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

February 16, 2012
NOC-AE-12002795
10CFR54
STI: 33302799
File: G25

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
Clarification to Supplemental Response to Request for Additional Information for the
South Texas Project License Renewal Application – SAMA (TAC No. 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. STPNOC Letter dated January 19, 2012 from D. W. Rencurrel to NRC Document Control Desk, "Supplemental Response to Requests for Additional Information for the South Texas Project License Renewal Application - SAMA (TAC Nos. ME4938 and ME5122)" (NOC-AE-11002773) (ML12030A081)
3. Summary of Telephone Conference Call Held on January 31, 2012, Between the U.S. Nuclear Regulatory Commission and STP Nuclear Operating Company, Concerning Requests for Additional Information Pertaining to the South Texas Project License Renewal Application (ML12033A134)

By Reference 1, STP Nuclear Operating Company (STPNOC) submitted the License Renewal Application (LRA) for South Texas Project (STP) Units 1 and 2. By Reference 2, STPNOC provided supplemental information to a response to NRC requests for additional information regarding severe accident mitigation alternatives (SAMA). This letter provides clarification to the information provided in Reference 2 as agreed to by STPNOC during a teleconference (Reference 3) with the Nuclear Regulatory Commission on January 31, 2012.

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.

A147
NRR

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

Executed on 2/16/2012.
Date

D. W. Rencurrel
Senior Vice President,
Technical Support & Oversight

KJT

Enclosure: Clarification to STPNOC Response to Requests for Additional Information

cc:
(paper copy)

Regional Administrator, Region IV
U. S. Nuclear Regulatory Commission
1600 East Lamar Boulevard
Arlington, Texas 76011-4511

Balwant K. Singal
Senior Project Manager
U.S. Nuclear Regulatory Commission
One White Flint North (MS 8B1)
11555 Rockville Pike
Rockville, MD 20852

Senior Resident Inspector
U. S. Nuclear Regulatory Commission
P. O. Box 289, Mail Code: MN116
Wadsworth, TX 77483

C. M. Canady
City of Austin
Electric Utility Department
721 Barton Springs Road
Austin, TX 78704

John W. Daily
License Renewal Project Manager (Safety)
U.S. Nuclear Regulatory Commission
One White Flint North (MS O11-F1)
Washington, DC 20555-0001

Tam Tran
License Renewal Project Manager
(Environmental)
U. S. Nuclear Regulatory Commission
One White Flint North (MS O11F01)
Washington, DC 20555-0001

(electronic copy)

A. H. Gutterman, Esquire
Kathryn M. Sutton, Esquire
Morgan, Lewis & Bockius, LLP

John Ragan
Chris O'Hara
Jim von Suskil
NRG South Texas LP

Kevin Pollo
Richard Pena
City Public Service

Peter Nemeth
Crain Caton & James, P.C.

C. Mele
City of Austin

Richard A. Ratliff
Alice Rogers
Texas Department of State Health Services

Balwant K. Singal
John W. Daily
Tam Tran
U. S. Nuclear Regulatory Commission

SOUTH TEXAS PROJECT
LICENSE RENEWAL APPLICATION

CLARIFICATION TO STPNOC RESPONSE TO
REQUESTS FOR ADDITIONAL INFORMATION

Reference: STPNOC Letter dated January 19, 2012 from D. W. Rencurrel to NRC Document Control Desk, "Supplemental Response to Requests for Additional Information for the South Texas Project License Renewal Application - SAMA (TAC Nos. ME4938 and ME5122)" (NOC-AE-11002773) (ML12030A081)

As the result of a teleconference between the Nuclear Regulatory Commission and STP Nuclear Operating Company (STPNOC) on January 31, 2012 regarding the referenced letter, STPNOC provides the following clarifying information.

Clarification 1

NRC Request:

Background information:

The staff's assessment of SAMA 4 scenario listed in the January 12, 2012, response (ML12030A081), is that it is potentially cost-beneficial if the staff takes into account the applicant's August 23, 2011, response (ML11250A067), to the original May 31, 2011, RAI 2.e (ML11140A015), regarding non-conservative source terms (the applicant did not address this in the revised analysis of identified SAMAs in the January 19, 2012, RAI response (ML12030A081)). RAI 2.e is listed below:

RAI 2.e:

ER Section F.3.6 describes the selection of the representative accident sequence/source terms for the major release categories. The one example discussed was that an accident sequence with a moderate frequency and severe release characteristics would be selected over an accident sequence with a relatively high frequency and a minor radionuclide release. From the information provided, none of the selected representative sequences (for those categories where multiple source term results are provided) follow this conservative example. For major Release Categories II and III, the selected sequences are not those with the most severe release characteristics. While the information provided in ER Table F.3-8 indicates that the representative sequences are appropriate for the base case, this is not necessarily true for a SAMA case where the Level 2 end-state distribution would be different from the base case. For example, if a SAMA primarily impacted sequences which have low reactor pressure vessel (RPV) failure pressure then the frequency of end-states R07SU and R11 U would be reduced. Since these end-states have higher release fractions (and most likely, higher dose-risk and offsite economic cost risk per event) than the representative sequence chosen, the benefit could be larger than that assessed using the representative release fractions.

If the source term chosen for a release category is not the most severe of the significantly contributing end-states, the benefit could be underestimated for any SAMA which primarily impacts an end-state with a higher release fraction. For example, SAMA 4 impacts only the end-state VSEQ (interfacing system loss of coolant accident (LOCA)) portion of Release Category I. It is not clear that end-state VSEQ has a less severe release than the ISGTR end-state, which was chosen as representative for Release Category I. Release fractions for Inter-System LOCA (ISLOCA) are usually greater than that given for ISGTR. The STP IPE (Table 4.8.3-4) gives interfacing system Cs and I release fractions from 0.15 to 0.4 depending on the methodology. Similarly for SAMA 10, which impacts steam generator tube rupture (SGTR) sequences, the removal of these sequences from Release Category III will have a more significant impact since the release fractions for SGTR are three orders of magnitude greater than those for the representative sequence. Provide further support for the selection of the representative sequences and their adequacy for the SAMA analysis.

Clarification needed:

The staff requested the applicant to provide further justification for why it is not cost-beneficial based on further review and breakdown of its benefit analysis.

STPNOC Response:

The Severe Accident Mitigation Alternative (SAMA) 4 averted cost-risk estimates for the fire update (Table 19 of Attachment 1 to the Enclosure of the referenced letter), for the seismic update (Table 6 of Attachment 2 to the Enclosure of the referenced letter), and for the "integrated" update (Table 12 of Attachment 2 to the Enclosure of the referenced letter) are inconsistent.

Specifically, the averted cost-risk for SAMA 4 is approximately the same when the updated fire and seismic results are considered separately (approximately $71,000 using the 95th percentile Probabilistic Risk Assessment (PRA) results). However, when the fire and seismic updates are considered simultaneously (in the "integrated" model), the averted cost-risk is estimated to be approximately $83,000. While this is a relatively small change compared to the South Texas Project (STP) maximum averted cost-risk (MACR), SAMA 4 could be classified as cost-beneficial if this larger averted cost-risk is used as the starting point to scale up the results to account for the conservative source terms used in the sensitivity analysis for the response to SAMA RAI 2e (Reference: STPNOC letter dated July 5, 2011, NOC-AE-11002687, ML11193A016).

The calculation results were reviewed to identify and evaluate the source of the differences in the SAMA 4 averted cost-risk estimates. The results of the review indicate that the differences are due to the rounding of the core damage frequency (CDF) and Level 2 release category frequencies. If the PRA results for the "integrated" model are used without rounding, the averted cost-risk for SAMA 4 is consistent with the other cases (i.e. $71,226 when the nominal source terms and the 95th percentile multiplier are applied).

When the rounding error is eliminated, the SAMA 4 averted cost-risk is reduced and would not be cost beneficial when the "conservative" source term is applied.

Clarification 2

NRC Request:

Background information:

Table 5 of the applicant's January 19, 2012, response (ML12030A081) indicates, for the essential cooling water (ECW) pumps with HCLPFs (high confidence of a low probability of failure) of 0.48g, the credible failure mode of the pumps is the seismic restraint bolts for the support of the pump casing. However, the applicant did not evaluate this plant modification as a SAMA candidate and it appears to the staff that a SAMA to replace the existing bolts with stronger bolts might be a much less expensive SAMA than the "seismic safe" system that the applicant evaluated as a cost beneficial alternative, which could prove to be a cost beneficial lower cost mitigation alternative.

Clarification needed:

The staff requests the applicant to provide a discussion of the potential for cost beneficial lower cost mitigation alternatives for this ECW pumps failure mode (e.g., replacing the ECW seismic restraint bolts).

Discussion:

During the conference call, the applicant confirmed understanding of the request and the action of providing additional clarification in February 2012, as LRA supplement. Hence, there is no need for a follow-up RAI.

STPNOC Response:

The split fraction importance review documented in Tables 8 and 9 of Attachment 2 to the Enclosure of the referenced letter) was limited to those contributors that correlate to averted cost-risk values of $100,000 or more. No contributors related to the Essential Cooling Water (ECW) system met this criterion. Therefore, no SAMAs were developed to address ECW failures.

While failure of the ECW pump casing seismic restraint bolts may be a credible failure mode for the pumps, these failures are not large contributors to risk. In order to demonstrate the limited impact of a SAMA to replace the ECW pump casing seismic restraint bolts, an averted cost-risk was estimated using PRA insights. The importance results for the "integrated" model described in the referenced letter were reviewed to identify the contribution from ECW pump seismic restraint bolt failures. The component identifier "ECWPUMP" represents seismically-induced ECW pump failures that include this failure mode. The following table summarizes the Level 1 and Level 2 Fussel-Vesely importance values for the ECWPUMP component. These values are based on contribution to total risk, which includes internal and external events risk from the "integrated" model, nominal source terms, and nominal PRA results.

ECWPUMP Importance Summary (based on total risk)	
Sequence Group	**ECWPUMP Fussell-Vesely Value**
CDF	2.0689E-2
Level 2	2.6085E-2

As described in the STP License Renewal Application Environmental Report (ER), the Level 2 sequence group is based on the combined results of release category Groups 1, 2, and 3. The ECWPUMP Fussell-Vesely values were used to estimate the reductions in CDF, Dose-Risk, and offsite economic cost-risk (OECR) that would result from eliminating the failures represented by ECWPUMP. The following table summarizes these results that are rounded off.

PRA Results Summary for ECW Pump Seismic Restraint Bolt Enhancement

	CDF	Dose-Risk	OECR
Base Value	1.06E-05	3.48	$2,988
SAMA Value	1.04E-05	3.39	$2,910
Percent Change	-2.1%	-2.6%	-2.6%

Using the methodology from Section F.4 of the ER, these results were used to calculate the cost-risk for the site assuming that the ECW pump seismic restraint bolts are made 100 percent reliable. The resulting value which accounts for both STP Units is $881,732. The total averted cost-risk is the difference between this resulting value and the MACR from the "integrated" model base case documented in the referenced letter.

Averted Cost Risk for ECW Pump Seismic Restraint Bolt Enhancement

Base Case Cost-Risk	SAMA Cost-Risk	Averted Cost-Risk
$902,000	$881,732	$20,268

If the 95th percentile PRA results are applied, the averted cost-risk is $54,276 based on the 2.7 multiplier. Because this value is below the minimum expected implementation cost of $100,000, replacing the ECW pump seismic restraint bolts is not considered to be a cost-beneficial plant enhancement.