

May 12, 2008

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

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 40 RELATED TO  
THE SRP SECTION 02.04.13 FOR THE SOUTH TEXAS COMBINED LICENSE  
APPLICATION

Dear Mr. Gibson:

By letter dated September 20, 2007, STP Nuclear Operating Company (STPNOC) 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 45 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.

Mr. Gregory Gibson

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If you have any questions or comments concerning this matter, you may contact me at 301-415-1146 or [Raj.Anand@nrc.gov](mailto:Raj.Anand@nrc.gov), or you may contact George Wunder at 301-415-1494 or [George.Wunder@nrc.gov](mailto:George.Wunder@nrc.gov).

Sincerely,

**/RA/**

Raj Anand, Project Manager  
ESBWR/ABWR Projects Branch 2  
Division of New Reactor Licensing  
Office of New Reactors

Docket Nos. 52-012  
52-013

eRAI Tracking No: 254

Enclosure:  
Request for Additional Information

cc: William Mookhoek

Mr. Gregory Gibson

-2-

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Raj Anand, Project Manager  
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Enclosure:  
Request for Additional Information

cc: William Mookhoek

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NRO-002

OFFICE	SBPB/TR	SBPB/BC	NGE2/PM	OGC	NGE2/L-PM
NAME	HAhn*	MThaggard*	RAnand*	JBiggins*	GWunder*
DATE	5/06/08	5/08/08	5/08/08	5/09/08	5/12/08

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

**OFFICIAL RECORD COPY**

## Request for Additional Information

South Texas Project Units 3 and 4  
South Texas Project Nuclear Operating Co.  
Docket No. 52-012 and 52-013

SRP Section: 02.04.13 - Accidental Releases of Radioactive Liquid Effluents in Ground and Surface Waters

Application Section: 02.04S.13 – Accidental Releases of Radioactive Liquid Effluents in Ground and Surface Waters

### QUESTIONS

#### 02.04.13-1

In FSAR Section 2.4S.13.1, Direct Release to Groundwater, the applicant states that this section provides a conservative analysis of accidental release and migration. The process followed to consider, eliminate, and accept plausible alternative pathways (and conceptual models) is not specified. For example, when during the process followed were non-isothermal or buoyancy effects considered in the analysis of contaminant migration? Was the potential for chelating agents (organic compounds that alter sorption) being present considered, when determining the geochemical mobility of normally adsorbed radionuclides? This RAI is related to RAI 02.04.12-1 which requests that the process followed to arrive at the plausible alternative pathways be described more fully.

#### 02.04.13-2

In FSAR Section 2.4S.13.1.2, Conceptual Model, the applicant describes the exposure as indirect and through animals (livestock). Is this germane to the analysis and results presented? In FSAR Section 2.4S.13.1.2 it is noted that the Shallow Aquifer is used for livestock watering and occasional domestic supply. During the period for which the license being sought, could the off-site well be a domestic well allowing direct exposure? Any changed or new information on the subsurface pathway in FSAR Section 2.4S.12 should be reflected in this and subsequent subsections of FSAR Section 2.4S.13.

#### 02.04.13-3

In FSAR Section 2.4S.13.1.2, Conceptual Model, the applicant's statement toward the end of the section that "Other pathways that were considered and then rejected..." needs to be coordinated with the discussion of pathways in FSAR Section 2.4S.12. The discussion of alternative pathways in FSAR Section 2.4S.13 should parallel that in FSAR Section 2.4S.12. Please clarify.

#### 02.04.13-4

In FSAR Section 2.4S.13.1.2, Conceptual Model, the applicant closes with a four-point summary of the alternate pathways. This needs elaboration, for example, (a) Under item (1), were thermal phenomena and buoyancy of heated water considered when making the statement "... there is no mechanism to lift the liquid ..."? While data are not included, the waste waters may be at elevated temperature relative to the ambient groundwater setting, and buoyancy may be a factor to be considered. (b) Under item (2), it is not clear that the schematic diagram in FSAR Figure 2.4S.12-21 represents actual data. In which tables do the data appear? Please provide a realistic three-dimensional analysis. Complete the potentiometric surfaces of the Upper Shallow Aquifer, i.e., show

contours underlying the MCR. The potentiometric surfaces of the Lower Shallow Aquifer indicate groundwater flow toward and under the MCR rather than around it. Why would the Upper Shallow Aquifer not also present an under rather than around pathway? Explain the reasons why the pathways presented are the most plausible, by providing the basis for them. (c) Under item (4), the issue of under versus around appears again. In addition, was the concept of the paleochannel raised in FSAR Section 2.4S.12.2.4.1 incorporated into the rationale when discarding this pathway?

02.04.13-5

In FSAR Section 2.4S.13.1.3, Analysis of Accidental Releases to Groundwater, and FSAR Section 2.4S.13.4, Compliance with 10 CFR 20, are the effluent concentration limits identified and used in this analysis those for indirect exposure through animals (i.e., livestock) alone? Or, are the comparisons presented made to effluent concentration limits from 10 CFR Part 20, Appendix B, Table 2, Column 2? Please clarify.

02.04.13-6

In FSAR Section 2.4S.13.1.3.2, Transport Considering Advection, Radioactive Decay, and Retardation and FSAR Section 2.4S.13.4, "Compliance with 10 CFR 20", the applicant describes the Kd values selected for use differently. In the former the applicant states "The Kd values from the reference are assumed to be lognormally distributed, and, for conservatism, the selected Kd values were taken as the lowest 10 percentile probability in the data distribution." Later, the applicant states, "...incorporated the minimum laboratory Kd values (or 10 percent of the literature value for those isotopes without site-specific laboratory tests)." These are not equivalent statements. Please clarify.

02.04.13-7

Provide a copy of reference 2.4S.13-7.

02.04.13-8

While the applicant describes the importance of including chain decay progeny calculations in the dosimetric calculations, not all progeny results are presented. Describe and present the progeny results. Include for example, Mo-99 → Tc-99, Tc-99m → Tc-99, and Te-129m → I-129.

02.04.13-9

Reconcile the following statements in the FSAR Section 2.4S.13.2: (a) "Because there are no outdoor tanks in the LWMS that could release radioactive effluent, no accident scenario could result in the release of effluent directly to the surface water" and (b) "A flood, such as that caused by an MCR dike breach, could flood the Radwaste Building and potentially release radioactive materials into the environment. A flood of this magnitude would disperse and dilute the radionuclide concentration of a surface water spill."

02.04.13-10

Describe the mechanisms of and effects from floods other than that caused by the postulated breach of the MCR embankment on the Radwaste Building. Postulate the most severe accidental release of radionuclide liquid effluents to the surface water, and provide a conservative analysis of the contamination process for the postulated scenario.