

## **13.0 CONDUCT OF OPERATIONS**

This chapter of the Final Safety Analysis Report (FSAR) application provides information relating to the preparations and plans for the design, construction, and operation of the plant. The purpose of this chapter is to document the U.S Nuclear Regulatory Commission (NRC) staff's conclusions on whether the Combined License (COL) applicant establishes and maintains a staff of adequate size and technical competence and whether the operating plans to be followed by the licensee are adequate to protect public health and safety.

### **13.1 Organizational Structure of Applicant**

#### **13.1.1 Introduction**

This section of the FSAR addresses the design, construction, preoperational, operational and maintenance responsibilities of the organization. The management and technical support organization includes a description of the corporate or home office organization, its functions and responsibilities, and the number and the qualifications of personnel. Activities of the organization include facility design, design review, design approval, construction management, testing, and operation of the plant. The descriptions of the design, construction, preoperational, operational, and maintenance responsibilities include the following:

- How these responsibilities are assigned by the headquarters staff and implemented within the organizational units
- The responsible working- or performance-level organizational unit
- The estimated number of persons to be assigned to each unit with responsibility for the project
- The general educational and experience requirements for identified positions or classes of positions
- The early plans for providing technical support for the operation of the facility
- This section also describes the structure, functions, and responsibilities of the onsite organization established to operate and maintain the plant. The applicant has renumbered Section 13.1.1 and has added other subsections in FSAR Section 13.1.

#### **13.1.2 Summary of Application**

In South Texas Project (STP) Units 3 and 4 FSAR Section 13.1, the applicant has added subsections to FSAR Section 13.1. Several of these subsections are new and differ from the structure in Section 13.1 of Regulatory Guide (RG) 1.206.

#### **13.1.3 Regulatory Basis**

The relevant requirements of the Commission regulations for the organizational structure of applicant, and the associated acceptance criteria, are in Sections 13.1.1 and 13.1.2-13.1.3 of NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants"; the Standard Review Plan (SRP).

In particular, the applicable regulatory guidance for the organizational structure of the applicant is as follows:

- American National Standards Institute (ANSI)/American Nuclear Society (ANS)-3.1-1993, as endorsed and amended by Regulatory Guide (RG) 1.8, "Qualification and Training of Personnel for Nuclear Power Plants."

The applicable regulations and regulatory guidance for the management, technical support, and operating organizations of the applicant are as follows:

- Title 10 of the *Code of Federal Regulations* (10 CFR) 50.40(b), "Common Standards," which requires the applicant to be technically qualified to engage in the proposed activities authorized by the license.
- 10 CFR 50.54(j-m), "Conditions of Licenses"

RG 1.33, "Quality Assurance Program Requirements (Operation)"

#### **13.1.4 Technical Evaluation**

NUREG-0800, Section 13.1.2-13.1.3, "Operating Organization," states that the applicant's operating organization should be characterized as follows:

1. The applicant is technically qualified as specified in 10 CFR 50.40(b).
2. An adequate number of licensed operators will be available at all required times to satisfy the minimum staffing requirements of 10 CFR 50.54(j-m).
3. On-shift personnel provide the initial facility response in the event of an emergency.
4. Organizational requirements for the plant manager and radiation protection manager have been satisfied.
5. Qualification requirements and qualifications of plant personnel conform to the guidance of RG 1.8.
6. Organizational requirements conform to the guidance of RG 1.33.

NRC staff compared Section 13.1 of the STP Units 3 and 4 COL FSAR to the guidance in NUREG-0800, Section 13. This section of the COL FSAR is not part of the certified U.S. Advanced Boiling-Water Reactor (ABWR) design certification document (DCD).

The applicant has added new sections and information to Section 13.1 related to the site-specific organizational structure and beyond the structure described in RG 1.206. The new section titles are:

- 13.1.1, "Management and Technical Support Organization"
- 13.1.2, "Operating Organization"
- 13.1.3, "Qualifications Requirements of Nuclear Plant Personnel"

The applicant describes the organization for the management and the means of providing technical support to the plant staff for the design, construction, and operation of the facility. The applicant also describes plans for managing the project and utilizing the nuclear steam supply system vendor and the architect engineer. The applicant adds that this chapter provides assurance that the applicant will establish and maintain a staff of adequate size and technical competence, and that operating plans are adequate to protect public health and safety.

The applicant describes the assignment of plant operating responsibilities, the reporting chain up through the chief executive officer, the functions and responsibilities of each major plant staff group, the proposed shift crew complement for single-unit or multiple-unit operations, the qualification requirements for the plant staff, and staff qualifications. Resumes for management and principal supervisory and technical positions will be submitted upon request after position vacancies are filled.

The applicant has added text to Section 13.1.3, "Qualification of Nuclear Plant Personnel," stating that the qualifications of managers and supervisors of the technical support organization will meet the education and experience requirements described in ANSI 18.1/ANS-3.1-1993 and in RG 1.8.

The above information contributes to the judgment that the applicant is in compliance with the requirements of 10 CFR 50.40(b). That is, the applicant is technically qualified to engage in design and construction activities and to operate a nuclear power plant; and the applicant will have the necessary managerial and technical resources to support the plant staff in the event of an emergency. The applicant has identified the organizational positions responsible for fire protection-related situations and has delegated the authority of these positions to implement fire protection requirements.

### **13.1.5 Post Combined License Activities**

There are no post COL activities related to this section.

### **13.1.6 Conclusion**

The staff compared STP Units 3 and 4 FSAR Section 13.1, "Organizational Structure of Applicant," to the relevant NRC regulations; the acceptance criteria defined in NUREG-0800, Section 13; and other NRC RGs. The staff concluded that the applicant is in compliance with the NRC regulations.

The staff's review confirmed that the applicant has addressed the relevant information to satisfy the requirements of 10 CFR 50.40(b) and 10 CFR 50.54(j-m), and no outstanding information is expected to be addressed in the COL FSAR related to this section.

## **13.2 Training**

### **13.2.1 Introduction**

This section of the FSAR addresses the description and schedule of the training program for reactor operators and senior reactor operators (i.e., licensed operators). The discussion addresses the scope of licensing examinations as well as training requirements. The

licensed operator training program also includes the requalification programs required in 10 CFR 50.54(i)(i-1) and 10 CFR 55.59, "Requalification." In addition, this section of the FSAR includes the description and schedule of the training program for non-licensed plant staff.

### **13.2.2 Summary of Application**

Section 13.2 of the STP Units 3 and 4 COL FSAR incorporates by reference Nuclear Energy Institute (NEI) 06-13, "Template for an Industry Training Program Description." In addition, in FSAR Section 13.2, the applicant provides the following:

- COL License Information Item
- COL License Information Item 13.1 Incorporation of Operating Experience

The applicant provides information to address COL Information Item 13.1. The applicant adds that "the results of reviews of operating experience are incorporated into training and retraining programs in accordance with the provisions of the TMI Action Item I.C.5, Appendix 1A."

### **13.2.3 Regulatory Basis**

The relevant requirements of the Commission regulations for the training and the associated acceptance criteria are in Section 13.2 of NUREG-0800. In particular, the regulatory basis for accepting the applicant's information in Section 13.2 is in 10 CFR Parts 19, 26, 50, 52, and 55; Appendix E of 10 CFR Part 50; the guidance of RGs 1.8 and 1.149; NUREG-1021, "Operator Licensing Examination Standards for Power Reactors"; and NUREG-1220, "Training Review Criteria and Procedures." The COL License Information Item 13.1 is reviewed using the guidance in NUREG-0800 Sections 13.2.1, "Reactor Operator Requalification Program; Reactor Operator Training," and 13.2.2, "Non-Licensed Plant Staff Training."

The Operational Program for the Non-Licensed Plant Staff Training Program is in 10 CFR 50.120 and 10 CFR 52.79(a)(33).

The Operational Program for the Reactor Operator Training Program is in 10 CFR 55.13, 55.31, 55.41, 55.43, and 55.45.

The Operational Program for the Reactor Operator Requalification Program is satisfied based on meeting the requirements of 10 CFR 52.79(a)(34), 50.54(i), and 55.59.

The relevant criteria for reviewing COL License Information Item 13.1, which relates to the incorporation of operating experience, are based on meeting the provisions of the Three Mile Island (TMI) Action Item I.C.5, Appendix 1A, "Feedback of Operating Experience." Moreover, COL License Information Item 13.1 is satisfied based on following the guidance of NUREG-0800 Section 13.2, "Training."

### **13.2.4 Technical Evaluation**

NRC staff reviewed Section 13.2 of the STP Units 3 and 4 COL FSAR and checked the referenced ABWR DCD. This section is not part of the certified ABWR DCD.

- COL License Information Item
- COL License Information Item 13.1 Incorporation of Operating Experience

The applicant provides information in Table 13.4S-1 regarding program implementation milestones. NUREG-0800 Subsection 13.2.2.I.1 and Subparts B, C, and D require numerous training programs to be implemented relative to (before) loading or receiving fuel.

Table 13.4S 1 in many cases does not accurately reflect these milestones. As a result, the staff issued request for additional information (**RAI 13.02.02-1-Question 11645**) requesting the applicant to clarify or modify FSAR Table 13.4S-1 to ensure that the intent of NUREG-0800 is met. The applicant's response to **RAI 13.02.02-1-Question 11645** (letter dated July 21, 2009, [ML091760905]) indicates that Table 13.4S-1 will be revised to state, "implementation will occur prior to the milestone indicated." The staff determined that this response is acceptable. This issue is being tracked as **Confirmatory Item 13.02.02-1**.

The applicant also states that NEI 06-13, "Template for an Industry Training Program Description", including all subsections, is incorporated by reference. NEI 06-13A, Revision 1 was written to provide COL applicants with a generic program description for use with COL application submittals. In a letter dated December 5, 2008, the staff stated that the training template of NEI-06-13A, Revision 1, is an acceptable means for describing training programs for licensed operators and non-licensed plant staff. The staff found the applicant's incorporation of NEI 06-13A, Revision 1 acceptable because it utilizes an NRC-endorsed methodology.

The staff performed this review in accordance with the requirements of TMI Action Item I.C.5, "Feedback of Operating Experience," on the incorporation of operational experience into the training and procedure development programs. The staff used the applicable sections of the SRP and RG 1.206 and has determined the applicant's response is acceptable.

### **13.2.5 Post Combined License Activities**

There are no post COL activities related to this section.

### **13.2.6 Conclusion**

The staff compared the application to the relevant NRC regulations; the acceptance criteria in NUREG-0800 Section 13.2, and other NRC regulatory guides and concluded that the applicant is in compliance with the NRC regulations. The staff also concluded that the applicant has adequately addressed COL License Information Item 13.1 regarding the incorporation of operating experience.

The staff's review confirmed that the applicant has addressed the relevant information relating to training. With the exception of Confirmatory Item 13.02.02-1, no outstanding information is expected to be addressed in the COL FSAR related to this section. As a result of this confirmatory item, the staff was unable to finalize its conclusions relating to training in accordance with NRC requirements.

### **13.3 Emergency Planning**

#### **13.3.1 Introduction**

This section of the FSAR addresses the emergency plans, design features, facilities, functions, and equipment necessary for emergency planning that must be considered in a COL application. The emergency plans include the applicant's onsite emergency plan and the State and local offsite emergency plans for the STP site. The emergency plans express the overall concept of operation and describe the essential elements of advance planning that have been considered and the provisions that have been made to cope with radiological emergency situations.

#### **13.3.2 Summary of Application**

Section 13.3 of the STP Unit 3 and 4 COL FSAR incorporates by reference Section 13.3 of the certified ABWR DCD, Revision 4 referenced in 10 CFR Part 52, Appendix A. Table 13.3-1, "ABWR Design Considerations for Emergency Planning Requirements," describes the design considerations for the technical support center (TSC), operational support center (OSC), emergency operations facility (EOF), counting room for analyzing post-accident samples, and an onsite decontamination facility.

In addition, in FSAR Section 13.3, the applicant provides the following:

- COL License Information Item
- COL License Information Item 13.2 Emergency Plans

In COL FSAR Subsection 13.3.1.1, the applicant states:

- a. A comprehensive site Emergency Plan for STP is provided in COLA Par 5.

- Onsite Emergency Plans

Part 5, "Emergency Plan," of the COL application includes the emergency plan for responding to a broad range of radiological emergencies, including hostile actions, at STP Units 3 and 4.

- Offsite Emergency Plans

The Texas Radiological Emergency Management (REM) Plan is included in Section 5.6, "State of Texas Emergency Management Plan," in Part 5, "Emergency Plan," of the STP COL application. The Texas REM Plan consists of five tabs and a manual of REM procedures and is maintained under a separate cover by the Department of State Health Services (DSHS). The REM Plan assigns responsibilities to State agencies and details procedures for conducting a coordinated response to radiological emergencies. The five tabs in the REM Plan address five types of emergencies:

- Fixed nuclear facility accidents

- Production/utilization accidents
- Federal facility accidents
- Transportation accidents
- Waste storage/disposal accidents

The REM Procedures Manual consists of a series of procedures that provide guidance and ensure uniformity in the performance of selected tasks applicable to any or all of the various types of radiological emergencies. Where specific instructions are required for implementing a given procedure, with respect to an individual facility or accident type, those instructions are incorporated in the appropriate tab of the Texas REM Plan.

The “Emergency Management Basic Plan for Matagorda County, Bay City, and Palacios,” is included as Section 5.5, “Matagorda County Emergency Management Basic Plan,” in Part 5, “Emergency Plan,” of the STP COL application. This plan provides a framework for officials of Matagorda County to use for planning and performing their respective emergency functions.

- Emergency Planning ITAAC

In Section 4.0, “Emergency Planning ITAAC,” of Part 9, “Inspections, Tests, Analyses, and Acceptance Criteria,” of the COL application, the applicant proposes site-specific emergency planning ITAAC in Table 4.0-1, “Emergency Planning - Inspection, Test, Analysis, and Acceptance Criteria (EP-ITAAC).”

Section 2.17, “Emergency Response Facilities,” of Part 2, “FSAR,” of the COL application, incorporates by reference all tables in Section 2.17, “Emergency Response Facilities,” of the ABWR DCD. Table 2.17.1, “Emergency Response Facilities,” contains six emergency planning ITAAC related to the location and size of the TSC, the location of the OSC, TSC and OSC voice communications, and plant parameter displays in the TSC.

### **13.3.3 Regulatory Basis**

The regulatory basis of the information incorporated by reference is documented in NUREG-1503, “Final SER Related to Certification of the Advanced BWR Design,” dated July 1994 (ML080670560), and in NUREG–1503 Supplement 1, “Final Safety Evaluation Report Related to the Certification of the Advance Boiling Water Reactor Design,” dated May 1997 (ML080710134).

NRC staff reviewed the application and considered the regulatory requirements of 10 CFR 52.79(a)(21) and 10 CFR 52.79(a)(22)(i), which require the application to include emergency plans that comply with the requirements of 10 CFR 50.47 and Appendix E to 10 CFR Part 50 and emergency plan certifications from State and local government agencies with emergency planning responsibilities. Under the requirements of 10 CFR 50.47(a)(1)(ii), no initial COL under the requirements of 10 CFR Part 52 will be issued unless a finding is made by the NRC that there is a reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. In addition, under 10 CFR 50.47(a)(2), the NRC will base the finding on a review of the Federal Emergency Management Agency (FEMA)

findings and determinations as to whether State and local offsite emergency plans are adequate and whether there is reasonable assurance that they can be implemented; and on NRC assessments as to whether the applicant's onsite emergency plans are adequate and whether there is reasonable assurance that they can be implemented.

In addition, the staff considered the applicable requirements in 10 CFR 52.77, 10 CFR 52.80, and 10 CFR 100.21.

Section 13.3, "Emergency Planning," of the SRP (NUREG-0800) includes guidance concerning the review and evaluation of emergency planning information submitted in a COL application and the determination of compliance with the applicable regulations. The SRP identifies 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"; NUREG-0696, "Functional Criteria for Emergency Response Facilities"; and other related guidance that NRC staff should consider during the review. The applicable acceptance criteria are identified in Section 13.3.II, "Acceptance Criteria," of NUREG-0800.

The regulatory basis for COL License Information Item 13.2, which relates to emergency planning, is established in 10 CFR 52.77, 10 CFR 50.33(g), and 10 CFR 52.79(a)(21).

The regulatory basis for implementing the operational program related to emergency planning is established in Section V, "Implementing Procedures," and Section IV.F, "Training," of Appendix E to 10 CFR Part 50.

In addition, Section 13.3, "Emergency Planning," in NUREG-0800, "Standard Review Plan," states that if an application is for an additional reactor or reactors at an operating reactor site, and the applicant proposes to incorporate and extend elements of the existing emergency planning program to the new reactor (included by reference), those existing elements should be considered acceptable and adequate. The reviewer should generally focus the review on the extension of the existing program to the new reactor and should determine whether the incorporated emergency planning program information from the existing reactor site (1) is applicable to the proposed reactor; (2) is up-to-date when the application is submitted; and (3) reflects the use of the site for constructing a new reactor (or reactors) and appropriately incorporates the new reactor(s) into the existing plan. Accordingly, the applicant submitted a modification of the STP Units 1 and 2 Emergency Plan to reflect Units 3 and 4.

In 44 CFR Part 353, Appendix A, "Memorandum of Understanding (MOU) Between Federal Emergency Management Agency and Nuclear Regulatory Commission Relating to Radiological Emergency Planning and Preparedness," dated September 14, 1993, the information states that FEMA is responsible for the findings and determinations as to whether offsite emergency plans are adequate and can be implemented. FEMA radiological offsite emergency preparedness (REP) documents provide guidance on various topics for use by State and local organizations responsible for radiological emergency preparedness and response. 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," provides a basis for State and local governments to develop radiological emergency plans.



#### 13.3.4 Technical Evaluation

NRC staff reviewed Section 13.3 of the STP Units 3 and 4 COL FSAR and checked the referenced ABWR DCD to ensure that the combination of the information in the COL FSAR and the information in the ABWR DCD appropriately represents the complete scope of information relating to this review topic.<sup>1</sup> The staff's review confirmed that the information in the application and the information incorporated by reference address the required information relating to the emergency planning.

The NRC staff's review of the emergency planning information related to COL License Information Item 13.2 is in Attachment 13.3A, "COL Information Items, Supplemental Information Items and Departures," of this section of the safety evaluation report (SER).

NRC staff reviewed the following sections of the COL application for conformance with the applicable standards and requirements identified in Section 13.3, "Emergency Planning," of NUREG-0800, "Standard Review Plan":

- Part 2, "FSAR"
- Part 5, "Emergency Planning"
- Part 9, "ITAAC"

The staff's review of the information provided in the COL application that is not part of the STP Units 3 and 4 Emergency Plan is addressed in Attachment 13.3B, "Emergency Planning Information in the Application," of this SER section.

The staff reviewed the changes in the STP Units 1 and 2 Emergency Plan which were identified in the STP Units 3 and 4 Emergency Plan for conformance with the applicable standards and requirements identified in Section 13.3, "Emergency Planning," of NUREG-0800, "Standard Review Plan," dated March 2007. The results of the staff's review are in Attachment 13.3C. The staff also reviewed the License Condition proposed by the applicant regarding the emergency action level scheme for STP (see Section 13.3C.4.3). In addition, the staff reviewed the radiological consequences to personnel in the TSC from postulated fission product releases. **Open Item 13-03-1** was created to track the applicant's submittal of the radiological consequence assessment.

The staff also reviewed and compared Table 4.0-1, "Emergency Planning - Inspection, Test, Analysis, and Acceptance Criteria (EP-ITAAC)," in Part 9, "ITAAC," of the COL application against the generic ITAAC in Table 14.3.10-1, "Emergency Planning - Generic Inspections, Tests, Analyses, & Acceptance Criteria (EP-ITAAC)," in the SRP. The results of the NRC staff's review are in Section 13.3C.S, "Emergency Planning ITAAC," of this SER.

Pursuant to 10 CFR 52.79(a)(21) and 10 CFR 52.81, the staff reviewed the COL application according to the standards set out in 10 CFR Part 50, including 10 CFR 50.47 and Appendix E to 10 CFR Part 50. The results of the NRC staff's review are in Attachments 13.3A, 13.3B and 13.3C.

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<sup>1</sup> See "Finality of Referenced NRC Approvals" in SER Section 1.1.3, for a discussion on the staff's review related to verification of the scope of information to be included in a COL application that references a design certification.

FEMA reviewed the offsite emergency plans for the State of Texas, Matagorda County, and the incorporated cities of Bay City and Palacios. FEMA also reviewed the applicant's responses to the RAIs. On January 27, 2010, FEMA submitted to the NRC an Interim Findings Report for Reasonable Assurance (ML100350989). FEMA's review of the offsite emergency plans determined that the plans are adequate, and there is reasonable assurance that they can be implemented.

### **13.3.5 Post Combined License Activities**

The applicant identifies the following post COL activities:

- License Condition 13.03-01

The License Condition related to emergency planning is described in SER Section 13.3C.4.2.

- Implementation Milestones

Information regarding the implementation of operational programs related to emergency planning is in Table 13.4S-1, "Operational Programs Required by NRC Regulations and Program Implementation," in Section 13.4S, "Operational Program Implementation," of Part 2, "FSAR," of the COL application.

- ITAAC

In Section 4.0, "Emergency Planning ITAAC," of Part 9, "Inspections, Tests, Analyses, and Acceptance Criteria," of the COL application, the applicant proposes site-specific emergency planning ITAAC in Table 4.0-1, "Emergency Planning - Inspection, Test, Analysis, and Acceptance Criteria (EP-ITAAC)." In addition, Section 2.17, "Emergency Response Facilities," of Part 2, "FSAR," of the COL application, incorporates by reference all tables in Section 2.17, "Emergency Response Facilities," of the ABWR DCD. Table 2.17.1, "Emergency Response Facilities," contains six emergency planning ITAAC related to the location and size of the TSC, the location of the OSC, TSC and OSC voice communications, and plant parameter displays in the TSC.

### **13.3.6 Conclusions**

NRC staff concluded that the information pertaining to emergency planning in Section 13.3 of the STP Units 3 and 4 COL FSAR adequately incorporates by reference those elements of the ABWR DCD that address emergency planning. Therefore, the staff found this information acceptable.

The staff reviewed the radiological emergency response plan for STP Units 3 and 4. The staff concluded that the STP Units 1 and 2 Emergency Plan, which was modified to reflect the inclusion of STP Units 3 and 4 (1) is applicable to the proposed reactors, (2) is up-to-date when the application was submitted, and (3) reflects use of the site for the construction of new reactors and appropriately incorporates the new reactors into the existing emergency plan.

The staff also concluded that the applicant has adequately addressed COL License Information Item 13.2. The staff reviewed the information associated with this item against the relevant

NRC regulations, including the acceptance criteria identified in Section 13.3 of NUREG-0800. The staff concluded that the applicant is in compliance with the relevant NRC regulations.

The staff also found that the STP Units 3 and 4 Emergency Plan provides an adequate expression of the overall concept of the operation and describes the essential elements of advanced planning and the provisions adopted to cope with emergency situations. Therefore, the staff concluded that the STP Units 1 and 2 Emergency Plan as modified reflects STP Units 3 and 4. When fully implemented, the emergency plan will meet the relevant requirements of 10 CFR 50.47, Appendix E to 10 CFR Part 50, 10 CFR 52.79(a)(21), 10 CFR 52.80(a), and the guidance discussed above in NUREG-0654/FEMA-REP-1 and NUREG-0800.

FEMA provided the findings and determinations concerning the adequacy of offsite emergency planning and preparedness, which are based on FEMA's review of State and local emergency plans. FEMA concluded that the offsite State and local emergency plans are adequate to cope with an incident at STP, and there is reasonable assurance that these plans can be implemented.

Furthermore, pursuant to 10 CFR 50.47(a), the staff concluded that subject to the License Condition related to emergency action levels (EALs) and the satisfactory completion of the emergency planning ITAAC, there is a reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency at STP Units 3 and 4, and that emergency preparedness at STP Units 3 and 4 is adequate to support full-power operations.

Because the detailed design for the TSC and the Service Building heating, ventilation, and air conditioning (HVAC) is in progress and is not scheduled to be completed until the first quarter of 2010, the staff will track the submittal of an assessment of the radiological consequences to personnel in the TSC from postulated fission product releases as **Open Item 13.03-1**. In addition, the staff will track the submittal of the proposed License Condition regarding the emergency action level scheme for STP in the next revision of the application as **Confirmatory item 13.03-72**. After the staff reviews the applicant's resolution to **Open Item 13.03-1** and **Confirmatory Item 13.03-72**, the staff will complete its evaluation of the STP Units 3 and 4 Emergency Plan and will finalize its determinations regarding the overall adequacy of the emergency plans for STP Units 3 and 4.

## **Attachment 13.3A – COL Information Items, Supplemental Information Items and Departures**

This section addresses the COL information items, supplemental information items, and departures associated with emergency planning.

- **13.3A.1 Regulatory Basis**

The regulatory basis of the information incorporated by reference is in NUREG–1503. The relevant requirements of the Commission regulations for the COL license information items, the supplemental information, and the associated acceptance criteria are in Section 13.3 of NUREG–0800.

- **13.3A.2 Technical Information in the Application**

- COL Information Item

- COL License Information Item 13.2 Emergency Planning

In COL FSAR Subsection 13.3.1.1, the applicant states:

B. A comprehensive site Emergency Plan for STP is provided in COLA Part 5.

- **13.3A.3 Technical Evaluation**

- COL License Information Item 13.2 Emergency Plans

As specified in COL License Information Item 13.2 and in FSAR Subsection 13.3.1.1, “Emergency Plans,” the applicant has submitted a comprehensive site emergency plan and radiological emergency plans for the State and local government authorities with emergency planning responsibilities during emergency situations at the STP, in accordance with applicable NRC regulations.

- **13.3A.4 Post Combined License Activities**

There are no post COL activities related to this section.

- **13.3A.5 Conclusion**

NRC staff compared COL License Information Item 13.2 in the application to the applicable NRC regulations and acceptance criteria in Section 13.3 of NUREG–0800. The staff’s review confirmed that the applicant has addressed the relevant information, and no outstanding information is expected to be addressed in the COL FSAR related to this section.

## **Attachment 13.3B – Emergency Planning Information in the Application**

This section of the FSER contains the NRC staff's evaluation of the emergency planning information that is not part of the Emergency Plan but is a required component of the COL application. However, this evaluation does not address the applicant's plan for responding to a radiological emergency. That plan is evaluated in Attachment 13.3C of this FSER section.

- **13.3B.1 FSAR and the Onsite Emergency Plan**

**13.3B.1.1 Regulatory Basis:** Section III, "The Final Safety Analysis Report," of Appendix E to 10 CFR Part 50 requires the FSAR to contain plans for coping with emergencies. Requirements of 10 CFR 52.79(a)(21) states that the FSAR should contain an onsite emergency plan that complies with 10 CFR 50.47 and Appendix E to 10 CFR Part 50.

**13.3B.1.2 Technical Information in the Application:** Section 13.3, "Emergency Planning," of Part 2, "FSAR," of the COL application states that Part 5, "STP 3 & 4 Emergency Plan," contains a comprehensive onsite emergency plan.

**13.3B.1.3 Technical Evaluation:** The comprehensive onsite emergency plan for STP Units 3 and 4 is in Part 5 of the COL application. NRC staff found that the application adequately addresses the above regulations.

- **13.3B.2 Submittal of State and Local Emergency Plans**

**13.3B.2.1 Regulatory Basis:** The requirements in 10 CFR 50.33(g) and 10 CFR 52.77 include (in part) the submittal of State and local emergency plans.

**13.3B.2.2 Technical Information in the Application:** The list of State and local emergency planning documents in Part 5 of the COL application includes:

1. State of Texas Emergency Management Plan:  
Annex D: "Radiological Emergency Management"  
Tab 1: "Fixed Nuclear Facility Accident Response"  
Chapter 2: "South Texas Project Electric Generating Station"
2. Matagorda County Emergency Management Plan - Basic Plan (Matagorda County, Bay City, Palacios)

**13.3B.2.3 Technical Evaluation:** The State of Texas and Matagorda County (which includes the cities of Bay City and Palacios) are the only State and local government entities wholly or partially within the plume exposure and ingestion pathway emergency planning zones (EPZs). Their emergency plans have been submitted with the application. The results of the FEMA review and the findings and determinations related to the offsite plans for the STP Units 3 and 4 site are in Section 13.3.6 of this SER.

- **13.3B.3 Description of the EPZs**

**13.3B.3.1 Regulatory Basis:** In 10 CFR 50.33, “Contents of the application; general information,” 10 CFR 50.33(g) requires (in part) a description of the plume exposure pathway and ingestion pathway EPZs.

**13.3B.3.2 Technical Information in the Application:** FSAR Section 1.1.7, “Description of Location,” indicates that the facility (STP Units 3 and 4) is co-located with STP Units 1 and 2, (two existing pressurized water reactors). FSAR Figure 2.1S-1, “Surrounding Area Map,” depicts the STP site and the surrounding area within 50 miles. FSAR Figure 2.1S-2, “10-Mile Radius Map,” depicts the general location of the STP site and localities surrounding the site within 10 miles. Figure 2.1S-3, “Site Area Map,” depicts the exclusion area boundary (EAB) and the low-population zone (LPZ) (a 3-mile radius) with respect to the existing operating Units 1 and 2 and the proposed Units 3 and 4.

**13.3B.3.3 Technical Evaluation:** The proposed STP Units 3 and 4 will be co-located within the existing EAB of the currently operating Units 1 and 2. Therefore, Units 1, 2, 3, and 4 will all use the existing plume and ingestion exposure pathway EPZs, which consist of an area about 10 miles in radius and about 50 miles in radius, respectively. NRC staff found that the application adequately addresses the above regulation.

- **13.3B.4 Certifications from State and Local Governments**

**13.3B.4.1 Regulatory Basis:** 10 CFR 52.79(a)(22)(i) requires certifications from the State and local government agencies with emergency planning responsibilities that (1) the proposed emergency plans are practicable; (2) these agencies are committed to participating in any further development of the plans, including any required field demonstrations; and (3) these agencies are committed to executing their responsibilities under the plans in the event of an emergency.

**13.3B.4.2 Technical Information in the Application:** Chapter 7, “Letters of Agreement,” of the STP Units 3 and 4 Emergency Plan includes letters signed by the Radiation Program Officer of the Texas DSHS, the Matagorda County Judge, the Mayor of Bay City, and the Mayor of the City of Palacios certifying that (1) the proposed emergency plans are practicable; (2) these agencies are committed to participating in any further development of the plans, including any required field demonstrations; and (3) these agencies are committed to executing their responsibilities under the plans in the event of an emergency.

**13.3B.4.3 Technical Evaluation:** The application contains certifications from the State of Texas and Matagorda County, including the cities of Bay City and Palacios. These entities are the only State and local government agencies with emergency planning responsibilities. NRC staff found that the application adequately addresses the above regulation.

- **13.3B.5 Evaluation Against the SRP**

**13.3B.5.1 Regulatory Basis:** 10 CFR 52.79(a)(41) requires that the application include an evaluation of the facility against the SRP in effect 6 months before the docket date of the application. Section 13.3, “Emergency Planning,” Revision 3 of NUREG–0800, dated

March 2007, provides guidance for reviewing onsite emergency plans for nuclear power plants. Requirements of 10 CFR 52.79(a)(41) state that the evaluation should identify and describe all differences from the SRP acceptance criteria in SRP Section 13.3. The evaluation should also determine how the proposed alternatives to the SRP criteria comply with the Commission's regulations.

**13.3B.5.2 Technical Information in the Application:** Table 1.8-13, "Summary of Differences from SRP Section 13," of the ABWR DCD Tier 2 states that there are no differences with the SRP acceptance criteria in design features, analytical techniques, and procedural measures.

**13.3B.5.3 Technical Evaluation:** NRC staff reviewed the applicant's evaluation of the STP Emergency Plan against the applicable portions of Subsection 13.3, "Emergency Planning," of NUREG-0800, "Standard Review Plan," issued in March 2007, and the generic emergency planning ITAAC listed in Table 14.3.10-1 of NUREG-0800, "Standard Review Plan," also issued in March 2007. The staff found that the application adequately addresses the above regulation.

- **13.3B.6 Reference to a Standard Design**

**13.3B.6.1 Regulatory Basis:** 10 CFR 52.73, "Relationship to other subparts," states that the application for a COL may reference a standard design.

**13.3B.6.2 Technical Information in the Application:** Section 13.3, "Emergency Planning," of Part 2, "FSAR," of the COL application states that the information in this section of the referenced ABWR DCD, including all subsections and tables, is incorporated by reference.

**13.3B.6.3 Technical Evaluation:** The COL application incorporates by reference Section 13.3, "Emergency Planning," of the certified ABWR DCD. NRC staff found that the FSAR reference to the ABWR DCD is appropriate and adequate.

- **13.3B.7 Impediments to the Development of Emergency Plans**

**13.3B.7.1 Regulatory Basis:** 10 CFR 52.81, "Standards for review of applications," states that COL applications will be reviewed according to the standards in 10 CFR Parts 50 and 100. Therefore, the requirements of 10 CFR 100, "Reactor Site Criteria," Subpart B, "Evaluation Factors for Stationary Power Reactor Site Applications on or after January 10, 1997," are applicable. 10 CFR 100.1(c) and 10 CFR 100.21(g) require the identification of physical characteristics unique to the proposed site that could pose a significant impediment to the development of emergency plans.

**13.3B.7.2 Technical Information in the Application:** The "South Texas Project Development of the Evacuation Time Estimates" Final Report (dated April 2008) describes the analyses undertaken and the results obtained by a study that updates the existing evacuation time estimates (ETE) for STP.

**13.3B.7.3 Technical Evaluation:** Because the ETE analysis did not identify any physical characteristics unique to the proposed site that could pose a significant impediment to further development of the STP Units 3 and 4 Emergency Plan, and the fact that an emergency plan already exists for the site, NRC staff therefore found that the application has adequately

addressed the above regulations. See SER Section 13.3C.18 for the staff's evaluation of the ETE analysis.

- **13.3B.8 Compliance with TMI-related Requirements**

**13.3B.8.1 Regulatory Basis:** 10 CFR 52.79(a)(17) states that the application should contain information with respect to compliance with the technically relevant positions of the Three Mile Island (TMI) requirements in 10 CFR 50.34(f). The technically relevant portions of 10 CFR 50.34(f) that relate to emergency planning are the following:

- 10 CFR 50.34(f)(2)(iv) specifically requires a plant safety parameter display console that will display to operators a minimum set of parameters defining the safety status of the plant. The console must be capable of displaying a full range of important plant parameters and data trends on demand and capable of indicating when process limits are being approached or exceeded.
- 10 CFR 50.34(f)(2)(viii) requires that the application describe the capability to promptly obtain and analyze samples from the reactor coolant system and the containment that may contain accident source term radioactive materials without radiation exposures to the individual that exceed 5 rem to the whole body or 50 rem to the extremities. Materials to be analyzed and quantified include certain radionuclides that are indicators of the degree of core damage (e.g., noble gases, radioiodines, cesiums, and nonvolatile isotopes; hydrogen in the containment atmosphere; dissolved gases; chloride; and boron concentrations).
- 10 CFR 50.34(f)(2)(xvii) requires that the application describe instruments to measure, record and readout in the control room for: (1) containment pressure, (2) containment water level, (3) containment hydrogen concentration, (4) containment radiation intensity (high level), and (5) noble gas effluents at all potential accident release points. In addition, the application must describe a continuous sampling capability for radioactive iodines and particulates in gaseous effluents from all potential accidents release points, and for onsite capability to analyze and measure these samples.
- 10 CFR 50.34(f)(2)(xxv) requires a description of the onsite TSC and OSC.

**13.3B.8.2 Technical Information in the Emergency Plan:** The applicant adds the following section related to the display of plant information to the STP Units 3 and 4 Emergency Plan:

G.14, "Plant Information & Control System - PICS (Units 3 and 4 only)."

The information needed to support the Emergency Response facilities will be provided through the Plant Information & Control System (PICS). PICS is the primary integration point for most plant control and monitoring systems and serves as the primary interface for the control operator. The system provides the functions of the Safety Parameter Display System in accordance with NUREG-0696 and NUREG-0737, Supplement 1 through displays on the main control, panels and various video display units in the main control room, TSC and EOF of each Unit 3 and 4. The system also makes the full complement of plant status information available to all users. This includes the status of the reactor



protection and ESF systems and the various process, area and environmental release point radiation monitors.

Table 13.3-1, "ABWR Design Considerations for Emergency Planning Requirements," in the ABWR DCD Tier 2 indicates that the counting room for analyzing post-accident samples is located in the service building. Section 9.3.2 of the ABWR DCD Tier 2 states that the post-accident sampling system meets the applicable requirements except as described in Section 1A.2.7 of the DCD FSAR for the upper limit of activity in the samples at the time they are taken. STD DEP T1 2.14-1 in the COL FSAR Section 1A.2.7, "Post-Accident Sampling," states in Section (2):

There shall be onsite capability to perform the following within the 3 hour time period:

- a. Determine the presence and amount of certain radionuclides in the reactor coolant and containment atmosphere that may be indicators of the degree of core damage. Meets the requirements of NUREG-0737.
- b. Hydrogen in containment atmosphere. Hydrogen in containment atmosphere is measured by the Containment Atmospheric Monitoring System. Meets the requirements of NUREG-0737 with the exception that the design follows the guidance of RG 1.7 Rev. 3, which permits the hydrogen monitor to be classified as nonsafety-related.
- c. Dissolved gases, chloride and boron in liquids. Dissolved gases are discussed in item 4 below. Meets the requirements concerning chloride and boron of NUREG-0737.
- d. Inline monitoring capability is acceptable. No inline monitors are provided in PASS.

ABWR DCD Tier 2 Section 13.3, "Emergency Planning," notes that the design features pertaining to emergency planning in the ABWR standard plant scope include the TSC and the OSC. ABWR DCD Tier 2 Table 13.3-1, "ABWR Design Considerations for Emergency Planning Requirements," includes the following information:

- (i) The ABWR Standard Plant will comply with all the TSC design requirements. Specifically, a TSC of sufficient size (at least 175 m<sup>2</sup> of floor space) to support 25 people is located in the service building adjacent to the control building. The TSC is non-safety-related and is not Seismic Category I. The necessary facilities and equipment are called for in Section 2 of NUREG-0696. The TSC has displays for the plant parameters that are included in the fixed position displays on the Main Control Room Panels. The TSC has voice communication equipment for communication with the Main Control Room, Emergency Operations Facility, Operational Support Center (OSC), and NRC Headquarters Operation Center.
- (ii) The ABWR Standard Plant will comply with all the OSC design requirements. Specifically, the lunch room adjacent to the TSC in the service building which

is adjacent to the control building will be identified as the OSC. The OSC is nonsafety-related and is not seismic Category I. The OSC has voice communication equipment for communication with the main control room and the TSC. The COL applicant is responsible for identifying the communication interfaces for inclusion in the detailed design of the control room and TSC. The detailed requirements are provided in Section 3 of NUREG-0696.

**13.3B.8.3 Technical Evaluation:** NRC staff found the addition of Section G.14 to the STP 3 and 4 Emergency Plan acceptable and the PICS capable of displaying a full complement of plant parameters in the TSC and EOF. In addition, Section G.14 states that the main control room panels will meet the guidance in Supplement 1 to NUREG-0737. Supplement 1 to NUREG-0737 states that RG 1.97 reflects the parameters that should be provided in the main control room, and Regulatory Guide 1.97 includes the parameters specified in 10 CFR 50.34(f)(2)(xvii).

After reviewing the incorporation of Section G.14 into the STP Units 3 and 4 Emergency Plan, the staff concluded that the new section (1) is applicable to the proposed reactors, (2) is up-to-date, and (3) reflects the use of the existing site for the construction of two additional reactor units and appropriately incorporates the new reactors into the existing plan.

The staff found that the applicant adequately describes the capability to promptly obtain and analyze the required samples from the reactor coolant system and the containment.

The staff also finds that the design features pertaining to emergency planning that include the TSC and the OSC are described in Section 13.3 of the ABWR DCD Tier 2.

- **13.3B.9 Post Combined License Activities Related to Emergency Planning Information in the Application**

There are no post COL license activities related to “Emergency Planning Information in the Application” in the COL application.

- **13.3B.10 Conclusion Related to Emergency Planning Information in the Application**

NRC staff reviewed the information (excluding the information related to onsite and offsite emergency plans) in the STP COL application. The staff reviewed the information against the requirements of 10 CFR 50.33(g); 10 CFR 50.34(b)(6)(v); 10 CFR 50.34(f)(2)(iv); 10 CFR 50.34(f)(2)(viii); 10 CFR 50.34(f)(2)(xvii); 10 CFR 50.34(f)(2)(xxv); 10 CFR 50.34(h)(1)(i); 10 CFR 50.34(h)(2) and (3); 10 CFR 50.47(c)(2); 10 CFR 52.73; 10 CFR 52.77; 10 CFR 52.79(a)(21); 10 CFR 52.79(a)(22)(i); 10 CFR 52.79(a)(41); 10 CFR 52.81; 10 CFR 100.1(c); 10 CFR 100.21(g); and 10 CFR Part 50, Appendix E, Sections III and IV. The staff concluded that the content of the COL application (excluding the information related to onsite and offsite emergency plans) is acceptable.

## Attachment 13.3C – Onsite Emergency Plan

This attachment to the SER provides the results of the NRC staff's review of the onsite emergency plan, which the applicant characterizes as a modification of the STP Units 1 and 2 Emergency Plan to reflect Units 3 and 4.

In accordance with the guidance in Section 13.3, "Emergency Planning," of NUREG-0800, "Standard Review Plan," the applicant has revised the existing STP Units 1 and 2 Emergency Plan by extending its applicability to the new STP Units 3 and 4. The new site emergency plan is the STP Units 3 and 4 Emergency Plan. Therefore, the staff focused the NRC review on the changes identified in the STP Units 3 and 4 Emergency Plan and applied the following guidance from NUREG-0800:

In general, if an application is for an additional reactor at an operating reactor site, and the application proposes to incorporate and extend elements of the existing emergency planning program to the new reactor (included by reference), those existing elements should be considered acceptable and adequate. The reviewer should generally focus the review on the extension of the existing program to the new reactor, and should determine whether the incorporated emergency planning program information from the existing reactor site (1) is applicable to the proposed reactor, (2) is up-to-date when the application is submitted, and (3) reflects use of the site for the construction of a new reactor (or reactors) and appropriately incorporates the new reactor(s) into the existing plan.

The existing site emergency plan for STP Units 1 and 2, which was changed to include Units 3 and 4, is considered acceptable and adequate, because the NRC performs oversight of emergency preparedness by monitoring performance indicators and through inspection. In addition, NRC inspectors perform routine inspections, observe drills and exercises, and review licensee corrective actions and emergency plan changes in accordance with the established inspection program for operating reactors. Also, licensees are required to conduct an exercise involving Federal, State, and local agencies every two years. The NRC and FEMA evaluate these exercises.

NRC staff issued **RAI 13.03-23** requesting the applicant to confirm that a 10 CFR 50.54(q) review was performed for the proposed extension of the existing site's emergency plan to ensure that the addition of new units will not decrease the effectiveness of the existing plans. The staff also asked the applicant to confirm that the plans, as changed, will continue to meet the standards of 10 CFR 50.47(b) and the requirements of Appendix E to 10 CFR Part 50. In response to **RAI 13.03-23**, the applicant agreed to perform the review and to provide the 10 CFR 50.54(q) evaluation checklist. The staff reviewed the checklist and found the applicant's response acceptable.

Part 2 of the COL application, "FSAR," Tier 2 Chapter 13.0, "Conduct of Operations," Subsection 13.3.1.1, "Emergency Plans," states that a comprehensive site emergency plan for STP Units 3 and 4 is provided as Part 5, "Emergency Plan," of the COL application. Part 5 contains the STP Units 3 and 4 Emergency Plan, the emergency preparedness program milestone and implementation schedule, the threshold value technical basis (for EALs), the ETE analysis, letters of agreement (LOAs), and State and county EAL reviews.

Chapter 4, “Emergency Planning ITAAC,” of COL application Part 9 contains the emergency planning inspections, tests, analyses, and the emergency planning ITAAC to address those aspects of the STP Units 3 and 4 Emergency Plan that cannot be completed in the COL application phase.

The following SER subsections describe the NRC staff’s review of the STP Units 3 and 4 Emergency Plan, which parallels the planning standards and evaluation criteria<sup>2</sup> in NUREG-0654/FEMA-REP-1, “Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants,” which was issued in November 1980, in addition to the March 2002 addenda.

- **13.3C.1 Assignment of Responsibility (Organizational Control)**

**13.3C.1.1 Regulatory Basis:** 10 CFR 50.47(b)(1) states that “primary responsibilities for emergency response by the nuclear facility licensee and by State and local organizations within the Emergency Planning Zones have been assigned, the emergency responsibilities of the various supporting organizations have been specifically established, and each principal response organization has staff to respond and to augment its initial response on a continuous basis.”

To determine whether the proposed changes identified in the STP Units 3 and 4 Emergency Plan meet the applicable regulatory requirements in 10 CFR 50.47(b)(1), NRC staff evaluated the changes against the detailed evaluation criteria<sup>1</sup> in NUREG–0654/FEMA-REP-1.

Appendix E.IV.A.5 of 10 CFR Part 50 requires the emergency plan to identify—by position and function to be performed—other employees of the licensee with special qualifications for coping with emergency conditions that may arise, such as consultants, who will not be employees of the licensee and who may be called upon for assistance during emergencies. The emergency plan shall describe the special qualifications of those persons.

**13.3C.1.2 Technical Information in the Emergency Plan: [A.1.a and C.3]** Section B, “Assignment of Responsibility,” of the STP Units 3 and 4 Emergency Plan describes the activation and responsibilities of the station emergency response organization and the various State, local, Federal, and private-sector organizations that will contribute to the emergency response effort.

In **RAI 13.03-25**, the staff asked the applicant to verify and correct, if necessary, certain statements regarding cooperation with the Matagorda County Sheriff’s Office, the United States Coast Guard, and other Federal agencies. The applicant’s response to **RAI 13.03-25** states that the following changes will be made in the next revision of the STP Units 3 and 4 Emergency Plan:

- (1) The last line of Section B.4.7, “Matagorda County Sheriff’s Office,” will be revised to be consistent with the LOA.

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<sup>1</sup> The bracketed alphanumeric designations used throughout this SER section identify the Evaluation Criteria for each Planning Standard in NUREG–0654/FEMA-REP-1 that were used by the NRC staff to determine compliance with 10 CFR 50.47(b).

- (2) Section B.4.8, "United States Coast Guard (Corpus Christi)," will be revised to be consistent with the LOA.
- (3) Section B.4.9, "United States Coast Guard (Galveston)," will be revised to be consistent with the LOA.
- (4) Section B.4.10, "Resources of Other Federal Agencies," will be revised to reference the "National Response Framework (NRF)" instead of the "Federal National Response Plan."

In **RAI 13.03-27**, NRC staff asked the applicant to explain the LOA with OXEA Chemicals and to identify where the LOA is located in the Emergency Plan. The applicant's response to **RAI 13.03-27** includes a copy of the LOA with OXEA Chemicals.

In **RAI 13.03-29**, NRC staff asked the applicant to clarify the title of the individual responsible for notifying the State of an emergency. The applicant's response to **RAI 13.03-29** states that the STP will revise Section B.6.2, "State of Texas and Matagorda County," of the STP Units 3 and 4 Emergency Plan by replacing "Station's Emergency Director" in the second bullet of that section to read, "Station's Unit-specific Emergency Director."

In **RAI 13.03-33**, NRC staff asked the applicant to discuss the replacement of the "Federal Emergency Response Team" with the "National Response Plan" in Figure B-1, "Interrelationship of Emergency Response Organization." The applicant's response to **RAI 13.03-33** states that the original text, "Federal Emergency Response Team," will be restored in the text box and the "National Response Plan" text will be removed.

In **RAI 13.03-34**, NRC staff asked the applicant to clarify the title of the person in charge at the DSHS in Table B-1, "Responsible Primary Organizations." The applicant's response to **RAI 13.03-34** states that Table B-1 will be revised to reflect the new title of "Radiation Program Officer" as the person in charge at the DSHS, and the "Bureau Chief" text will be deleted.

In addition, emergency planning **ITAAC-1.1** in Table 4.0-1, "Emergency Planning - Inspection, Test, Analysis, and Acceptance Criteria (EP-ITAAC)," in Part 9 of the STP COL application states, "The staff exists to provide 24-hour per day emergency response and manning of communications links, including continuous operations for a protracted period."

**13.3C.1.3 Technical Evaluation:** NRC staff found the applicant's responses to **RAIs 13.03-25, 27, 29, 33, and 34** acceptable. The staff also verified that the changes proposed by the applicant in responses to **RAIs 13.03-25, 27, 29, 33 and 34** are in Revision 3 of the STP Units 3 and 4 Emergency Plan.

The NRC staff reviewed the above changes to Section B, "Assignment of Responsibility," of the STP Units 1 and 2 Emergency Plan, which was modified to reflect the inclusion of STP Units 3 and 4, and concluded that the proposed changes (1) are applicable to the proposed reactors, (2) are up-to-date when the application was submitted, and (3) reflect use of the site for the construction of new reactors and appropriately incorporate the new reactors into the existing emergency plan. The staff's evaluation of proposed emergency planning ITAAC 1.1 is in Section 13.3C.19 of this SER.

#### **13.3C.1.4 Conclusion for “Assignment of Responsibility (Organizational Control)”**

NRC staff reviewed the proposed changes to the STP Units 3 and 4 Emergency Plan against the guidance in Planning Standard A, "Assignment of Responsibility (Organizational Control)," of NUREG–0654/FEMA-REP-1. On the basis of the review of the onsite emergency plan as described above for assignment of responsibility (organizational control), the staff concluded that the information in the STP Units 3 and 4 Emergency Plan is acceptable and meets the requirements of 10 CFR 50.47(b)(1) and Section IV.A.5 of Appendix E to 10 CFR Part 50.

#### **• 13.3C.2 Onsite Emergency Organization**

**13.3C.2.1 Regulatory Basis:** 10 CFR 50.47 (b)(2) requires that (1) on-shift facility licensee responsibilities for emergency response are unambiguously defined, (2) adequate staffing to provide initial facility accident response in key functional areas is maintained at all times, (3) timely augmentation of response capabilities is available, and (4) the interfaces among various onsite response activities and offsite support and response activities are specified.

To determine whether the proposed emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(2), NRC staff evaluated the plan against the detailed evaluation criteria<sup>2</sup> in NUREG–0654/FEMA-REP-1.

The staff also evaluated the proposed emergency plan changes against the following:

- 10 CFR Part 50, Appendix E, Section IV.A.1, which requires the emergency plan to describe the normal plant operating organization
- 10 CFR Part 50, Appendix E, Section IV.A.2.b, which requires the emergency plan to describe the onsite emergency response organization with a detailed discussion of the plant’s staff emergency assignments

**13.3C.2.2 Technical Information in the Emergency Plan: [B.1]** The STP Units 3 and 4 Emergency Plan contains Section C, “Organizational Control of Emergencies,” which describes the organizations required during a declared emergency as well as those required for daily operations. The applicant has proposed the following changes in the STP Units 3 and 4 Emergency Plan:

- Section C.1, “Normal Station Operating Organization,” was revised to describe a change in the daily station operating organization. Specifically, the General Managers will now report to the Group Vice Presidents for Units 1 and 2 and for Units 3 and 4, respectively.
- Subsection C.3.5, “Shift Technical Advisor,” was revised to reflect the addition and availability of a Shift Technical Advisor for the new reactor type.
- Subsection C.3.5, “Shift Technical Advisor,” was also revised to reflect the assignment of one Shift Technical Advisor per reactor type who will be available in the control room when any of the four units is above cold shutdown.
- Subsection C.3.5, the text related to the ENS [Emergency Notification System] Communicator was moved from this subsection, and added to Subsection C.3.6, “The ENS Communicator duties.”

**13.3C.2.3 Technical Evaluation:** The applicant incorporates into the STP Units 3 and 4 Emergency Plan the above four changes related to the normal onsite organization with respect to their emergency assignments. NRC staff reviewed the changes to Section C, "Organization Control of Emergencies," of the STP Units 3 and 4 Emergency Plan and concluded that the proposed changes (1) are applicable to the proposed reactors, (2) are up-to-date, and (3) reflect the use of the existing site for the construction of two additional reactor units and appropriately incorporate the new reactors into the existing plan.

**13.3C.2.4 Regulatory Basis:** 10 CFR Part 50, Appendix E, Section IV.A.4, which requires the identification of emergency response personnel by position and function to be performed.

**13.3C.2.5 Technical Information in the Emergency Plan: [B.5 and B.7]** The applicant proposes a number of changes to Table C-1, "Minimum Staffing Requirements (STPEGS) (Including Capability for Additional Staffing)." These changes also include proposed staffing for STP Units 3 and 4.

In **RAI 13.03-38(1)**, NRC staff asked the applicant to discuss the time specified in the emergency plan for augmenting the on-shift staffing in the event of an emergency. The applicant's response to **RAI 13.03-38(1)** states that the 75-minute response column will be restored, and Table C-1 will again have 60- and 75-minute response columns. In addition, because the "#" sign at the bottom of Table C-1 does not apply to any case in that table, the applicant states that the symbol will be removed. The applicant also states that the Shift Technical Advisor assigned to the on-shift response organization is trained in basic core damage analysis, has no other Emergency Response Organization (ERO) responsibilities, and can provide core and thermal hydraulic performance assistance during the early stages of an emergency.

In **RAI 13.03-31**, NRC staff asked the applicant to clarify the responsibilities of plant operators during an emergency. The applicant's response to **RAI 13.03-31** proposes changes to Section C.3.7, "Plant Operators," that clarify plant operator responsibilities.

In **RAI 13.03-36**, NRC staff asked the applicant to identify when the OSC Coordinator reports to the OSC, because of an apparent inconsistency in the narratives for other facilities listed under Section C.4, "Emergency Response Organization." The applicant's response to **RAI 13.03-36** states that Section C.4.8, "Operations Support Center Coordinator," will be revised as follows:

C.4.8 "Operations Support Center Coordinator"

The Operations Support Center Coordinator reports to the Operations Support Center at an Alert or higher and assumes responsibility for Operations Support Center activities and ensures accountability of the Operations Support Center is maintained. The Operations Support Center Coordinator ensures that emergency teams formed and dispatched are properly briefed and their status monitored, resources and personnel to perform Operations Support Center activities are adequate, and adequate communications and information flow is maintained with the Technical Support Center. The Operations Support Center Coordinator ensures that deviations from Station procedures and NRC regulations are approved by the Emergency Director.

In addition, the applicant proposed emergency planning **ITAAC 2.1** in Table 4.0-1, of Part 9 of COL application which states, “The staff exists to provide minimum and augmented on-shift staffing levels, consistent with Table B-1 of NUREG-0654/FEMA-REP-1, Rev. 1.”

**13.3C.2.6 Technical Evaluation:** The staff verified that the changes proposed by the applicant’s responses to **RAIs 13.03-31, 13.03-36, and 13.03-38(1)** are in Revision 3 of the STP Units 3 and 4 Emergency Plan.

NRC staff also reviewed the above changes to Section C, “Organization Control of Emergencies,” of the STP Units 3 and 4 Emergency Plan and concluded that the content of the information in the proposed change (1) is applicable to the proposed reactors, (2) is up-to-date, and (3) reflects the use of the existing site for the construction of two additional reactor units and appropriately incorporates the new reactors into the existing plan. The staff’s evaluation of the proposed emergency planning ITAAC 2.1 is in Section 13.3C.19, “Emergency Planning ITAAC,” of this SER.

### **13.3C.2.7 Conclusion for “Onsite Emergency Organization”**

On the basis of the review of the proposed changes to the STP Units 3 and 4 Emergency Plan (as described above) regarding onsite emergency organization, the staff concluded that the changes are acceptable because they meet the applicable requirements in 10 CFR 50.47(b)(2) and Sections IV.A.1 and 2.b of Appendix E to 10 CFR Part 50.

### **• 13.3C.3 Emergency Response Support and Resources**

**13.3C.3.1 Regulatory Basis:** 10 CFR 50.47(b)(3) requires that arrangements for requesting assistance and effectively using resources have been made, arrangements to accommodate various State and local staff at the licensee’s near-site EOF have been made, and other organizations capable of augmenting the planned response have been identified.

To determine whether the proposed emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(3), NRC staff evaluated the plan against the detailed evaluation criteria<sup>2</sup> in NUREG–0654/FEMA-REP-1.

The staff also evaluated the proposed emergency plan changes against the following:

- 10 CFR Part 50, Appendix E, Section IV.A.6, which requires a description of the local and offsite services to be provided in support of the licensee’s emergency organization
- 10 CFR Part 50, Appendix E, Section IV.A.7, which requires the identification of and assistance expected from appropriate State, local, and Federal agencies with responsibilities for coping with emergencies

**13.3C.3.2 Technical Information in the Emergency Plan: [C.4]** The STP Units 3 and 4 Emergency Plan contains Section B, “Assignment of Responsibility,” which addresses the activation of the station emergency response organization; and various State, local, Federal, and private sector organizations to support the response effort. The applicant proposes the following changes:



1. Information will be added to Subsection B.5.2, "ABWR Nuclear Steam Supply Services," to state that services provided by an ABWR NSSS vendor during an emergency event at STP will be obtained on a 24-hour basis under a contract between the Station and the vendor.

However, in response to **RAI 13.03-26**, NRC staff requested additional information regarding the need for an LOA with the NSSS vendor. The applicant's response states that the proposed Subsection B.5.2 of the STP Units 3 and 4 Emergency Plan will be revised to be consistent with the role of Toshiba Corporation as the NSSS for STP Units 3 and 4. The applicant will also revise the STP Units 3 and 4 Emergency Plan Figure F-2, "Emergency Response Facilities Communications Pathway Typical Functional Diagram Alert, Site Area, and General Emergencies."

2. Subsection B.5.17, "Matagorda County Environmental Health," will be changed to more completely describe the support that will be provided in the event of an emergency.

**13.3C.3.3 Technical Evaluation:** NRC staff found the applicant's response to **RAI 13.03-26** acceptable and verified that the changes to Section B.5.2 and Figure F-2 are in Revision 3 of the STP Units 3 and 4 Emergency Plan. Therefore, the staff concluded that the proposed changes (1) are applicable to the proposed reactors, (2) are up-to-date, and (3) reflect the use of the existing site for the construction of two additional reactor units and appropriately incorporate the new reactors into the existing plan.

#### **13.3C.3.4 Conclusion for "Emergency Response Support and Resources"**

On the basis of the review of the STP Units 3 and 4 Emergency Plan against Planning Standard C, "Emergency Response Support and Resources," of NUREG-0654/FEMA-REP-1 and requirements in Appendix E to 10 CFR Part 50, NRC staff found the changes to the STP Units 3 and 4 Emergency Plan acceptable because they are consistent with the standards of 10 CFR 50.47(b)(3) and meet the requirements of Appendix E to 10 CFR Part 50, as described above.

- **13.3C.4 Emergency Classification System**

**13.3C.4.1 Regulatory Basis:** 10 CFR 50.47(b)(4) requires a standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters. In addition, 10 CFR Part 50, Appendix E, Section IV.B requires NRC approval of initial EALs.

To determine whether the proposed emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(4), the staff evaluated the plan against the detailed evaluation criteria<sup>2</sup> in NUREG-0654/FEMA-REP-1.

To determine whether the proposed emergency plan meets the applicable regulatory requirements related to the "Emergency Classification System," the staff also evaluated the emergency plan against the requirements in Section IV.B and C of Appendix E to 10 CFR Part 50.

**13.3C.4.2 Technical Information in the Emergency Plan: [D.1 and D.2]** Section D, "Emergency Classification System," of the STP Units 3 and 4 Emergency Plan states that this section of the plan describes the emergency classification system used to categorize an event into one of four classification levels. The spectrum of possible emergency events is categorized in the following four emergency classifications based on the recommendations of NEI 99-01, Revision 5, "Unusual Event, Alert, Site Area Emergency, and General Emergency." In Table D-1, "Initiating Conditions for Emergency Classification," the applicant provides initiating conditions for entry into the four emergency classifications.

In **RAI 13.03-72**, NRC staff stated that the STP COL did not fully address certain aspects of the required EAL scheme. This is because various equipment setpoints and other information cannot be determined until the as-built information is available (e.g., head corrections, radiation shine, final technical specifications, and equipment calculations and tolerances). Consequently, the staff asked the applicant to either develop the remainder of its EAL scheme, including EALs related to digital instrumentation and control (I&C), or propose a license condition that the applicant will create a fully developed set of EALs in accordance with the specified guidance document. These fully developed EALs must be submitted to the NRC for confirmation at least 180 days prior to fuel load. In addition, the staff stated that the EALs must be kept in a document controlled by 10 CFR 50.54(q), such as the emergency plan; or a lower tier document, such as the Emergency Plan Implementing Procedures.

The applicant's response to **RAI 13.03-72** dated September 28, 2009, (ML092730445) proposes the following License Condition:

STP Nuclear Operating Company shall submit a fully developed set of EALs to the NRC in accordance with NEI 99-01 Revision 5 and endorsed the EAL scheme with the following exceptions:

- STP Units 3 & 4 proposes the exclusion of NEI 99-01 Revision 5 Initiating Conditions (ICs) SU3, SA4 and SS6. These ICs will not be applicable to STP based on the ABWR Digital Instrumentation and Controls (I&C) design, and
- STP proposes inserting replacement ICs for SA4 and SS6 into the final Emergency Action Level Bases Document for Units 3 & 4. These proposed ICs are provided as Enclosures 2 (SA4) and 3 (SS6) which are applicable to STP Units 3 & 4 Digital Instrumentation and Control, and
- STP proposes the addition of ICs for Cold Shutdown CU9 and CA5 into the final Emergency Action Level Bases Document for Units 3 & 4. These proposed ICs are provided as Enclosures 4 (CU9) and 5 (CA5) which are applicable to STP Units 3 & 4 Digital Instrumentation and Control."

These fully developed EALs shall be submitted to the NRC for confirmation at least 180 days before initial fuel loading.

Enclosures 2, 3, 4, and 5 referred to above were included with the response to **RAI 13.03-72**. The incorporation of the proposed license condition into the COL application is tracked as **Confirmatory Item 13.03-72**.

Also in the response to **RAI 13.03-72**, the applicant proposes a revision to Section D.1, "Event Classification," in the STP Units 3 and 4 Emergency Plan stating that the emergency response procedure related to emergency classification will be controlled in accordance with the requirements of 10 CFR 50.54(q). In addition, the applicant proposes a change to Section 5.3, "Emergency Action Levels," in the STP Units 3 and 4 Emergency Plan to address the need to provide fully developed EALs to the NRC at least 180 days before initial fuel loading.

In response to **RAI 13.03-72**, the applicant also proposes emergency planning **ITAAC Acceptance Criterion 3.1**, which relates to the emergency classification scheme and states:

The specified parameters are retrievable in the Control Room, TSC, and EOF, and the ranges of the displays encompass the values specified in the emergency classification and EAL scheme.

The acceptance testing criteria will be in accordance with Table 2.7.1a, Item B, Tier 1 Design Certification for the ABWR. Additional data required to support the EAL scheme will be retrievable in the Control Room, TSC, and EOF.

- **13.3C.4.3 Technical Evaluation:** NRC staff found the exclusion of ICs SU3, SA4, and SS6 acceptable because these ICs will not be applicable to the STP based on the ABWR Digital I&Cs design. In addition, the staff found the replacement ICs for SA4 and SS6, which are applicable to the power operation, startup, and hot standby/shutdown modes, are acceptable because they address control and indication systems unique to the plant design. The addition of ICs CU9 and CA5 are also acceptable because they address control and indication systems unique to the plant design when the reactors are in the cold shutdown mode.

NRC staff also reviewed the applicant's response to **RAI 13.03-72**. The staff found the revision to Section D.1 acceptable and verified that the change is in Revision 3 of the STP Units 3 and 4 Emergency Plan. In addition, the staff found the applicant's proposal to revise Section 5.3 acceptable and confirmed that this change is also in Revision 3 of the STP Units 3 and 4 Emergency Plan. Therefore, the staff concluded that the proposed changes (1) are applicable to the proposed reactors, (2) are up-to-date, and (3) reflect the use of the existing site for the construction of two additional reactor units and appropriately incorporate the new reactors into the existing plan.

The staff's technical evaluation of emergency planning ITAAC is in Section 13.3C.19, "Emergency Planning ITAAC."

**13.3C.4.4 Technical Information in the Emergency Plan: [D.2]** NRC staff issued **RAI 13.03-46** requesting the applicant to clarify the assumption that most of the "Unusual Events" listed will be terminated quickly. The applicant's response to **RAI 13.03-46** states that the STP will revise Section D.1 of the STP Units 3 and 4 Emergency Plan by deleting the following sentence:

It should be noted that most of the listed initiating conditions for the Unusual Event classification are events that can be expected to be terminated quickly,

and therefore, the notification process may occur after the event has been corrected.

**13.3C.4.5 Technical Evaluation:** NRC staff found the response to **RAI 13.03-46** acceptable and verified the deletion of the above sentence from Section D.1 in Revision 3 of the STP Units 3 and 4 Emergency Plan. Therefore, the staff concluded that the proposed change (1) is applicable to the proposed reactors, (2) is up-to-date, and (3) reflects the use of the existing site for the construction of two additional reactor units and appropriately incorporates the new reactors into the existing plan.

**13.3C.4.6 Regulatory Basis:** 10 CFR Part 50, Appendix E, Section IV.B requires that initial EALs be discussed and agreed upon by the applicant or licensee and State and local government authorities.

**13.3C.4.7 Technical Information in the Emergency Plan:** Letters that provide documentation of the EAL review by State and local governments are included in Section 5.8, "State and County EAL Review," of the STP Units 3 and 4 Emergency Plan. These letters state that the signature on the letter indicates that the parties have discussed and agreed with the proposed EALs.

**13.3C.4.8 Technical Evaluation:** NRC staff found that the letters in Section 5.8 of the STP Units 3 and 4 Emergency Plan documenting the STP Units 3 and 4 EAL review by State and local government authorities are acceptable because they meet the requirements of 10 CFR Part 50, Appendix E, Section IV.B. Therefore, the staff concluded that the documentation (1) is applicable to the proposed reactors, (2) is up-to-date, and (3) reflects the use of the existing site for the construction of two additional reactor units and appropriately incorporates the new reactors into the existing plan.

#### **13.3C.4.9 Conclusion for "Emergency Classification System"**

After reviewing the STP Units 3 and 4 Emergency Plan described above for the emergency classification system, NRC staff concluded that the information is consistent with Planning Standard D, "Emergency Classification," of NUREG-0654/FEMA-REP-1. Therefore, when considering the proposed License Condition, the information is acceptable and meets the requirements of 10 CFR 50.47(b)(4) and applicable portions of Sections IV.B and C of Appendix E to 10 CFR Part 50.

- **13.3C.5 Notification Methods and Procedures**

**13.3C.5.1 Regulatory Basis:** Section 13.3, "Emergency Planning," of the SRP (NUREG-0800) includes guidance concerning the review and evaluation of emergency planning information submitted in a COL application and the determination of compliance with the applicable regulations. Related acceptance criteria are identified in Section 13.3.II, "Acceptance Criteria," of NUREG-0800.

**13.3C.5.2 Technical Information in the Emergency Plan:** Section E, "Notification Methods and Procedures," of the STP Units 3 and 4 Emergency Plan describes the established methods and procedures to be used by the Station to notify Federal, State, and county response organizations and to activate the Station Emergency Response organization.

However, the applicant proposes emergency planning **ITAAC 4.1 and 4.2** in Part 9, "Inspections, Tests, Analyses, Acceptance Criteria," of the COL application to confirm that the means exist to notify responsible State and local agencies and emergency response personnel.

**13.3C.5.3 Technical Evaluation:** As discussed in Chapter 13.3 of NUREG-0800, if an applicant proposes to extend an existing site emergency plan to the new reactor, the existing emergency plan should be considered acceptable and adequate, and NRC staff should focus the review on changes related to the new reactor. However, the applicant does not propose any changes in Section E, "Notification Methods and Procedures," of the STP Units 3 and 4 Emergency Plan.

See Section 13.3C.19, "Emergency Planning ITAAC," of this SER section for the staff's evaluation of emergency planning ITAAC Acceptance Criteria 4.1 and 4.2.

#### **13.3C.5.4 Conclusion for "Notification Methods and Procedures"**

Because the notification methods and procedures will be the same for STP Units 3 and 4 as those for STP Units 1 and 2, the applicant is not proposing any changes to the STP Units 3 and 4 Emergency Plan. Therefore, NRC staff found this section of the STP Unit 3 and 4 Emergency Plan acceptable because the existing emergency site plan is considered acceptable and adequate.

- **13.3C.6 Emergency Communications**

**13.3C.6.1 Regulatory Basis:** Section 13.3, "Emergency Planning," of the SRP (NUREG-0800) includes guidance concerning the review and evaluation of emergency planning information submitted in a COL application and the determination of compliance with the applicable regulations. Related acceptance criteria are identified in Section 13.3.II, "Acceptance Criteria," of NUREG-0800.

**13.3C.6.2 Technical Information in the Emergency Plan:** Addendum E-1, "Emergency Response Facilities Communications," of the STP Units 3 and 4 Emergency Plan describes the communications systems designed to allow contact among plant personnel and plant-to-offsite communications during normal and emergency conditions.

However, the applicant proposes the following two emergency planning ITAAC in Part 9, "Inspections, Tests, Analyses, Acceptance Criteria," of the COL application related to emergency communications:

- Emergency planning **ITAAC 5.1** confirms that the means exists for communications among the control room, the TSC, the EOF, principal State and local emergency operation centers, and radiological field teams.
- Emergency planning **ITAAC 5.2** confirms that the means exists for communications from the control room, TSC, and EOF to the NRC headquarters and regional office emergency operations centers (EOCs) (including the establishment of the Emergency Response Data System [or its successor system] between the onsite computer system and the NRC Operations Center).

**13.3C.6.3 Technical Evaluation:** As discussed in Chapter 13.3 of NUREG–0800, if an application proposes to extend an existing site emergency plan to the new reactor, the existing emergency plan should be considered acceptable and adequate, and NRC staff should focus the review on changes to the emergency plan that are related to the new reactor. However, the applicant does not propose any changes to Addendum E-1, "Emergency Response Facilities Communications," of the STP Units 3 and 4 Emergency Plan.

See Section 13.3C.19, "Emergency Planning ITAAC," of this SER section for the staff's evaluation of emergency planning ITAAC 5.1 and 5.2.

#### **13.3C.6.4 Conclusion for "Emergency Communications"**

Because emergency communications will be the same for Units 3 and 4 as those for STP Units 1 and 2, the applicant does not propose any changes for the STP Units 3 and 4 Emergency Plan. Therefore, NRC staff found this section of the STP Unit 3 and 4 Emergency Plan acceptable because the existing emergency site plan is considered acceptable and adequate.

- **13.3C.7 Public Education and Information**

**13.3C.7.1 Regulatory Basis:** As discussed in Chapter 13.3 of NUREG–0800, if an application proposes to extend an existing site emergency plan to the new reactor, the existing emergency plan should be considered acceptable and adequate, and NRC staff should focus the review on the changes related to the new reactor. However, the applicant does not propose any changes to Section K, "Media Relations," of the STP Units 3 and 4 Emergency Plan.

**13.3C.7.2 Technical Information in the Emergency Plan:** Section K, "Media Relations," of the STP Units 3 and 4 Emergency Plan describes the media relations to be developed and used for educating, notifying, and alerting the public for the purpose of emergency preparedness at the Station.

**13.3C.7.3 Technical Evaluation:** As discussed in Chapter 13.3 of the NUREG–0800, if an application proposes to extend an existing emergency site plan to the new reactor, the existing emergency plan should be considered acceptable and adequate, and the NRC staff's review should focus on changes to the emergency plan that are related to the new reactor. However, the applicant does not propose any changes to Addendum E-1, "Emergency Response Facilities Communications," of the STP Units 3 and 4 Emergency Plan.

#### **13.3C.7.4 Conclusion for "Public Education and Information"**

Because public education and information will be the same for all four STP Units, the applicant has not proposed any changes for the STP Units 3 and 4 Emergency Plan. Therefore, NRC staff found this section of the STP Unit 3 and 4 Emergency Plan acceptable, because the existing site emergency plan is considered acceptable and adequate.

- **13.3C.8 Emergency Facilities and Equipment**

**13.3C.8.1 Regulatory Basis:** 10 CFR Part 50, Appendix E, Section.IV.E.8 requires an onsite TSC and EOF "from which effective direction can be given and effective control can be

exercised during an emergency.” In addition, 10 CFR 50.34(f)(2)(xxv) requires a description of the onsite TSC and OSC.

10 CFR 50.47(b)(8) requires that the applicant must provide and maintain adequate emergency facilities and equipment to support the emergency response. To determine whether the proposed changes identified in the STP Units 3 and 4 Emergency Plan meet the applicable regulatory requirements in 10 CFR 50.47(b)(8), NRC staff evaluated the changes against the detailed evaluation criteria<sup>2</sup> in NUREG-0654/FEMA-REP-1.

**13.3C.8.2 Technical Information in the Emergency Plan:** The STP Units 3 and 4 Emergency Plan contains Section G, “Emergency Response Facilities,” which describes the location of equipment and facilities for use in the event of an emergency. The applicant incorporates the following four changes related to emergency response facilities into the STP Units 3 and 4 Emergency Plan:

- Changes in Section G.2, “Operations Support Center,” reflect the inclusion of Figure G-6 to provide a typical layout of each Unit 3 and 4 OSC.
- Changes in Section G.3, “Technical Support Center,” identify the location of the TSCs for each unit and their typical layout.
- Changes in Figure G-5, “Typical Emergency Operations Facility,” identify the figure as also applicable to STP Units 3 and 4.
- Changes in Figure G-8, “Control Room Technical Support Center, and Operations Support Center Locations Units 3 and 4,” identify the locations of the control room, the TSC, and the OSC for STP Units 3 and 4.

**[H.1, H.2 and H.9]** In addition, the applicant has proposed emergency planning ITAAC 6.1 and 6.2 to confirm that the licensee has established a TSC, an OSC, and an EOF.

**13.3C.8.3 Technical Evaluation:** NRC staff issued the following RAIs regarding Section G, “Emergency Response Facilities,” in the STP Units 3 and 4 Emergency Plan.

The staff issued **RAI 13.03-73** requesting the applicant to provide additional information related to the habitability of the TSC as well as an assessment of the radiological consequences to the personnel in the TSC from the postulated fission product releases, as a result of the design-basis accidents. The applicant’s response to **RAI 13.03-73** states that the radiological consequence analysis involves several parameters associated with the service building HVAC system that serves the TSC, which is dependent on the detailed design of the system. Because the design is in progress and is scheduled to be completed in the first quarter of 2010, the applicant states that the results will be submitted by May 31, 2010. Verification of the submittal of an assessment of the radiological consequences from postulated fission product releases to personnel in the TSC is being tracked as **Open Item 13.03-1**.

The staff issued **RAI 13.03-40** requesting the applicant to explain the alignment of identified activation times for emergency response facilities in the following sections of the STP Units 3 and 4 Emergency Plan: Sections G.2, “Operations Support Center”; G.3, “Technical Support Center”; and G.4, “Emergency Operations Facility.” The applicant’s response to **RAI 13.03-40** states that “Activated” is intended to mean that the facility is capable of performing its intended

function, including assembling the minimum staffing specified in Table C-1. The applicant will revise the Emergency Plan in Section G.2, "Operations Support Center"; Section G.3, "Technical Support Center"; and Section G.4, "Emergency Operations Facility." The revision will specify that each facility is "designed to be activated within approximately 60 minutes." These changes will eliminate the ambiguity created by the use of the term "fully activated." The changes will also eliminate a discrepancy between Emergency Plan Sections G.2, G.3, and G.4 and Table C-1, which specifies that minimum staffing requirements are achieved in approximately 60 minutes. The staff verified that the changes proposed by the applicant in response to **RAI 13.03-40** are in Revision 3 of the STP Units 3 and 4 Emergency Plan.

Therefore, the staff concluded that the proposed changes (1) are applicable to the proposed reactors, (2) are up-to-date, and (3) reflect the use of the existing site for the construction of two additional reactor units and appropriately incorporate the new reactors into the existing plan.

**13.3C.8.4 Technical Information in the Emergency Plan: [H.6.c]** In the STP Units 3 and 4 Emergency Plan, Section G, "Emergency Response Facilities," describes the location of equipment and facilities, which are maintained for use in an emergency at the site.

In **RAI 13.03-45**, NRC staff asked the applicant to provide additional information related to radiological laboratory capabilities of STP Units 3 and 4 and the mobile laboratory. The applicant's response to **RAI 13.03-45** refers to Section G.9, "Laboratory Facilities," of the STP Units 3 and 4 Emergency Plan, which states that the Station will have radiological and radiochemistry laboratories located in each unit. These laboratories will be located in all four STP units. The physical separation of the units will allow the facilities in the unaffected unit to be used as a backup. The applicant proposes the following replacement text for Section G.9:

G.9 "Laboratory Facilities"

The Station has radiological and radiochemistry laboratories located in each unit. The facilities are designed to provide quick and efficient analyses of samples from the Station process systems, the reactor coolant system, and secondary systems. The specific instruments incorporated in the systems that are utilized for core damage assessment are certified to perform their intended functions in an accident environment with abnormal chemistry and radiation parameters. Environmental monitoring sample analysis can also be performed in the facilities of either unit. The physical separation of the units will allow the facilities in the unaffected unit to be used as a backup. The Station radiological and radiochemical laboratory facilities may be supplemented by the following:

- A mobile radiological laboratory set up at the staging area at the Bay City Civic Center and operated by the Department of State Health Services
- The laboratory facilities of neighboring nuclear facilities coordinated by the Institute of Nuclear Power Operations
- AREVA NP INC.
- TXU Power (Letter of Agreement)



The applicant also states that the mobile radiological laboratory in G.9 refers to the mobile laboratory provided by the State of Texas, which is capable of providing Gamma spectroscopy, Alpha spectroscopy, and Alpha and Beta liquid scintillation counting.

**13.3C.8.5 Technical Evaluation:** NRC staff found the applicant's response to **RAI 13.03 45** acceptable. The staff verified that the proposed revisions to Section G.9 are in Revision 2 of the STP Units 3 and 4 Emergency Plan.

After reviewing the proposed changes to Section G.9, "Laboratory Facilities," of the STP Units 3 and 4 Emergency Plan, the staff concluded that the content of the information in the proposed change (1) is applicable to the proposed reactors, (2) is up-to-date, and (3) reflects the use of the existing site for the construction of two additional reactor units and appropriately incorporates the new reactors into the existing plan.

### **13.3C.8.6 Conclusion for "Emergency Facilities and Equipment"**

NRC staff reviewed the proposed changes to the STP Units 3 and 4 Emergency Plan against Planning Standard H of NUREG-0654/FEMA-REP-1 and applicable requirements in 10 CFR Part 50. The staff's determination as to whether this planning standard is acceptable will be based on the adequacy of the applicant's response to **Open Item 13.03-1**.

### **13.3C.9 Accident Assessment**

**13.3C.9.1 Regulatory Basis:** 10 CFR Part 50, Appendix E, Section IV.B requires (in part) that the applicant provide descriptions of the means to be used for determining the magnitude of, and for continually assessing the impact of, the release of radioactive materials.

10 CFR 50.47(b)(9) requires that there should be adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition. To determine whether the proposed emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(9), NRC staff evaluated the plan against the detailed evaluation criteria<sup>2</sup> in NUREG-0654/FEMA-REP-1.

**13.3C.9.2 Technical Information in the Emergency Plan: [I.1]** The STP Units 3 and 4 Emergency Plan contains Section H, "Accident Assessment," which describes the techniques, methods, and procedures for initial and long-term assessments of an emergency. The applicant incorporates the following changes into the STP Units 3 and 4 Emergency Plan related to accident assessments:

- Section H.1.2, "Seismic Monitoring," was changed to reflect the substitution of a digital triaxial seismograph with a triaxial time history accelerometer and the description of the location of the seismic instrumentation.
- Section H.1.3, "Plant Process Instrumentation," was changed to include a reference to the Plant Information and Control System (PICS) for STP Units 3 and 4.
- Table H-1, "Assessment Instrumentation," was changed to reflect (a) the replacement of a digital triaxial seismograph with a triaxial accelerometer and its location; and (b) the inclusion of a Fire Protection System Display in the STP Units 3 and 4 main control room.

In addition, the applicant has proposed emergency planning **ITAAC 7.1 through 7.7** in Part 9, "Inspections, Tests, Analyses, Acceptance Criteria," of the COL application to confirm the following:

- The means to provide initial and continuing radiological assessments throughout the course of an accident [I.2]
- The means to determine the source term of releases of radioactive material within plant systems and the magnitude of the release of radioactive materials based on plant system parameters and effluent monitors [I.3]
- The means to continuously assess the impact of the release of radioactive materials into the environment, accounting for the relationship between effluent monitor readings and onsite and offsite exposures and contamination for various meteorological conditions [I.4]
- The means to acquire and evaluate meteorological information [I.5]
- The means to determine the release rate and projected doses if the instrumentation used for assessment is off scale or inoperable [I.6]
- The means to make rapid assessments of actual or potential magnitudes and locations of any radiological hazards through liquid or gaseous release pathways, including activation, notification means, field team composition, transportation, communication, monitoring equipment, and estimated deployment times [I.8]

**13.3C.9.3 Technical Evaluation:** NRC staff verified that the proposed changes accurately describe instrumentation changes related to STP Units 3 and 4 in Revision 2 of the STP Units 3 and 4 Emergency Plan. See Section 13.3C.19, "Emergency Planning ITAAC," of this SER for the staff's evaluation of emergency planning ITAAC 7.1 through 7.7. Therefore, the staff concluded that the proposed changes (1) are applicable to the proposed reactors, (2) are up-to-date, and (3) reflect the use of the existing site for the construction of two additional reactor units and appropriately incorporate the new reactors into the existing plan.

#### **13.3C.9.4 Conclusion for "Accident Assessment"**

After reviewing the proposed changes related to accident assessment, the staff concluded that the changes are acceptable and meet the applicable requirements of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b), as cited above.

- **13.3C.10 Protective Response**

**13.3C.10.1 Regulatory Basis:** As discussed in Chapter 13.3 of NUREG-0800, if an application proposes to extend an existing site emergency plan to the new reactor, the existing emergency plan should be considered acceptable and adequate, and NRC staff should focus the review on the changes related to the new reactor. However, the applicant does not propose any changes to Section I, "Protective Response," of the STP Units 3 and 4 Emergency Plan.

**13.3C.10.2 Technical Information in the Emergency Plan:** Section I, "Protective Response," of the STP Units 3 and 4 Emergency Plan describes the protective response actions for protecting onsite and offsite personnel in the plume exposure pathway EPZ.

**13.3C.10.3 Technical Evaluation:** As discussed in Chapter 13.3 of NUREG–0800, if an application proposes to extend an existing site emergency plan to the new reactor, the existing emergency plan should be considered acceptable and adequate, and NRC staff should focus the review on changes to the emergency plan that are related to the new reactor. However, the applicant does not propose any changes to Section I, "Protective Response," of the STP Units 3 and 4 Emergency Plan.

**13.3C.10.4 Conclusion for “Protective Response”**

Because the protective response actions will be the same for all four STP Units, the applicant is not proposing any changes in the STP Units 3 and 4 Emergency Plan. Therefore, NRC staff found this section of the STP Unit 3 and 4 Emergency Plan acceptable because the existing site emergency plan is considered acceptable and adequate.

- **13.3C.11 Radiological Exposure Control**

**13.3C.11.1 Regulatory Basis:** As discussed in Chapter 13.3 of NUREG–0800, if an application proposes to extend an existing site emergency plan to the new reactor, the existing emergency plan should be considered acceptable and adequate, and NRC staff should focus the review on changes related to the new reactor. However, the applicant does not propose any changes to Section J, "Radiation Exposure Control," of the STP Units 3 and 4 Emergency Plan.

**13.3C.11.2 Technical Information in the Emergency Plan:** Section J, "Radiation Exposure Control," describes applicable radiation control measures such as personnel exposure monitoring, contamination control, radiological surveys, and personnel decontamination.

**13.3C.11.3 Technical Evaluation:** As discussed in Chapter 13.3 of NUREG–0800, if an application proposes to extend an existing site emergency plan to the new reactor, the existing emergency plan should be considered acceptable and adequate, and NRC staff should focus the review on changes to the emergency plan that are related to the new reactor. However, the applicant does not propose any changes to Section J, "Radiation Exposure Control," of the STP Units 3 and 4 Emergency Plan.

**13.3C.11.4 Conclusion for “Radiological Exposure Control”**

Because radiological exposure control will be the same for all four STP Units, the applicant is not proposing any changes in the STP Units 3 and 4 Emergency Plan. Therefore, NRC staff found this section of the STP Units 3 and 4 Emergency Plan acceptable because the existing site emergency plan is considered acceptable and adequate.

- **13.3C.12 Medical and Public Health Support**

**13.3C.12.1 Regulatory Basis:** As discussed in Chapter 13.3 of NUREG–0800, if an application proposes to extend an existing site emergency plan to the new reactor, the existing emergency plan should be considered acceptable and adequate, and NRC staff should focus the review on changes related to the new reactor. However, the applicant does not propose any changes related to the description of arrangements for medical services for contaminated and injured individuals in the STP Units 3 and 4 Emergency Plan.

**13.3C.12.2 Technical Information in the Emergency Plan:** The applicant is not proposing any changes to the following sections of the STP Units 3 and 4 Emergency Plan that are related to medical and public health support:

- Section J.5, “Radiological Considerations”
- Section 5.7, “Letters of Agreement,” which contains LOAs with the Matagorda County Emergency Medical Services, Matagorda County Hospital District, and Memorial Hermann Texas Medical Center.
- Section G.11, “First Aid”

**13.3C.12.3 Technical Evaluation:** Because the applicant is not proposing any changes to Section J.5, Section 5.7, and Section G of the STP Units 3 and 4 Emergency Plan, the existing emergency plan is considered acceptable and adequate.

#### **13.3C.12.4 Conclusion for “Medical and Public Health Support”**

Because medical and public health support will be the same for all four STP Units, the applicant is not proposing any changes in the STP Units 3 and 4 Emergency Plan. Therefore, NRC staff found the above sections of the STP Units 3 and 4 Emergency Plan acceptable because the existing site emergency plan is considered acceptable and adequate.

- **13.3C.13 Recovery and Reentry Planning and Post-accident Operations**

**13.3C.13.1 Regulatory Basis:** As discussed in Chapter 13.3 of NUREG-0800, if an application proposes to extend an existing site emergency plan to the new reactor, the existing emergency plan should be considered acceptable and adequate, and NRC staff should focus the review on changes related to the new reactor. However, the applicant does not propose any changes to Section L, “Recovery and Re-entry,” of the STP Units 3 and 4 Emergency Plan.

**13.3C.13.2 Technical Information in the Emergency Plan:** Section L of the STP Units 3 and 4 Emergency Plan describes the requirements for recovery and re-entry into evacuated areas of the Station following an emergency.

**13.3C.13.3 Technical Evaluation:** Because the applicant is not proposing any changes to Section L of the STP Units 3 and 4 Emergency Plan, the existing emergency plan is considered acceptable and adequate.

#### **13.3C.13.4 Conclusion for “Recovery and Reentry Planning and Post-accident Operations”**

Because Section L, “Recovery and Reentry,” is the same for all four STP Units, the applicant is not proposing any changes in the STP Units 3 and 4 Emergency Plan. Therefore, NRC staff found this section of the STP Units 3 and 4 Emergency Plan acceptable because the existing site emergency plan is considered acceptable and adequate.

- **13.3C.14 Exercises and Drills**

**13.3C.14.1 Regulatory Basis:** As discussed in Chapter 13.3 of NUREG–0800, if an application proposes to extend an existing site emergency plan to the new reactor, the existing emergency plan should be considered acceptable and adequate, and NRC staff should focus the review on changes related to the new reactor. However, the applicant does not propose any changes to Section N, "Drills and Exercises," of the STP Units 3 and 4 Emergency Plan.

**13.3C.14.2 Technical Information in the Emergency Plan:** Section N, "Exercises and Drills," describes the Drill-and-Exercise Program that will be used for the site to maintain emergency preparedness.

The applicant is proposing emergency planning **ITAAC 8.1** in Part 9, "Inspections, Tests, Analyses, Acceptance Criteria," of the COL application to confirm that the licensee conducts a full-participation exercise to evaluate major portions of emergency response capabilities, which include participation by each State and local agency in the plume exposure pathway EPZ and each State in the ingestion EPZ.

**13.3C.14.3 Technical Evaluation:** As discussed in Chapter 13.3 of NUREG–0800, if an application proposes to extend an existing site emergency plan to the new reactor, the existing emergency plan should be considered acceptable and adequate, and NRC staff should focus the review on changes to the emergency plan that are related to the new reactor. However, the applicant does not propose any changes to Section N of the STP Units 3 and 4 Emergency Plan.

See Section 13.3C.19, "Emergency Planning ITAAC," of this SER section for the staff's evaluation of emergency planning ITAAC 8.1.

**13.3C.14.4 Conclusion for "Exercises and Drills"**

Because Section N, "Exercises and Drills," will be the same for all four STP Units, the applicant is not proposing any changes in the STP Units 3 and 4 Emergency Plan. Therefore, NRC staff found this section of the STP Units 3 and 4 Emergency Plan acceptable because the existing site emergency plan is considered acceptable and adequate.

- **13.3C.15 Radiological Emergency Training**

**13.3C.15.1 Regulatory Basis:** 10 CFR 50.47(b)(15) requires that "radiological emergency response training should be provided to those who may be called on to assist in an emergency." To determine whether the proposed emergency plan meets the applicable regulatory requirements in 10 CFR 50.47(b)(15), NRC staff evaluated the plan against the detailed evaluation criteria<sup>2</sup> in NUREG–0654/FEMA-REP-1.

**13.3C.15.2 Technical Information in the Emergency Plan: [O.2]** Section M, "Emergency Preparedness Training," of the STP Units 3 and 4 Emergency Plan describes the emergency preparedness training program for onsite and offsite emergency response personnel to maintain a state of emergency preparedness for the STP site. The applicant is proposing the following change in the STP Units 3 and 4 Emergency Plan:

- Plant Information & Control System (PICS) operation training was added to Subsection M.4.1, "Specialized training shall be conducted to cover the following topics," for STP Units 3 and 4.

**[O.1]** In addition, the application is proposing emergency planning **ITAAC-9.1** in Part 9, "Inspections, Tests, Analyses, Acceptance Criteria," of the COL application stating that site-specific emergency response training was provided for those who may be called upon to provide assistance in the event of an emergency.

**13.3C.15.3 Technical Evaluation:** After reviewing the above change to Section M, "Emergency Preparedness Training," of the STP Units 3 and 4 Emergency Plan, NRC staff concluded that the proposed change (1) is applicable to the proposed reactors, (2) is up-to-date, and (3) reflects the use of the existing site for the construction of two additional reactor units and appropriately incorporates the new reactors into the existing plan. The staff also verified that the proposed change to Subsection M.4.1 is in Revision 2 of the STP Units 3 and 4 Emergency Plan.

See Section 13.3C.19, "Emergency Planning ITAAC," of this section of the SER for the staff's evaluation of emergency planning ITAAC 9.1.

**13.3C.15.4 Conclusion for "Radiological Emergency Training"**

NRC staff reviewed the proposed change to the STP Units 3 and 4 Emergency Plan against Planning Standard O, "Radiological Emergency Response Training," of NUREG-0654/FEMA-REP-1. The NRC found the proposed change acceptable because it is consistent with the standards of 10 CFR 50.47(b)(15), as described above.

- **13.3C.16 Responsibility for the Planning Effort: Development, Periodic Review and Distribution of Emergency Plans**

**13.3C.16.1 Regulatory Basis:** As discussed in Chapter 13.3 of NUREG-0800, if an application proposes to extend an existing site emergency plan to the new reactor, the existing emergency plan should be considered acceptable and adequate, and NRC staff should focus the review on changes related to the new reactor. However, the applicant does not propose any changes to Section O, "Emergency Preparedness," of the STP Units 3 and 4 Emergency Plan.

**13.3C.16.2 Technical Information in the Emergency Plan:** Section O, "Emergency Preparedness," describes the actions required for emergency plan development and review and for distribution and maintenance of the Station's emergency plan to maintain a state of emergency preparedness.

**13.3C.16.3 Technical Evaluation:** As discussed in Chapter 13.3 of NUREG-0800, if an application proposes to extend an existing site emergency plan to the new reactor, the existing emergency plan should be considered acceptable and adequate, and NRC staff should focus the review on changes in the emergency plan that are related to the new reactor. However, the applicant does not propose any changes to Section O of the STP Units 3 and 4 Emergency Plan.

#### **13.3C.16.4 Conclusion for “Responsibility for the Planning Effort: Development, Periodic Review, and Distribution of Emergency Plans”**

Because Section O, “Emergency Preparedness,” is the same for all four STP Units, the applicant is not proposing any changes in the STP Units 3 and 4 Emergency Plan. Therefore, NRC staff found this section of the STP Units 3 and 4 Emergency Plan acceptable because the existing site emergency plan is considered acceptable and adequate.

- **13.3C.17 Hostile Action-Based Considerations**

**13.3C.17.1 Regulatory Basis:** Regulatory Guide 1.206 specifies that applicants for a combined license need to address the Commission Order issued on February 25, 2002. The following item relates to the EALs for STP Units 3 and 4:

- Provide EALs that ensure that a security event results in an emergency classification declaration of at least a notification of unusual event. The classification scheme should also reflect the strategy for escalation to a higher-level event classification.

**13.3C.17.2 Technical Information in the Emergency Plan:** The applicant’s response to **RAI 13.03-72** proposes a License Condition to submit a fully developed set of EALs to the NRC at least 180 days before initial fuel loading, in accordance with the NEI 99-01 Revision 5-endorsed EAL scheme, with three exceptions. The emergency classification scheme in NEI 99-01 Revision 5 includes initiating conditions for hostile actions for each emergency class. Additional information related to the applicant’s response to **RAI 13.03-72** is in Section 13.3C.D of this SER.

**13.3C.17.3 Technical Evaluation:** The applicant proposes a License Condition to ensure that the STP Units 3 and 4 Emergency Plan will contain EALs so that a hostile action results in an emergency classification. The classification scheme also reflects the strategy for escalation to a higher level of event classifications. NRC staff found this proposed License Condition acceptable because it meets the guidance in NUREG–0800.

#### **13.3C.17.4 Conclusion for “Hostile Action-Based Considerations”**

After reviewing the onsite emergency plan described above, NRC staff concluded that the information in the STP Units 3 and 4 Emergency Plan is consistent with the EAL portion of Section 13.3 of NUREG–0800 related to considerations based on hostile actions. Therefore, the information is acceptable and meets the requirements of 10 CFR 52.79(a)(41), as it relates to EALs for responding to hostile actions.

- **13.3C.18 Evacuation Time Estimate (ETE) Analysis**

The STP Units 3 and 4 Emergency Plan includes an analysis of the time required to evacuate the plume exposure pathway EPZ. The ETE report, "South Texas Project Development of Evacuation Time Estimates," dated September 2007, is included as a separate document in the COL application but is considered part of the STP Units 3 and 4 Emergency Plan. The ETE report is incorporated into the STP Units 3 and 4 Emergency Plan as Chapter 4, "Evacuation

Time Estimate." The ETE report was revised in April 2008 and July 2009 to reflect the information in the response to the RAIs.

- **13.3C.18.1 Regulatory Basis for the ETE Analysis**

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

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

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

- **13.3C.18.2 Introductory Materials Related to the ETE Report**

**Technical Information in the ETE Report: [Section I of Appendix 4]:** Section 1, "Introduction," of the ETE report provides a basic description of the process used to estimate the ETEs. The report includes a description and a map (Figure 1-1, "Location of the South Texas Project") of the EPZ and surrounding area. NRC staff issued **RAI 13.03-3** requesting the applicant to provide additional information regarding the lack of political boundaries on the map. The applicant's response to **RAI 13.03-3** explains that the entire STP plume exposure pathway EPZ is within Matagorda County. The staff issued **RAI 13.03-2** requesting the applicant to provide additional information regarding communities that are not identified on the map. The applicant's response to **RAI 13.03-2** revises and labels Figure 1-1 to reflect the region surrounding the site out to metropolitan Houston and the cities of Matagorda, Palacios, and Bay City.

The major assumptions of the ETE report are in Section 2, "Study Estimates and Assumptions." Population estimates are based on the year 2000 census data and are projected to the year 2007. County-specific projections are based on growth rates that were estimated by comparing the 2000 census data with 2005 census estimates. Estimates of employees who commute into the EPZ to work are based on employment data obtained from county emergency management officials. Population estimates at special facilities are based on available data from county emergency management offices. Roadway capacity estimates are based on field surveys and the application of the *Highway Capacity Manual* (HCM 2000, Transportation Research Board, National Research Council, 2000). Population mobilization times are based on a statistical analysis of data acquired from a telephone survey, as is the relationship between the resident population and evacuating vehicles (occupancy factors). The transport of residents without access to private vehicles is assumed to be on buses. The effect of a voluntary (shadow) evacuation out to 15 miles is considered in the evacuation time calculation. The Matagorda Beach area (just south of the plume exposure pathway EPZ) has only one access road (FM 2031) that cuts through the plume exposure pathway EPZ.



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

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

**Technical Evaluation: [Section I of Appendix 4]:** The ETE report includes a map showing the proposed site, plume exposure pathway EPZ, transportation networks, topographical features, and political boundaries. The boundaries of the EPZ, in addition to the evacuation subareas within the EPZ, are based on factors such as current and projected demography, topography, land characteristics, access routes, and jurisdictional boundaries.

The ETE report describes the method of analyzing the evacuation times and includes a general description of the IDYNEV modeling system with the assumptions used in the ETE analysis. The IDYNEV system consists of several submodels: a macroscopic traffic simulation model; an intersection capacity model; and a dynamic, node-centric routing model that adjusts the "base" routing in the event of an imbalance in the levels of congestion on the outbound links. Another model of the IDYNEV system is the traffic assignment and distribution model, which integrates an equilibrium assignment model with a trip distribution algorithm to compute origin-destination volumes and paths of travel designed to minimize travel time. NRC staff found the clarifications acceptable in the applicant's responses to **RAI 13.03-2** and **RAI 13.03-3** regarding political boundaries and communities. The staff also confirmed that revised Figure 1-1, "Location of South Texas Project," is included in Revision 2 of the ETE report. Therefore, the staff found that the description of the process used to estimate evacuation times conforms to the guidance in Section I of Appendix 4 to NUREG-0654/FEMA-REP-1 and is thus acceptable.

- **13.3C.18.3 Demand Estimation**

**Technical Information in the ETE Report: [Section II to Appendix 4]:** Section 3, "Demand Estimation," of the ETE report estimates the number of people who may need to be evacuated (the "demand estimation"). Population estimates in the ETE report are based on the 2000 Census. The ETE report states that census data show a slightly decreased (0.3 percent) local population between the years 2000 and 2005. The report then conservatively assumes the earlier, larger population for the analyses. NRC staff issued **RAI 13.03-1** requesting the applicant to provide additional information regarding differences in the assumptions between the FSAR and the ETE report. The applicant's response to **RAI 13.03-1** notes that the estimates were prepared by separate contractors for areas with slightly different definitions that

corresponded within approximately 2 percent, thus providing confidence in the results. Therefore, the staff found this response to **RAI 13.03-1** acceptable.

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

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

The staff confirmed that the clarification in the applicant's response to **RAI 13.03-4(1)** is included in the July 2009 revision of the ETE report.

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

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

- Figure 3-2, "Permanent Residents by Sector"
- Figure 3-3, "Permanent Resident Vehicles by Sector"
- Figure 3-4, "Transient Population by Sector"
- Figure 3-5, "Transient Vehicles by Sector"
- Figure 3-6, "Non-resident Employee Population by Sector"
- Figure 3-7, "Non-resident Employee Vehicles by Sector"

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

**Technical Evaluation: [Section II to Appendix 4]:** The ETE report estimates the number of people who may need to be evacuated. The three population segments considered are permanent residents, transients, and persons in special facilities. The size of the permanent population is adjusted for growth. The population data are translated into two groups: those using automobiles and those without automobiles. The estimated number of vehicles used by permanent residents is based on an appropriate automobile occupancy factor. In addition, the report determined time estimates for the simultaneous evacuation of the entire plume exposure pathway EPZ.

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

NRC staff found the clarifications and ETE report revisions in the applicant's responses to **RAIs 13.03-1, 13.03-4(1), and 13.03-10** acceptable. Therefore, the staff found that the description of the estimated number of people who may need to be evacuated conforms to the guidance in Section II of Appendix 4 to NUREG-0654/FEMA-REP-1 and is thus acceptable.

- **13.3C.18.4 Traffic Capacity**

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

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

The staff verified that the changes proposed in response to **RAI 13.03-5** are included in the July 2009 revision of the STP Units 3 and 4 ETE report.

The staff issued **RAI 13.03-12**, requesting the applicant to provide additional information regarding the efficacy of using traffic and access control points to determine evacuation times. The applicant's response to **RAI 13.03-12** notes that although these concepts were discussed,

they were not applied to the modeling, so any efforts at traffic control will shorten the estimated evacuation time. However, the applicant also states in the response that the following text will be added to the first paragraph of Section 7.3:

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

The applicant's response to **RAI 13.03-12** also states that the annotations of delay times in congested areas shown in Figures 7-3, "Traffic Congestion at 45 Minutes after the Advisory to Evacuate," and 7-4, "Traffic Congestion at 1 Hour and 15 Minutes after the Advisory to Evacuate" will be added to the next revision of the ETE report. The staff confirmed that the proposed changes to the text and to Figures 7-3 and 7-4 in response to **RAI 13.03-12** are in the July 2009 revision of the ETE report.

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

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

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

The applicant's response to **RAI 13.03-13** explains that the evacuation routes in the ETE report are somewhat enhanced compared with those in the current Texas EMP. The applicant provides a new scalable electronic map with annotations of sector boundaries, nodes, and links used in the ETE analyses and corrections of omissions and inappropriate directional indications that reflect the evacuation network as modeled.

**Technical Evaluation: [Section III to Appendix 4]:** The ETE report provides a complete review of the evacuation road networks that are slightly enhanced compared with those in the older ETE report for STP Units 1 and 2. The report includes analyses of travel times and potential locations for congestion. The ETEs are not dependent on the establishment of traffic and access control points. Therefore, manpower and equipment shortages have no effect on the ETE calculations. The report also describes all evacuation route segments and their characteristics, including capacity, and a traffic control and management strategy that is designed to expedite the evacuation. The traffic management strategy is based on a field survey of critical locations and consultations with emergency management and enforcement personnel.

The ETE report includes assumptions for determining the number of vehicles needed, as well as the methodology for determining the transport-dependent population. The applicant also analyzes travel times and potential locations for serious congestion along the evacuation routes. NRC staff found the revisions to the ETE report in response to **RAIs 13.03-11, 13.03-13, and 13.03-14** acceptable. Therefore, the staff found that the description of the highway capacity estimates conforms to the guidance in Section III of Appendix 4 to NUREG-0654/FEMA-REP-1 and is thus acceptable.

- **13.3C.18.5 Analysis of Evacuation Times**

**Technical Information in the ETE Report: [Section IV to Appendix 4]:** Sections 4, 5, and 6 of the ETE report describe the methods used to estimate the evacuation times. Section 4 describes estimates of highway capacity that are discussed in detail in Section 13.3C.18.4. Section 5 provides estimates of the distributions of elapsed times associated with mobilization activities undertaken by the public to prepare for the evacuation trip (the "trip generation time").

Section 6 defines the various evacuation cases used in the time estimates. A case is defined as a combination of a scenario and a region. A scenario is defined as a combination of circumstances that include the time of day, day of the week, season, and weather conditions. Scenarios define the number of people in each affected population group and the respective mobilization time distributions. A region is defined as a grouping of contiguous evacuation zones that forms either a "keyhole" sector-based area or a circular area within the plume exposure pathway EPZ that is evacuated in response to a radiological emergency. The STP plume exposure pathway EPZ is defined as containing 11 separate evacuation zones that may be combined into regions, with boundaries along major roads or rivers. The boundary definitions are in Appendix L, "Zone Boundaries," of the ETE report. These boundaries do not bisect any population centers. In addition, these regions approximate (by radius and area) 2 miles and four 90-degree sectors, 5 miles and four 90-degree sectors, 10 miles and four 90-degree sectors, and 10 miles with an entire plume exposure pathway EPZ.

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

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

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

The staff issued **RAI 13.03-16** requesting the applicant to clarify the assumptions regarding "shadow evacuation," STP plant personnel evacuation, and behavior of commuters. The applicant's response to **RAI 13.03-16** clarifies these assumptions and also states that Subsection 2.3.3.b of Section 2.3, "Study Assumptions," will be revised as described in the applicant's response to **RAI 13.03-4(1)**, which is discussed in Section 13.3C.18.3 of this SER. Section 8, "Transit-Dependent and Special Facility Evacuation Time Estimates," of the ETE report includes separate calculations for special populations of schoolchildren and transit-

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

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

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

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

**Technical Evaluation: [Section IV to Appendix 4]:** A total of 264 ETEs were computed for the evacuation of the general public. Each ETE quantifies the aggregate evacuation time estimated for the population within one of the 22 Evacuation Regions to completely evacuate from that region, under the circumstances defined for 1 of 12 Evacuation Scenarios (22 x 12 = 264). There are separate ETEs calculated for transit-dependent evacuees, including schoolchildren. An acceptable variant of the NUREG-0654 format is used for the presentation of the evacuation times in Appendix J.

Distribution functions for notification of the various categories of evacuees were developed. The distribution functions for the action stages after notification predict what fraction of the population will complete a particular action within a given span of time. There are separate distributions for auto-owning households, school populations, and transit-dependent populations. These times are combined to form the trip-generation distributions. There are separate distributions for auto-owning households, school populations, and transit-dependent populations; there are also calculations for on-road travel and delay times. The process for developing an estimate of the time required to evacuate a particular segment of the non-auto-owning population dependent upon public transportation is similar to that used for the auto-owning population.

The applicant has added clarifying information in responses to the following **RAIs: 13.03-6(1); 13.03-7; 13.03-8(1)(a, c, and d); 13.03-8(2); 13.03-9; 13.03-12(2); 13.03-12(4); 13.03-12(5); 13.03-15(2)(b); 13.03-16(a, b, and d); 13.03-17(2)(a); 13.03-17(3); 13.03-17(4); 13.03-17(5); 13.03-17(6); and 13.03-17(7)**. The staff found these clarifications acceptable. The applicant also provided additional information in response to **RAIs 13.03-8(1)(b), 13.03-11, 13.03-15(1), 13.03-17(2)(a), 13.03-17(3), 13.03-17(4), and 13.03-17(6)(e)**. The staff found the additional data and information from the applicant in response to these RAIs acceptable. In addition, the applicant clarified and added textual revisions to the ETE report in response to **Rals 13.03-16(c), 13.03-17(4), and 13.03-17(5)**. The staff found these clarifications and revisions acceptable. The applicant also corrected and revised the ETE report in response to **RAIs 13.03-12(3), 13.013-15(2)(a), 13.03-12(1), 13.03-17(1), and 13.03-17(2)(b)**. The staff found these revisions acceptable. Therefore, the staff found that the description of the methods used to estimate the evacuation times conforms to the guidance in Section IV of Appendix 4 to NUREG-0654/FEMA-REP-1 and is thus acceptable.

- **13.3C.18.6 Other Requirements**

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

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

**Technical Evaluation: [Section V to Appendix 4]:** The applicant estimated the time required to confirm the evacuation. In addition, the applicant coordinated the development of the ETE report with the emergency planners from the State of Texas and Matagorda County



who are involved in responding to an emergency on the site. The applicant's response to **RAI 13.03 18(2)** clarifies confirmation times and the involvement of State and local officials to implement the confirmation process. The staff found the applicant's clarifications in response to this RAI acceptable. Therefore, the staff found that the description of the time and procedure to confirm the evacuation is acceptable because it conforms to the guidance in Section V of Appendix 4 to NUREG-0654/FEMA-REP-1.

- **13.3C.18.7 Conclusion**

On the basis of the evaluation described above of the report, "South Texas Project Development of Evacuation Time Estimates," dated July 2009, NRC staff concluded that the report is consistent with the guidance in Appendix 4 to NUREG-0654/FEMA-REP-1 and meets the applicable requirements of 10 CFR Part 50, Appendix E.IV.

- **13.3C.19 Emergency Planning ITAAC**

The applicant is proposing emergency planning ITAAC to address those elements of the STP Units 3 and 4 Emergency Plan that cannot be reasonably addressed before construction of the plant.

- **13.3C.19.1 Regulatory Basis**

NRC staff considered the following regulatory requirements and guidance in the evaluation of the ITAAC related to emergency planning:

- 10 CFR 52.80(a), "Contents of applications; additional technical information," requires the application to contain proposed inspections, tests, analyses, and acceptance criteria.
- Table C.II.1-B1, "Emergency Planning - Generic Inspections, Tests, and Acceptance Criteria (EP-ITAAC)," in RG 1.206.

- **13.3C.19.2 Technical Information in the Application**

Section 2.17, "Emergency Response Facilities," of Part 2, "FSAR," of the COL application incorporates by reference all tables in Section 2.17, "Emergency Response Facilities," of the ABWR DCD. Table 2.17.1, "Emergency Response Facilities," contains six emergency planning ITAAC related to the location and size of the TSC; the location of the OSC, TSC, and OSC voice communications; and plant parameter displays in the TSC.

Additional emergency planning ITAAC proposed for STP Units 3 and 4 are in Chapter 4, "Emergency Planning ITAAC," in Part 9, "Inspection, Tests, Analyses and Acceptance Criteria (ITAAC)," of the STP COL application. Table 4.0-1, "Emergency Planning - Inspection, Test, Analysis, and Acceptance Criteria (EP-ITAAC)," in Chapter 4, "Emergency Planning ITAAC," contains the emergency planning ITAAC for certain planning standards (Items 1 through 9 below) in 10 CFR 50.47(b) and requirements in 10 CFR Part 50, Appendix E, Section V (Item 10 below):

1. Assignment of Responsibility - Organizational Control
2. Onsite Emergency Response Organization

3. Emergency Classification System
4. Notification Methods and Procedures
5. Emergency Communications
6. Emergency Facilities and Equipment
7. Accident Assessment
8. Exercises and Drills
9. Radiological Emergency Response Training
10. Implementing Procedures

NRC staff issued **RAIs 14.03.10-1 through 13** requesting the applicant to discuss deviations in Table 4.0-1 from the guidance in Table C.II.1-B1 of Appendix B to RG 1.206.

### **13.3C.19.3 Technical Evaluation**

The applicant has submitted the emergency planning ITAAC, as required by 10 CFR 52.80(a). The applicant's response revises Table 4.0-1 so that it is consistent with the guidance in Table 14.3.10-1, "Emergency Planning - Generic Inspections, Tests, and Acceptance Criteria (EP-ITAAC)," in NUREG-0800. Section 2.17, "Emergency Response Facilities," of Part 2, "FSAR," of the COL application, incorporates by reference all tables in Section 2.17, "Emergency Response Facilities," of the ABWR DCD. Table 2.17.1, "Emergency Response Facilities," contains six emergency planning ITAAC related to the location and size of the TSC; the location of the OSC, TSC, and OSC voice communications; and plant parameter displays in the TSC.

NRC staff found the responses to **RAIs 14.03.10-1 through 13** acceptable because they are also consistent with the guidance in Table 14.3.10-1. The staff verified that the applicant has updated Table 4.0-1 in Chapter 4 of Part 9 of the COL application with the information in the responses to RAIs 14.03.10-1 through 13.

### **13.3C.19.4 Conclusion for Emergency Planning ITAAC**

NRC staff concluded that the information described in Section 2.17 and Part 9 of the FSAR related to emergency planning ITAAC is consistent with Table C.II.1-B1 as specified above. Therefore, the information related to the emergency planning ITAAC is acceptable and meets the applicable requirements of 10 CFR 52.80(a) and the related guidance in RG 1.206.

## **13.4 Review and Audit**

### **13.4.1 Introduction**

This section of the FSAR addresses the provisions for conducting an independent review of plant operations.

### **13.4.2 Summary of Application**

Section 13.4 of the STP Units 3 and 4 COL FSAR states that it incorporates by reference Section 13.4 of the ABWR DCD, Revision 4, referenced in 10 CFR Part 52, Appendix A. In addition, in FSAR Section 13.4, the applicant provides the following:

- COL License Information Item
- COL License Information Item 13.2a      Review and Audit

This COL license information item directs the applicant to provide a plan for conducting independent reviews of plant operations, and for the independent assessment of activities for safety enhancement in accordance with TMI Action Item I.B.1.2, and 10 CFR 50.40(b) as it relates to technical qualification requirements. The applicant states that Appendix B to NUREG–0933 indicates that TMI Action Item I.B.1.2, which relates to an independent safety engineering group, is not a residual generic safety issue that is applicable to operating and future reactor plants. The applicant adds that it does not maintain an independent safety engineering group.

### 13.4.3      Regulatory Basis

The relevant requirements of the Commission regulations for an independent review and audit, and the associated acceptance criteria, are in accordance with 10 CFR 50.40(b) as it relates to the technical qualification requirements and TMI Action Item I.B.1.2.

### 13.4.4      Technical Evaluation

As documented in NUREG–1503, NRC staff determined that review and audit information are outside the scope of the ABWR standard plant design. No information is provided in Section 13.4 of the DCD other than a COL information item, and the staff concluded that the proposed COL information item is acceptable. The staff reviewed Section 13.4 of the STP Units 3 and 4 COL FSAR and checked the referenced ABWR DCD to ensure that the combination of the information in the COL FSAR and the information in the ABWR DCD appropriately represents the complete scope of information relating to this review topic.<sup>1</sup> The staff’s review confirmed that the information in the application addresses the required information relating to the review and audit.

The staff reviewed the information in the COL FSAR:

- COL License Information Item
- COL License Information Item 13.2a      Review and Audit

The applicant states that Appendix B to NUREG–0933 indicates that TMI Action Item I.B.1.2—regarding an independent safety engineering group—is not a residual generic safety issue that is applicable to operating and future reactor plants and the applicant does not maintain an independent safety engineering group.

Appendix B to NUREG–0933 does not list TMI Action Item I.B as a required generic safety issue item applicable to operating or future plants. In addition, as evaluated in Section 13.1 of this SER, the applicant has provided acceptable information regarding technical qualification

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<sup>1</sup> See “*Finality of Referenced NRC Approvals*” in SER Section 1.1.3, for a discussion on the staff’s review related to verification of the scope of information to be included in a COL application that references a design certification.

requirements as specified in 10 CFR 50.40(b). Therefore, NRC staff found the applicant's response consistent with the guidance in NUREG-0933 and 10 CFR 50.40(b). COL License Information Item 13.2a is therefore resolved.

#### **13.4.5 Post Combined License Activities**

There are no post COL activities related to this section.

#### **13.4.6 Conclusion**

NRC staff reviewed the application and checked the referenced DCD. The staff's review confirmed that the applicant has addressed the required information, and no outstanding information is expected to be addressed in the COL FSAR related to this section. The staff's review confirmed that the applicant has adequately addressed the COL license information in accordance with the guidance in NUREG-0933.

- **13.4S Operational Program Implementation**

- **13.4S.1 Introduction**

This section of the FSAR addresses the operational programs described in NRC guidance SECY-05-0197. The section includes a description of the programs and the proposed implementation milestones for each program.

- **13.4S.2 Summary of Application**

Section 13.4S of the STP Units 3 and 4 COL FSAR provides a description of and the proposed implementation milestones for each operational program, in compliance with the guidance of RG 1.206, Section C.I.13.4. The applicant provides this information in FSAR Table 13.4S-1, which lists each operational program, the regulatory requirement for the program, the associated implementation milestone(s), and the section of the FSAR that describes the operational program.

- **13.4S.3 Regulatory Basis**

The relevant requirements of the Commission regulations for the operational program implementation, and the associated acceptance criteria, are in Section 13.4 of NUREG-0800.

The regulatory basis of the operational programs described in Section 13.4S of this application is identified in the individual chapters of this SER that address the evaluations of the specific operational programs, as clarified by the regulatory guidance in SECY-05-0197 and RG 1.206.

- **13.4S.4 Technical Evaluation**

NRC staff reviewed Section 13.4S of the STP Units 3 and 4 COL FSAR to ensure that the information in the COL FSAR appropriately represents the complete scope of information

relating to this review topic.<sup>1</sup> The staff's review confirmed that the information in the application addresses the required information relating to the implementation of operational programs.

The staff reviewed FSAR Table 13.4S-1 and determined that the applicant has identified the operational programs required by NRC regulations and has provided a description of the proposed implementation milestones for each program. The technical evaluation of the operational programs ensures that the applicant has fully described the programs and their associated implementation milestones. Each program is evaluated in the respective section of this SER.

- **13.4S.5 Post Combined License Activities**

In FSAR Table 13.4S-1, the applicant identifies the implementation milestones for each operational program. These implementation milestones specify the activities to be completed following the issuance of the COL. The implementation of each operational program will be evaluated by NRC staff according to the respective implementation milestone.

- **13.4S.6 Conclusion**

NRC staff reviewed Section 13.4S of the STP Unit 3 and 4 COL FSAR and checked the referenced DCD. The staff's review confirmed that the applicant has addressed the relevant information, and no outstanding information is expected to be addressed in the COL FSAR related to this section.

## **13.5 Plant Procedures**

### **13.5.1 Introduction**

This section of the FSAR addresses the administrative and operating procedures the applicant uses to ensure that routine operating, off-normal, and emergency activities are conducted in a safe manner. This section briefly describes the nature and content of the plant procedures and includes a schedule for preparing administrative and operating procedures. This description of the procedures delineates the functional position for revising and approving procedures before their implementation.

### **13.5.2 Summary of Application**

Section 13.5 of the STP Units 3 and 4 COL FSAR states that it incorporates by reference Section 13.5 of the certified ABWR DCD, Revision 4, referenced in 10 CFR Part 52, Appendix A.

In addition, in FSAR Section 13.5, the applicant provides the following:

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<sup>1</sup> See "*Finality of Referenced NRC Approvals*" in SER Section 1.1.3, for a discussion on the staff's review related to verification of the scope of information to be included in a COL application that references a design certification.

- COL License Information Item

- COL License Information Item 13.3 Plant Operating Procedures Development Plan

The applicant provides supplemental information to address the plant operating procedures development plan.

- COL License Information Item 13.4 Emergency Procedures Development

The applicant provides supplemental information to address the emergency procedures development plan.

- COL License Information Item 13.5 Implementation of the Plan

The applicant provides supplemental information to address the implementation of the plan.

- COL License Information Item 13.6 Procedures Included in Scope Plan

The applicant provides supplemental information to address the procedures included in the scope plan.

### **13.5.3 Regulatory Basis**

The relevant requirements of the Commission regulations for the plant procedures and the associated acceptance criteria are in Section 13.5.1, "Administrative Procedures," and Subsection 13.5.2.1, "Operating and Emergency Operating Procedures," of NUREG-0800.

The relevant requirements for reviewing COL License Information Item 13.3 regarding plant operating procedures are based on (1) meeting the requirements of methods and criteria described in 10 CFR 52.79(a)(14), (26), (29)(i), (29)(ii), (33), and (34), and in TMI Action Plan Items I.C.1 and I.C.9; and (2) meeting the guidance of NUREG-0800, Subsection 13.5.2.1. The review of COL License Information Item 13.4 relating to the development of emergency procedures is based on meeting the requirements of 10 CFR 52.79(a)(14), (26), (29)(i), (29)(ii), (33), and (34), and the guidance of NUREG-0800, Subsection 13.5.2.1.

The relevant requirements for reviewing COL License Information Item 13.5 related to implementation of the plan are based on the following:

- Meeting the requirements of 10 CFR 52.79(a)(14), (26), (29)(i), (29)(ii), (33), and (34)
- Meeting the TMI Action Plan requirements described in NUREG-0737 and Supplement 1 to NUREG-0737
- The elements described in ANSI 18.7/ANS-3.2 or a subsequent NRC-approved version of ANSI/ANS-3.2
- The procedures specified in the Human Factors Verification and Validation (V&V) Implementation Plan described in Article VII of Table 18E-1
- The plant procedures in accordance with the provisions of TMI Action Plan item I.C.5
- The guidance of NUREG-0800, Subsections 13.5.1.1 and 13.5.2.1

The relevant requirements for reviewing COL License Information Item 13.6 related to the procedures included in the scope of the plan are based on (1) meeting the requirements of the procedures in Section A3, Section A5, and Section A10 of ANSI/ANS-3.2; and (2) meeting the guidance of NUREG–0800, Subsections 13.5.1.1 and 13.5.2.1.

#### **13.5.4 Technical Evaluation**

NRC staff reviewed Section 13.5 of the STP Units 3 and 4 COL FSAR and checked the referenced ABWR DCD. This section of the ABWR DCD contains detailed COL information items.

The staff performed the review in accordance with the requirements established in 10 CFR 52.79(a)(14), (26), (29)(i), (29)(ii), (33), and (34), and the guidance in SRP Section 13, NUREG–0800.

The staff reviewed the information in the COL FSAR:

- COL License Information Items
- COL License Information Item 13.3 Plant Operating Procedures Development Plan

As specified in COL License Information Item 13.3 and in FSAR Subsection 13.5.3.1, “Plant Operating Procedures Development Plan,” the applicant describes the content of and the process for the development of plant operating procedures, which are to be in accordance with TMI Items I.C.1 and I.C.9. NUREG–0800, Chapter 13.5.2.1 states that the applicant is to provide descriptions of the content and the development process for operating procedures, which include meeting the requirements of TMI Action Plan Items I.C.1 and I.C.9 to control the implementation, maintenance, and revision of plant operating procedures.

NRC staff compared COL License Information Item 13.3 in the application to the applicable NRC regulations and acceptance criteria in Subsection 13.5.2.1 of NUREG–0800. The staff’s review confirmed that the applicant has addressed the relevant information, and no outstanding information is expected to be addressed in the COL FSAR related to this section.

- COL License Information Item 13.4 Emergency Procedures Development Plan

As specified in COL License Information Item 13.4 and in FSAR Subsection 13.5.3.2, “Emergency Operating Procedures,” the applicant describes the content and the process of an emergency operating procedures (EOP) program, which will include a writer’s guide, plant-specific technical guidelines (P-STGs), and the EOP training program description for the development of EOP’s. The applicant stated that it would follow the NUREG-0800 criteria applicable to these items. NUREG–0800, Chapter 13.5.2.1 states that the applicant is to provide descriptions of the content and the development process for EOPs including P-STGs, a writer’s guide, and the EOP training program description.

NRC staff compared COL License Information Item 13.4 in the application to the applicable NRC regulations and acceptance criteria in Subsection 13.5.2.1 of NUREG–0800. The staff’s

review confirmed that the applicant has addressed the relevant information, and no outstanding information is expected to be addressed in the COL FSAR related to this section.

- COL License Information Item 13.5 Implementation of the Plan

As specified in COL License Information Item 13.5 and in FSAR Subsection 13.5.3.3, "Implementation of the Plan," the applicant identifies and describes the classifications of operating procedures. The applicant stated that it would follow the NUREG-0800 criteria applicable to the nature and content of these items. NUREG-0800, Chapter 13.5.2.1 states that the applicant is to identify the classifications of operating procedures that may be used in the implementation of the operating procedures development plan.

Subsection 13.5.1.1.I of NUREG-0800 states, "the application should describe the nature and content of the procedures." STP Units 3 and 4 FSAR Subsection 13.5.3.4.1 lists the required administrative procedures per NUREG-0800. However, FSAR Subsections 13.5.3.3.1(3) and (4) state that a review of existing STP procedures will be conducted and any necessary changes will be made to the existing procedures. NRC staff did not find these discussions clear as to what is needed and when. Simply stating that the changes will be made in the FSAR does not meet the intent of NUREG-0800. Therefore, the staff issued RAI 13.05.01.01-1 requesting the applicant to clarify, revise, or explain how these FSAR subsections meet the intent in NUREG-0800, Subsection 13.5.1.1. In response, the applicant concurred. The applicant committed to revise FSAR Subsections 13.5.3.3.1(3), (4), and (5) to clarify the development of the administrative procedures by stating that administrative procedures will be developed based on experience, and that these procedures will be consistent with NUREG-0800 guidelines. The staff found the response acceptable. This RAI is now **Confirmatory Item 13.05.01.01-1**.

The staff compared COL License Information Item 13.5 in the application to the applicable NRC regulations and acceptance criteria in Section 13.5.2.1 of NUREG-0800. The staff's review confirmed that the applicant has addressed the relevant information and, with the exception of the incorporation of the information in the RAI response as identified above, no outstanding information is expected to be addressed in the COL FSAR related to this section.

- COL License Information Item 13.6 Procedures Included in Scope Plan

As specified in COL License Information Item 13.6 and in FSAR Subsection 13.5.3.4, "Procedures Included in the Scope of Plan," the applicant describes the scope of operating procedures that will extend to include the following: Administrative Procedures; Maintenance and Operating Procedures; Radiation Control Procedures; General Plant Procedures; System Operating Procedures; Alarm Response Procedures; Abnormal Operating Procedures; Calibration, Inspection, and Test Procedures; and Emergency Operating procedures. NUREG-0800, Chapter 13.5.2.1 states that the applicant is to identify the scope of operating procedures that may be used in the implementation of the operating procedures development plan.

NRC staff compared COL License Information Item 13.6 in the application to the applicable NRC regulations and acceptance criteria in Subsection 13.5.2.1 of NUREG-0800. The staff's review confirmed that the applicant has addressed the relevant information, and no outstanding information is expected to be addressed in the COL FSAR related to this section.



### **13.5.5 Post Combined License Activities**

A review of the procedures is part of the Construction Inspection Program.

### **13.5.6 Conclusion**

NRC staff compared STP Units 3 and 4 FSAR Section 13.5, "Plant Procedures," to the relevant NRC regulations; the acceptance criteria defined in NUREG-0800, Subsections 13.5.1.1 and 13.5.2.1; and other NRC RGs. The staff concluded that the applicant is in compliance with the NRC regulations. The staff also concluded that, with the exception of **Confirmatory Item 13.05.01.01-1**, the applicant has adequately addressed COL License Information Items 13.3, 13.4, 13.5, and 13.6.

The staff's review confirmed that the applicant has addressed the relevant information to satisfy the requirements of 10 CFR 52.79(a) (14), (26), (29)(i), (29)(ii), (33), and (34), as applicable, and, with the exception of **Confirmatory Item 13.05.01.01-1**, no outstanding information is expected to be addressed in the COL FSAR related to this section.