emergency plans for the proposed new facility.

- In RAI 13.3-78i, the staff asked the applicant to clarify the discrepancy between the 2003 ETE study, which assumes 8–10 hunters per hunting camp, and Section 2.2.3.3 of Part 4, which states that each camp could have up to 20–30 hunters on a weekend day. In response, the applicant stated that the figure of 20–30 hunters represents a peak population figure for the most heavily used camps. Therefore, the figure of 8–10 hunters is a realistic average population for all of the camps. The applicant amended Section 2.2.3.3 of Revision 2 to Part 4 to clarify the difference between the peak and average population figures.

- In RAI 13.3-78j, the staff asked the applicant to provide information on the method for notifying the segment of the transient population associated with hunting and fishing. In response, the applicant stated that Section 3.5.3 of Part 4 gives information on this topic. For this notification, the applicant will use the ANS established to support GGNS Unit 1, which has been installed, tested, and found to be adequate for the entire plume exposure EPZ.

- In RAI 13.3-78k, the staff asked the applicant to clarify discrepancies between the 2003 ETE study, which estimates 80 workers (weekend), 700 workers (weekday), and 80 workers (weeknight), and Section 2.2.3.3 of Part 4, which reports that an outage requires 210 workers (weekend day), 800 workers (weekday), and 170 workers (weeknight). In response, the applicant stated that the 2003 ETE study uses updated site population figures that are more recent and lower than the figures described in the ER and Part 4 of the application. It updated Section 3.3.3, "Grand Gulf Nuclear Station," and Table 3-3 of the 2003 ETE study in Revision 1 to use the higher Part 4 site population figures. This change also resulted in additional modifications to population and vehicle-loading figures carried forward into related tables and figures. The applicant also stated the following:

  > The use of revised GGNS workforce population figures does not affect the conclusions of the 2003 ETE Study. As a practical matter, the 1986 ETE actually used a much higher workforce population (than the current workforce). Thus, as shown in 2003 ETE Study Table 5-1 for PAA 1, the difference between PAA vehicle demand decreased from 1986 to 2002 by 500 vehicles. Based on bounding projections for the proposed new facility, the workforce could be as high as 1160 persons (ER Table 3.0-1, Item 17.5). Without offering an exact assessment, it can be concluded that the increase in some additional 1200 persons is generally offset by the decrease in vehicle loading from 1986 to 2002. Thus, the overall impact to 1986 conclusions regarding evacuation time would be generally unchanged. Given this qualitative assessment, it is further concluded

> that the evacuation of the total site workforce, including the proposed new facility, would not pose a physical characteristic that would be a significant impediment to developing a fully integrated emergency plan.

- Section 2.0 of the 2003 ETE study assumes a vehicle occupancy rate of 2.0. However, Table 3-3 of the 2003 ETE study uses a factor of 1.0 on weekends and weeknights. Finally, the 1986 ETE assumes that, during the weekdays, employees will evacuate at a weighted average of 1.9 persons per vehicle. In RAI 13.3-78l, the staff asked the applicant to clarify these discrepancies. In response, the applicant stated that, as initially constructed, Table 3.3 of the 2003 ETE study uses a vehicle occupancy rate of 1.0 persons per vehicle evacuating from GGNS on nights and weekends, which is consistent with Table 1 of the 1986 ETE. To provide consistency with the stated assumptions, the applicant updated Table 3-3 of the 2003 ETE study, Revision 1, to use a vehicle occupancy rate of 2.0 persons per vehicle evacuating from GGNS. However, the peak weekday scenario is limiting and uses an assumption of 2.0 persons per vehicle, consistent with the 1986 ETE. Thus, this change in Table 3-3 computations for weekend and weeknight vehicle loading will have no impact on the study's final results in Table 3-4, which presents outcomes for the limiting peak weekday scenario.

- In RAI 13.3-78m, the staff asked the applicant to clarify whether it considered commercial fishermen as part of the transient population. In response, the applicant stated the following:

> As noted in Section 2.2.3.3 there is only limited commercial fishing on the Mississippi River and within the plume exposure pathway area. The number is considered statistically so small (i.e., less than 20) and would likely be distributed in several waterway areas such that they have essentially no meaningful additional impact to evacuation times. As such commercial fishermen, as a unique transient population segment, were not explicitly considered in the 2003 ETE Study computation of vehicle loading. However, there is sufficient double counting of various population segments to more than make up for this omission.

Table 3-3 of the 2003 ETE study considered special facilities and transient populations together, instead of as separate populations, which is consistent with the assumption in the 1986 ETE and Part 4. Assumption 2.2 in the 2003 ETE study also stated that, based on the applicant's interpretation of NUREG-0654/FEMA-REP-1, the ETE need only consider evacuation of permanent and transient populations, since special facilities populations are evacuated separately. In RAI 13.3-77, the staff asked the applicant to clarify why the evacuation estimates did not consider population segments separately, as identified in Section II of Appendix 4 to NUREG-0654 (e.g., permanent residents, transients, and persons in special facilities). In response, the applicant stated the following:

> The 2003 ETE Study was conducted to determine if the results of the 1986 ETE remained valid under current conditions. The overall method involved evaluation of updated population data and transportation roadway characteristics and a qualitative assessment of the potential impact on the results of the 1986 ETE. The 2003 ETE Study made no attempt to update the computer modeling used in the 1986 ETE. While some limited clarifications to the 1986 ETE's assumptions

were used in the 2003 ETE Study, the Study was generally constrained by the 1986 computer modeling and underlying assumptions. At the same time, the Study's method in using updated evacuee population, vehicle loading, and roadway networks, is considered appropriate and adequate for the purpose of identifying physical characteristics that may represent a significant impediment to developing expanded emergency plans to support the proposed new facility.

Table 3-3 of the 2003 ETE Study includes separate tabulations of the special facility, recreational transient, and workforce transient populations and expected vehicle loads. Therefore, the population of the individual segments may be readily determined by reviewing the table. Table 3-4 transfers these populations and vehicle loads to Protective Action Areas. Table 4-2 compares the estimated vehicle loads to the estimated roadway capacities as a means of validating the findings of the 1986 ETE. See Tables 3-1 through 3-4 and Table 4-2 of the 2003 ETE Study. Thus, the Study did consider the primary population segments (permanent, workforce, special facility, and transient recreational) separately in computing vehicle loading by PAA. However, the Staff is correct in noting that vehicles are summed together for a given PAA (applying Assumption 2.14 regarding the translation of busses to vehicles entering the transportation network). As a result of this approach, there was no explicit determination of evacuation time by population segment. Such an approach was beyond the scope and purpose of this Study.

Section 5.3, "Evacuation Preparation Times and Departure Distributions," of the 1986 ETE noted that the transport-dependent population will begin to evacuate between T=75 and T=135 minutes. The total ETE shown in Table 6, "Evacuation Clear-Time Estimates," of the 1986 ETE is 145–150 minutes. In RAI 13.3-92, the staff asked the applicant to clarify whether this estimate includes the transport-dependent population. In response, the applicant stated the following:

Section 1.1 of the 1986 ETE indicates that the ETEs include time required for notification, mobilization, and movement. Various sections of the 1986 ETE discuss the details of evacuating the transport-dependent population, indicating that this population segment was considered in the 1986 ETE. If the transport-dependent population begins to evacuate between T=75 and T=135 minutes, and the estimated total evacuation time is 145–150 minutes, then the actual on-road travel time (to reach the boundary of the plume exposure EPZ) for the transport-dependent population could be expected as between 10 and 75 minutes.

In addition, Evacuation Analysis Area 8 in the 2003 ETE study included a large transient population during the peak weekend scenario. In RAIs 13.3-87a and 13.3-87e, the staff asked the applicant to clarify whether it developed specific trip generation times for this group, including an assessment of whether a portion of this group returns home to gather belongings and evacuate as a family unit. In response, the applicant stated that the 1986 ETE was performed before the publication of NUREG/CR-4831; therefore, it is not fully consistent with that document. The applicant also noted that, while the 1986 ETE did not use the term "trip generation time," Section 1.1, "Study Purpose," of the 1986 ETE indicated that the time estimates include the times required for public notification, preparation, and mobilization, as

well as actual movement out of the EPZ from various areas, at different times, and under a range of weather conditions. These concepts appeared to be consistent with those included in the NUREG/CR-4831 discussion of trip generation times. In addition, the applicant stated the following:

> With regard to the weekend transient population in Evacuation Analysis Area 8, the applicant notes that Evacuation Analysis Area 8 includes the entire EPZ. Table 3-1 of the 2003 ETE Study indicates that the weekend recreational transient population has dropped from 2728 (in 1986) to 1820 (in 2002). Therefore, the applicant believes that the estimated evacuation times for this population segment are adequately bounded by the 1986 ETE, as updated by the 2003 ETE Study.

13.3.3.11.1.6 Demand Estimation/Special Facility Population. Section 3.4, "Special Facilities Population," of the 1986 ETE described the special facilities population within the plume exposure pathway EPZ. Table 3, "Special Facilities Population," of that study estimated the special population to reach 5713 (weekdays), 2144 (weeknights), and 2144 (weekends). Table 3-3, "Special Facilities and Transient Populations," of the 2003 ETE study, Revision 1, estimates the total special facility population as 7673 (weekdays), 2944 (weeknights), and 2910 (weekends). Section 2.2.3.6 and Table 2-1 of Part 4 also listed special facilities populations.

The 1986 ETE, 2003 ETE study, and Revision 0 to Part 4 of the application contained various apparent inconsistencies in the special needs population. Section 2.2.3.6 of Part 4, and Section 3.3.1, "Alcorn State University," of the 2003 ETE study reported that 2000 students live on campus. The permanent resident population estimate did not include these students, but they were considered part of the special facilities population segment. Part 4 and the 2003 ETE study stated that 1800 of these students have their own vehicles. In RAI 13.3-79a, the staff asked the applicant to clarify the derivation of this number and whether the other 200 students are considered as part of the transport-dependent population. In addition, the staff asked the applicant in RAI 13.3-79b to clarify where it addressed the families of the 182 staff members and to identify the population segment that includes these families.

In response, the applicant stated the following:

> The number of Alcorn State University students having their own cars was determined through conversations with campus security officials. However, this information was not specifically used in the 2003 ETE Study calculations. While the current state and local plans establish provisions for identifying the numbers and locations of transport-dependent individuals and for evacuating these individuals, for vehicle loading purposes, the 2003 ETE Study assumed that all of the Alcorn State University evacuee population would be transported in privately-owned vehicles (see 2003 ETE Study Assumption 2.13).
>
> Per Assumption 2.15, the ASU student population was set at 2,400. An additional 750 persons were added, accounting for ASU employees, resulting in a sub-total of 3,150 persons. Further, some portion of staff and their families reside on campus (estimated at 182 persons; rounded conservatively up for the Study to 200 persons). Even though some double counting was incurred, this

> value of 200 was added to 3,150 to arrive at what is considered an appropriately conservative value for the ASU evacuee population. This value of 3,350 persons was used as the special facility population in PAA 6. See Table 3-3 and 3-4. Thus, there was no explicit distinction made between auto-owning and transportation-dependent persons for the ASU evacuation population. This assumption provides a conservative estimate of evacuation roadway vehicle loading.
>
> As discussed in Section 2.2.3.6, the ASU housing/campus complex is located on the outer boundary of the plume exposure pathway EPZ with the majority of the campus just outside the 10 mile circle. Assumptions regarding ASU's population are considered appropriate for the purposes and goals of this Study. In addition, evacuees must only proceed a relatively short distance to move out of the defined EPZ. Furthermore, the primary evacuation route from the campus is MS State Highway 552 which, within a short distance from the campus, becomes a 4-lane freeway with a 55 mph speed limit (2003 ETE Study, Section 3.3.1). Thus, small to moderate changes in ASU related populations and vehicle capacity assumptions are likely to have very little impact on evacuation from the plume exposure pathway EPZ.

The applicant updated Assumption 2.15 in Revision 1 to the 2003 ETE study and in Revision 2 to Part 4 of the application to clarify the treatment of the total ASU evacuee population, as described above.

The State and local plans identified in the application do not provide information regarding school bus availability or capacity. In RAI 13.3-79c and subsequently Open Item 13.3-1g, the staff asked the applicant to provide additional information regarding the availability of buses and drivers and the process for mobilizing them during an evacuation to transport students in Claiborne County and Tensas Parish (e.g., whether evacuations can occur in a single trip or require return trips). In response, the applicant stated that SERI believed it had provided sufficient information regarding emergency plans in accordance with 10 CFR 52.17, and that this issue would be more appropriately addressed in the context of full and integrated emergency plans, which would be submitted with a COL application, rather than this ESP application.

In RAI 13.3-79d, the staff asked the applicant to provide travel times for special facility populations and information supporting the assumptions for the time distributions. In response, the applicant stated the following:

> The 2003 ETE Study did not explicitly evaluate travel times and time distributions, but rather made comparisons of likely changes in vehicle loadings from those described in the 1986 ETE to the resulting figures of the 2003 ETE Study, using updated population values. The results of this comparison were then assessed in light of the capacity of the current evacuation roadway network. This approach is considered adequate and appropriate for the purposes of this Study.

In RAI 13.3-93, the staff asked the applicant to clarify inconsistencies between the schools and special facilities listed in Table 2-1 of Part 4 and the special facilities for Claiborne County and

Tensas Parish identified in the 2003 ETE study. In response, the applicant stated the following:

> Sections 3.1, "Tensas Parish, Louisiana," and 3.2, "Claiborne County, Mississippi," of the 2003 ETE Study should have listed only those special facilities for which special transportation resources are required:
>
> 1. Alcorn State University (ASU) and Lake Bruin Country Club should not have been listed in these sections. See response to RAI 13.3-79 regarding ASU. Persons at Lake Bruin Country Club were included in the transient recreational segment and would evacuate by private vehicles.
>
> 2. The Richardson School should have been listed as a special facility population segment. Table 2-1 of Part 4 listed all of the special facilities in the Plume Exposure EPZ, regardless of transportation arrangements.

The applicant amended Table 2-1 in Revision 2 to Part 4 of the application and Sections 3.1, "Tensas Parish, Louisiana," and 3.2, "Claiborne County, Mississippi," of the 2003 ETE study, Revision 1, to provide a consistent listing of special facilities, as described above. The applicant noted that these updates relate only to the presentation of information and do not alter the accounting of evacuees in the various population segments; thus, the changes have no impact on the study's conclusions.

Section D.1.g, "Local Government, School Board," of Enclosure I to Attachment 2 to LPRRP Supplement II indicated that the school board was responsible for providing buses and drivers for the evacuation of students, residents, and transients from affected areas. Section II.F, "Special Needs Facilities," of MREPP Annex F also identified the use of buses and ambulances from neighboring communities, such as Natchez and Vicksburg, for transporting special needs persons in the event of an evacuation. In RAIs 13.3-87b and 13.3-87c, the staff asked the applicant to provide trip generation times for these population groups that address the mobilization and availability of buses (e.g., whether single trips will suffice or if return trips will be necessary). In addition, in RAI 13.3-87d, the staff asked the applicant to clarify whether the trip generation times estimated for the evacuation include the mobilization of available transportation for mobility-impaired people and special needs populations, as described in Section II.F, "Special Needs Facilities," of PGCCREPP Annex F.

In response to RAIs 13.3-87b, 13.3-87c, and 13.3-87d, the applicant stated that the 1986 ETE was performed before the publication of NUREG/CR-4831; therefore, it was not fully consistent with that document. The applicant also indicated that, while the 1986 ETE did not use the term "trip generation time," Section 1.1 of the 1986 ETE stated that the estimates included the times required for public notification, preparation, mobilization, and actual movement out of the EPZ from various areas, during different times, and under a range of weather conditions. These concepts appeared to be consistent with those included in the NUREG/CR-4831 discussion of trip generation times. In addition, the applicant stated the following:

> With regard to the weekend transient population in Evacuation Analysis Area 8, the applicant notes that Evacuation Analysis Area 8 includes the entire EPZ. Table 3-1 of the 2003 ETE Study indicates that the weekend recreational transient population has dropped from 2728 (in 1986) to 1820 (in 2002). Therefore, the applicant believes that the estimated evacuation times for this

> population segment are adequately bounded by the 1986 ETE, as updated by the 2003 ETE Study.

13.3.3.11.1.7 Emergency Planning Zone and Subareas. Section 2, "Emergency Planning Zone and Sub-Areas," of the 1986 ETE described the subareas analyzed, including one 0–2 mile case, two 0–5 mile cases, four 0–10 mile cases, and one full EPZ. This approach was consistent with Section 5.1, "Description of the Evacuation Sub Areas," of the 2003 ETE study. However, Appendix 4 to NUREG-0654/FEMA-REP-1 stated that applicants should consider analysis areas of approximately 2 miles and 5 miles, both with four 90-degree sectors. Section 2 of the 1986 ETE indicated that the study did not evaluate two 90-degree cases from 0–5 miles because these areas have virtually no population.

Table 6, "Evacuation Clear-Time Estimates," of the 1986 ETE provided estimates for each of the eight subareas for the four scenarios evaluated, with times ranging from 135–150 minutes. These estimates were consistent with those provided in Table 5-1, "Summary of Evacuation Time Estimate Assumptions and Differences," of the 2003 ETE study.

13.3.3.11.1.8 Traffic Capacity. The 1986 ETE described the evacuation roadway network in Section 4.0 and Table 5, "Primary Evacuation Routes," and illustrated it in Figure 11, "Designated Evacuation Routings Within the EPZ." The analysis of evacuation traffic flow operations, described in Section 7.0, "Analysis of Evacuation Traffic Flow Operations," of the 1986 ETE, concluded that only two areas would experience minor vehicle queuing and that all other roadways have surplus capacity to meet the demand from evacuation. According to the 1986 ETE, the major area of vehicle queuing and delay within the plume exposure pathway EPZ (until approximately 100 minutes into the evacuation) will occur northeast of the plant through Ingleside as a result of the relatively high vehicle demand associated with GGNS during weekday periods. The 1986 ETE also identified temporary queuing along State Route 128, out of St. Joseph, Louisiana.

A subsequent evaluation of significant changes to major roads, described in Section 4.0 of the 2003 ETE study, concluded that, with the exception of the two areas of roadway identified in 1986 where vehicle queuing would occur, all other roadways in the evacuation network have excess capacity such that traffic tends to remain in free-flow conditions. Section 3.3.3 of the 2003 ETE study further indicated that queuing in this area should no longer occur because the workforce has decreased. The applicant stated in response to RAI 13.3-74b, discussed previously, that the projected workforce is not considered a significant concern in future planning because of the much improved capacity of the major evacuation route (i.e., U.S. Highway 61). The applicant also stated the following:

> However, it is recognized that the total evacuation workforce population for the impacted area, PAA1 [Protective Action Area 1], would increase. The primary evacuation routing would be from the GGNS site, over the Grand Gulf Road to the east to Highway 61, and then north toward Vicksburg (2003 ETE Study, Table 4-1). As a practical matter, the 1986 ETE actually used a workforce population much larger than the current workforce. Thus, as shown in the 2003 ETE Study, Table 5-1 for PAA1, the difference between PAA vehicle demand decreased from 1986 to 2002 by 500 vehicles. Based on bounding projections for the proposed new facility, the workforce could be as high as 1160 persons

(Environmental Report, Table 3.0-1, Item 17.5). Without offering an exact assessment, it can be concluded that the increase in some additional 1200 persons is generally offset by the decrease in vehicle loading from 1986 to 2002. Thus, the overall impact to 1986 conclusions regarding evacuation time would be generally unchanged. Given this quantitative assessment, it is further concluded that the evacuation of the total workforce, including the proposed new facility, would not pose a physical characteristic that would be a significant impediment to developing a fully integrated emergency plan.

Section 10 of the 1986 ETE provided the analysis for the road segment characteristics, consistent with Appendix 4 to NUREG-0654/FEMA-REP-1. Table 4-1, "GGNS EPZ Roadway Analysis 1986–2002," of the 2003 ETE study described roadway improvements made within each defined PAA and lists a revised estimated roadway capacity. Table 2-2 of Part 4 also summarized the roadway capacities, but these estimates are not consistent with the 2003 ETE study. In RAI 13.3-90, the staff asked the applicant to clarify the differences in the evacuation route roadway capacities provided in Table 4-1 of the 2003 ETE study and Table 2-2 of Part 4. In response, the applicant stated that it updated the roadway capacities in Tables 4-1 and 5-1 in Revision 1 to the 2003 ETE study and Table 2-1 of Revision 2 to Part 4 to ensure consistency between the documents. In addition, the applicant stated that these changes have no impact on the findings for a given PAA or on the study's conclusions.

Section II.H.4, "Evacuation Travel," of PGCCREPP Annex F indicated that potential impediments (e.g., natural disasters and the seasonal impassability of roads) may create a major problem in the use of evacuation routes. In RAI 13.3-91a, the staff asked the applicant to clarify whether the ETE adverse weather scenarios consider the evacuation roadways known to be impacted by seasonal conditions (e.g., flooding). In response, the applicant stated the following:

> Assumption 2.11 of the 2003 ETE Study indicates that the applicant conservatively assumed a 25% reduction in roadway traffic capacity for adverse weather conditions. (See also the response to RAI 13.3-95.) This is consistent with the approach used in the 1986 ETE. No roadways were given unique consideration (or penalty) in the 2003 ETE Study due to the special weather-related situations.
>
> For the purposes of the Study, it is considered appropriate and sufficient to apply a conservative traffic capacity penalty across the board to all routes rather than consider unique, local impacts to one area. It is recognized, however, that planning must consider possible changes and impact to planned routes due to adverse weather conditions. Consideration of these impacts is a prudent component of contingency planning and is evidenced by the referenced local plan's discussion and procedural guidance, if such physical impediments arise.

In addition, in RAI 13.3-91b, the staff asked the applicant to clarify whether the ETE analysis considers the impact of traffic passing through the EPZ and any potential effect on an evacuation. In response, the applicant stated the following:

> The GGNS site and EPZ are located in a rural area where traffic congestion is rare. The 2003 ETE Study found that surplus capacity exists on many of the

evacuation roadways. Table 4-1 of the 2003 ETE Study includes information on average daily traffic counts on the designated evacuation roadways. A comparison of the average daily traffic count to the corresponding roadway capacities indicates that the background traffic is a small fraction of the roadway capacity. Because traffic control measures will limit traffic into the EPZ following declaration of an emergency, the applicant believes it is unlikely that background traffic will have a significant effect on evacuation times. In addition, interviews with state DOT officials and local emergency management officials indicated that they believe that the evacuation time estimated by the 1986 ETE remains accurate or conservative. (See also response to RAI 13.3-96 regarding discussions with local officials.)

In Section 2.2.3.6 of Part 4, the applicant indicated that ASU Stadium may have 20,000 or more visitors on some football game days, which may occur five or six times in the fall. While Section 2.2.3.6 of Part 4 indicated that traffic control in the campus areas was adequate to ensure that a large temporary traffic increase on the roads from an ASU football game will not prevent or preclude other residents from accessing roadways to evacuate if necessary, the 1986 ETE analysis did not include this assumption. Therefore, it may not have been analyzed. In RAI 13.3-80, the staff asked the applicant to provide further information in support of its conclusion. In response, the applicant stated the following:

The proximity of Alcorn State University (ASU) to the GGNS site is clearly recognized in the planning efforts of the licensee and state/local agencies. The most obvious indication of this is that the standard 10 mile plume exposure pathway EPZ has been expanded to include and define a unique Protective Action Area (PAA 6) along the SW compass point. Thus, population estimates, evacuation, etc. for PAA 6 are included in emergency planning efforts. However, the NRC is correct in noting that the particular circumstance involving the presence of potentially large crowds on the ASU campus for football games was apparently not specifically considered in the 1986 ETE. As a matter of completeness, the applicant considered it to be prudent to address this special situation in the 2003 ETE Study, even though the probability of an emergency at the GGNS severe enough to warrant evacuation occurring coincidentally with a particular type of high attendance athletic contest at ASU is considered quite low. The following summarizes the treatment of this subject:

1. This special circumstance was, in general, approached in a more qualitative manner. The following repeat key points already stated in Study Section 2.2.3.6:

    a. The event itself is relatively infrequent, that is 5 or 6 games per year.

    b. The campus itself is located on the extreme boundary of the 10 mile circle (from the site); thus, as a practical matter the physical evacuation requires only a short travel distance to be beyond the EPZ boundary.

c. The primary evacuation route utilizes State Highway 552 which is a relatively high capacity, four lane freeway allowing efficient movement of evacuees east to the primary roadway south, U.S. Highway 61.

d. Effective traffic control measures are expected since, as a practical matter, the movement of these game day populations is demonstrated each year. The campus police, in effect, must implement their traffic plans to control and facilitate outbound traffic several times each year, far more often than the exercising of broader emergency plans.

e. Also, while not explicitly mentioned in Study Section 2.2.3.6, given a student population of 3100 (Study Section 3.3.1), it can be concluded that the bulk of the stadium population would be not students and that these would likely have come to the game with 2 to 4 persons per vehicle. Thus, evacuation of the crowd would take advantage of higher vehicle loading.

2. To provide greater confidence on this matter, as part of the 2003 ETE Study, informal discussions were held with ASU campus police staff involved in the handling of game-day traffic, including the explicit issue of evacuating the stadium crowd in the event of a simultaneous emergency at the GGNS site. Interviews with the campus police indicated that they remained confident that the stadium/campus crowd could be evacuated within the estimated 3 hour ETE estimate, determined in 1986.

3. Regarding the potential constraint of ASU game traffic, there would be no overall changes to the conclusions, namely, that evacuation would occur to other outbound emergency evacuation traffic in that PAA or other PAAs.

   a. Referring to Figure 2-6 and 2003 ETE Study Table 4-1, there are 5 PAAs in the southern portion of the EPZ, namely 4a, 4b, 5a, 5b, and 6 (which includes ASU).

   b. Of these 5 PAAs, only 5a and 6 (per Study Table 4-1) are to use Highway 552 and then Highway 61 South. Of the remaining 3 areas, only PAA 5b is to use Highway 61.

   c. PAA 5a: It is recognized that should evacuation of 5a be required concurrent with a game on the ASU campus, the evacuation of PAA 5a would likely be delayed. However, the vehicle load evacuating PAA 5a is quite small, i.e., less than 15 vehicles (2003 ETE Study Table 5-1). Their evacuation would be delayed by being incorporated into the ASU traffic flow but would be expected to be within the 3 hour ETE estimate, based on the above discussion.

d. PAA 5b: This PAA is directed to Highway 61 south. Its evacuating vehicle load is greater than PAA 5a but still small, i.e., approximately 200 vehicles (2003 ETE Study Table 5-1). The evacuation of PAA 5b on Highway 61 south could be delayed by the Highway 552 merger of game traffic on Highway 61 (well outside of the 10 mile EPZ). However, it is expected that the addition of 200 additional vehicles would not substantially change the overall result, that game traffic can be moved off campus and out of the area within 3 hours. Another consideration is that ASU game day exits are accomplished using the current Highway 61 which to the south is 2 lanes. As noted in Table 4-1 of the 2003 ETE Study, Mississippi Department of Transportation planning calls for the additional improvement of Highway 61 South to a four lane freeway similar to the current portion of the highway north of Port Gibson (to Vicksburg). With the added capacity, the evacuation of PAAs 5a, 5b, and 6 would be significantly more rapid.

e. PAA 4a, 4b: These PAAs, while south of the GGNS site, are evacuated to the east towards Hazelhurst, MS on Highway 547 (Study Table 4-1) and would expected to have no practical impact on the evacuation of ASU game-day traffic to the south.

In summary, it is recognized that the potential football game-day crowd can be significant. However, it is considered a rare event and is handled effectively when the games do occur. A qualitative assessment of the evacuation, coupled with interviews with local authorities having the responsibility for the safety of the campus visitors, gives confidence that this location on the extreme boundary of the EPZ can be evacuated effectively. While a more rigorous, quantitative approach was not used, it is expected that such an effort would yield the same conclusion and is not warranted in this instance. The alternative, qualitative assessment described above is considered adequate for this purpose. The evacuation of ASU game-day crowds is not considered an emergency planning concern and does not represent a significant impediment to the development of emergency plans in support of the proposed new facility. Furthermore, this analysis demonstrates that the essential elements of advance planning have been considered and that provisions have been made to cope with emergency situations.

In RAI 13.3-85, the staff asked the applicant to clarify whether it had verified the evacuation routes in the field to determine if the assessment of changes addresses potential impediments in the roadway network. If so, the applicant should describe the method(s) used. In response, the applicant stated the following:

As indicated in Section 1.4 of the 2003 ETE Study, the evaluation included interviews with Mississippi and Louisiana Department of Transportation (DOT) supervisors. Following these interviews, a field verification was conducted by the 2003 ETE Study author, accompanied by a representative of the GGNS Emergency Planning staff, to validate information on the major evacuation

> roadways provided by DOT personnel. The interviews and personal observations included sufficient detail to identify potential impediments in the roadway network.
>
> In general the "field verification" involved the verification of roadway network improvements that were described by local officials in the above noted introductory interviews. This activity generally consisted of the observation of various qualities of the roadway, as needed, such as number of lanes, posted speed limits, lines of sight availability, intersection markings, traffic control devices, etc. One goal of the field work was to note if any obvious physical characteristics existed that might represent a significant impediment to the later expansion of current emergency plans. No such characteristics were noted. Beyond that, the overall goal was to provide additional assurance that roadway capacities, as described by the state DOT, were reasonable based on the roadway qualities observed and the professional judgement of the verification team. This method was considered sufficient and appropriate to support use of roadway capacities in the 2003 ETE Study.

Section 6.0 of the 2003 ETE study indicated that the emergency management directors and the highway foremen in Tensas Parish, Louisiana, and Claiborne County, Mississippi, agreed with the conclusion of the 1986 ETE, that the entire EPZ can be evacuated in less than 3 hours at any time of day or in any weather conditions, remained valid. In RAI 13.3-96 and subsequently in Open Item 13.3-4, the staff asked the applicant to clarify whether the applicable State emergency management and transportation officials/agencies have reviewed the conclusions from the 2003 ETE study and the preliminary analysis described in Section 2.2.4.4 of Part 4 of the application. In response, the applicant stated that SERI believed it had provided sufficient information regarding emergency plans in accordance with 10 CFR 52.17, and that this issue would be more appropriately addressed in the context of full and integrated emergency plans, which would be submitted with a COL application, rather than this ESP application. Subsequently, the GGNS licensee, in response to a RAI, stated the following in its letter dated June 28, 2005:

> All agencies in the States of Louisiana and Mississippi agreed that the 2003 ETE results support the conclusion in the 1986 ETE study, that the entire EPZ can be evacuated in any time of day or weather conditions in less than 3 hours and remains valid.

The applicant described its concept for implementing protective measures for the plume exposure pathway and provided maps showing evacuation routes, evacuation/shelter areas, and relocation centers in host areas. Figure 3-2 in Part 4 illustrated the designated evacuation routes within the plume exposure pathway EPZ based on those currently contained in the GGNS Unit 1 emergency plan and the 1986 ETE. In RAI 13.3-42, the staff asked the applicant to provide a legible version of Figure 3-2 or a description of evacuation routes. In Revision 2 to Part 4, the applicant provided an updated version of Figure 3-2 in electronic format to facilitate its enlargement and review by the NRC.

Figure 3-3, "Mass Care Reception Center Locations," in Part 4 showed the locations of mass care reception centers in the State of Mississippi based on those currently contained in the GGNS Unit 1 emergency plan. In Section 3.10.2 of Part 4, the applicant indicated that

Figure 3-2, instead of Figure 3-3, depicted the locations of existing mass care reception centers. In RAI 13.3-43, the staff asked the applicant to provide a legible version of Figure 3-3 or a description of the mass care reception center locations in the State of Mississippi, and clarify the discrepancy in the figure reference. In Revision 2 to Part 4, the applicant provided an updated version of Figure 3-2 in electronic format to facilitate its enlargement and review by the NRC. The applicant revised the figure to illustrate the mass care reception center locations in the State of Mississippi. In addition, Revision 2 to Part 4 of the application also modified Section 3.10.2 to clarify that Figure 3-2 illustrated the planned evacuation routes and that Figure 3-3 depicted the locations of existing mass care reception centers for evacuees.

In RAI 13.3-44, the staff asked the applicant to provide a map illustrating the location of and general routes to reception centers in the State of Louisiana. In Revision 2 to Part 4, the applicant amended Figure 3-3 to comply with this request.

Appendix 1, "GGNS 10 Mile (Plume Exposure Pathway) EPZ," to MREPP Annex O included a map showing the sectors. Appendix 3, "GGNS Evacuation," to MREPP Annex O provided maps showing the evacuation routes and reception and shelter facilities in the State of Mississippi. In RAI 13.3-63 and subsequently Open Item 13.3-1h, the staff asked the applicant to provide a map of the evacuation/shelter areas or, as referred to in Part 4, PAAs (e.g., Area 1, 2A/B) for MREPP Annex O. In response, the applicant stated that SERI believed it had provided sufficient information regarding emergency plans in accordance with 10 CFR 52.17, and that this issue would be more appropriately addressed in the context of full and integrated emergency plans, which would be submitted with a COL application, rather than this ESP application.

Appendix B to Attachment 2 to LPRRP Supplement II included a map showing the PAAs within the established plume exposure pathway EPZ for GGNS. Tab C, "Evacuation Routes for the Established Plume Exposure Pathway 10-mile EPZ for GGNS," of Appendix D to Attachment 2 to LPRRP Supplement II provided the evacuation routes in the State of Louisiana. Enclosure I to Attachment 2 to LPRRP Supplement II depicted the reception centers for the State of Louisiana in Figure G-1, "Tensas Parish Reception Centers and Shelter Locations," and Figure G-1a, "Reception Center and Shelter Listing."

The applicant included maps showing population distribution around the site. Section 2.2 of Part 4 described the 2003 ETE study and included the following figures illustrating population distribution around the site:

- Figure 2-4
- Figure 2-5, "Projected 2002 Population Distribution 10–50 Mile Radius"
- Figure 2-6

However, Figure 2-6 in Part 4 appeared to be inconsistent with Figure 1.1 of the 2003 ETE study, which showed an evacuee population of 197 in Area 2b and 400 in Area 3b. Figure 2-6 gave an evacuee population of 365 in Area 2b and 509 in Area 3b. In RAI 13.3-45, the staff asked the applicant to provide an updated Figure 2-6 for Part 4, consistent with Figure 1.1 of the 2003 ETE study. In response, the applicant stated the following:

> Both of the subject figures, that is Figure 1.1 from the 2003 ETE Study and Figure 2-6 in Part 4, not only present the boundaries of the plume exposure

pathway EPZ, but also are provided for illustrative purposes, giving an overall sense of evacuation population by protective action area (PAA). The key data results for evacuation are found in Table 3-4 of the Study.

In general, the staff is correct in noting inconsistencies in the 2003 ETE Study Figure 1.1 and Part 4 Figure 2-6. Upon further review of the figures, it is concluded that both Figure 1.1 (Study) and Figure 2-6 (Part 4) should be updated and reflect the same totals for each PAA. Table 3-4 was reviewed and confirmed to accurately present the total evacuation population (for the limiting scenario, that is, peak weekday). The total limited evacuation value, as currently described in Sections 2.3.3.7, is 20,369 persons. Due to several minor adjustments, there will be a slight, net increase in this value to 20,505 persons.

According to the applicant, because the subject figures illustrated results, corrections to these figures do not impact the 2003 ETE study, its results, or its conclusions.

Figure 2-5 of Part 4 illustrated a projected 2002 population distribution for a 10–50-mile radius. However, Part 4 did not discuss the source for these population estimates, nor was it readily apparent in the 2003 ETE study. In RAI 13.3-46, the staff asked the applicant to identify the source for the estimates. In response, the applicant stated that, as indicated by the footnote in Section 2.2.2 of Part 4, it derived the 2002 population projections from 2000 data published by the U.S. Census Bureau.

Appendix 1, “Maps and Supporting Attachments, Evacuation Route Protective Action Area/Population Density Maps,” to PGCCREPP Annex O contained maps which showed the boundaries, evacuation route, permanent resident population, estimated transient population, and estimated evacuee population for each area.

Tab B, “1985 Projected Permanent and Transient Populations,” of Appendix B to Attachment 2 of LPRRP Supplement II included a map showing the population within the Louisiana PAAs for the established GGNS plume exposure pathway (10-mile) EPZ.

The applicant also discussed its proposed means for notifying all segments of the transient and resident populations.

Section 3.5.3 of Part 4 indicated that, because of the proximity to and common EPZ boundaries with GGNS Unit 1, the applicant expected the proposed new facility to share the existing ANS used for GGNS as the primary means for notifying the population within the plume exposure pathway EPZ, including the transient population. In addition, the applicant will supply institutions located in the plume exposure pathway EPZ with tone-activated receivers to supplement the siren system.

In Section 3.10.2 of Part 4, the applicant stated that the affected counties or parishes will be responsible for warning and/or advising the population at risk of an impending emergency. The State of Mississippi will prepare written messages for emergency dissemination to the public, accompanied by support information provided by the proposed new facility. In RAI 13.3-48, the staff asked the applicant to state whether the written messages refer to the EAS and to identify the responsibility for the preparation of written messages in the State of Louisiana. In Revision 2 to Part 4, the applicant amended Section 3.10.2 to state the following:

> Warning and/or advising the population-at-risk of an impending emergency will be the responsibility of the counties or parishes affected. These counties or parishes also will be responsible for the preparation and dissemination of informational material concerning protective actions for the general public. Written messages for emergency dissemination to the public will be prepared by the States of Mississippi and Louisiana with supporting information provided by the proposed new facility. These messages will be distributed via the Emergency Alert System. These prepared messages will be documented in the affected state emergency plans.

Section II, "Concept of Operations, General," of MREPP Annex C provided extensive information concerning the ANS and the notification process in the State of Mississippi. The MREPP further stated that the public ANS provided the State of Mississippi with the capability to transmit both an alert signal, via sirens, and an informational or instructional message, via the ENS, to essentially 100 percent of the population throughout the plume exposure pathway EPZ within 15 minutes of a protective action decision. State and local officials shared the responsibility for activating this system. In addition, tone-alert receivers placed in various locations supplemented the siren system.

Section II.C, "Responsibilities," of MREPP Annex C designated MEMA as responsible for activating the ENS and noted that PGCCCD activates the ANS, including the tone-alert receivers. The Claiborne County Sheriff's Office will supplement the ANS through route alerting to ensure adequate coverage in the event of a siren failure.

Section II.B, "Protective Response," of PGCCREPP Annex E provided for the activation of the siren system, in coordination with MEMA and MSDH/DRH, should any protective action for the

general public be implemented. The PGCCCD will advised Tensas Parish before siren activation.

Section II.A, "Situation," to LPRRP Chapter 4 indicated that the public ANS combines parish/State and utility alert systems (e.g., sirens, monitors, and mobile loudspeakers), as well as alert stations for notification. Section F.7 of Enclosure I to Attachment 2 to LPRRP Supplement II further stated the following:

> An Alert Notification System located throughout the 10 mile EPZ will be used to alert the public to listen to...the ENS radio stations. That portion of the system located within the [Tensas] Parish will be activated from the Parish EOC.... Special notification devices (tone activated alarm pagers) are provided by special facilities including schools, hospital, and major employers....
>
> Mobile sirens and public address systems mounted on patrol cars, fire department and other emergency vehicles could provide backup to the Alert Notification System.

Section E.5 of the enclosure listed the primary alert system for Tensas Parish as comprising a combination of fixed sirens, tone-activated radios, and reliance on the USCG for the notification of ships along the Mississippi River. Should an element of the primary alert system fail, a

number of backup methods were available, including route alerting in populated and wetland areas, commercial telephones, and tone-activated radios.

The applicant described the proposed means for protecting those persons whose mobility may be impaired. Section 3.10.2 of Part 4 indicated that the proposed new facility will provide PARs to State and local civil defense agencies. The States of Mississippi and Louisiana and the counties/parishes within the plume exposure pathway EPZ are responsible for implementing protective actions offsite.

Tab C, "Special Needs Population," of Appendix 5 to MREPP Annex F noted that, in the State of Mississippi, a precautionary transfer of the special needs population out of the area may occur during a site area emergency classification in order to effectively remove that population segment from the traffic flow associated with an evacuation during a general emergency classification. The special needs population will be transported to the host county reception centers; those members of this population who require medical attention will be transported to the nearest support hospital.

Appendix 8 to PGCCREPP Annex F addressed actions for the special needs population and stated that the Claiborne County public transportation coordinator was responsible for notifying special needs groups and/or persons, except for schools, within Claiborne County.

Section III, "Concept of Operations," of LPRRP Chapter 7 noted that private automobiles, augmented by buses, will serve as the principal means of transportation in the event of an evacuation in the State of Louisiana. Specific arrangements existed for the transportation of institutionalized persons and schoolchildren. Section IV.A.5, "Potassium Iodide," of LPRRP Chapter 7 provided information on the use of KI for institutionalized persons who are unable to evacuate quickly. It defined institutionalized persons as those individuals residing in nursing homes or confined to hospitals or penal institutions. Section G.3, "Protective Response for the Plume Exposure Pathway, Evacuation," of Enclosure I to Attachment 2 to LPRRP Supplement II also addressed evacuation for special needs populations, including schools, medical facilities, and incarceration facilities.

The applicant also proposed the methodology for the use of radioprotective drugs for emergency workers and institutionalized persons. Appendix 5, "Potassium Iodide Policy," to MREPP Annex G provided information about KI and its use and indicated that the State of Mississippi had opted not to provide KI to the general public. In addition, KI in tablet form was available to emergency workers, hospitals, and nursing homes located within the plume exposure pathway EPZ. The Claiborne County plan specified those facilities, municipalities, agencies, and teams that receive KI for use by emergency workers.

Section II.E, "The Use of Potassium Iodide," of PGCCREPP Annex G indicated that KI will be taken only at the direct order of the State health officer, in accordance with MSDH policy. The PGCC radiological officer will ensure that KI was distributed at the time of an emergency, according to established arrangements. Other guidance contained in Appendix 3, "Potassium Iodide Policy," to PGCCREPP Annex G was consistent with the MREPP. In RAI 13.3-64 and subsequently Open Item 13.3-1c, the staff asked the applicant to describe the means for using radioprotective drugs for institutionalized persons within the Mississippi portion of the plume exposure pathway EPZ whose immediate evacuation may be infeasible or very difficult. In response, the applicant stated that SERI believed it had provided sufficient information

regarding emergency plans in accordance with 10 CFR 52.17, and that this issue would be more appropriately addressed in the context of full and integrated emergency plans, which would be submitted with a COL application, rather than this ESP application.

Section IV.A.5 of LPRRP Chapter 7 provided information on the use of KI for institutionalized persons in the State of Louisiana who are unable to evacuate quickly. Section V.B, "Radiological Exposure Control Measures for Emergency Workers," of LPRRP Chapter 9 stated that KI will be available for use by emergency workers operating in the risk area during an emergency. Section V.B further stated that KI will be administered with the approval of the Department of Health and Hospitals (DHH) State health officer, in accordance with State policy.

Section IV.5, "Radiological Exposure Control, Concept of Operations," of Attachment 2 to LPRRP Supplement II indicated that arrangements will be made for the acquisition, distribution, and use of KI at the time of an accident. The use of KI will be considered for emergency workers and institutionalized persons in the State of Louisiana who may not be able to evacuate immediately. Section D.2, "Parish-Level State Support Agencies," of Enclosure I to Attachment 2 to LPRRP Supplement II indicated that the Parish Health Unit of the State DHH was responsible for assisting with the expedient acquisition of radioprotective drugs and for their use by emergency workers and institutionalized persons, if required. In RAI 13.3-65 and subsequently Open Item 13.3-1c, the staff asked the applicant to describe the means for the use of radioprotective drugs by emergency workers and institutionalized persons within the plume exposure pathway EPZ in the State of Louisiana whose immediate evacuation may be infeasible or very difficult. In response, the applicant stated that SERI believed it had provided sufficient information regarding emergency plans in accordance with 10 CFR 52.17, and that this issue would be more appropriately addressed in the context of full and integrated emergency plans, which would be submitted with a COL application, rather than this ESP application.

The applicant described the proposed means for relocation. Section II.B, "Protective Action," of MREPP Annex E provided information on the actions taken by the State and local governments at the establishment of the alert, site area emergency, and general emergency notification classes in the State of Mississippi. Section II, "Concept of Operations," of MREPP Annex F provided additional details on actions taken to support the evacuation of the plume exposure pathway EPZ, including the evacuation of special populations.

Section IV, "Organization and Responsibilities," of the PGCCREPP Basic Plan listed the responsibilities of organizations in Claiborne County and the City of Port Gibson, relative to their involvement with identifying and providing for transportation needs during an evacuation. Section II.F and Section II.G, "Medical and Public Health Facility Evacuation," of PGCCREPP Annex F provided details on the evacuation of special needs facilities, including hospitals and nursing homes.

Section III of LPRRP Chapter 7 noted that private automobiles, augmented by bus transportation, will serve as the principal means of transportation in the event of an evacuation. In addition, Section III.E indicated that specific arrangements have been made for the transportation of institutionalized persons and schoolchildren. Section II.N, "Concept of Operation," of Attachment 2 to LPRRP Supplement II stated that privately owned vehicles will be the primary mode of transportation, which was consistent with Section G.3 of Enclosure I to the attachment. Section D.1.g, "Local Government, School Board," of Enclosure I also

indicated that the Tensas Parish School Board was responsible for providing school buses and drivers to assist in the evacuation of residents and transients from the affected areas. In addition, Section D.1.h, "Local Government, American Medical Response Ambulance Service," assigned the responsibility of providing transportation support for nonambulatory evacuees.

The applicant discussed potential relocation centers in host areas. Section II.D, "Reception Centers," and Section II.E, "Shelter Facilities," of MREPP Annex F listed the reception centers and shelter facilities for GGNS in the State of Mississippi. Appendix 5 to MREPP Annex F provided the addresses for these facilities. Appendix 7, "Reception Center and Shelter Facility Operations," to PGCCREPP Annex F also listed the reception centers and shelter facilities (at least 20 miles from the GGNS site) and their locations. Tab B, "GGNS Shelter Facilities," of Appendix 5 to MREPP Annex F and Tab B, "GGNS Shelter Facilities," of Appendix 7 to PGCCREPP Annex F addressed the availability of shelters and indicated that their total capacity in the State of Mississippi is 7217.

Figures G-1 and G-1a in Enclosure I to Attachment 2 to LPRRP Supplement II provided a map and addresses for the three reception centers in the State of Louisiana, as well as their relative locations from the GGNS site, but did not provide information on shelter capacity. In RAI 13.3-75 and subsequently in Open Item 13.3-1i, the staff asked the applicant to describe its plans to address shelter facility capabilities based on any anticipated population increase within the plume exposure pathway. In response to RAI 13.3-75, the applicant stated that the currently implemented State and local plans, which provided for sheltering as a possible protective action, must be periodically reviewed and updated. According to the applicant, the 2003 ETE study, made available to State and local agencies, will be considered for possible impacts to State and local plans, including shelter capacity adequacy. In addition, the applicant's response to Open Item 13.3-1i stated that SERI believed it had provided sufficient information regarding emergency plans in accordance with 10 CFR 52.17, and that this issue

would be more appropriately addressed in the context of full and integrated emergency plans, which would be submitted with a COL application, rather than this ESP application.

In Table 2-2 of Part 4 of the application, the applicant projected the traffic capacities of the evacuation routes under emergency conditions. Table 2-2 also listed the roadway capacity (vehicles per hour) for each of the primary evacuation routes, based on the 2003 ETE study.

The applicant also described the control of access to evacuated areas. Section 3.3.1.3 of Part 4 stated that the Claiborne County Sheriff's Department and the Port Gibson Police Department may be activated to assist in emergency efforts, including controlling access to areas affected by the emergency. The applicant did not specify the organization(s) responsible for such control in Louisiana. In RAI 13.3-47, the staff asked the applicant to clarify whether it intended Section 3.3.1.3 of Part 4 to describe measures to control access to areas at the proposed reactor site or within the plume exposure pathway. In response, the applicant stated that, with respect to the provisions for controlling access to areas affected by the emergency, the local law enforcement agencies control entry to public roads and other areas accessible to the public. Although this necessarily affects the accessibility of the site via public roadways, the site security force retains responsibility for controlling site access. The applicant expected that similar arrangements will be made for the proposed new facilities. In Revision 2 to Part 4, the applicant amended Section 3.3.1.3 to clarify the roles of local law enforcement agencies, consistent with Supplement 2 guidance:

> Law enforcement responsibilities will include controlling matters of civil disorder within Claiborne County (provided by Sheriff's Department) and within the city limits of Port Gibson (provided by Sheriff's Department and Port Gibson Police Department).

In addition, the applicant indicated in Section 3.3.2.7 of Part 4 that USCG has jurisdiction over Mississippi River traffic, and that the USCG Captain of the Port exercised his authority to control traffic through the establishment of a safety zone in the immediate area.

Appendix 6, "Traffic Management Concepts," to MREPP Annex F and Appendix 5, "Traffic Management Concepts," to PGCCREPP Annex F assigned the responsibility for controlling access to the evacuated areas around GGNS in the State of Mississippi to the Highway Patrol, local law enforcement, the National Park Service, and MDOT.

Section IV.A.3, "Access Control," of LPRRP Chapter 7 defined access control as a protective action used to prevent undue radiological exposure to members of the public entering a PAA in the State of Louisiana. In addition, the LPRRP indicated that access control may be used as a separate action or in conjunction with other actions, such as evacuation or sheltering. Such control was the responsibility of the law enforcement office of the parish at risk, which will be augmented, as necessary, by the Louisiana State Police. Section D.1.d, "Local Government, Sheriff's Office," of Enclosure I to Attachment 2 to LPRRP Supplement II assigned the sheriff's office as the lead law enforcement and traffic control agency within Tensas Parish, with responsibility for instituting access control and area security. Section D.2 of Enclosure I also identified State Police Troop F as responsible for assisting the sheriff's office in establishing access control to affected areas. In addition, Section G.1, "Control of Entrance into Affected Areas," of the enclosure indicated that the Tensas Parish Sheriff's Office and St. Joseph and Newellton law enforcement personnel provided support in controlling access, with assistance as requested from the Louisiana State Police. Finally, Section G.3 of the enclosure stated that strict traffic control measures will govern ingress to and egress from affected areas.

The applicant also described the plan for identifying and dealing with potential impediments when implementing protective measures for the plume exposure pathway. Appendix 6 to MREPP Annex F referenced specific procedures and checklists for traffic control point and access control point conduct. Section II.H.4 to PGCCREPP Annex F indicated that potential impediments will require implementation of the alternatives, depending on the impediment.

Section III of LPRRP Chapter 7 indicated that procedures for dealing with potential impediments along primary evacuation routes will essentially follow parish enclosures to the LPRRP. Section D.1.j, "Local Government, Tensas Parish Police Jury Highway Department," of Enclosure I to Attachment 2 to LPRRP Supplement II assigned the responsibility for clearing impediments to allow road passage. Section G.3 of the enclosure also stated that strict traffic control measures will be used to remove impediments on evacuation routes.

The applicant gave time estimates for the evacuation of various sectors and distances based on a dynamic analysis of the plume exposure pathway EPZ. Section 2.2 of Part 4 of the application provided a preliminary analysis of the time required to evacuate transient and permanent populations from various sectors and distances within the 10-mile plume exposure pathway EPZ. Section 2.2.1 of Part 4 noted that a detailed ETE for the plume exposure pathway EPZ, performed in March 1986, showed a maximum evacuation time for the affected

area of approximately 3 hours. Appendix D to Attachment 2 to LPRRP Supplement II, MREPP Annex F, and Appendix 6, "GGNS Evacuation Time Estimate Study," to PGCCREPP Annex F summarized the 1986 ETE. The applicant further indicated in Section 2.2.1 that a detailed evaluation in May 2003 of the original ETE more fully considered the impact of historical population growth and transportation system improvements.

The applicant prepared Revision 1 to the 2003 ETE study, dated January 2005, and provided it in response to RAI Letter 6. Associated changes were also incorporated by applicant into Revision 2 to Part 4 of the application. While Revision 1 to the 2003 ETE study updated the increase in population (1986–2002) from 10.4 to 11.1 percent, both Revision 1 to the 2003 ETE study and Revision 2 to Part 4 confirmed that the original 1986 ETE of 3 hours continued to be valid because of substantial roadway improvements.

The applicant provided the bases for choosing recommended protective actions along the plume exposure pathway during emergency conditions. Annex E, "Protective Actions," of the MREPP and PGCCREPP Annex E, "Protective Response," provided information on the bases for the choice of recommended protective actions in the State of Mississippi, given the emergency class and in accordance with EPA PAGs.

Section IV, "Protective Response Options," of LPRRP Chapter 7 discussed the PAR options available (e.g., sheltering, respiratory protection, access control, evacuation, KI, and limitation to duration of exposure) in the State of Louisiana and the considerations for each population (e.g., general public, emergency workers, institutionalized individuals, and schoolchildren). Tab 1 of LPRRP Chapter 7 provided the technical bases for recommending sheltering or evacuation as a protective action.

The applicant also discussed the means for registering and monitoring evacuees at reception centers in host areas. Appendix 5 to MREPP Annex F provided information on the functioning of the reception centers and shelter facilities in the State of Mississippi. The Mississippi Department of Human Services will supply the registration forms to the reception centers. The county civil defense/emergency management department, under the supervision of the MSDH/DRH, will assure that evacuees and their vehicles are monitored and decontaminated. Appendix 3, "Evacuee Monitoring and Decontamination Procedures for People and Vehicles," to MREPP Annex G detailed the methods and equipment to be used to monitor evacuees and their vehicles upon their arrival at a reception center.

Appendix 7 to PGCCREPP Annex F also provided basic information on the reception center and shelter facility operations in the State of Mississippi. All reception centers and shelter facilities were located in host (support) counties, which are referenced in PGCCREPP Annex N, "Supporting Plans and Procedures."

Section IV, "Radiological Exposure Control Measures for the General Public," of LPRRP Chapter 9 detailed the monitoring and registration of evacuees in the State of Louisiana. At-risk and support parishes will perform contamination surveys at reception centers for all anticipated evacuees within 12 hours of the completion of the evacuation. Chapter 5, "Radiological Exposure Control," of Attachment 2 to LPRRP Supplement II indicated that surveying and decontamination for members of the public will take place at reception centers in the State of Louisiana, which will be established in Franklin, Concordia, and Madison Parishes.

Section D of Enclosure I to Attachment 2 to LPRRP Supplement II indicated that the American Red Cross was responsible for providing reception and care for evacuees. Section H.1, "Public Health Support, Reception and Care," of Enclosure I also indicated that the reception center extension service will register evacuees initially. The American Red Cross, in conjunction with the Office of Family Security, will perform a second, more detailed registration of evacuees at the shelters.

13.3.3.11.2 Regulatory Evaluation

Part 1 of the ESP application stated that the emergency planning information in Part 4 identifies the major features of an emergency plan, which will be developed consistent with the requirements of 10 CFR 52.17(b)(2)(i), using the guidance provided in NUREG-0654/FEMA-REP-1 and Supplement 2.

In its review of the application, the staff considered the regulatory requirements in 10 CFR 52.17(b)(2)(i), 10 CFR 52.18, and Sections III, IV.A, IV.B, IV.D, and IV.E of Appendix E to 10 CFR Part 50. Under 10 CFR 52.17(b)(2)(i), an applicant for an ESP may propose the major features of the emergency plans for NRC review and approval, in consultation with FEMA, in the absence of complete and integrated emergency plans. Under 10 CFR 52.18, after consultation with FEMA, the NRC will determine whether the major features of an emergency plan submitted under 10 CFR 52.17(b)(2)(i) are acceptable. Supplement 2 and RS-002 provide guidance concerning the review and evaluation of emergency planning information given in an ESP application. Supplement 2 also provides specific evaluation criteria for major features of emergency plans, including those which apply to major feature J, "Protective Response."

Major feature J calls for the applicant to describe protective actions for the plume exposure pathway EPZ for the public and emergency workers, including evacuation routes, transportation, and handling evacuees. The application should identify guidelines for the choice of protective actions, consistent with Federal guidance, as well as the bases and mechanism for recommending protective actions to State and local authorities. The application should describe each organization's concept for implementing protective actions and describe contacts and arrangements with offsite agencies. In addition, the applicant should prepare an ETE for the 10-mile plume exposure pathway EPZ.

13.3.3.11.3 Technical Evaluation

The staff finds that the applicant's responses to RAIs 13.3-37 and 13.3-38, which were implemented in Revision 2 to Part 4 of the application, are acceptable. Revision 2 to Part 4 of the application and the MREPP described the evacuation routes and transportation for onsite individuals to suitable locations, including alternatives for inclement weather, high traffic density, and specific radiological conditions. In addition, Section 3.10.1 of Part 4 of the application described the methods for notification and accountability of site personnel. Because this information is outside the scope of the ESP application review, the staff deferred its evaluation to the COL application process.

The staff finds that the applicant's responses to RAIs 13.3-39, 13.3-40, and 13.3-41, which were implemented in Revision 2 to Part 4 of the application, are acceptable. In Revision 2 to Part 4 of the application, the applicant described a mechanism for recommending protective

actions to the appropriate State and local authorities in accordance with EPA-400-R-92-001 and consistent with the guidance contained in Supplement 3, “Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants—Criteria for Protective Action Recommendations for Severe Accidents—Draft Report for Interim Use and Comment,” to NUREG-0654/FEMA-REP-1, Revision 1.

The applicant performed a detailed ETE for the plume exposure pathway EPZ in March 1986 and determined that the maximum evacuation time for the affected area is approximately 3 hours. Appendix E to the Grand Gulf Nuclear Station Emergency Plan, Revision 50, contained this detailed ETE of the GGNS Emergency Plan, referred to as the 1986 ETE. In addition, as documented in the addendum to Appendix E, a door-to-door demographic survey conducted in August 1992 in the GGNS plume exposure pathway EPZ showed a negligible increase in the permanent population of 0.54 percent (47 people). As such, the addendum concluded that the population change should have no discernible effect on the emergency plan and that the population figures listed in the 1986 ETE remained valid.

In support of the ESP application, in Section 2.2 of Part 4, the applicant provided a preliminary analysis of the time required to evacuate transient and permanent populations from various sectors and distances within the 10-mile plume exposure pathway. This preliminary analysis, performed in May 2003, involved a detailed evaluation of the original ETE to more fully consider the impact of historical population growth and transportation system improvements. The 2003 ETE study showed both an increase of 10.4 percent in the plume exposure pathway EPZ population and substantial improvements to major evacuation roadways that have increased the surplus capacity since the 1986 review. The evaluation was consistent with the guidance on updates contained in NUREG/CR-4831, which stated the following:

> As a general rule, a 10 percent increase in population indicates a need to check evacuation times. An initial assessment would involve determining whether growth had taken place in areas constrained by roadway capacity. If the possibility exists for increased evacuation times, a detailed analysis is necessary.

The 2003 ETE study met the intent of this initial assessment and concluded that, although the EPZ population increased by 10.4 percent, the time estimates in the 1986 ETE remained valid and, in some cases, may even have overstated actual evacuation times because of substantial improvements to major evacuation roadways since 1986.

On January 25, 2005, the applicant submitted Revision 1 to the 2003 ETE study in response to RAI Letter 6, dated August 13, 2004, which updated the peak EPZ population increase (1986–2002) to 11.1 percent. Associated changes were also incorporated in Revision 2 to Part 4 of the application. The staff finds that the applicant’s responses to RAIs 13.3-76, 13.3-77, 13.3-78a through 78m, 13.3-79a, 79b and 79d, 13.3-80, 13.3-81, 13.3-82, 13.3-83, 13.3-84, 13.3-85, 13.3-86, 13.3-87a through 87e, 13.3-88, 13.3-89, 13.3-90, 13.3-91, 13.3-92, 13.3-93, 13.3-94, and 13.3-95 are acceptable. .

In Section 2.2.4.4 of Revision 2 to Part 4 of the application, the applicant indicated that Revision 1 to the 2003 ETE study concluded that the maximum evacuation time for the affected area of approximately 3 hours from the 1986 ETE remains valid. In addition, the applicant also concluded that no physical characteristics unique to the site could pose a significant

impediment to the development of emergency plans and the implementation of protective actions for the areas surrounding the proposed new facility. This conclusion was consistent with Section 6.0 of Revision 1 to the 2003 ETE study.

The 1986 ETE was prepared in accordance with Appendix 4 to NUREG-0654/FEMA-REP-1, which was consistent with the guidance contained in Evaluation Criterion J.3 for ESP applications in Section V of Supplement 2. The format used and contents of the 1986 ETE were consistent with the guidance in Appendix 4 to NUREG-0654/FEMA-REP-1.

Because the 1986 ETE preceded the publication of NUREG/CR-4831, it was not fully consistent with that document. Since the 2003 ETE study essentially updated the 1986 ETE, in that it evaluated population growth and evacuation roadway changes, the 2003 ETE study was also not fully consistent with NUREG/CR-4831. In addition, the applicant made no attempt and was not required to update the specific method or computer modeling used in the 1986 ETE for the 2003 ETE study. As such, the 1986 computer modeling and underlying assumptions also generally constrained the 2003 ETE study.

Based on the changes to the assumptions and data inputs implemented under Revision 1 to the 2003 ETE study and Revision 2 to Part 4 of the application, the staff considers that the ETE preliminary analysis, contained in Section 2.2 of Part 4, and Revision 1 to the 2003 ETE study adequately describe the current population distributions and roadway improvements, using the guidance in Appendix 4 to NUREG-0654/FEMA-REP-1. In RAI 13.3-79c, the staff asked for further information regarding the availability and capacity of school buses or other transportation methods, the availability of drivers, and the process for mobilizing them during an evacuation for the transport of students, residents, transients, and special needs populations in Claiborne County and Tensas Parish (e.g., whether evacuations can occur in a single trip or require return trips). The staff identified consideration of this information as Open Item 13.3-1g in the draft SER. The staff reviewed the applicant's response, and finds it acceptable for an ESP application, except to the extent that the arrangements would need to be expanded to incorporate relevant aspects of a proposed new reactor design in a COL or OL application. The staff will determine the adequacy of such incorporation during a COL or OL review. Therefore, Open Item 13.3-1g is resolved.

Section 6.0 of the 2003 ETE study indicated that the emergency management directors and local transportation department officials (highway foreman) for both Tensas Parish, Louisiana, and Claiborne County, Mississippi, agreed that the conclusion in the 1986 ETE, that the entire EPZ can be evacuated at any time of day or in any weather conditions in less than 3 hours, remained valid. In RAI 13.3-96, the staff asked the applicant for further information to clarify that the 2003 ETE study results had been reviewed by applicable State emergency management and transportation officials/agencies in accordance with NUREG/CR-4831. The staff identified consideration of this information as Open Item 13.3-4 in the draft SER. The staff reviewed the applicant's response, as supplemented by a letter from the GGNS licensee dated June 28, 2005, and finds that the results of the 2003 ETE study were subsequently review and concurred on by the appropriate State officials. Therefore, Open Item 13.3-4 is resolved.

The staff finds that the applicant's responses to RAIs 13.3-42, 13.3-43, and 13.3-44, which were implemented in Revision 2 to Part 4 of the application, are acceptable. Revision 2 to Part 4 of the application, the MREPP, and Enclosure I to Attachment 2 of LPRRP Supplement II, provided maps showing evacuation routes, evacuation/shelter areas, and

relocation centers, as applicable. In RAI 13.3-63, the staff asked for further information illustrating the evacuation/shelter areas or, as referred to in Part 4 of the application, PAAs (e.g., Area 1, 2A/B) for MREPP Annex O. The staff identified consideration of this information as Open Item 13.3-1h in the draft SER. The staff reviewed the applicant's response, and find the maps acceptable for an ESP application, except to the extent that the arrangements would need to be expanded to incorporate relevant aspects of a proposed new reactor design in a COL or OL application. The staff will determine the adequacy of such incorporation during a COL or OL review. Therefore, Open Item 13.3-1h is resolved.

The staff finds that the applicant's responses to RAIs 13.3-45 and 13.3-46, which were implemented in Revision 2 to Part 4 of the application and Revision 1 to the 2003 ETE study, are acceptable. Revision 2 to Part 4 of the application, the PGCCREPP, and Attachment 2 to LPRRP Supplement II, provided maps showing the population distribution around the site based on sectors or designated evacuation areas.

The staff finds that the applicant's response to RAI 13.3-48, which was implemented in Revision 2 to Part 4 of the application, is acceptable. Revision 2 to Part 4 of the application, the MREPP, PGCCREPP, LPRRP, and Enclosure I of Attachment 2 to LPRRP Supplement II, discussed the proposed means for notifying all segments of the transient and resident populations.

Revision 2 to Part 4 of the application, the MREPP, PGCCREPP, LPRRP, and Enclosure I of Attachment 2 to LPRRP Supplement II discussed the proposed means for protecting those persons whose mobility may be impaired (e.g., because of institutional or other confinement).

The MREPP, PGCCREPP, LPRRP, and Enclosure I and Attachment 2 of LPRRP Supplement II discussed the use of radioprotective drugs within the plume exposure EPZ. In RAIs 13.3-64 and 13.3-65, the staff asked for further information to describe the means for using radioprotective drugs for emergency workers and institutionalized persons within the plume exposure pathway EPZ in the States of Louisiana and Mississippi, whose immediate evacuation may be infeasible or very difficult. The staff identified consideration of this information as Open Item 13.3-1c in the draft SER. The staff reviewed the applicant's response, and finds State/local plans acceptable for an ESP application, except to the extent that the arrangements would need to be expanded to incorporate relevant aspects of a proposed new reactor design in a COL or OL application. The staff will determine the adequacy of such incorporation during a COL or OL review. Therefore, Open Item 13.3-1c is resolved.

The MREPP, PGCCREPP, LPRRP, and Enclosure I and Attachment 2 to LPRRP Supplement II discussed the proposed means of relocation. In addition, the MREPP, PGCCREPP, and Enclosure I to Attachment 2 to LPRRP Supplement II identified potential relocation centers in host areas which are at least 10 miles beyond the boundaries of the plume exposure EPZ. Annexes to the MREPP and PGCCREPP Annex F addressed the availability of shelters and indicate their total capacity in the State of Mississippi. In RAI 13.3-75, the staff asked for further information to describe shelter facility capabilities based on any anticipated population increase within the plume exposure pathway EPZ. The staff identified consideration of this information as Open Item 13.3-1i in the draft SER. The staff reviewed the applicant's response, and finds it acceptable for an ESP application, except to the extent that the arrangements would need to be expanded to incorporate relevant aspects of a proposed new reactor design in a

COL or OL application. The staff will determine the adequacy of such incorporation during a COL or OL review. Therefore, Open Item 13.3-1i is resolved.

Part 4 of the application projected the traffic capacities of evacuation routes under emergency conditions and listed the roadway capacity (vehicles per hour) for each of the primary evacuation routes, based on the 2003 ETE study.

The staff finds that the applicant's response to RAI 13.3-47, which was implemented in Revision 2 to Part 4 of the application, is acceptable. Revision 2 to Part 4 of the application, the MREPP, PGCCREPP, LPRRP, and Enclosure I to Attachment 2 to LPRRP Supplement II, discussed the control of access to evacuated areas and organizational responsibilities for such control.

The MREPP, PGCCREPP, LPRRP, and Enclosure I to Attachment 2 to LPRRP Supplement II discussed the identification of and the means for dealing with potential impediments (e.g., seasonal impassability of roads) to the use of evacuation routes, as well as contingency measures.

Appendix D to Attachment 2 to LPRRP Supplement II, MREPP Annex F, and PGCCREPP Appendix 6 summarized the time estimates for the evacuation of the various PAAs, based on the dynamic analysis performed in the 1986 ETE.

The MREPP, PGCCREPP, and LPRRP discussed the basis for the choice of recommended protective actions from the plume exposure pathway during emergency conditions. In addition, the MREPP, PGCCREPP, LPRRP, and Enclosure I and Attachment 2 to LPRRP Supplement II described the means for registering and monitoring evacuees at reception centers in host areas.

13.3.3.11.4 Conclusions

As discussed above, the applicant has described a range of protective actions for the plume exposure pathway EPZ for the public and emergency workers, including guidelines for the choice of protective actions that are consistent with Federal guidance, and protective actions for the ingestion exposure pathway EPZ. Based on its review, the staff concludes that the proposed major feature J is consistent with the guidelines in RS-002 and Supplement 2. Therefore, this feature is acceptable and meets the requirements of 10 CFR 52.17(b)(2)(i), 10 CFR 52.18, and Sections III, IV.A, IV.B, IV.D, and IV.E of Appendix E to 10 CFR Part 50, insofar as it describes the essential elements of advanced planning that have been considered for accident assessment, as set forth above.

13.3.3.12 Radiological Exposure Control (Major Feature K)

13.3.3.12.1 Technical Information in the Application

Section 3.11.1, "Personnel Dose Limits and Controls," of Part 4 of the application described the guidelines for dose limits and gave exposure guidance for individuals, including support personnel and facility employees. These guidelines restricted the radiation dose to support personnel to administrative limits and provided additional guidance for exposures to emergency workers at the site. The applicant also provided emergency worker dose limits consistent with

Table 2-2 in EPA-400-R-92-001 and addressed lifesaving activities (e.g., removing injured persons, providing first aid, performing personnel decontamination), as well as taking corrective and assessment actions or field monitoring measurements necessary to protect valuable property or large populations (e.g., prevent or mitigate a release, assess impact of a release).

In Section 3.11.2, "Onsite Radiation Protection Program," of Part 4, the applicant indicated that, should the need arise for State and local agency emergency workers located outside of the site boundaries to receive exposures in excess of the PAGs for the general public, the authority for such exposures would rest with the affected State and county agencies. Should these workers be located inside the site boundaries when such a need arises, the site emergency director would issue the necessary authorizations, in consultation with the appropriate agency authority.

Section 3.11.2 of Part 4 provided the following description of the emergency onsite radiation protection program, including methods to implement dose limits:

> The facility will maintain an onsite radiation protection program adequate to ensure compliance with the requirements of 10 CFR 20, Standards for Protection Against Radiation, and any specific facility license requirements. Such radiation protection programs typically include a combination of physical and administrative controls as are appropriate to direct station activities and maintain individual and collective doses as low as is reasonably achievable. Some of the routine administrative controls included in the radiation protection program may be suspended during a declared emergency as may be necessary to provide timely assessment and control of the situation. However, pre-approved procedures and lines of authority that are specifically developed for such conditions will be implemented to ensure appropriate response to the conditions that exist.

The applicant provided further guidance in Section 3.11.1 of Part 4 concerning the authorization of KI to reduce radioiodine uptake for emergency organization personnel, including approval authority by the emergency director or offsite emergency coordinator.

The applicant described the process for determining doses received by emergency personnel, including volunteers, in any nuclear emergency. In Section 3.11.3, "Monitoring of Individual Doses," of Part 4, the applicant indicated that it will make provisions for a 24-hour-per-day capability to determine the doses received by emergency personnel. In addition, it will write specific emergency procedures for the issuance of permanent record dosimetry devices and self-reading dosimeters to emergency personnel. Finally, it will determine radionuclide intakes by in vitro or in vivo radioactivity measurements and/or an analysis of facility air and water samples, as appropriate. Following its determination of individual radionuclide intakes, the applicant will determine internal doses using technically justified biological models. In addition to the onsite capabilities described, Section 3.11.3 also indicated that the applicant will develop and maintain provisions to allow for offsite performance of these analyses.

In the State of Mississippi, the State and local emergency plans referenced the following materials:

- MREPP Section II.C, "Radiological Exposure Control Measures for Emergency Workers, Responsibilities," of Annex G

- MREPP Section II.C, “Emergency Worker Personnel Monitoring,” of Appendix 4 to Annex G

- PGCCREPP Section II.B.2, “Recovery Operation,” of Annex H

Section II.B, “Radiological Exposure Control Measures for Emergency Workers, Organization,” of PGCCREPP Annex G detailed the methods used to determine doses received by emergency personnel. Tab A, “Hospital Survey for Radiation Accident Capabilities,” of Appendix 10 to PGCCREPP Annex F also indicated that the Riverland Medical Center can provide radiological support to individuals requiring assessment for internal contamination (whole body count or radiological assay). In RAI 13.3-66 and subsequently in Open item 13.3-1d, the staff asked the applicant to describe the State of Mississippi’s guidance related to bioassay or whole body counting for use in determining offsite emergency worker doses caused by the uptake of radioactive material (e.g., ingestion). In response, the applicant stated that SERI believed it had provided sufficient information regarding emergency plans in accordance with 10 CFR 52.17, and that this issue would be more appropriately addressed in the context of full and integrated emergency plans, which would be submitted with a COL application, rather than this ESP application.

For the State of Louisiana, information regarding emergency personnel dose determination appears in Chapter 5 of Attachment 2 to LPRRP Supplement II, which stated that emergency workers, as volunteers, were advised of risks and trained in the proper use of dosimeters; limitation of exposure (time, distance, shielding); and the use, administration, limitations, and precautions of KI.

Section V of LPRRP Chapter 9 indicated that each LDEQ (or other appropriate State agency) emergency worker will be provided with dosimeters. Emergency workers performing services during an incident in a location that was not directly impacted by the radioactive plume may use area dosimetry.

The applicant described the process for acquiring and distributing dosimeters. In Section 3.11.1 of Part 4, the applicant noted that it will write specific emergency procedures for the issuance of permanent record dosimetry devices and self-reading dosimeters to emergency personnel. These procedures will also include instructions on how often to read the dosimeters and how to maintain appropriate records. In RAI 13.3-50, the staff asked the applicant to clarify whether emergency procedures for issuance of dosimetry will cover offsite emergency personnel (e.g., firefighting, ambulance, law enforcement) required to enter a protected area of the proposed reactor(s). In Revision 2 to Part 4, the applicant amended Section 3.11.3 to state the following:

> Specific emergency procedures will be written for the issuance of permanent record dosimetry devices (or systems) (e.g., thermoluminescent dosimeters) and self-reading dosimeters to emergency personnel, including both onsite and offsite emergency response personnel who must enter areas within the protected area where personnel dosimeters are required.

For the State of Mississippi, the applicant referenced the following information and indicated that all emergency workers in the State of Mississippi are required to use direct-reading dosimeters and a permanent record dosimeter (e.g., TLD) or film badge:

- MREPP Section II.C of Annex G
- MREPP Appendix 4, "Emergency Worker Monitoring and Decontamination Procedures for Personnel and Vehicles," to Annex G
- PGCCREPP Section II.B.2 of Annex H

Section II.C of MREPP Annex G also stated that MEMA did not pre-position dosimeters and TLDs and that State emergency workers will receive dosimetry from kits in the SEOC. Civil defense/emergency management personnel at a local EOC in the State of Mississippi will issue dosimetry to local emergency workers.

For the State of Louisiana, the following material contained information regarding the distribution of dosimetry:

- LPRRP Chapter 5 of Attachment 2 to Supplement II
- LPRRP Section D of Enclosure I to Attachment 2 to Supplement II
- LDEQ Radiological Emergency Response Operating Procedure 4, "Radiation Exposure Control"

At-risk and support parishes in the State of Louisiana were responsible for maintaining dosimeters and necessary decontamination survey equipment in a state of readiness to facilitate a State response at the time of an accident. The applicant suggested that resources to protect local government emergency workers will be drawn primarily from at-risk and support parishes and augmented by the State government, as necessary. These resources will include dosimeters and permanent exposure recording devices (e.g., TLDs) as described in Section V of LPRRP Chapter 9.

Section D.1.c, "Local Government, Tensas Parish Emergency Preparedness," of Enclosure I to Attachment 2 of LPRRP Supplement II noted that the Tensas Parish radiological officer was responsible for distributing dosimetry devices and issuing pocket dosimeters and TLDs to emergency workers.

Section 3.11.1 of Part 4 partially described the decision chain for authorizing emergency workers to incur exposures in excess of the EPA dose limits while performing emergency services. In this section, the applicant stated that management authorization will be required before an emergency worker can exceed the exposure limits listed in EPA-400-R-92-001. Section 3.11.2 of Part 4 further indicated that the applicant will implement preapproved procedures and lines of authority to ensure an appropriate response and will develop and conduct training on these procedures and lines of authority. In RAI 13.3-49, the staff asked the applicant to describe a decision chain for authorizing emergency workers to incur exposures in excess of the EPA dose limits while performing emergency services. In Revision 2 to Part 4, the applicant amended Section 3.11.2 to state the following:

> Authorization for personnel exposures exceeding the routine occupational dose limits will be requested by the responsible supervisor in the affected emergency response facility and approved by either the Emergency Director or Offsite Emergency Coordinator. To ensure effective implementation under emergency conditions, training on these procedures and lines of authority will be developed and conducted in accordance with Section 3.16 of this Plan.

Section II.E, "Emergency Worker Authorization for Exceeding EPA PAGs," of MREPP Annex G and Section II.D, "Emergency Worker Authorization for Exceeding EPA PAGs," of PGCCREPP Annex G stated that emergency workers are instructed to leave the risk area and report to their supervisors if they register an exposure of 1 rem on their dosimeters. Local emergency workers must obtain authorization to exceed the PAG limits of 5 rem total effective dose equivalent (TEDE) and 25 rem committed dose equivalent (CDE) to the thyroid from the RERT coordinator and the State health officer/MSDH, with the concurrence of city and county elected officials, as described in Section II.E of MREPP Annex G. Beyond the emergency PAG level of 25 rem TEDE or 125 rem CDE to the thyroid, emergency workers were restricted to lifesaving missions and required to obtain specific authorization from the State health officer/MSDH. An emergency worker exposure limit for lifesaving did not exist under the MREPP and PGCCREPP if all the following criteria were met:

- The mission involves saving a human life and is the last option available.
- The maximum radiological exposure control protection available will be provided to the emergency worker and time will be limited to the greatest extent possible.
- Emergency workers are volunteers and are fully cognizant of the potential risk.

The applicant referenced Section V.D of LPRRP Chapter 9. In addition, Chapter 5 of Attachment 2 to LPRRP Supplement II included information regarding the decision chain for authorizing emergency worker exposure in excess of EPA dose limits contained in EPA-400-R-92-001. The LDEQ Radiological Emergency Response Operational Procedure 1, "Radiation Exposure Control," contained additional information. The State and parish emergency management team in the State of Louisiana used a 1-rem TEDE notification and a 5-rem TEDE turnback value for emergency worker exposure control. As described in Section V.D of LPRRP Chapter 9, if exposures for emergency workers beyond 5 rem whole body dose (TEDE) were determined to be necessary, the principal decisionmaker for the involved unit of government will be required to authorize such activities. The secretary of LDEQ was the State's decisionmaker for authorizing any dose in excess of 25 rem for all State and local emergency workers. The LDEQ Radiological Emergency Response Operational Procedure 1 required the radiological defense officer at the parish level to be briefed and advised accordingly; a final decision will be communicated to the parish emergency director. The president of the Tensas Parish Police Jury was responsible for authorizing emergency workers within his/her jurisdiction to incur exposures in excess of the EPA PAGs for the general public in EPA-400-R-92-001 (up to 25 rem). As discussed in Chapter 5 of Attachment 2 to LPRRP Supplement II, in the State of Louisiana, authorization would be considered after consultation with LDEQ.

The applicant also described specific action levels for determining the need for the decontamination of emergency workers, equipment and vehicles, and members of the general

public and their possessions. Section 3.11.4, "Decontamination and First Aid," of Part 4 indicated that when contamination exceeding values specified in site procedures is detected, preventive measures (e.g., containment, decontamination, or storage for decay of short-lived radionuclides) will be initiated to mitigate the possibility of the spread of contamination. Routine site contamination limits, as delineated in the proposed new facility's radiation protection program, will apply during emergency situations. However, the emergency director may alter these limits, as necessary, to ensure the appropriate level of overall safety. In RAI 13.3-51, the staff asked the applicant to describe the action levels for the decontamination of emergency workers, equipment, and vehicles at, and/or from, the proposed reactor(s). In Revision 2 to Part 4, the applicant amended Section 3.11.4 to state the following:

> Contamination action levels for decontamination of emergency workers, equipment, and vehicles are established in GGNS Unit 1 Radiation Protection Procedures. The applicant expects that similar action levels will be made in Radiation Protection Procedures associated with the proposed new facility. The Emergency Director may alter these contamination action levels as necessary to ensure the appropriate level of overall safety.

The following sources described required action levels and guidance for decontamination of the public, emergency workers, and their possessions in the State of Mississippi:

- Appendix 3, "Evacuee Monitoring and Decontamination Procedures for People and Vehicles," to MREPP Annex G

- Appendix 4, "Emergency Worker Monitoring and Decontamination Procedures for Personnel and Vehicles," to MREPP Annex G

- Appendix 6, "Monitoring and Decontamination Procedures for Emergency Worker Vehicles and Personnel," to PGCCREPP Annex G

Section IV of LPRRP Chapter 9 indicates that persons in the State of Louisiana surveyed and found to have a reading greater than 0.1 millirem per hour (mrem/hr) above background are considered contaminated. Chapter 5 of Attachment 2 to LPRRP Supplement II also included information regarding the action level for determining the need for decontamination. Section IV of LPRRP Chapter 9 required that clothing with levels of contamination greater than 0.1 mrem/hr be stored in a separate, restricted area and vehicles containing interior contamination be impounded.

Section 3.11.4 of Part 4 described, in part, the means for radiological decontamination of emergency personnel wounds, supplies, instruments, and equipment. This section indicated that onsite personnel decontamination stations for emergency conditions will be fully equipped with decontamination material. The final radiological emergency plan for the proposed new facility will describe the location of the primary and alternate decontamination facilities. These facilities will be equipped for disrobing, collecting contaminated clothing, showering of contaminated personnel, and distributing clean clothing. In RAI 13.3-52, the staff asked the applicant to describe the means for decontamination of personnel wounds for individuals from the proposed new facility. In Revision 2 to Part 4, the applicant amended Section 3.11.4 to state the following:

Provisions for decontamination of personnel wounds are established in GGNS Unit 1 Radiation Protection Procedures. These provisions include, for minor wounds, the use of tepid water and mild detergents. For more serious wounds, decontamination is performed under the direction of qualified medical personnel. The applicant expects that similar provisions for decontamination of personnel wounds will be made in Radiation Protection Procedures associated with the proposed new facility.

The applicant also identified primary and backup medical facilities in Section 3.12 of Part 4 for injured personnel with radiological contamination from the proposed new facility who require emergency treatment for radiation-related accidents. These facilities will maintain hospital emergency kits for the treatment of contaminated personnel.

For the State of Mississippi, Section III, "Decontamination Procedures," of Appendix 4 to MREPP Annex G and Section III, "Decontamination Procedures," of Appendix 6 to PGCCREPP Annex G indicated that local governments will be responsible for providing facilities and personnel to conduct radiological monitoring and decontamination of emergency workers under the guidance of MSDH/DRH. Tab A, "Emergency Worker Decon Station Locations," of Appendix 3 to MREPP Annex G identified three locations in Claiborne and Warren Counties as the primary locations for emergency worker decontamination and listed backup locations in Warren, Adams, Copiah, and Hinds Counties. Tab G, "Reception Center Supply Inventory," of Appendix 3 to MREPP Annex G included an inventory list of decontamination supplies. The civil defense/emergency management offices in Warren, Copiah, Adams, and Hinds Counties store monitoring and decontamination supplies and will transfer these supplies to specific monitoring and decontamination facilities when needed.

Both State and local plans in Mississippi detailed the process for the monitoring and decontamination of emergency workers, equipment, and vehicles and provided the procedures for general decontamination methods. If more extensive decontamination were required, MSDH/DRH would be available to assist and to advise whether an emergency worker should be transported to a hospital. Tab A of Appendix 10 to PGCCREPP Annex F listed three hospitals with the capability of decontaminating wounds.

For the State of Louisiana, Section V.C, "Radiological Exposure Control Measures for Emergency Workers," of LPRRP Chapter 9 indicated that decontamination surveys and decontamination procedures for parish and State emergency workers will take place at the same sites as those used for the general public, unless a specific emergency worker decontamination center is designated. The following material contained information regarding decontamination of emergency personnel and equipment:

- LPRRP Chapter 5 of Attachment 2 to Supplement II
- LPRRP Section D of Enclosure I to Attachment 2 to Supplement II
- LPRRP Tab A, "Resource Requirements for Radiological Exposure Control," of Chapter 5 of Attachment 2 to Supplement II, which includes a list of supplies and resource requirements for the reception/survey/decontamination center

Section V.C of LPRRP Chapter 9 required that emergency workers report to a reception or decontamination center at the conclusion of their shift during the emergency. Decontamination for personnel, supplies, and equipment will also take place at reception or decontamination centers, in accordance with implementing procedures. In addition, Section V.C indicated that the medical treatment of contaminated emergency workers will take place at the same medical facilities used for the general public.

Section IV of LPRRP Chapter 9 required that each reception center have the following available:

- shower facilities for men and women
- a change of clothing for contaminated individuals
- facilities for storing contaminated items, including clothing
- vehicles and drivers to transport contaminated individuals to medical facilities

13.3.3.12.2 Regulatory Evaluation

Part 1 of the ESP application stated that the emergency planning information in Part 4 identifies the major features of an emergency plan, which will be developed consistent with the requirements of 10 CFR 52.17(b)(2)(i), using guidance provided in NUREG-0654/FEMA-REP-1 and Supplement 2.

In its review of the application, the staff considered the regulatory requirements in 10 CFR 52.17(b)(2)(i), 10 CFR 52.18, and Sections III, IV.A, IV.B, and IV.E of Appendix E to 10 CFR Part 50. Under 10 CFR 52.17(b)(2)(i), an applicant for an ESP may propose the major features of the emergency plans for NRC review and approval, in consultation with FEMA, in the absence of complete and integrated emergency plans. Under 10 CFR 52.18, after consultation with FEMA, the NRC will determine whether the major features of an emergency plan submitted under 10 CFR 52.17(b)(2)(i) are acceptable. Supplement 2 and RS-002 provide guidance concerning the review and evaluation of emergency planning information given in an ESP application. Supplement 2 also provides specific evaluation criteria for major features of emergency plans, including those which apply to major feature K, “Radiological Exposure Control.”

Major feature K calls for the applicant to describe an onsite radiation protection program and the means for determining and controlling radiological exposures to emergency workers and volunteers (on site and off site), including a decision chain for authorizing exposures in excess of EPA dose limits. The ESP application should also describe specific action levels and the means for radiological decontamination of personnel (including wounds), vehicles, equipment, supplies, and possessions.

13.3.3.12.3 Technical Evaluation

Part 4 of the ESP application described guidelines on dose limits for emergency workers consistent with Table 2-2 in EPA-400-R-92-001, the performance of lifesaving activities (e.g., removing injured persons, providing first aid, performing personnel decontamination), and the corrective and assessment actions or field monitoring measurements necessary to protect valuable property or large populations (e.g., prevent or mitigate a release, assess impact of a release). In addition, Part 4 described an onsite radiation protection program that the applicant

will implement during emergencies which are consistent with 10 CFR Part 20, “Standards for Protection Against Radiation,” and EPA-400-R-92-001, including methods to implement dose limits.

Revision 2 to Part 4 of the application, the MREPP, PGCCREPP, LPRRP, and Attachment 2 to LPRRP Supplement II described how the applicant and State and local agencies will determine the doses received by emergency personnel, including volunteers, involved in any nuclear accident. In RAI 13.3-66, the staff asked for further information to describe guidance established in the PGCCRERP related to bioassay or whole body counting for determination of offsite emergency worker dose due to uptake of radioactive material. The staff identified consideration of this information as Open Item 13.3-1d in the draft SER. The staff reviewed the applicant’s response, and finds it acceptable for an ESP application, except to the extent that the arrangements would need to be expanded to incorporate relevant aspects of a proposed new reactor design in a COL or OL application. The staff will determine the adequacy of such incorporation during a COL or OL review. Therefore, Open Item 13.3-1d is resolved.

The staff finds that the applicant’s response to RAI 13.3-50, which was implemented in Revision 2 to Part 4 of the application, is acceptable. Revision 2 to Part 4, the MREPP, PGCCREPP, Attachment 2 to LPRRP Supplement II, and Enclosure I to Attachment 2 of LPRRP Supplement II, described how the applicant and State and local agencies will acquire and distribute dosimeters.

The staff finds that the applicant’s response to RAI 13.3-49, which was implemented in Revision 2 to Part 4 of the application, is acceptable. Revision 2 to Part 4, the MREPP, LPRRP, Attachment 2 to LPRRP Supplement II, described a decision chain for authorizing emergency workers to incur exposures in excess of the EPA dose limits for workers performing emergency services.
The staff finds that the applicant’s response to RAI 13.3-51, which was implemented in Revision 2 to Part 4 of the application, is acceptable. Revision 2 to Part 4, the MREPP, PGCCREPP, LPRRP, Attachment 2 to LPRRP Supplement II, discussed specific action levels, as applicable, for determining the need for the decontamination of emergency workers, equipment and vehicles, and members of the general public and their possessions.

The staff finds that the applicant’s response to RAI 13.3-52, which was implemented in Revision 2 to Part 4 of the application, is acceptable. Revision 2 to Part 4, the MREPP, PGCCREPP, LPRRP, Attachment 2 to LPRRP Supplement II, and Enclosure I to Attachment 2 of LPRRP Supplement II, described an appropriate means for radiological decontamination of emergency personnel wounds, supplies, instruments, and equipment.

13.3.3.12.4 Conclusions

As discussed above, the applicant has described the means for controlling radiological exposures to emergency workers in an emergency. Based on its review, the staff concludes that the proposed major feature K is consistent with the guidance in RS-002 and Supplement 2. Therefore, this feature is acceptable and meets the requirements of 10 CFR 52.17(b)(2)(i), 10 CFR 52.18, and Sections III, IV.A, IV.B, and IV.E of Appendix E to 10 CFR Part 50, insofar as it describes the essential elements of advanced planning that have been considered for radiological exposure control, as set forth above.

13.3.3.13 Medical and Public Health Support (Major Feature L)

13.3.3.13.1 Technical Information in the Application

Section 3.12 of Part 4 described the contacts and arrangements the applicant has made for the evaluation of radiation exposure and uptake. This section indicated that Claiborne County Hospital, as the primary medical facility, will accept victims of radiation-related accidents for emergency medical and surgical treatment and observation. Vicksburg Medical Center and Parkview Regional Medical Center will serve as backup medical facilities, having the same emergency medical capabilities as Claiborne County Hospital. Appendix D to the existing GGNS Emergency Plan (Revision 50) has an agreement with the Ochsner Clinic to provide hospital and medical services for injured, radiologically contaminated, or overexposed personnel. In RAI 13.3-53, the staff asked the applicant to clarify whether personnel of the backup medical facilities will receive training equivalent to that received by personnel of the primary facility. In Revision 2 to Part 4, the applicant amended Section 3.12 to state the following:

> Both of the back-up medical facilities, River Region Medical Center and The Oschner Clinic, have the ability to provide support on a 24 hour per day, seven day per week basis. The applicant expects that similar arrangements for primary and back-up medical facilities will be made for the proposed new facility. Training for both primary and back-up medical facilities will be offered as described in Section 3.15.

The applicant further indicated that the training will address emergency medical and surgical treatment and observation of victims of radiation-related accidents, including the evaluation and treatment of personnel who are injured or radiologically contaminated or who received radiation overexposure and uptake.

For the State of Mississippi, Appendix 10 to MREPP Annex F and Section II, “Medical and Health Services,” of Appendix 10 to PGCCREPP Annex F identified River Region Medical Center as the primary facility and Riverland Medical Center and Claiborne County Hospital (PGCCREPP only) as backup facilities. Appendix 1 to MREPP Annex M cited a letter of agreement with Riverland Medical Center to provide care for accident victims with radiation exposure, internal contamination, external contamination, and contaminated wounds. Riverland Medical Center can also evaluate the radiation status of a patient by performing radiological assay of specimens and whole body counting. In addition, Claiborne County Hospital can provide care for individuals with radiation exposure. The State of Mississippi has obtained letters of agreement to ensure medical support for any injured individual from a fixed nuclear facility that is radiologically contaminated, should primary and backup medical resources be exhausted. Appendix 10 to MREPP Annex F cited the Radiation Emergency Assistance Center in Oak Ridge, Tennessee, and the National Disaster Medical System in Rockville, Maryland, as having the potential to provide additional radiological emergency services, as necessary.

As further described in Tab A of Appendix 10 to PGCCREPP Annex F, River Region Medical Center and Claiborne County Hospital can evaluate the radiation status of a patient using handheld instruments. Tab A of Appendix 10 to PGCCREPP Annex F stated that Riverland Medical Center also has the capability to evaluate the radiation status of a patient using a whole body counter and the radiological assay of collected specimens (e.g., blood, urine, smears,

tissues).

For the State of Louisiana, Section D of Enclosure I to Attachment 2 to LPRRP Supplement II identified the Louisiana State Department of Health and Hospitals and the Parish Health Unit as responsible for assisting in the coordination of required medical services. Appendix I-1 to Enclosure I to Attachment 2 to LPRRP Supplement II listed both Riverland Medical Center (primary) and the Ochsner Clinic (secondary) for emergency medical services. Tab 2, "Hospitals Capable of Treating Contaminated Injured Personnel," of LPRRP Chapter 10 identified Riverland Medical Center in Ferriday, Louisiana, as the primary medical facility for Tensas Parish and Our Lady of the Lake Regional Medical Center in Baton Rouge, Louisiana, as backup. The Ochsner Foundation was identified as the primary hospital for St. John the Baptist and St. Charles Parishes. However, Tab 1 of Chapter 14 of the LPRRP Basic Plan did not list Riverland Medical Center as having an agreement with the State of Louisiana. In RAI 13.3-67 and subsequently in Open Item 13.3-1e, the staff asked the applicant to clarify these apparent inconsistencies between the LPRRP, and Enclosure I to Attachment 2 to LPRRP Supplement II regarding the description of contacts and arrangements for local and backup hospital services. In response, the applicant stated that SERI believed it had provided sufficient information regarding emergency plans in accordance with 10 CFR 52.17, and that this issue would be more appropriately addressed in the context of full and integrated emergency plans, which would be submitted with a COL application, rather than this ESP application.

The applicant also described the emergency medical services facilities capable of providing medical support for an injured individual who may be radiologically contaminated. For the State of Mississippi, Tab A of Appendix 10 to PGCCREPP Annex F listed the location of hospitals and described their capabilities for providing treatment to radiation accident victims for internal and external contaminations, as well as contaminated wounds.

For the State of Louisiana, Tab 2 of LPRRP Chapter 10 identified hospitals that have the capability to provide appropriate medical services to injured persons who may be radiologically contaminated, including the location, type, and capacity of the facility. In RAI 13.3-68 and subsequently in Open Item 13.3-1, the staff asked the applicant to describe special radiological capabilities for the hospitals listed. In response, the applicant stated that SERI believed it had provided sufficient information regarding emergency plans in accordance with 10 CFR 52.17, and that this issue would be more appropriately addressed in the context of full and integrated emergency plans, which would be submitted with a COL application, rather than this ESP application.

13.3.3.13.2 Regulatory Evaluation

Part 1 of the ESP application stated that the emergency planning information in Part 4 identifies the major features of an emergency plan, which will be developed consistent with the requirements of 10 CFR 52.17(b)(2)(i), using guidance provided in NUREG-0654/FEMA-REP-1 and Supplement 2.

In its review of the application, the staff considered the regulatory requirements in 10 CFR 52.17(b)(2)(i), 10 CFR 52.18, and Sections III, IV.A, IV.C, and IV.E of Appendix E to 10 CFR Part 50. Under 10 CFR 52.17(b)(2)(i), an applicant for an ESP may propose the major features of the emergency plans for NRC review and approval, in consultation with FEMA, in

the absence of complete and integrated emergency plans. Under 10 CFR 52.18, after consultation with FEMA, the NRC will determine whether the major features of an emergency plan submitted under 10 CFR 52.17(b)(2)(i) are acceptable. Supplement 2 and RS-002 provide guidance concerning the review and evaluation of emergency planning information given in an ESP application. Supplement 2 also provides specific evaluation criteria for major features of an emergency plan, including those which apply to major feature L, "Medical and Public Health Support."

Major feature L calls for the applicant to describe the contacts and arrangements it made for medical services for injured individuals who may be radiologically contaminated and to develop lists indicating the locations and capabilities of emergency medical services facilities.

13.3.3.13.3 Technical Evaluation

The staff finds that the applicant's response to RAI 13.3-53, which was implemented in Revision 2 to Part 4 of the application, is acceptable. Revision 2 to Part 4, the MREPP, PGCCREPP, LPRRP, and Enclosure I to Attachment 2 of LPRRP Supplement II, described the contacts and arrangements made for local and backup hospital and medical services having the capability to evaluate radiation exposure and uptake. However, in RAI 13.3-67, the staff asked for further information to clarify inconsistencies between the LPRRP and Enclosure 1 to Attachment 2 of LPRRP Supplement 2, regarding the description of contacts and arrangements for local and backup hospital services. The staff identified consideration of this information as Open Item 13.3-1e in the draft SER. The staff reviewed the applicant's response, and finds it acceptable for an ESP application, except to the extent that the arrangements would need to be expanded to incorporate relevant aspects of a proposed new reactor design in a COL or OL application. The staff will determine the adequacy of such incorporation during a COL or OL review. Therefore, Open Item 13.3-1e is resolved.

The PGCCREPP and LPRRP identified the location of public and private hospitals, as well as other emergency medical services facilities within the State or contiguous States, considered capable of providing medical support for any injured individual that may be radiologically contaminated. In RAI 13.3-68, the staff asked for further information to describe special radiological capabilities for hospitals listed in the LPRRP Chapter 10. The staff identified consideration of this information as Open Item 13.3-1f in the draft SER. The staff reviewed the applicant's response, and finds it acceptable for an ESP application, except to the extent that the arrangements would need to be expanded to incorporate relevant aspects of a proposed new reactor design in a COL or OL application. The staff will determine the adequacy of such incorporation during a COL or OL review. Therefore, Open Item 13.3-1f is resolved.

13.3.3.13.4 Conclusions

As discussed above, the applicant has described the contacts and arrangements for medical services capable of evaluating radiation exposure and uptake. Based on its review, the staff concludes that the proposed major feature K is consistent with the guidance in RS-002 and Supplement 2. Therefore, this feature is acceptable and meets the requirements of 10 CFR 52.17(b)(2)(i), 10 CFR 52.18, and Sections III, IV.A, IV.C, and IV.E of Appendix E to 10 CFR Part 50, insofar as it describes the essential elements of advanced planning that have been considered for medical and public health support, as set forth above.

13.3.3.14 Radiological Emergency Response Training (Major Feature O)

13.3.3.14.1 Technical Information in the Application

The applicant described the training program for instructing and qualifying personnel responsible for implementing radiological response plans. Specifically, Sections 3.15.2, "Facility Staff," and 3.15.5, "Training Development and Conduct," of Part 4 described the overall process the applicant will use to establish the training program. The applicant further stated in Section 3.15.1, "Licensee Staff," of Part 4 that it will appoint an appropriate manager to ensure that required emergency preparedness training, commensurate with their positions, will be provided for all personnel who are part of the emergency response organization.

Section 3.15 of Part 4 indicated that the applicant will provide initial training to all identified emergency organization positions/duties and emergency services organizations before the stage of facility construction and licensing requiring an active emergency plan is reached. Section 3.15.3, "Emergency Response Organization," of Part 4 also stated that personnel from the applicant's emergency response organization will receive initial and periodic retraining tailored to their responsibilities. All emergency response personnel will undergo plant access training, fitness-for-duty training, and emergency plan specialized and procedure training.

In RAI 13.3-54, the staff asked the applicant to describe the specialized initial and periodic retraining for the following categories of individuals in its emergency organization:

- directors or coordinators of the response organizations
- personnel responsible for accident assessment
- radiological monitoring teams and radiological analysis personnel
- first aid and rescue personnel (station fire aid team/fire brigade)
- personnel responsible for transmission of emergency information and instructions

In response, the applicant stated that the training described in Sections 3.15.1 through 3.15.4, "Orientation and Training Program for Offsite Support Agencies," of Part 4 applied to the categories of personnel listed above.

Section 3.15.4 of Part 4 addressed the scope of training and the means of providing such training to representatives of local fire departments, law enforcement, and ambulance and hospital services, who may be required to enter the site during an emergency or provide medical treatment to personnel from the site. The applicant further indicated that this training will include, at a minimum, the following information:

- station layout
- communication interfaces and procedures between the onsite organizations and the offsite support organizations
- expected responses to emergencies

- anticipated protective actions
- basic health physics and radiation protection
- primary and alternate plant access routes and access procedures

The applicant further addressed the training provided to local civil defense/emergency preparedness personnel, and the means by which this training will be conducted, in Section 3.15.4 of Part 4. The applicant indicated that it may assist in the training of county/parish emergency organization personnel, if requested. While Section 3.15.4 outlined the training to be offered, it did not specify the frequency for conducting continuing training to ensure proficiency. According to Section II.B.3, "Concept of Operations, Responsibilities, Utility," of MREPP Annex K, the licensee will also provided training for transportation personnel in support of the MREPP. In RAI 13.3-55, the staff asked the applicant to describe the frequency for conducting training for offsite support agencies to ensure proficiency. In Revision 2 to Part 4, the applicant amended Section 3.15.4 to state the following:

> Refresher training will be offered at an established frequency as necessary to ensure the affected agencies are able to effectively discharge their responsibilities. The adequacy of the selected training frequency may be assessed through the evaluation of periodic drills and exercises and the training content and frequency may be modified as necessary to ensure the continued effectiveness of the emergency response organization.

With regard to training for State and local responders in the States of Mississippi and Louisiana, the following documents described the responsibilities for, and contents of, initial and continuing radiological emergency response training programs for offsite response organizations:

- MREPP Basic Plan, Section VII, "Training," and Annex K, "Training"
- PGCCREPP Basic Plan, Section VII, "Training," and Annex K, "Training"
- LPRRP Chapter 12, "Training"
- LPRRP Chapter 8, "Radiological Emergency Response Training," of Attachment 2 to Supplement II

The applicant will provide the following specific types of training, depending on the category of personnel:

Directors or coordinators of the response organizations. Section II.M, "Detailed Course Descriptions, Task Specific Courses," of Appendix 2 to MREPP Annex K indicated that, because of the wide variety of responsibilities involved in a response to an accident at a fixed nuclear facility, task-specific training will be developed on the use of checklists and standard operating procedures (SOPs) in the State and/or local REP plans. As discussed in Section II.B.1.a, "Responsibilities, Claiborne County," of PGCCREPP Annex K, training of the director and staff for this responsibility will be assigned in accordance with the requirements of the county and city governments, MEMA, and FEMA.

Section III.A.4, “Training Programs, Response Plan Implementing Personnel,” of LPRRP Chapter 12 established that personnel who will receive training on radiological emergency response include directors or coordinators and staff of the response organizations. The LOEP, in conjunction with LDEQ, provided for the initial and followup training of parish emergency preparedness personnel who will evaluate protective response recommendations and coordinate the implementation of parish protective response in accordance with Chapter 8 of Attachment 2 to LPRRP Supplement II.

Personnel responsible for accident assessment. The PGCCREPP referred to the MREPP Basic Plan which, according to Appendix 1, “List of Available Training,” and Appendix 2, “Detailed Course Descriptions,” to MREPP Annex K, listed courses that include the knowledge base required by personnel responsible for radiological accident assessment. Section II.D, “Accident Assessment, Training,” of MREPP Annex D indicated that each agency will train its own personnel to accomplish assigned missions with the assistance of MSDH/DRH and MEMA.

Section III.A.4 of LPRRP Chapter 12 established that personnel who will receive training on radiological emergency response include accident assessment personnel. Section IV, “Federal Training Programs,” of LPRRP Chapter 12 indicated that selected LDEQ assessment personnel will attend the Radiological Accident Assessment Course offered by FEMA at the Emergency Management Institute (EMI). Section IV of LPRRP Chapter 12 also stated that selected individuals from LDEQ will attend the Health Physics in Radiation Accidents Course for health physicists.

Radiological monitoring teams and radiological analysis personnel. The PGCCREPP referenced the MREPP Basic Plan which, according to Appendices 1 and 2 to MREPP Annex K, listed courses offered by EMI (at the Federal level) and by MEMA (at the State level). These courses include the knowledge base required by radiological monitoring teams and radiological analysis personnel.

Section III.A.4 of LPRRP Chapter 12 established that personnel who will receive training on radiological emergency response include radiological monitoring personnel. Section III.B.1, “Training Programs, Response Organization Personnel,” of LPRRP Chapter 12 indicated that LDEQ will provide for the technical training of department staff who will perform field sampling, sample analysis, accident assessment, dose calculations, and protective response evaluations. Section IV of LPRRP Chapter 12 also noted that selected LDEQ response team personnel will attend the Radiological Emergency Response Operations Course funded by FEMA.

Police, security, and firefighting personnel. Appendices 1 and 2 to MREPP Annex K listed courses that include the knowledge base required by police, security, and firefighting personnel. Section II.M of Appendix 2 to MREPP Annex K further stated that, because of the wide variety of responsibilities involved in a response to an accident at a fixed nuclear facility, task-specific training will be developed on the use of checklists and SOPs in the State and/or local radiological emergency plans (REPs).

Section III, “Training Programs,” of LPRRP Chapter 12 established that personnel who will receive training on radiological emergency response include police security and firefighting personnel. Chapter 8 of Attachment 2 to LPRRP Supplement II indicated that radiological emergency response training will be given to sheriffs and deputies, security personnel, and firefighting and rescue personnel.

First aid and rescue personnel. Appendices 1 and 2 to MREPP Annex K listed courses that include the knowledge base required by first aid and rescue personnel. Section II.C.3.c, "Medical and Public Health Services, Concept of Operations," of Appendix 10 to PGCCREPP Annex F indicated that support ambulance services in Mississippi will participate in training and exercises to ensure the adequate treatment and care of contaminated individuals.

Section III.A.4 of LPRRP Chapter 12 noted that personnel who will receive training on radiological emergency response include first aid and rescue personnel. Chapter 8 of Attachment 2 to LPRRP Supplement II indicated that training will be provided for emergency response personnel and ambulance/rescue workers. The training will include notification procedures, basic radiation protection concepts, and the specific roles of each support organization.

Local support services personnel, including civil defense/emergency services personnel. Section 3.15.4 of Part 4 stated that civil defense/emergency preparedness agency personnel will be provided training through participation in joint utility/State/local status meetings and invitations to attend the training offered to the agencies listed above, as well as their respective State emergency preparedness organizations.

Section II.M of Appendix 2 to MREPP Annex K indicated that, because of the wide variety of responsibilities involved in a response to an accident at a fixed nuclear facility, task-specific training will be developed on the use of checklists and SOPs in the State and/or local REPs. Chapter 8 of Attachment 2 to LPRRP Supplement II discussed radiological emergency response training for the various support organizations that the utility has not trained.

Medical support personnel. Section 3.15.4 of Part 4 identified hospital services. Section II.B.3 of MREPP Annex K indicated that GGNS provides training for hospital staff in support of the MREPP.

Section IV.B of LPRRP Chapter 12 stated that selected individuals will attend the Medical Planning and Care in Radiation Accidents Course designed for physicians who may be called upon to provide first aid or medical care in the event of a radiation accident. This section also indicated that selected individuals will attend the Handling of Radiation Accidents by Emergency Personnel Course for emergency room surgeons and nurses who may be called upon to administer initial hospital aid to a radiation accident victim. Attachment 2 to LPRRP Supplement II noted that, for each primary and backup hospital designated to provide medical support for injured personnel who may be radiologically contaminated, initial and periodic retraining programs will be provided on evaluating and treating injured patients with radiological contamination.

Personnel responsible for transmission of emergency information and instructions.

Section 3.15 of Part 4 indicated that a training program will include personnel responsible for the transmission of emergency response information and instructions.

Section II.M of Appendix 2 to MREPP Annex K stated that, because of the wide variety of responsibilities involved in a response to an accident at a fixed nuclear facility, task-specific training will be developed on the use of checklists and SOPs in the State and/or local REPs. Additionally, Section III, "Concept of Operations," to MREPP Annex J noted that GGNS staff will

contact various news media outlets annually to provide points of contact for public information in an emergency and to discuss radiological emergency planning. Section III, "Concept of Operations," of PGCCREPP Annex J contained additional information.

Section III.A.4 of LPRRP Chapter 12 indicated that communications personnel are among those who will receive training on radiological emergency response. Section D.1.c of Enclosure I to Attachment 2 to LPRRP Supplement II stated that the Tensas Parish Emergency Preparedness Coordinator was responsible for supervising the development and implementation of training, as well as public information and education programs, within the parish.

13.3.3.14.2 Regulatory Evaluation

Part 1 of the ESP application stated that the emergency planning information in Part 4 identifies the major features of an emergency plan, which will be developed consistent with the requirements of 10 CFR 52.17(b)(2)(i), using guidance provided in NUREG-0654/FEMA-REP-1 and Supplement 2.

In its review of the application, the staff considered the regulatory requirements in 10 CFR 52.17(b)(2)(i), 10 CFR 52.18, and Sections III, IV.A, and IV.F of Appendix E to 10 CFR Part 50. Under 10 CFR 52.17(b)(2)(i), an applicant for an ESP may propose the major features of the emergency plans for NRC review and approval, in consultation with FEMA, in the absence of complete and integrated emergency plans. Under 10 CFR 52.18, after consultation with FEMA, the NRC will determine whether the major features of an emergency plan submitted under 10 CFR 52.17(b)(2)(i) are acceptable. Supplement 2 and RS-002 provide guidance concerning the review and evaluation of emergency planning information given in an ESP application. Supplement 2 also provides specific evaluation criteria for major features of emergency plans, including those which apply to major feature O, "Radiological Emergency Response Training."

Major feature O calls for the applicant to describe a radiological emergency response training program for personnel who would implement radiological emergency response plans.

13.3.3.14.3 Technical Evaluation

The staff finds that the applicant's responses to RAIs 13.3-54 and 13.3-55, which were implemented in Revision 2 to Part 4 of the application, are acceptable. Revision 2 to Part 4 of the application, the MREPP, PGCCREPP, LPRRP, Attachment 2 to LPRRP Supplement II, and Enclosure I to Attachment 2 of LPRRP Supplement II, described a training program for instructing and qualifying personnel who will implement radiological response plans. The applicant and responsible State and local agencies/organizations will provide specialized initial training and periodic retraining for the following categories of personnel, as applicable:

- directors or coordinators of the response organizations
- personnel responsible for accident assessment
- radiological monitoring teams and radiological analysis personnel
- police, security, and firefighting personnel

- first aid and rescue personnel
- local support services personnel, including civil defense/emergency services personnel
- medical support personnel
- personnel responsible for transmission of emergency information and instructions

13.3.3.14.4 Conclusions

As discussed above, the applicant has described a radiological emergency response training program for those who may be called on to assist in an emergency, including a training program for instructing and qualifying personnel who would implement the radiological emergency response plans. In addition, the applicant has described specialized initial training and periodic training. Based on its review, the staff concludes that proposed major feature O is consistent with the guidelines in RS-002 and Supplement 2. Therefore, it is acceptable and meets the requirements of 10 CFR 52.17(b)(2)(i), 10 CFR 52.18, and Sections III, IV.A, and IV.F of Appendix E to 10 CFR Part 50, insofar as it describes the essential elements of advanced planning that have been considered for radiological emergency response training, as set forth above.

13.3.3.15 Responsibility for the Planning Effort: Development, Periodic Review, and Distribution of Emergency Plans (Supplement 2, Major Feature P)

13.3.3.15.1 Technical Information in the Application

The applicant described the training of individuals responsible for the planning effort. Section 3.16.1, "Licensee Responsibility," of Part 4 indicated that the licensee will assign an individual with significant expertise to the position of manager for emergency preparedness and to those positions that provided technical or management support for emergency preparedness efforts. The licensee will also undertake an ongoing effort to provide these individuals with opportunities to periodically enhance and update their knowledge of pertinent subject matter.

As discussed in Section II.B.1, "Concept of Operations, Responsibilities, State," of MREPP Annex K, MEMA, in coordination with MSDH/DRH, provided for training of personnel who implement the MREPP. Additionally, Appendices 1 and 2 of MREPP Annex K listed available training, including EMI courses that provide appropriate instruction for emergency planning personnel. Section II.B.1, "Concept of Operations, Responsibilities," of PGCCREPP Annex K indicated that the PGCCCD Council was responsible for assuring that persons who are assigned to duties in emergency response organizations are scheduled to attend training.

Section IV of LPRRP Chapter 12 noted that the personnel of key response organizations who will be coordinating their organizations' response activities during an accident receive orientation and training on their assigned functions. Specifically, this section stated that designated personnel responsible for those individuals involved in radiological emergency response planning at the State and parish level will attend the following courses:

- Radiological Emergency Preparedness Planning
- Radiological Accident Assessment
- Radiological Emergency Response Operations
- Medical Planning and Care in Radiation Accidents
- Health Physics in Radiation Accident
- Handling of Radiation Accidents by Emergency Personnel

Section 3.16.1 of Part 4 described, in part, the title of the individual with overall authority and responsibility for radiological emergency response planning. An appropriate manager who will have overall authority and responsibility for the emergency planning effort will be appointed to discharge the responsibilities of the emergency planning coordinator.

Section 3.3.2 of Part 4 established MEMA as the designated State authority in the State of Mississippi; as such, MEMA has the responsibility for the general planning and coordination of the State of Mississippi's response to nuclear plant accidents, as detailed in the MREPP. MREPP Section IX, "Plan Development and Maintenance," indicated that MEMA was responsible for the development and maintenance of the MREPP. In RAI 13.3-69, the staff asked the applicant to identify, by title, the MEMA individual who has the overall authority and responsibility for radiological emergency response planning, development and updating of plans, and coordination of these plans with other response organizations. In response, the applicant stated the following:

> The Director of MEMA, subject to the direction and control of the Governor of Mississippi, is the executive head of the emergency management agency and is responsible to the Governor for carrying out the program for emergency management of this State. He coordinates the activities of all organizations for emergency management within the State, and maintains liaison with and cooperates with emergency management agencies and organizations of other States and of the Federal government, and has such additional authority, duties, and responsibilities authorized by Title 33, Chapter 15, of the Mississippi Code, as amended, as may be prescribed by the Governor.

In Section 3.3.2 of Part 4, the applicant further indicated that the PGCCCD Director was the designated county and executive authority with responsibility for planning and coordinating the county's emergency response activities.

Section V of the LPRRP Basic Plan stated that the LDEQ has jurisdiction over matters affecting the environment, including the regulation and control of radiation. In addition, the secretary of LDEQ, or official designee, was authorized to direct the development and implementation of emergency response plans for fixed nuclear facility accidents.

Section 3.3.2 of Part 4 also noted that the president of the Tensas Parish Police Jury, as the chief executive of Tensas Parish, was responsible by law for emergency preparedness operations. Section D.1.c of Enclosure I to Attachment 2 to LPRRP Supplement II indicated

that the Tensas Parish Emergency Preparedness Office, which is under the direction of the emergency preparedness coordinator, was responsible for the development and maintenance of implementing procedures.

The applicant described the emergency planning coordinator, who has the responsibility for the development and updating of emergency plans and coordination of these plans with other response organizations. Section 3.16.1 of Part 4 stated that the appointed manager (emergency planning coordinator) will discharge responsibility for (1) developing and updating plans, (2) coordinating the plans with those of affected response organizations, and (3) coordinating periodic reviews and updates of the plan as needed.

Section IX of the MREPP stated that MEMA was responsible for the development and maintenance of the MREPP. All State and local agencies were required to submit supporting plans and procedures to MEMA for review; MEMA then coordinated all revision efforts and ensured that all agencies involved conduct an annual review of the MREPP and individual support plans.

Section IV.A.2, "Organization and Responsibilities, Claiborne County," of the PGCCREPP indicated that the PGCCCD planning coordinator was responsible for updating and maintaining the plan (including annual reviews) and all supporting SOPs, as well as assisting other county and city organizations to establish plans and procedures in support of the PGCCREPP. According to PGCCREPP Section IX, county and city agencies with responsibilities under the PGCCCD submitted supporting plans and procedures to the PGCCCD for review and approval. In addition, as described in PGCCREPP Section IV.D.2, "Organization and Responsibilities, State," MEMA assisted local governments in the development and maintenance of REPs and procedures and provides affected counties, State agencies, and fixed nuclear facilities with copies of the MREPP and any subsequent revisions.

Section V of the LPRRP Basic Plan authorized the secretary of LDEQ, or official designee, to direct the development and implementation of emergency response plans for fixed nuclear facility accidents. In addition, LPRRP Section VI of the Basic Plan established that all State departments involved in responding to a radiological emergency at a fixed nuclear facility will develop detailed procedures for the implementation of assigned support responsibilities and will coordinate these implementing procedures with other State and local agencies. In RAI 13.3-70, the staff asked the applicant to identify, by title, the LDEQ individual/position with authority and responsibility for updating and coordinating emergency plans with other response organizations. In response, the applicant stated the following:

> The Secretary, Louisiana Department of Environmental Quality has authority and responsibility for updating the Louisiana Peacetime Radiological Response Plan (LPRRP). The LPRRP in its entirety is a component of the Louisiana Emergency Operations Plan (LEOP). The Director, Louisiana Office of Homeland Security and Emergency Preparedness (under the Louisiana Military Department), formerly the Louisiana Office of Emergency Preparedness, is responsible for coordination of the activities of all organizations involved in emergency management in the State of Louisiana.

The staff noted that Section 3.A, "LDEQ Required Action/Primary Function," of LEOP Attachment 4H assigned the responsibility for preparing the LPRRP and detailed implementing

procedures for all primary functions to the Department of Environmental Quality. These functions included requirements for supporting departments, agencies, and offices to initiate coordination with other supporting departments to ensure that they are aware of their roles and are prepared to take necessary action.

Section D.1.c of Enclosure I to Attachment 2 to LPRRP Supplement II stated that the Tensas Parish Emergency Preparedness Office, under the direction of the emergency preparedness coordinator, was responsible for supervising the development and maintenance of plans and procedures for the parish's response to an accident at GGNS, including an annual review and update of emergency implementing procedures. Additionally, Enclosure I further directed that the Tensas Parish emergency preparedness coordinator will act as liaison with municipalities within the parish, with responsibility for ensuring the coordination of special facility (e.g., industry and school) emergency procedures and protective actions with parish plans.

Section 3.16.1 of Part 4 further described the updating of plans and agreements. This section stated that LOAs with offsite organizations and agencies will be reviewed during the periodic plan reviews and updated as necessary. In addition, the applicant indicated that the appointed manager, by virtue of his or her involvement with the emergency preparedness program, will ensure that other individuals affected by the plan, including both licensee employees and Federal, State, and local officials, are informed of revisions to the plan.

For the State of Mississippi, MREPP Section IX noted that MEMA was responsible for the development and maintenance of the MREPP and that all State and local agencies are required to submit supporting plans and procedures to MEMA for review. MEMA will coordinate all revision efforts and ensure that all involved agencies conduct an annual review of the MREPP and support plans. Section IV.A.2 of the PGCCREPP indicated that the PGCCCD planning coordinator was responsible for updating and maintaining the plan (including annual reviews) and supporting SOPs and will assist other county and city organizations to establish plans and procedures in support of the PGCCREPP.

For the State of Louisiana, LPRRP Section VIII.B, "Administration, Review and Revision," stated that the LDEQ will conduct an annual review of the plan and related agreements and will update or certify the plan to be current. Furthermore, LPRRP Section VIII.B stated that the LDEQ will revise the plan based on the annual review, as well as address deficiencies resulting from drills, exercises, responses to real events, and interagency coordination. Section D.1.c of Enclosure I to Attachment 2 to LPRRP Supplement II indicated that the Tensas Parish Emergency Preparedness Office, under the direction of the emergency preparedness coordinator, was responsible for supervising the development and maintenance of plans and procedures for the parish's response.

In RAI 13.3-71, the staff asked the applicant to clarify its procedure for updating the contacts and arrangements described in the MREPP, PGCCREPP, and LPRRP. In response, the applicant stated that issues related to State and local plans should be deferred to the COL review stage.

Section 3.16.2, "Plan Distribution," of Part 4 described the forwarding of emergency response plans and approved changes to organizations and individuals with implementation responsibilities. The major features plan will not be distributed because it is not associated with an operating facility. Furthermore, copies of the completed emergency plan will be distributed

only when construction and licensing of the proposed new facility reach a stage requiring an active emergency plan. In RAI 13.3-56, the staff asked the applicant to describe its method for marking revisions made to the plan. In Revision 2 to Part 4, the applicant amended Section 3.16.2 to state the following:

> Changes to the plan will be indicated, using generally accepted administrative practices and word processing technology to clearly indicate the subject changes. The expected method used will most likely consist of providing dates and/or revision numbers on each page and change markings, such as text or margin markings, to indicate where changes have been made.

Section IX of the MREPP indicated that all changes/updates are submitted to MEMA for review and comment; MEMA then coordinated all revision efforts. Sections III and IV of MREPP provided the record of revisions and a distribution list for the plan, respectively. All plan pages are marked with a revision number and date. Section IV.A of MREPP, "Organization and Responsibilities, State," also noted that MEMA will provide affected counties, State agencies, and fixed nuclear facilities with copies of the MREPP and any subsequent revisions.

Section IX, "Plan Development and Maintenance," of PGCCREPP stated that county and city agencies with responsibilities under the PGCCCD will submit supporting plans and procedures to the PGCCCD for review and approval. For the PGCCREPP to be effective, the contents must be known and understood by those who are responsible for its implementation. All pages of the PGCCREPP are dated and marked with the revision number.

Section VIII.C, "Administration, Distribution," of the LPRRP directed the LDEQ to forward the plan to all affected organizations and appropriate individuals responsible for implementation of the plan. The LDEQ will also distribute sufficient copies of the plan to the State library system to provide members of the general public ample access. In addition, LPRRP Section VIII.C indicated the following:

- LDEQ will maintain a distribution list of controlled-copy holders of the plan.
- LDEQ will forward approved changes to controlled-copy holders of the plan.
- LDEQ will forward dated inserts to controlled-copy holders of the plan to bring their copies to current status.

The applicant described the development of a table of contents and cross-reference to Supplement 2 criteria. The table of contents provided in the front of Part 4 of the ESP application listed various sections and subsections based on Supplement 2, including major elements. Part 4 of the ESP application also provided Table 4-1,"NUREG-0654, Revision 1, Supplement 2, Cross-Reference." In RAI 13.3-57, the staff asked the applicant to clarify Table 4-1 to reflect changes made by the applicant in response to the staff's RAIs. In Revision 2 to Part 4, the applicant amended Table 4-1 to identify the correct cross-references between Supplement 2 and the content of Part 4 of its ESP application.

Section 1.0 of Part 4 indicated that the current emergency plans supporting GGNS Unit 1 were developed to be consistent with the emergency response plans of the affected States (Mississippi and Louisiana) and localities. In RAI 13.3-58, the staff asked the applicant to

explain why it did not include references to the entire LPRRP and LEOP in Section 1.2, "References," of Part 4 since this section contains basic plan information for the State of Louisiana which the applicant used in the ESP review. In Revision 2 to Part 4, the applicant amended Section 1.2 to reference Revision 9 to the LPRRP.

In addition, the staff asked the applicant, in RAI 13.3-59, to clarify whether the ESP application should incorporate relevant sections of the existing GGNS Unit 1 emergency plan to the extent that they support the emergency planning description in the ESP application. In response, the applicant stated that it did not intend to broadly incorporate sections of the GGNS Unit 1 emergency plan into the ESP application. The applicant further explained that it may have referred to specific sections of the GGNS Unit 1 emergency plan as needed to clarify or support the ESP application.

The MREPP, PGCCREPP, and LPRRP each contain a table of contents and a cross-reference to the planning standards and associated evaluation criteria in NUREG-0654/FEMA-REP-1.

13.3.3.15.2 Regulatory Evaluation

Part 1 of the ESP application stated that the emergency planning information in Part 4 identifies the major features of an emergency plan, which will be developed consistent with the requirements of 10 CFR 52.17(b)(2)(i), using guidance provided in NUREG-0654/FEMA-REP-1 and Supplement 2.

In its review of the application, the staff considered the regulatory requirements in 10 CFR 52.17(b)(2)(i), 10 CFR 52.18, and Sections III, IV.A, IV.F, and IV.G of Appendix E to 10 CFR Part 50. Under 10 CFR 52.17(b)(2)(i), an applicant for an ESP may propose the major features of the emergency plans for NRC review and approval, in consultation with FEMA, in the absence of complete and integrated emergency plans. Under 10 CFR 52.18, after consultation with FEMA, the NRC will determine whether the major features of an emergency plan submitted under 10 CFR 52.17(b)(2)(i) are acceptable. Supplement 2 and RS-002 provide guidance concerning the review and evaluation of emergency planning information given in an ESP application. Supplement 2 also provides specific evaluation criteria for major features of emergency plans, including those which apply to major feature P, "Responsibility for the Planning Effort: Development, Periodic Review, and Distribution of Emergency Plans."

Major feature P calls for the applicant to describe the development, review, distribution, and update of emergency plans. The application should also designate an emergency planning coordinator for each organization and identify (by title) individuals with emergency planning responsibilities. In addition, the application should describe training for those responsible for the planning effort.

13.3.3.15.3 Technical Evaluation

Revision 2 to Part 4 of the application, the MREPP, PGCCREPP, and LPRRP provided for the training of individuals responsible for the planning effort.

The staff finds that the applicant's response to RAI 13.3-69 is acceptable. Revision 2 to Part 4, the MREPP, PGCCREPP, LPRRP, and Enclosure I to Attachment 2 of LPRRP Supplement II,

identified, by title, the individual with the overall authority and responsibility for radiological emergency response planning.

The staff finds that the applicant's response to RAI 13.3-70 is acceptable. Revision 2 to Part 4, the MREPP, PGCCREPP, LPRRP, Enclosure I to Attachment 2 of LPRRP Supplement II, and LEOP, designated an emergency planning coordinator with responsibility for the development and update of emergency plans and the coordination of these plans with other response organizations. In addition, Part 4, the MREPP, PGCCREPP, LPRRP, and Enclosure I to Attachment 2 of LPRRP Supplement II discussed how the applicant and State and local organizations will update their respective plans and agreements, as needed. In this evaluation, the staff considered the updating of agreements as part of the process for the updating of plans, which is described above. Therefore, the staff finds that the applicant's response to RAI 13.3-71 is acceptable.

The staff finds that the applicant's response to RAI 13.3-56, which were implemented in Revision 2 to Part 4 of the application, is acceptable. Revision 2 to Part 4, the MREPP, PGCCREPP, and LPRRP, discussed forwarding the emergency response plans and approved changes to the plans to all organizations and appropriate individuals with responsibility for their implementation, as well as the appropriate marking of the revised pages.

The staff finds that the applicant's responses to RAIs 13.3-57, 13.3-58, and 13.3-59 are acceptable. Revision 2 to Part 4 of the application contained a specific table of contents and a cross-reference to the major features and associated evaluation criteria in Supplement 2 for the ESP applicant. Existing State and local plans currently provide a cross-reference to the evaluation criteria as specified in Section II to NUREG-0654/FEMA-REP-1.

13.3.3.15.4 Conclusions

As discussed above, the applicant has described the responsibilities for plan development and review and for distributing and updating emergency plans. In addition, the applicant has identified those responsible for the planning effort and has described the training that they receive. Based on its review, the staff concludes that proposed major feature P is consistent with the guidelines in RS-002 and Supplement 2. Therefore, it is acceptable and meets the requirements of 10 CFR 52.17(b)(2)(i), 10 CFR 52.18, and Sections III, IV.A, IV.F, and IV.G of Appendix E to 10 CFR Part 50, insofar as it describes the essential elements of advanced planning that have been considered for the development, periodic review, and distribution of emergency plans, as set forth above.

13.6 Site Characteristics—Security Plans

The NRC staff reviewed the physical security aspects of the ESP application to determine if site characteristics are such that the applicant can develop adequate security plans and measures.

13.6.1 Technical Information in the Application

In Section 3.1.6 of the GGNS SSAR, the applicant, SERI, stated that it has sufficient land area to accommodate any new unit(s) constructed on the ESP site. The applicant indicated that the site characteristics are such that the applicable NRC regulations, guidance documents, and orders can be met. The applicant based this conclusion on the size of the owner-controlled

area, which is large enough to provide adequate distance between vital areas and the probable location of a security boundary.

In RAI 3.1.6-1, the staff asked the applicant to provide scale drawings depicting various site features (i.e., roads, shoreline, culverts). In response to RAI 3.1.6-1, SERI provided a figure and referred to other figures in the application that depict the requested features.

Section 3.1.6 of the SSAR states that a security program is in place for the existing GGNS unit on the site and notes that the program complies with the NRC Order for Interim Compensatory Measures, dated February 25, 2002. SSAR Section 3.1.6 also states that the initial design requirements will incorporate security considerations as inputs and integrate them into the overall design as an important element. The SSAR concludes that NRC security requirements could be met for such a facility. The nearby transportation of hazardous materials or nearby hazardous material facilities poses no security hazards that would preclude the development of an adequate security plan for a new unit(s).

13.6.2 Regulatory Evaluation

In SSAR Sections 1.8 and 3.1.6, SERI identified Title 10, Section 100.21(f), of the *Code of Federal Regulations* (10 CFR 100.21(f)) and 10 CFR 73.55, "Requirements for Physical Protection of Licensed Activities in Nuclear Power Reactors against Radiological Sabotage," as the applicable regulations. The applicant also noted that RG 4.7, Revision 2, "General Site Suitability Criteria for Nuclear Power Stations," issued April 1998, provides applicable guidance. The staff finds that the applicant correctly identified the applicable regulations and guidance, as requested in RAI 1.4-1.

The NRC regulations require that ESP applicants address characteristics of the proposed site that could affect security. Specifically, 10 CFR 52.17 requires that site characteristics comply with 10 CFR Part 100 and 10 CFR 100.21(f) indicates that site characteristics must be such that applicants can develop adequate security plans and measures. In RG 4.7, the NRC provides amplifying guidance and notes that 10 CFR 73.55 describes physical protection requirements for nuclear power plants.

RS-002 states that the NRC staff provided guidance to the first three prospective ESP applicants in three substantially identical letters (Agencywide Documents Access and Management System (ADAMS) Accession No. ML030980029). These letters serve as review guidance for the ESP applications to which they apply. However, RS-002 also indicates that the NRC security orders referenced in the letters are, by their nature, subject to modification depending on changes in the terrorist threat level. The security orders do not form part of the licensing basis of the ESP and should not be imposed as conditions of prospective permits. Therefore, the NRC staff based the security review of ESP applications on the requirements of 10 CFR Part 100 and 10 CFR Part 73, "Physical Protection of Plants and Materials," or other applicable existing regulations.

13.6.3 Technical Evaluation

The staff reviewed the application and RAI responses. It also examined aspects of the application during an onsite visit. The proposed ESP site is located adjacent to the Mississippi River in Claiborne County, Mississippi, near one licensed nuclear power reactor (GGNS Unit 1)

owned by SERI and operated by Entergy Operations, Inc. The GGNS site is defined by a trapezoidal-shaped 2100 acre plot of land located directly adjacent to the Mississippi River. The ESP facility power block location, or site footprint, that bounds the prospective location for any new nuclear power reactor(s) that might be constructed on the proposed ESP site is located west of the existing GGNS protected area and no closer than 900 yards from the site boundary.

Using the criteria set forth in 10 CFR 100.21(f), the staff identified and considered various site characteristics that could affect the establishment of adequate security plans and measures. The staff considered pedestrian land, vehicular land, railroad, and water approaches, including potential high-ground adversary advantage areas, nearby road transportation routes, nearby hazardous material facilities, nearby pipelines, and culverts that could provide a pathway into the protected area.

With respect to pedestrian approaches, the staff found that various figures in the application (e.g., Figure 2.1-2) identify the applicant's proposed power block (within which all safety-related structures would be located if one or more reactors were to be constructed on the site). In RAI 3.1.6-1, the staff requested SERI to provide scale drawings that depict various site features (i.e., roads, shoreline, culverts). In its response, the applicant provided a figure and referred to other figures in the application that depict the requested features. The staff concluded that the distance from the planned locations of vital equipment and structures (which might be located anywhere in the proposed power block because a design is not specified at the ESP stage) to the planned protected area boundary can be made large enough that holders of a COL or construction permit (CP) could appropriately locate delay barriers, isolation zones, detection equipment, and vehicle barriers to protect vital equipment and structures.

With respect to water approaches, the staff noted that vital equipment for the existing GGNS unit is sufficiently far from the Mississippi River that restrictions to river access are not required. The need for such restrictions for any new units would depend on the design of the units and their location on the ESP footprint (i.e., the proposed power block). The site configuration would not present any significant impediments to the development of such restrictions.

With respect to vehicular land and railroad approaches, the staff identified existing roads, rail spurs, and site terrain features. The staff concluded that the location of existing roads and site terrain features do not preclude the establishment of adequate vehicle control measures to (1) prevent the use of a land vehicle to gain unauthorized proximity to vital areas, and (2) protect against a vehicle bomb. The staff based its conclusion on the fact that the location of the existing vehicle checkpoint, which could be used for vehicular control to the ESP site, has adequate standoff distance from the proposed power block to mitigate vehicle-bomb overpressure effects. Further, the staff confirmed during a site visit that the terrain features on all borders of the site are amenable to the implementation of a vehicle barrier system.

With respect to threats posed by deliberate vehicle explosions on nearby transportation routes, the staff noted that the nearest public road is 3000 feet from the proposed powerblock area. A gasoline tanker explosion involving 8500 gallons of gasoline detonated at a distance of 3000 feet would not result in an overpressure greater than 1 pound per square inch (psi) at the proposed powerblock area (see RG 1.91, Revision 1, "Evaluations of Explosions Postulated to Occur on Transportation Routes Near Nuclear Power Plants," issued February 1978). The pressure threshold for human eardrum rupture is 5 psi, which is the first point of human

incapacitation (see U.S. Army Technical Manual 5-1300, “Structures to Resist the Effects of Accidental Explosions,” issued November 1990). A peak positive overpressure of 1 psi is a conservative threshold below which no significant damage would be expected for structures, systems, and components of concern (see RG 1.91).

The staff examined the overall site terrain with respect to features (including existing manmade features, such as culverts, as well as natural features) that potential adversaries could use to their advantage. No such features would preclude the establishment of adequate security plans and measures.

With respect to nearby hazardous material facilities and nearby pipelines, the staff found that the distances to those facilities and the associated hazardous materials identified did not pose an impediment to the development of adequate security plans or measures.

Considering RG 4.7, special measures may be needed to support the security response strategy timeline requirements of 10 CFR 73.55(c). Because the exact locations and design of barriers are not known at the ESP stage, the staff identified a COL action item for the COL or CP applicant to provide specific designs for protected area barriers to support the security response strategy timelines. This is **COL Action Item 13.6-1.**

13.6.4 Conclusions

As set forth above, the staff examined the site characteristics with respect to their potential to affect the establishment of adequate security plans and measures. The staff examined pedestrian, vehicle, and water approaches, including existing culverts, nearby railroad lines, nearby hazardous materials facilities, nearby pipelines, and other transportation routes, as well as terrain features. Based on the above evaluation, the staff concludes that the ESP site characteristics would allow an applicant for a COL or CP to develop adequate security plans and measures for reactor(s) that it might construct and operate on the ESP site.

15. POSTULATED ACCIDENTS AND ACCIDENT DOSE CONSEQUENCES

15.1 Technical Information in the Application

In Section 3.3 of the site safety analysis report (SSAR) submitted by Systems Energy Resources, Inc. (SERI or the applicant), as part of the early site permit (ESP) application for the Grand Gulf Nuclear Station (GGNS) site, the applicant analyzed and provided the radiological consequences of design-basis accidents (DBAs) to demonstrate that a new nuclear unit(s) could be sited at the proposed ESP site without undue risk to the health and safety of the public, in compliance with the requirements of Title 10, Section 52.17, "Contents of Applications," of the *Code of Federal Regulations* (10 CFR 52.17) and 10 CFR Part 100, "Reactor Site Criteria." The applicant did not identify a particular reactor design to be considered for the proposed ESP site. Instead, SERI developed a set of reactor DBA source term parameters using surrogate reactor characteristics. The applicant used these parameters, in conjunction with site characteristics for accident analysis purposes, to assess the suitability of the proposed ESP site. These plant parameters collectively constitute a plant parameter envelope (PPE).

The applicant developed a PPE using seven reactor designs—five water-cooled reactors and two gas-cooled reactors—though it used source terms for only three of these designs as inputs to its DBA analyses. The water-cooled reactors included in the PPE were (1) a version of the Westinghouse Advanced Plant 1000 (AP1000), (2) the certified General Electric Advanced Boiling-Water Reactor (ABWR), (3) the Atomic Energy of Canada Advanced CANDU Reactor (ACR-700), (4) the General Electric Economic and Simple Boiling-Water Reactor (ESBWR), and (5) the Westinghouse-led International Reactor Innovative and Secure (IRIS) reactor. The ACR-700 is light-water cooled but heavy-water moderated. The two gas-cooled reactors were (1) the General Atomics Gas Turbine Modular Helium Reactor (GT-MHR) and (2) the Pebble Bed Modular Reactor (PBMR). The applicant stated that it did not intend to limit the PPE values to these reactor designs, but rather to provide a broad overall outline of a design concept and to include other potential reactor designs, if they fall within the PPE parameter values.

In selecting DBAs for dose consequence analyses, the applicant primarily focused on two light-water reactors (LWRs), the certified ABWR and a version of the AP1000[1], to serve as surrogates. The applicant stated that it selected these two reactor designs because they are (or are based on) previously certified standard designs and have recognized bases for postulated accident analyses. Using source terms developed from these two designs, the applicant performed and provided radiological consequence analyses for the following DBAs:

- pressurized-water reactor (PWR) main steamline break
- PWR feedwater system pipe break
- locked rotor accident

[1] As discussed later in this section, the applicant referenced a version of the AP1000 design available at the time the applicant submitted its ESP application. Westinghouse subsequently revised the AP1000 design before the U.S. Nuclear Regulatory Commission staff's issuance of a final safety evaluation report for the AP1000 design certification.

- reactor coolant pump shaft break
- PWR rod ejection accident
- boiling-water reactor (BWR) control rod drop accident
- failure of small lines carrying primary coolant outside containment
- PWR steam generator tube failure
- BWR main steamline break
- PWR and BWR loss-of-coolant accidents
- fuel-handling accident

The applicant presented the dose consequence assessment results in a series of tables found in SSAR Section 3.3 which provide the postulated radiological consequences of the DBAs identified above at the proposed exclusion area boundary (EAB) and the low-population zone (LPZ). The dose consequence assessment results in the tables also demonstrate that any potential doses would be within the radiological dose consequence evaluation factors set forth in 10 CFR 50.34(a)(1). The applicant provided the accident-specific source terms (release rates of radioactive materials from the ESP footprint (PPE values) to the environment) and resulting site-specific dose consequences for each DBA in Tables 3.3.2 through 3.3-28 of the SSAR.

In Request for Additional Information (RAI) 3.3-1, the staff asked the applicant to clarify whether the 0- to 2-hour EAB doses presented in the SSAR are for the 2-hour period with the greatest EAB doses. In its response, the applicant stated that the 0- to 2-hour EAB doses presented in the SSAR are for any 2-hour period with the greatest EAB doses. For the ABWR, the EAB doses are calculated for the first 2 hours of the accident. The applicant clarified and provided this information in Revision 2 of its application.

In RAI 3.3-2, the staff asked the applicant to provide references and explain the methodology it used to determine time-dependent activity releases for each DBA and to provide the curie content in such releases for each DBA. The applicant stated in its response that the methodologies used for calculating time-dependent activity releases for the ABWR and AP1000 appear in the respective design certification documents. In Revision 2 of the ESP application, the applicant provided new tables in Section 3.3 to show the time-dependent activity releases in curies for each DBA. The staff finds the methodologies used in the respective design certification documents and new tables to be acceptable.

In RAI 3.3-3, the staff asked the applicant to justify the use of the alternative source term methodology, in accordance with Regulatory Guide 1.183, “Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Plants,” issued July 2000, for evaluating ABWR radiological consequences, while the ABWR design is certified with Technical Information Document (TID)-14844, “Calculation of Distance Factors for Power and Test Reactor Sites,” issued March 1962, source term and with the dose criteria in thyroid and whole body doses. The applicant revised Section 3.3.3 in Revision 2 of the application to clarify that the ABWR radiological consequence analyses are based on the TID-14844 source term. Table 3.3-1 in Revision 2 of the application provides the offsite doses in thyroid and whole body doses.

In RAI 3.3-4, the staff noted that Westinghouse has revised its χ/Q values in the AP1000 design control document (DCD) since the applicant submitted the Grand Gulf ESP application and asked whether the applicant planned to use the updated values in revising its application. The

applicant responded that it elected not to update the ESP application to incorporate the latest χ/Q values in the AP1000 design certification, stating that the AP1000 certification is still undergoing U.S. Nuclear Regulatory Commission (NRC) review that may result in additional changes in the future. The staff finds that the assumed preliminary χ/Q values used by the applicant in its accident analyses are reasonable and, therefore, adequate for the purpose of demonstrating that a reactor with design characteristics similar to an AP1000 could be sited at the proposed ESP site.

In RAI 3.3-7, the staff asked the applicant to provide, for each DBA, the doses it used for the EAB and the LPZ for the AP1000 and the ABWR, as well as the ratios of site-specific χ/Q values to design certification χ/Qs used. In its response, the applicant stated that it would revise the dose tables in SSAR Section 3.3 to show the χ/Q values and doses from the AP1000 and ABWR DCDs, in addition to the ratios of site-specific χ/Q values to design certification χ/Q values. The applicant provided this information in the SSAR Section 3.3 tables in Revision 2 of its application.

In RAI 3.3-8, the staff noted that SSAR Section 3.3 provides total effective dose equivalent (TEDE) values for the ABWR design, while the ABWR design is certified with the thyroid and whole body doses specified in 10 CFR Part 100. The staff asked the applicant to explain how the doses compare. In its response, the applicant revised the SSAR in Revision 2 of its application to include the thyroid and whole body doses from the ABWR DCD, in addition to the estimated TEDE values. The thyroid and whole body doses met 10 CFR 100.11 dose criteria and its estimated TEDE values met 10 CFR 100.21, respectively. The staff finds the revised tables to be acceptable.

15.2 Regulatory Evaluation

In SSAR Sections 1.4 and 3.3, the applicant identified the following applicable NRC regulations and guidance regarding reactor accident radiological consequence analyses:

- 10 CFR 52.17
- 10 CFR Part 100
- 10 CFR 50.34, “Contents of Applications; Technical Information”
- RG 1.3, Revision 2, “Assumptions Used for Evaluating the Potential Radiological Consequences of a Loss of Coolant Accident for Boiling Water Reactors,” issued June 1974
- RG 1.25, “Assumptions Used for Evaluating the Potential Radiological Consequences of a Fuel Handling Accident in the Fuel Handling and Storage Facility for Boiling and Pressurized Water Reactors,” issued March 1972
- RG 1.145, “Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants,” issued November 1982
- RG 1.183

- NUREG-0800, Revision 3, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," issued July 1997

- TID-14844

The staff reviewed SSAR Sections 1.4 and 3.3 for conformance with the applicable regulations and considered the corresponding guidance, as identified above. In its evaluation, the staff used the dose consequence evaluation factors found in 10 CFR 50.34(a)(1) that are a factor in determining the acceptability of the site, in accordance with 10 CFR 52.17(a)(1).

The regulations at 10 CFR 52.17(a)(1) require that ESP applications contain an analysis and evaluation of the major structures, systems, and components of the facility that bear significantly on the acceptability of the site under the radiological consequence evaluation factors identified in 10 CFR 50.34(a)(1). In addition, the ESP site characteristics must comply with the requirements of 10 CFR Part 100. The regulations at 10 CFR 50.34(a)(1)(ii)(D) require the following for a postulated fission product release based on a major accident:

- An individual located at any point on the boundary of the exclusion area for any 2-hour period following the onset of the postulated fission product release would not receive a radiation dose in excess of 25 rem TEDE.

- An individual located at any point on the boundary of the LPZ who is exposed to the radioactive cloud resulting from the postulated fission product release (during the entire period of its passage) would not receive a radiation dose in excess of 25 rem TEDE.

Because the applicant has not selected a reactor design to be constructed on the proposed ESP site, the applicant used a PPE approach to demonstrate that it meets these requirements. A PPE is a set of plant design parameters that are expected to bound the characteristics of a reactor(s) that may be constructed at a site, and it serves as a surrogate for actual reactor design information. As discussed in Review Standard (RS)-002, "Processing Applications for Early Site Permits," and in Chapter 1 of this SER, the staff considers the PPE approach to be an acceptable method for assessing site suitability. For the purposes of this analysis, the applicant proposed a fission product release from the ESP footprint to the environment; the staff reviewed the applicant's dose evaluation based on this release.

15.3 Technical Evaluation

The applicant evaluated the suitability of the site under the radiological consequence evaluation factors identified in 10 CFR 50.34(a)(1) using bounding reactor accident source terms and dose consequences as a set of PPE values based on two surrogate designs, as well as site-specific χ/Q values derived from the ESP footprint. The following sections describe the staff's review of each aspect of this evaluation.

15.3.1 Selection of DBAs

The applicant selected the DBAs listed in Section 3.3.1 of this SER on the basis of the proposed AP1000 reactor design and the certified ABWR reactor design, indicating that it chose these two reactor designs because they have (or are based on) previously certified

standard designs and have recognized bases for postulated accident analyses. The staff finds that the applicant selected DBAs that are consistent with the DBAs listed and analyzed in NUREG-0800 and RG 1.183. Therefore, the staff finds that the applicant provided an acceptable DBA selection for evaluating the compliance of the proposed ESP site with the dose consequence evaluation factors specified in 10 CFR 50.34(a)(1). The applicant stated that, because of their greater potential for inherent safety, it expects the DBAs of the other reactors under consideration for the proposed ESP site to be bounded by those DBAs analyzed in the proposed AP1000 and certified ABWR DCDs. While the staff has not reviewed these designs in detail, other than the proposed AP1000 and certified ABWR, it believes that conclusions drawn regarding the site's acceptability based on the AP1000 and ABWR designs are likely to be valid for the other reactor designs the applicant is considering. At the time of any combined license (COL) or construction permit (CP) application that might be filed with respect to construction and operation of a reactor at the Grand Gulf ESP site, the applicant will confirm, and the staff will evaluate, whether the analyses considered here bound the design proposed in the COL or CP application.

15.3.2 Design-Specific (Assumed) χ/Q Values

To support its accident analyses based on the ABWR as a surrogate design, the applicant used the assumed χ/Q values in the certified ABWR DCD. In evaluating the AP1000, the applicant used those χ/Q values in the proposed AP1000 DCD that were under review by the staff at the time the Grand Gulf ESP application was submitted. Westinghouse subsequently revised the χ/Q values in the AP1000 DCD. Consequently, the assumed χ/Q values and the calculated design-specific doses used in the Grand Gulf ESP application may differ from those associated with a certified AP1000 DCD. However, the staff determined that the PPE values for the assumed χ/Q values associated with the AP1000 design used by the applicant in its accident analyses are reasonable and, therefore, are adequate for the purpose of demonstrating that a reactor with design characteristics similar to an AP1000 could be sited at the proposed ESP site. In response to RAI 3.3-7, the applicant provided AP1000 and ABWR χ/Q values it used for the version of the AP1000 and the certified ABWR that it considered. Table 15.3-1 of this SER lists these χ/Q values.:

Table 15.3-1 Design-Specific (Assumed) χ/Q Values in s/m^3

Location and Time Interval	AP1000	ABWR
0 to 2 hour EAB	6.0×10^{-4}	1.37×10^{-3}
0 to 8 hour LPZ	1.35×10^{-4}	1.56×10^{-4}
8 to 24 hour LPZ	1.0×10^{-4}	9.61×10^{-5}
1 to 4 day LPZ	5.4×10^{-5}	3.36×10^{-5}
4 to 30 day LPZ	2.2×10^{-5}	7.42×10^{-6}

15.3.3 Site-Specific χ/Qs

The staff reviewed the applicant's site-specific χ/Q values and performed an independent evaluation of atmospheric dispersion in accordance with the guidance provided in Section 2.3.4 of RS-002. The staff finds the χ/Q values to be acceptable, as described in Section 2.3.4 of this SER. Table 15.3-2 of this SER lists the site-specific χ/Q values used by the applicant and reviewed by the staff. The staff intends to include these site-specific χ/Qs in any ESP that the NRC may issue for the Grand Gulf ESP site.

15.3.4 Source Terms and Radiological Consequence Evaluations

To evaluate the suitability of the site using the radiological consequence evaluation factors in 10 CFR 50.34(a)(1), the applicant provided the bounding reactor accident source terms as a set of PPE values based on (1) the surrogate AP1000 and ABWR designs, and (2) the site-specific χ/Qs based on the ESP footprint. The source terms are expressed as the timing and release rate of fission products to the environment from the proposed ESP site. The dose consequences are then derived from the source terms using established methods.

The AP1000 source terms are based on the guidance provided in RG 1.183. The methodologies and assumptions that the AP1000 vendor, Westinghouse, used in its radiological consequence analyses are consistent with the guidance provided in RG 1.183. The resulting doses calculated for the AP1000 design using assumed site parameters meet the dose consequence evaluation factors specified in 10 CFR 50.34(a)(1) (i.e., 25 rem TEDE). The methodologies and assumptions that the ABWR vendor, General Electric, used in its radiological consequence analyses for the ABWR design are consistent with the guidance provided in RGs 1.3 and 1.25. The guidance in TID-14844 forms the basis of the ABWR source terms. The resulting doses for the ABWR reactor design using assumed site parameters meet the dose consequence evaluation factors specified in 10 CFR 100.11, "Determination of Exclusion Area, Low Population Zone, and Population Center Distance," which are 300 rem to the thyroid and 25 rem to the whole body. While the requirements of 10 CFR 100.11 are not applicable to ESPs, the staff notes that the final rule at Appendix A, "Design Certification Rule for the U.S. Advanced Boiling Water Reactor," to 10 CFR Part 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants," states the following:

> The Commission has determined that with regard to the revised design basis accident radiation dose acceptance criteria in 10 CFR 50.34, the ABWR design meets the new dose criteria, based on the NRC staff's radiological consequence analyses, provided that the site parameters are not revised.

Therefore, the staff concludes that the certified ABWR design, in conjunction with assumed site parameters, meets the dose consequence evaluation factors specified in 10 CFR 100.11, as well as those specified in 10 CFR 50.34(a)(1).

In determining the potential radiological consequence doses resulting from DBAs at the proposed site, the applicant used the site-specific atmospheric dispersion factors (χ/Q values), in conjunction with the DBA radiological consequence doses and the postulated χ/Q values provided in the SSAR of the certified ABWR (SSAR/ABWR) and the proposed AP1000 DCD.

The certified ABWR and the proposed AP1000 designs met the radiological consequence evaluation factors identified in 10 CFR 50.34(a)(1) with their postulated χ/Q values.

The χ/Q values indicate the atmospheric dilution capability. Smaller χ/Q values are associated with greater dilution capability, resulting in lower radiological doses. The radiological consequence doses are directly proportional to the χ/Q values. Table 1.9-1 of the SSAR provides the site-specific χ/Q values the applicant used in its radiological consequence analyses, and Section 2.3.4 of this SER discusses the staff's evaluation of these χ/Q values.

The applicant used the atmospheric dispersion computer code (PAVAN) to derive its site-specific χ/Q values. In RAI 2.3.4-2, the staff asked the applicant to provide a copy of the PAVAN computer code input and output files used to generate the EAB and LPZ χ/Q values presented in SSAR Section 2.3.4. The applicant complied with this request in its response to the RAI.

The applicant used the ratios of the site-specific χ/Q values to those postulated in the SSAR/ABWR and AP1000 DCD to determine and demonstrate that the radiological consequence doses at the proposed site meet the requirements of 10 CFR 50.34. The estimated site-specific χ/Q values for the proposed site are lower than those postulated in the SSAR/ABWR and AP1000 DCD. The certified ABWR and the proposed AP1000 designs met the radiological consequence evaluation factors identified in 10 CFR 50.34(a)(1) with their postulated χ/Q values. Accordingly, the resulting DBA radiological consequence doses at the proposed site are lower than those provided in the SSAR/ABWR and AP1000 DCD and, therefore, meet the requirements of 10 CFR 50.34.

The staff accepts that the radiological consequences of the DBAs at the proposed site based on the AP1000 and ABWR designs are likely to be valid for the other reactor designs the applicant is considering. Whether or not the final reactor design the applicant selects for use at the Grand Gulf ESP site is in fact bounded by the acceptance made here would be subject to review during the staff's consideration of any COL or CP application. In accordance with 10 CFR 52.79(a)(1), at the COL stage, the staff will evaluate whether the design of the facility falls within the parameters specified in an ESP, should the NRC issue one for the Grand Gulf ESP site.

The staff verified the design-specific source terms the applicant provided and finds them to be consistent with those evaluated as part of the design certification reviews. Further, the staff finds that the references provided by the applicant and the methodology it used to determine timing and release rate of fission product source terms to the environment (and consequent dose consequences) from the proposed ESP site are acceptable. Therefore, the staff finds the source terms from the PPE (i.e., the ESP footprint) themselves to be reasonable and acceptable. The staff intends to include the site-specific χ/Q values as site characteristics listed in Appendix A to this SER, for use in any ESP that the NRC might issue for the Grand Gulf site.

Based on its evaluation of the applicant's analysis methodology and inputs to that analysis, the staff finds that the applicant correctly concluded that the dose consequences for the chosen surrogate designs comply with the dose consequence evaluation factors of 10 CFR 50.34(a)(1). Table 15.3-2 of this SER identifies the following site χ/Q values as appropriate for inclusion in any ESP that the NRC might issue for the Grand Gulf ESP site.

Table 15.3-2 Staff's Proposed Short-Term (Accident Release) Atmospheric Dispersion Site Characteristics (Site-Specific χ/Q Values)

Location and Time Interval	χ/Q Value
0 to 2 hour EAB	5.95×10^{-4} s/m^3
0 to 8 hour LPZ	8.83×10^{-5} s/m^3
8 to 24 hour LPZ	6.16×10^{-5} s/m^3
1 to 4 day LPZ	2.82×10^{-5} s/m^3
4 to 30 day LPZ	9.15×10^{-6} s/m^3

RS-002 calls for the staff to perform a confirmatory radiological consequence calculation. However, the design-related inputs to the applicant's dose calculation were directly extracted from design documentation previously submitted to and reviewed by the NRC in connection with design certification applications. Because the applicant simply used the ratio of the site specific a/Q values to the postulated design χ/Q values, the staff did not consider an independent calculation to be useful or necessary and, therefore, did not perform one.

15.4 Conclusions

As set forth above, the applicant submitted its radiological consequence analyses using the site-specific χ/Q values and PPE source term values and concluded that the proposed site meets the radiological consequence evaluation factors identified in 10 CFR 50.34(a)(1). Based on the reasons set forth above, the staff finds that the applicant's PPE values for source terms included as inputs to the radiological consequence analyses are reasonable. Further, the staff finds that the applicant's site-specific χ/Q values and dose consequence evaluation methodology are acceptable.

Therefore, the staff concludes that the proposed distances to the EAB and the LPZ outer boundary of the proposed ESP site, in conjunction with the fission product release rates to the environment provided by the applicant as PPE values, are adequate to provide reasonable assurance that the radiological consequences of the DBAs will be within the dose consequence evaluation factors set forth at 10 CFR 50.34(a)(1) for the proposed ESP site. This conclusion is subject to confirmation at the COL or CP stage that the design of the facility specified by the COL or CP applicant falls within the ESP PPE values.

The staff further concludes that (1) the applicant demonstrated that the proposed ESP site is suitable for power reactors with source term characteristics bounded by those of the ABWR and AP1000 without undue risk to the health and safety of the public, and (2) the applicant complies with the requirements of 10 CFR 52.17 and 10 CFR Part 100.