

General Information or Other (PAR)

Event # 45343

Rep Org: SARGENT & LUNDY LLC	Notification Date / Time: 09/11/2009 16:00 (EDT)
Supplier: SARGENT & LUNDY LLC	Event Date / Time: 09/11/2009 (CDT)
	Last Modification: 09/11/2009
Region: 3	Docket #:
City: CHICAGO	Agreement State: Yes
County:	License #:
State: IL	
NRC Notified by: PAULA SCHOLL	Notifications: DAVID PROULX R4DO
HQ Ops Officer: PETE SNYDER	ALAN BLAMEY R2DO
Emergency Class: NON EMERGENCY	OMID TABATABAI NRO
10 CFR Section:	PART 21 GROUP NRR
21.21 UNSPECIFIED PARAGRAPH	

PROBLEM WITH SEISMIC SOIL STRUCTURE ANALYSIS SOFTWARE

"ACS SASSI (Sargent & Lundy Program No. 03.7.848-2.21) by Ghiocel Predictive Technologies Inc. (GPT) is a program which performs seismic soil- structure interaction (SSI) analysis. Sargent & Lundy (S&L) purchased licenses to use ACS SASSI NQA Version 2.2.1 from GPT in 2008 and verified and validated the software under S&L's QA program.

"S&L used ACS SASSI for seismic analysis activities for South Texas Project Units 3 & 4 (STP 3&4).

"On July 14, 2009, during SSI analysis of the Control Building performed to address the STP 3&4 Shear Wave Velocity Departure, irregularities were observed in the results obtained using ACS SASSI and the analysis was halted. The irregularities in turn led us to question the results for the Ultimate Heat Sink / Reactor Service Water Pump House (UHS/RSWPH) completed earlier.

"Our investigations, including a review of other uses of the software, indicate that numerical instability may occur with high numbers of soil layers, even when soil layer properties and number of soil layers (less than or equal to 100) are within the parameters stated in the User's Manual. Our investigations indicate that the results for the Control Building with 94 layers, the Reactor Building with 84 layers, and the UHS/RSWPH with 100 layers are not reliable. Some individual results are conservative, others are not.

"S&L recommended to the South Texas Project Nuclear Operating Company (STPNOC) that the work performed using ACS SASSI NQA Version 2.2.1 relied upon to support licensing positions and to support the design basis be reanalyzed using SASSI 2000, Version 3.0. STPNOC accepted this recommendation.

"S&L is no longer using ACS SASSI for production work. In addition, we have investigated whether SASSI 2000

JE19
NRR

General Information or Other (PAR) Event # 45343
has similar irregularities. We concluded that SASSI 2000 does not have this condition and is fundamentally sound."

Sargent & Lundy^{LLC}

PAULA L. SCHOLL
Senior Vice President
(312) 269-6645
paula.l.scholl@sargentlundy.com

September 11, 2009

10 CFR 21 Report
ACS SASSI Computer Program

Document Control Desk
United States Regulatory Commission
Washington, D. C. 20555-0001

Dear Sir:

This report is being made in accordance with 10 CFR 21.21(d)(1).

ACS SASSI (Sargent & Lundy Program No. 03.7.848-2.21) by Ghiocel Predictive Technologies Inc. (GPT Inc.) is a program which performs seismic soil-structure interaction (SSI) analysis. Sargent & Lundy (S&L) purchased licenses to use ACS SASSI NQA Version 2.2.1 from GPT Inc. in 2008 and verified and validated the software under S&L's QA program.

Sargent & Lundy used ACS SASSI for seismic analysis activities for South Texas Project Units 3&4 (STP 3&4).

On July 14, 2009, during SSI analysis of the Control Building performed to address the STP 3&4 Shear Wave Velocity Departure, irregularities were observed in the results obtained using ACS SASSI and the analysis was halted. The irregularities in turn led us to question the results for the Ultimate Heat Sink/Reactor Service Water Pump House (UHS/RSW Pump House) completed earlier.

Our investigations, including a review of other uses of the software, indicate that numerical instability may occur with high numbers of soil layers, even when soil layer properties and number of soil layers (≤ 100) are within the parameters stated in the User's Manual. Our investigations indicate that the results for the Control Building with 94 layers, the Reactor Building with 84 layers and the UHS/RSW Pump House with 100 layers are not reliable. Some individual results are conservative, others are not.

United States Regulatory Commission
ACS SASSI Computer Program

September 11, 2009
Page 2 of 3

Sargent & Lundy has used ACS SASSI only for STP 3&4. ACS SASSI was used in the applications shown in the following Table:

SSI Analysis	Program	Purpose	Status
1. Preliminary seismic analysis of the Reactor Building.	ACS SASSI	Study	This work was done as a study. It is not relied upon for any downstream analysis or design.
2. Benchmarking analyses in support of seismic models	ACS SASSI	Licensing Support	Reanalyze with SASSI 2000 (due September 30, 2009)
3. SSI analysis of the Control Building to address the STP 3&4 Shear Wave Velocity Departure	SASSI 2000	Licensing Support	Complete – ACS SASSI was not used after suspected error – results were based on SASSI 2000
4. SSI analysis of the Reactor Building to address the STP 3&4 Shear Wave Velocity Departure	ACS SASSI	Licensing Support	Reanalyze with SASSI 2000 (due September 30, 2009)
5. SSI analyses of the UHS/RSW Pump House	ACS SASSI	Design Basis & Licensing Support	Reanalyze with SASSI 2000 (due November 24, 2009)

Sargent & Lundy recommended to the South Texas Project Nuclear Operating Company (STPNOC) that work performed using ACS SASSI NQA Version 2.2.1 relied upon to support licensing positions and to support the design basis be reanalyzed using SASSI 2000, Version 3.0. STPNOC accepted this recommendation. The schedule for completion of the reanalysis is noted in the Table above.

We believe that this non-compliance is reportable under the provisions of 10CFR21. On March 16, 2009, S&L issued safety-related Calculation No. U7-UHS-C-CALC-6001 titled "Soil-Structure Interaction Analysis of the UHS-Pump House Buildings" for STP 3&4. This calculation utilized the ACS SASSI NQA Version 2.2.1. It provides the design basis seismic parameters used for overall stability evaluations, confirmation of member sizing, design of concrete reinforcement and generation of response spectra for the UHS/RSW Pump House. The SSI reanalysis (Item 5 above) will be used to revise calculations used for design of the UHS/RSW Pump House. These calculations are expected to be complete by December 31, 2009. Further, comparison of results using ACS SASSI and comparable software, i.e., SASSI 2000, indicate that the ACS SASSI results are not conservative in all cases. Therefore, the safety hazard that could be created using Calculation No. U7-UHS-C-CALC-6001 or ACS SASSI is the design of insufficient reinforcement.

Sargent & Lundy is no longer using ACS SASSI for production work. In addition, we have investigated whether SASSI 2000 has similar irregularities. We concluded that SASSI 2000 does not have this condition and is fundamentally sound.

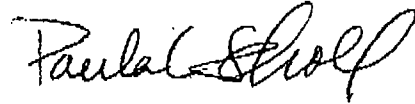
For your information, we have discussed this issue directly with Dr. Dan Ghiocel, President & Chief of Engineering, GPT Inc. They issued a software error notice letter on this issue dated September 10, 2009.

United States Regulatory Commission
ACS SASSI Computer Program

September 11, 2009
Page 3 of 3

If you have any questions or require further clarification on this issue, please feel free to contact me at the above listed number or our QA Director, Randall Kurtz, at (312) 269-6562.

Yours very truly,



Paula L. Scholl
Director of Engineering