



South Texas Project Electric Generating Station 4000 Avenue F – Suite A Bay City, Texas 77414

November 23, 2009
U7-C-STP-NRC-090212

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 Request for Additional Information

Reference: Letter, Mark McBurnett to NRC, “Proposed Revision to Environmental Report”, dated November 11, 2009 (U7-C-STP-NRC-090201).

STP Nuclear Operating Company (STPNOC) previously submitted proposed changes to COLA Part 3, Environmental Report which included supplemental information in Section 5.4, among others. In the proposed supplemental information we identified a detection limit for Cobalt 60 in sediment as a typical sensitivity. We have revised the section to reflect the threshold as it is described in the Units 1 & 2 Offsite Dose Calculation Manual (ODCM). The revised text to Section 5.4 is shown in the attachment to this letter which replaces the text previously submitted the reference letter. The changes are indicated by revision bars in the attachment.

There are no commitments in this letter

If you have any questions, please feel free to contact me at (361) 972-7136, or Russell W. Kiesling at (361)-972-4716.

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

DO91
NRW

STI: 32580496

Executed on 11/23/09



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

sad

Attachment: COLA Part 3 Section 5.4 Supplemental Text

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

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COLA REVISION

STPNOC makes the following revisions to the Environmental Report, which will be incorporated into the next routine update of the COLA.

ER Section 5.4.1

STPNOC modifies ER Section 5.4.1 as follows:

5.4.1 Exposure Pathways

Radioactive liquids and gases would be discharged to the environment during normal operation of STP 3 & 4. The released quantities have been estimated in Tables 3.5-1 (liquids) and 3.5-2 (gases). The impact of these releases and any direct radiation to individuals, population groups, and biota in the vicinity of the new units was evaluated by considering the most important pathways from the release to the receptors of interest. The major pathways are those that could yield the highest radiological doses for a given receptor. The relative importance of a pathway is based on the type and amount of radioactivity released, the environmental transport mechanism, and the consumption or usage factors of the receptor.

The exposure pathways considered and the analytical methods used to estimate doses to the maximally exposed individual (MEI) and to the population surrounding the new units are based on NRC Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR 50," Appendix I (Rev.1, October 1977) (Reference 5.4-1) and NRC Regulatory Guide (RG) 1.111, "Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water-Cooled Reactors," (Revision 1, July 1977) (Reference 5.4-2). An MEI is a member of the public located to receive the maximum possible calculated dose. The annual dose to each nearby receptor indicated in Section 2.7, corresponding to those in Table B4-6 (Reference 5.4-14) from the estimated new unit releases was calculated, and the maximum of those was denoted the MEI. The use of the MEI allows comparisons with established dose criteria to the public.

As discussed in Section 3.5.2, the Liquid Waste Management System (LWMS) is designed to segregate, collect, store, and process potentially radioactive liquids generated during various modes of plant operation: startup, normal operation, hot standby, shutdown, and refueling. This system is designed such that it may be operated to maximize the recycling of water within the plant, which would minimize the releases of liquid to the environment. The equipment utilized by the

STP 3 & 4 LWMS is a more extensive and more efficient version of the LWMS that is presently utilized in STP 1 & 2. FSAR Table 12.2-22 provides the concentrations of radionuclides that would be discharged to the MCR annually as a result of the operation of STP 3 & 4.

Because STP 3 & 4 would discharge to the MCR currently being used by STP 1 & 2, the radioactive liquid discharges from STP 1 & 2 must also be considered in determining the total radionuclides in the MCR. Radioactivity discharged in liquid effluents from STP 1 & 2 has decreased since 1992 due to the installation of additional filter-demineralizers to augment the installed liquid waste processing system demineralizers. Other than tritium, which is addressed in Section 5.2.3, the majority of radioactivity released in liquid effluents is comprised of fission and activation products. The primary long lived nuclide released from STP 1 & 2 has consistently been Co-60 with a 5.27 year half life.

Co-60 had been measured previously in the MCR sediment. During the recent five year period from 2003 to 2007, only 14 out of 29 sediment samples collected contained detectable Co-60. The recent five year average concentration for positive samples has declined to 72 pCi/kg. For comparison, the most restrictive NRC detection sensitivity for radioactive material in sediment is 150 pCi/kg. Improvements in operating practices and liquid waste processing over many years of operation coupled with radioactive decay have resulted in no detectable Co-60 in the six MCR sediment samples taken in 2007 (Reference 5.4-15).

Earlier monitoring attempts to measure Co-58 and Co-60 in the MCR water and bottom sediments has shown that cobalt behaves as a particle and precipitates out of the water column and concentrates in the sediments at the bottom of the reservoir. Hence, cobalt has never been detected in MCR water. The only radionuclide currently detected in the MCR water fraction is tritium.

Cs-137 is the most common nuclide detected in the MCR environment. Cs-137 exists in both the on site and off site environment due to nuclear weapons testing. Cs-137 is routinely found in soil, sediment, and some biological samples taken both on and off site at concentrations similar to or larger than those measured in MCR samples. This limits Cs-137 measurement as a tool for evaluating the impact of plant releases on the MCR environment. As a consequence, Co-60 has been monitored as a generalized indicator of radionuclide behavior in the MCR for over twenty years. In 2007, Cs-137 was measured in one MCR bottom sediment sample. However, Cs-137 was present in the environment before the operation of STP 1 & 2 and the sample concentrations were approximately equal to pre-operational values. The Cs-137 measured in the MCR does not suggest an increase due to plant operation (Reference 5.4-15).

Of the STP 1 & 2 effluents measured in the MCR only tritium, Co-60, and Cs-137 have been routinely detected. Other than tritium, the highest concentrations have consistently been measured in sediment. Of the nuclides that concentrate in the sediment, only Co-60 appears to be plant related. As mentioned previously, the Cs-137 measurements fall within the range measured for world wide fallout from nuclear weapons testing in the early 1960's.

Radioactive decay and a reduction of radioactive effluents to the reservoir have resulted in no detection of nuclides in biological samples taken in the MCR after 1992. Since the anticipated combined annual release rates for Co-58 and Co-60 for STP 1, 2, 3, and 4 would be less than the STP 1 & 2 combined annual release rates shortly after 1992, these radionuclides are not anticipated to be measurable in biological samples during future four unit operation.

STP 3 & 4 would contribute small amounts of fission and activation products to the MCR as shown in FSAR Table 12.2-22. After tritium, Co-60 is the largest single activity released annually by STP 1 & 2 and that may be released by STP 3 & 4. The maximum anticipated Co-60 release rate due to STP 3 & 4 operation based on a conservative calculation of source terms and removal efficiencies is 0.031 Ci per year. The STP 1 & 2 Co-60 discharges from 2003 to 2007 averaged about 0.013 Ci per year. If no further reductions are made in the STP 1 & 2 release rates, a total of 0.044 Ci could be added to the reservoir each year with all four plants operating. The equilibrium concentration of a radionuclide in bottom sediment can be estimated assuming the reservoir has approximately 7000 acres of exposed bottom surface and that all radioactive material released to the reservoir mixes in the top six inches of bottom sediment. The corresponding equilibrium concentration for Co-60 in the reservoir sediment would be less than the required detection capability of the radiological environmental monitoring program (Reference 5.4-16). Although the NRC requires no specific detection capability for Co-60 in sediment, the required sensitivity for Cs-134 and Cs-137 effectively sets the Co-60 detection sensitivity at a comparable concentration.

Other radioactive material to be released by STP 3 & 4, when combined with the current STP 1 & 2 releases, is anticipated to be undetectable in the sediment. This conclusion is supported by experience in the latter half of the 1990s when the releases from STP 1 & 2 were larger than those anticipated from the future releases from all four units. There is no evidence of accumulation above environmental detection levels for any nuclide during that period. Hence, even with four plants operating, the average equilibrium concentrations of radioactive materials in the reservoir sediments are anticipated to remain less than detectable. Additionally, no exposure pathway currently exists from reservoir sediment to people; i.e., the radioactive particles in the sediment are not soluble and therefore would not be carried into the groundwater. Even if people were directly exposed to the MCR sediment, no dose or health effect could be

measured with radioactive material below environmental detection levels. Therefore, the impacts of radionuclides in the sediment would be SMALL.

Of the nuclides discharged besides tritium, Co-60 represents the most activity for a single nuclide and should continue to be the predominant nuclide with STP 3 & 4 operation. Measurements have proven that cobalt added to the MCR does not remain in the water at concentrations exceeding the detection capability of the environmental monitoring program, typically about 2 pCi/liter as listed in Table 3 of the 2007 Annual Environmental Operating Report for surface water (Reference 5.4-15). The average diluted concentration during discharge to the MCR of Co-60 or other radionuclides is less than the 10 CFR 20 limits and would be diluted further by discharge into an off site body of water like the Colorado River. Consequently, any discharges of Co-60 or any other radionuclides from the MCR to the groundwater or surface water would not exceed 10 CFR 20 regulatory limits and therefore, radiological impacts to the groundwater and offsite surface water bodies, such as Little Robbins Slough, the Colorado River, and their associated tributaries would be SMALL.

Annual radiological monitoring of water and sediment in the MCR would continue. Section 6.2 describes the Radiological Environmental Monitoring Program and how it would be sufficient to monitor the radionuclides discharged to the MCR and subsequently to the groundwater and surface water as a result of the operation of all four units.

Based on the low concentrations of radionuclides detected in the historical monitoring of the water and sediment in the MCR, the expected minimal radionuclide contributions discharged to the MCR as a result of the addition of STP 3 & 4, and the fact that the radionuclide concentrations in the water of the MCR would be less than the limits in 10 CFR 20, impacts to the water and sediments in the MCR, and from discharges from the MCR to groundwater and surface water, would be SMALL.

ER Section 5.4.6

STPNOC adds the following references:

- 5.4-15 "2007 Annual Environmental Operating Report," South Texas Project Electric Generating Station, April 30, 2008.
- 5.4-16 Offsite Dose Calculation Manual (ODCM), Revision 13, South Texas Project, January 1, 2006