



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

September 22, 2011  
NOC-AE-11002735  
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U. S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
One White Flint North  
11555 Rockville Pike  
Rockville, MD 20852-2746

South Texas Project  
Units 1 and 2  
Docket Nos. STN 50-498, STN 50-499  
Response to Requests for Additional Information for the  
South Texas Project License Renewal Application (TAC Nos. ME4938 and ME5122)

- References: 1. STPNOC Letter dated October 25, 2010, from G. T. Powell to NRC Document Control Desk, "License Renewal Application" (NOC-AE-10002607) (ML103010257)  
2. NRC letter dated September 1, 2011, "Requests for Additional Information for the Review of the South Texas Project, License Renewal Application" (ML112360114)

By Reference 1, STP Nuclear Operating Company (STPNOC) submitted a License Renewal Application (LRA) for South Texas Project (STP) Units 1 and 2. By Reference 2, the NRC staff requests additional information for review of the STP LRA. STPNOC's response to the request for additional information is provided in the Enclosure to this letter.

There are no regulatory commitments in this letter.

Should you have any questions regarding this letter, please contact either Arden Aldridge, STP License Renewal Project Lead, at (361) 972-8243 or Ken Taplett, STP License Renewal Project regulatory point-of-contact, at (361) 972-8416.

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

Executed on September 22, 2011  
Date

G. T. Powell  
Vice President,  
Technical Support & Oversight

KJT

Enclosure: STPNOC Response to Requests for Additional Information

A147  
NRR

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STPNOC Response to Requests for Additional Information

SOUTH TEXAS PROJECT LICENSE RENEWAL APPLICATION  
REQUESTS FOR ADDITIONAL INFORMATION  
REGARDING THE ANALYSIS OF SEVERE  
ACCIDENT MITIGATION ALTERNATIVES

The requests for information (RAIs) listed below were derived from the discussion during the conference call of July 28, 2011 (ML11216A263). The purpose for the call was to seek additional clarification for the RAI responses of July 5, 2011 (ML11193A016).

**NRC RAI 3.b: Fire-analysis individual plant examination (IPE) - use of technical report NUREG/CR-6850**

Background: The response to this RAI simply indicates that a review of the NUREG/CR-6850 will be performed in the future. However, the recent research and guidance reported in NUREG/CR-6850, specifically in the areas of hot short probabilities, fire ignition frequencies, and non-suppression probabilities, indicate that the fire analysis methodologies utilized for the IPE may underestimate fire risk.

Requested information: Provide assurance that consideration of this new information is not expected to impact the selection of cost beneficial severe accident mitigation alternatives (SAMAs) for South Texas Project (STP).

STPNOC Response:

STPNOC will perform an assessment using the new information provided in NUREG/CR-6850, "EPRI/NRC-RES Fire PRA Methodology for Nuclear Power Facilities," for assessing impact on the selection of cost beneficial severe accident mitigation alternatives (SAMAs) for the South Texas Project (STP). The assessment will consider insights provided in NUREG/CR-6850 regarding hot short probabilities, fire ignition frequencies, and non-suppression probabilities. The STP Fire Probabilistic Risk Analysis (PRA) model will not be revised as a result of this study.

The insights from NUREG/CR-6850 will be applied to the fire analyses from the IPE and as augmented through the STP\_REV 6 version of the PRA model. The insights from NUREG/CR-6850 will be applied to the fire scenarios currently in the PRA model. The resultant core damage frequency (CDF) from the assessment will be used to screen the list of SAMAs currently considered in the LRA to re-evaluate if any SAMA would be cost-beneficial.

STPNOC expects to complete the assessment and report the results to the NRC by December 15, 2011.

**NRC RAI 3.c: Seismic-analysis IPE of external events (IPEEE) - use of Lawrence Livermore National Laboratory (LLNL) or United States Geological Survey (USGS) hazard curves**

Background: The response to this RAI did not provide the requested updated seismic core damage frequency (CDF) results. Instead, the applicant cited Notice IN 2010-18. While this Information Notice concluded that the US plants had adequate safety margin, it did indicate that the seismic CDF for STP could be as high as  $3E-06$  per year (for spectral accelerations of 5 hz and 10 hz). This is 40 times the total seismic CDF given in the environmental report (ER). Also, note that the STP IPE gives a seismic CDF using the LLNL hazard curve of  $1.7E-05$  per year which is over 200 times the value used in the probabilistic risk assessment (PRA). Since the seismic CDF was determined using point estimates, the seismic CDF for the analysis STP\_REV6, based on the LLNL hazard curve, can be obtained from the LLNL seismic frequencies from Table 3.4.4-9 of the IPE or IPEEE or both and the conditional core damage probabilities (CCDPs) from Table F.2-1 of the ER. The result is a seismic core damage frequency (SCDF) of  $8.7E-06$  per year.

Comparing the USGS hazard curves for the STP site with the Electric Power Research Institute (EPRI) hazard curves indicates that the frequency for the USGS curves is 60 to 150 times those for the EPRI curves over the range of 0.4 to 0.6 g which is the range for the largest contributors to STP seismic CDF. Furthermore, the USGS hazard curve is higher than the LLNL hazard curve by a factor of 1.5 to 2 over the same range.

Using the above method for determining the CDF for SEIS3 and SEIS4 initiators for the seismic event scenarios gives seismic CDFs of  $4E-06$  and  $5E-06$  per year, respectively.

This indicates that applying the LLNL hazard curves or the 2008 USGS hazard curves to the SEIS3 and SEIS4 initiators could lead to CDF contributions of about 60 to 150% of the STP\_REV6 total CDF.

Requested information: Provide an assessment of the seismic CDF contribution due to the updated USGS hazard curves and the potential for cost beneficial SAMAs.

STPNOC Response:

STPNOC will perform an assessment of the seismic CDF contribution due to the updated USGS hazard curves for impact on the selection of cost beneficial SAMAs for STP. The STP PRA model will not be revised as a result of this assessment.

The acceleration values from the USGS hazard curves will be applied to the current STP PRA model and will examine the impact on those key components previously identified in the current STP PRA model. Because the fragilities for many of these key components were conservative, revised fragilities may be assumed, if necessary and where justified, to determine the resultant CDF. The resultant CDF from the assessment will be used to screen the list of SAMAs currently considered in the LRA to re-evaluate if any SAMA would be cost-beneficial.

STPNOC expects to complete the assessment and report the results to the NRC by December 15, 2011.