

July 27, 2009

Mr. Scott Head, Manager  
Regulatory Affairs  
STP Nuclear Operating Company  
P. O. Box 289  
Wadsworth, TX 77483

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 166 RELATED TO  
SRP SECTION 12.03-12.04 FOR THE SOUTH TEXAS PROJECT COMBINED  
LICENSE APPLICATION

Dear Mr. Head:

By letter dated September 20, 2007, STP Nuclear Operating Company (STP) submitted for approval a combined license application pursuant to 10 CFR Part 52. The U. S. Nuclear Regulatory Commission (NRC) staff is performing a detailed review of this application to enable the staff to reach a conclusion on the safety of the proposed application.

The NRC staff has identified that additional information is needed to continue portions of the review. The staff's request for additional information (RAI) is contained in the enclosure to this letter.

To support the review schedule, you are requested to respond within **30** days of the date of this letter. If changes are needed to the safety analysis report, the staff requests that the RAI response include the proposed wording changes.

S. Head

-2-

If you have any questions or comments concerning this matter, I can be reached at 301-415-3104 or by e-mail at [Michael.Eudy@nrc.gov](mailto:Michael.Eudy@nrc.gov) or you may contact George Wunder at 301-415-1494 or [George.Wunder@nrc.gov](mailto:George.Wunder@nrc.gov).

Sincerely,

**/RA/**

Michael Eudy, Senior Project Manager  
ABWR Projects Branch  
Division of New Reactor Licensing  
Office of New Reactors

Docket Nos. 52-012  
52-013

eRAI Tracking Nos. 2724 and 3021

Enclosure:  
Request for Additional Information

cc: William Mookhoek  
Bill Stillwell

S. Head

-2-

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Michael Eudy, Project Manager  
ABWR Projects Branch  
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Office of New Reactors

Docket Nos. 52-012  
52-013

eRAI Tracking No. 2724 and 3021

Enclosure:  
Request for Additional Information

cc: William Mookhoek  
Scott Stephens

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**\*Approval captured electronically in the electronic RAI system.**

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Request for Additional Information No. 2724 Revision 2

7/27/2009

South Texas Project Units 3 and 4  
South Texas Project Nuclear Operating Co  
Docket No. 52-012 and 52-013  
SRP Section: 12.03-12.04 - Radiation Protection Design Features  
Application Section: 12.3-4

QUESTIONS for Health Physics Branch (CHPB)

12.03-12.04-3

Background

STP 3 & 4 utilizes the certified Advanced Boiling Water Reactor (ABWR) per 10 CFR 50 Appendix A. In accordance with 10 CFR 20.1406(a), the COL applicant is responsible for documenting in the application how facility design and procedures for operation will minimize, to the extent practicable, contamination of the facility and the environment, facilitate eventual decommissioning, and minimize, to the extent practicable, the generation of radioactive waste.

The staff developed Regulatory Guide 4.21 in order to provide guidance to the industry on how to meet the requirements of 10 CFR 20.1406 with respect to minimizing, to the extent practicable, contamination of the facility and the environment, facilitating eventual decommissioning, and minimizing, to the extent practicable, the generation of radioactive waste.

Appendix A of RG 4.21 contains examples of measures that might be taken to address the requirements of 10 CFR 20.1406.

The following 9 design and operational objectives summarize the objectives contained in the Regulatory Position section of RG 4.21.

- 1) Minimize leaks and spills and provide containment in areas where such events may occur,
- 2) Provide for adequate leak detection capability to provide prompt detection of leakage for any structure, system, or component which has the potential for leakage,
- 3) Use leak detection methods (e.g., instrumentation, automated samplers) capable of early detection of leaks in areas where it is difficult or impossible to conduct regular inspections (such as for spent fuel pools, tanks that are in contact with the ground, and buried, embedded, or subterranean piping) to avoid release of contamination from undetected leaks and to minimize contamination of the environment,
- 4) Reduce the need to decontaminate equipment and structures by decreasing the probability of any release, reducing any amounts released, and decreasing the spread of the contaminant from the source,
- 5) Periodically review operational practices to ensure that, operating procedures are revised to reflect the installation of new or modified equipment, personnel qualification and training are kept current, and facility personnel are following the operating procedures,

- 6) Facilitate decommissioning by a) maintenance of records relating to facility design and construction, facility design changes, site conditions before and after construction, onsite waste disposal and contamination and results of radiological surveys, b) minimizing embedded and buried piping, and c) designing the facility to facilitate the removal of any equipment and/or components that may require removal and/or replacement during facility operation or decommissioning,
- 7) Minimize the generation and volume of radioactive waste both during operation and during decommissioning (by minimizing the volume of components and structures that become contaminated during plant operation),
- 8) Develop a conceptual site model (based on site characterization and facility design and construction) which will aid in the understanding of the interface with environmental systems and the features that will control the movement of contamination in the environment,
- 9) Evaluate the final site configuration after construction to assist in preventing the migration of radio-nuclides offsite via unmonitored pathways.

The above list contains a mixture of design and operational objectives. Since Chapter 12 deals with radiation protection related issues, these objectives are partially addressed in various Sections of Chapter 12 of the FSAR. The subject matter of others (e.g., item number 8 on the conceptual site model) dictates that they be addressed in detail in other sections of the COL (e.g., Chapter 2 of the FSAR).

#### Questions

1. Using the guidance provided in Regulatory Guide 4.21, "Minimization of Contamination and Radioactive Waste Generation: Life Cycle Planning" (June 2008), describe the specific design features, operational programs, and facility operating procedures provided to meet the requirements of 10 CFR 20.1406(a).
2. Revise the STP 3 & 4 FSAR to include a description of the specific design features, operational programs, and operating procedures in the appropriate section of the COL where the system is described and include a reference to these sections in Chapter 12.3 of the FSAR. For example, an acceptable description of a groundwater monitoring program should include implementation considerations and a description of the key components of the program such as types and periodicity of routine samples to be taken, threshold activities to be detected, actions to be taken upon detection of leakage into the groundwater, and a description of quality assurance practices to be used to ensure a reasonable assurance of prompt identification of leakage into the groundwater.
3. The information presented in Chapter 12 of FSAR Tier 2, Rev. 2 identifies several STP 3 & 4 general design features that would minimize the contamination of the facility and the environment and would minimize the generation of radioactive waste. However, this information does not address design features that are unique to system designs or their locations in the plant warranting more technical details, and does not identify issues that should be addressed in establishing operating programs, processes, and procedures. For each of the systems listed below (and for any other plant systems which may generate radioactive waste or could result in the contamination of nonradioactive systems):

- Fuel Storage and Handling, including fuel transfer tube
- Nuclear Steam Supply
- Turbine Main Steam Supply
- Process Sampling System
- Other Features of the Steam and Power Conversion System
- Coolant Storage and Transfer System
- Radioactive Waste Management Systems
- Equipment, Floor, Chemical, and Detergent Drain Systems
- Building heating, ventilating and air conditioning systems used to process radioactive process and effluent streams

(a) Describe specific design features which are incorporated into the STP 3 & 4 design to comply with the requirements of 10 CFR 20.1406.

(b) List the specific design features in the appropriate section of the COL where the system is described and include a reference to these sections in Chapter 12.3 of the FSAR that:

- 1) Describe any design features to detect leakage (large acute or small, long term) from the piping in the radwaste trenches.
- 2) Describe the criteria which govern the frequency of performing periodic visual inspections of the piping in the radwaste pipe trenches to check for leaks and of the floor/wall expansion joints in the radwaste pipe trenches to ensure that no spills or leaks on the floors enter unmonitored areas beneath the floors and foundations.
- 3) Verify that there are no piping runs containing contaminated fluids that will be buried in the ground and not routed through one of the radwaste trenches.

Request for Additional Information No. 3021 Revision 2

7/27/2009

South Texas Project Units 3 and 4  
South Texas Project Nuclear Operating Co  
Docket No. 52-012 and 52-013  
SRP Section: 12.03-12.04 - Radiation Protection Design Features  
Application Section: 12.3

QUESTIONS for Health Physics Branch (CHPB)

12.03-12.04-4

10 CFR 20.1501(b) requires licensees to ensure that the instruments and equipment used for quantitative radiation measurements are calibrated periodically for the radiation measured. RG 1.206, Part C.I.12.3.4, Area Radiation and Airborne Radioactivity Monitoring Instrumentation, states that the applicant should provide information regarding the calibration methods and frequency for the monitoring instrumentation.

ABWR DCD Section 12.3.7.2, Operational Considerations, contains a COL information item for the COL applicant to address Area Radiation and Airborne Radioactivity Monitoring Instrumentation operational considerations including monitor alarm setpoint(s) and information on calibration of fixed area and airborne radioactivity monitors. STP FSAR Tier 2, Section 12.3.7.2, Operational Considerations, states that alarm setpoints will be established based on design background radiation levels and confirmed during the Startup Test Program and that calibration and operability will be completed during the Preoperational Test Program. Section 12.3.7.2 also states that airborne radiation monitoring operational considerations, such as procedures for operation and calibration of monitors and placement of portable monitors, will be established in accordance with the Operational Radiation Protection Program described in Section 12.5S. Section 12.5S references NEI 07-03, Generic FSAR Template Guidance for Radiation Protection Program Description as the basis for the Operational radiation Protection Program for STP 3 & 4. However, NEI 07-03 does not provide any information on the calibration of fixed area and airborne monitors—only calibration of portable monitors.

In accordance with RG 1.206, provide information on the calibration methods and frequency that will be used for the STP 3 & 4 fixed area and airborne monitors. Discuss to what extent the calibration guidance described in ANSI/ANS 6.8.1, Location and Design Criteria for Area Radiation Monitoring Systems for Light Water Nuclear Reactors will be incorporated. If not, describe the specific alternative approaches used.