Nuclear Operating Company
South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

February 25, 2010
U7-C-STP-NRC-100051

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

South Texas Project
Units 3 and 4
Docket Nos. 52-012 and 52-013
Response to Requests for Additional Information

Attached are responses to NRC staff questions included in Request for Additional Information (RAI) letter number 316 related to Combined License Application (COLA) Part 2, Tier 2, Sections 12.2, 12.3, and 12.4. This submittal completes the response to letter 316.

Attachments 1 and 2 contain responses to the RAI questions listed below:

12.02-17

12.03-12.04-15

When a change to the COLA is indicated, the change will be incorporated into the next routine revision of the COLA following NRC acceptance of the RAI response.

There are no commitments in this letter.

If you have any questions regarding these responses, please contact me at (361) 972-7136 or Bill Mookhoek at (361) 972-7274.

D091
NRO

STI 32620677

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 2/25/10

Scott Head
Manager, Regulatory Affairs
South Texas Project Units 3 & 4

scs

Attachments:

1. Question 12.02-17
2. Question 12.03-12.04-15

cc: w/o attachment except*
(paper copy)

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RAI 12.02-17:

QUESTION:

For compliance with the provisions of EPA's environmental radiation standards in 40 CFR 190, as specified in 10 CFR 20.1301(e):

The Total Body Dose listed under Units 3 and 4 (ABWR) for Liquid Pathway Doses in Table 12.2-30 should be two times the calculated value for one unit of 2.63E-4 mrem, to represent the dose from both uranium fuel cycle operations cited in the table. The dose from Table 12.2-29 lists 2.63E-4 mrem as the Total Body Dose from one unit, or one uranium fuel cycle operation. The staff requests that the applicant revise this table accordingly.

The Thyroid Dose listed under Units 3 and 4 (ABWR) for Liquid Pathway Doses should be two times the calculated value for one unit of 2.03E-4 mrem to represent the dose from both uranium fuel cycle operations cited in the table. The dose from Table 12.02-7-2 lists 2.03E-4 mrem as the Maximum Exposed Individual (MEI) thyroid dose for one unit, or one uranium fuel cycle operation. The staff requests that the applicant revise this table accordingly.

RESPONSE:

40 CFR 190.10(a) describes the Standards for Normal Operations: "The annual dose equivalent does not exceed 25 millirems to the whole body, 75 millirems to the thyroid, and 25 millirems to any other organ of any member of the public as the result of exposures to planned discharges of radioactive materials, radon and its daughters excepted, to the general environment from uranium fuel cycle operations and to radiation from these operations."

RAI 12.02-7 Table 12.2-30 compares the doses to the maximally exposed individual member of the public (MEI) from all existing and proposed power generating units at the STP site to the 40 CFR 190 limits given above. This MEI is, as noted in footnotes 2 through 4 of RAI 12.02-7 Table 12.2-30, a child; the doses in that table reflect the age group of the MEI.

The maximum liquid pathway total body dose of 2.63E-4 per ABWR unit, as noted in RAI 12.02-7 Tables 12.02-7-2 and 12.2-29, is to a teenager. The liquid pathway total body dose only represents a small portion of the all pathway total dose for the ABWR units, with the gaseous pathway total body dose being much greater than the liquid pathway total body dose. The difference between the gaseous pathway total body dose to the child and the teenage member of the public is much greater than the difference between the liquid pathway total body dose to the child and teenage member of the public. Therefore, the gaseous pathway MEI, a child, has a greater all pathway total body dose than the liquid pathway MEI, a teenager. The total body liquid pathway dose from the proposed ABWR units in RAI 12.02-7 Table 12.2-30 reflects the age group of the MEI with the greatest total body all pathway dose, a child, and not the total body liquid pathway dose from the MEI with the greatest total body liquid pathway dose. The all pathway total body dose for each receptor is calculated in the illustration below.

The all pathway total body dose to the maximally exposed teenage member of the public from the ABWR units (units 3 & 4) would be 5.0 (direct radiation) + 0.00053 (twice the teenager liquid pathway total body dose per unit from RAI 12.02-7 Table 12.02-7-2) + 0.53 (twice the teenager gaseous pathway total body dose per unit from RAI 12.02-7 Table 12.02-7-1) = 5.53 mrem/yr. RAI 12.02-7 Table 12.2-30 lists the all pathways total body dose to the maximally exposed child member of the public as 5.70 mrem/yr. The contribution from existing Units 1 & 2 to either of these age-group doses would remain 0.01 (to the third significant figure of the total site dose), as given in RAI 12.02-7 Table 12.2-30. RAI 12.02-7 Table 12.2-30 remains valid.

Candidate COLA Revision:

No change to the COLA is required as a result of this response.

RAI 12.03-12.04-15

QUESTION:

In FSAR Section 12.3.7.3, the following information is provided to address COL License Information Item 12.8:

> "The information demonstrating that the plant meets the criticality accident monitoring requirements of 10CFR70.24 will be provided as an amendment to the FSAR in accordance with 10 CFR 50.71(e), or an exemption from this 10 CFR 70.24 requirement will be requested, at least six months prior to fuel load (COM 12.3-1)."

A similar statement is included in COM 12.3-1 contained in the Commitments (Attachment 3) of the STP Combined License Application (letter ABR-AE-07000004).

It is the staff position that before a Part 52 COL license can be issued, the applicant must either provide the information demonstrating that the plant meets the criticality accident monitoring requirements of 10CFR70.24, or have an approved exemption from the 10 CFR 70.24 requirements.

Accordingly, the staff requests that the applicant provide the following additional information concerning Criticality Accident Monitoring for STP 3&4:

1. Provide the information demonstrating that each unit meets the criticality accident monitoring requirements of 10CFR70.24; or, have an approved exemption from the requirements of 10 CFR 70.24.

2. Provide a markup of the proposed FSAR revision in the response accordingly.

RESPONSE:

COL License Information item 12.8, addressed in COLA Section 12.3.7.3, requires information be provided demonstrating the plant meets the criticality accident monitoring requirements of 10 CFR 70.24 or that an exemption from the requirement be requested.

10 CFR 70.24(d)(1) provides that the holder of a combined license issued under part 52 does not need to meet 70.24(a),(b),(c) if the holder complies with the requirements of paragraph (b) of 10 CFR 50.68.

10 CFR 50.68, Criticality Accident Requirements, paragraph (a) states:

> "Each holder of a construction permit or operating license for a nuclear power reactor issued under this part or a combined license for a nuclear power reactor issued under part 52 of this chapter, shall comply with either 10 CFR 70.24 of this chapter or the requirements in paragraph (b) of this section."

Paragraph (b) provides license requirements for compliance in lieu of maintaining a monitoring system capable of detecting a criticality as described in 10 CFR 70.24. STPNOC will comply with Paragraph (b) requirements, summarized as follows:

1. STP 3 & 4 plant procedures for handling and storage of fuel assemblies will prohibit the handling and storage at any one time of more fuel assemblies than have determined to be safely subcritical under the most adverse moderation conditions feasible by unborated water.

2. Compliance with the criticality analysis requirements of 10 CFR 50.68(b) for fresh fuel is demonstrated in COLA Section 9.1.6.1, which provides COL License Information item 9.1.

3. If the maximum fresh fuel assembly reactivity in the loaded fresh fuel storage racks occurs and the racks are filled with optimum moderation, low-density hydrogenous fluid, K_{eff} will still maintain ≤ 0.98, at a 95% probability, and 95% confidence level.

4. Compliance with the criticality analysis requirements of 10 CFR 50.68(b) for spent fuel is demonstrated in COLA Section 9.1.6.3, which provides COL License Information item 9.3.

5. If any quantity of SNM, other than nuclear fuel, is stored onsite at STP 3 & 4, it will be less than the quantity necessary for a critical mass.

6. ABWR DCD Subsection 12.3.4.3 discusses the design parameters and requirements for two high-range detector channels for monitoring radiation from accidental fuel handling that is near the fuel pool and the fuel handling area. These radiation monitors are provided to detect excessive radiation levels and to initiate appropriate safety actions.

7. The maximum nominal U-235 enrichment of the fresh fuel assemblies will be limited to five percent by weight as shown in ABWR DCD figure 4.3-1.

8. The STP 3 & 4 COLA FSAR will be amended in the next revision as identified in the markup to Subsection 12.3.7.3, included with this RAI response, indicating compliance with 10 CFR 50.68(b).

In summary, for STP 3&4, STPNOC will comply with the provisions of 10 CFR 50.68(b), which according to the regulations as noted above is an acceptable alternative to the provisions of 10 CFR 70.24.

STP 3 & 4 FSAR Subsection 12.3.7.3 will be revised as follows. Gray shading shows the changes. STPNOC will revise COM 12.3-1 accordingly.

12.3.7.3 Requirements of 10CFR70.24

The following site specific supplement addresses COL License Information Item 12.8.

The information demonstrating that the plant meets the criticality accident monitoring requirements of 10CFR70.24 will be provided ~~as an amendment to the FSAR in accordance with 10 CFR 50.71(e), or an exemption from this 10 CFR 70.24 requirement will be requested, at least six months prior to fuel load~~ by meeting the requirements of 10 CFR 50.68(b), as provided for in 10 CFR 70.24(d)(1). (COM 12.3-1).