October 27, 2009

Randall L. Kurtz
Vice President
Quality Assurance Director
Sargent & Lundy LLC
55 E. Monroe Street
Chicago, Illinois 60603-5780

SUBJECT: NRC INSPECTION REPORT 99900507/2009-201 AND NOTICE OF NONONFORMANCE TO SARGENT & LUNDY LLC

Dear Mr. Kurtz:

On September 14–17, 2009, U.S. Nuclear Regulatory Commission (NRC) inspectors conducted an inspection at the Sargent & Lundy (S&L) headquarters in Chicago, IL. The enclosed report presents the details of that inspection.

This was a limited scope inspection that focused on assessing your compliance with the provisions of Title 10, Part 21 of the *Code of Federal Regulations* (10 CFR Part 21), "Reporting of Defects and Noncompliance," and selected portions of Appendix B to 10 CFR Part 50 (Appendix B), "Quality Assurance Program Criteria for Nuclear Power Plants and Fuel Reprocessing Plants." Specifically, the inspection team reviewed certain portions of your quality assurance (QA) program implementation of safety-related activities such as design control processes for detailed engineering and design, nonconformance activities, corrective action, document control, training and qualification, internal audits, and external supplier audits. The inspection team's main focus was on S&L's engineering and procurement activities in support of Toshiba America Nuclear Energy (TANE) Corporation (prime contractor) and Fluor Power (Fluor) Corporation (constructor) for South Texas Project Nuclear Operating Company (STPNOC) Units 3 & 4. While the NRC did review the implementation of portions of your QA and Part 21 programs, this NRC inspection report does not constitute NRC endorsement of these programs.

Based on the results of this inspection, the NRC inspectors identified one nonconformance for failure to implement the S&L QA Program. Specifically, your verification and validation of the Advanced Computer Software – System for Analysis of Soil-Structure Interaction (ACS SASSI) software did not include the full range of S&L's intended applications. This nonconformance to Appendix B, Criterion III, "Design Control," is cited in the enclosed Notice of Nonconformance (NON) and the circumstances surrounding it are described in detail in the enclosed inspection report.

Please provide a written explanation or statement within 30 days of this letter in accordance with the instructions specified in the enclosed NON.

In accordance with 10 CFR 2.390, "Public Exemptions, Requests for Withholding," the agency will make a copy of this letter, its enclosures, and your response available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), accessible at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request that such material be withheld from public disclosure, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21, "Requirements for the Protection of Safeguards Information."

Sincerely,

/RA/

Richard Rasmussen, Chief
Quality and Vendor Branch 2
Division of Construction Inspection
& Operational Programs
Office of New Reactors

Docket No. 99900507

Enclosure:
1. Notice of Nonconformance
2. Inspection Report 99900507/2009-201

In accordance with 10 CFR 2.390, "Public Exemptions, Requests for Withholding," the agency will make a copy of this letter, its enclosures, and your response available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), accessible at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request that such material be withheld from public disclosure, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21, "Requirements for the Protection of Safeguards Information."

Sincerely,

/RA/

Richard Rasmussen, Chief
Quality and Vendor Branch 2
Division of Construction Inspection
& Operational Programs
Office of New Reactors

Docket No. 99900507

Enclosure:
1. Notice of Nonconformance
2. Inspection Report 99900507/2009-201

DISTRIBUTION:
Cqvb/rf randall.l.kurtz@sargentlundy.com RidsNroDcipCqvb GTracy
JTappert KKavanagh

ADAMS Accession No.: **ML092990573**

OFFICE	NRO/DCIP/CQVB	NRO/DCIP/CQVB	NRO/DCIP/CQVB
NAME	ASakadales	AKeim	ARivera-Varona
DATE	10/26/2009	10/26/2009	10/27/2009 *(via email)*
OFFICE	NRO/DCIP/CQVB	NRO/DCIP/CQVB	NRO/DCIP/CQVB: BC
NAME	Glipscomb *(via email)*	RMcIntyre *(via email)*	RRasmussen
DATE	10/27/2009	10/23/2009	10/27/2009

OFFICIAL RECORD COPY

NOTICE OF NONCONFORMANCE

Sargent & Lundy LLC
55 E. Monroe Street
Chicago, Illinois 60603-5780

Docket Number 99900507
Inspection Report Number 2009-201

Based on the results of a Nuclear Regulatory Commission (NRC) inspection conducted September 14 - 17, 2009, of activities performed at Sargent & Lundy LLC (S&L) headquarters in Chicago, IL, certain activities were not conducted in accordance with NRC requirements that were contractually imposed upon S&L by NRC Combined Operating License (COL) license applicants.

Criterion III, "Design Control," of Appendix B to 10 CFR Part 50 states, in part, that "measures shall also be established for the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety related functions of the structures, systems and components." Additionally, Criterion III states in part that, "the design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program."

Section 02.00, "Quality Assurance Program," of the S&L Nuclear Quality Assurance Program Topical Report SL-TR-1A (QATR), Subsection 02.05 states that "the development and use of computer programs for quality-related activities are controlled by the Nuclear Quality Assurance Program, including Supplements 3S1 and 11S-2, and Subpart 2.7 of ANSI/ASME NQA-1-1994. Supplements 3S1 and 11S-2 and Subpart 2.7 of ANSI/ASME NQA-1-1994 provide requirements for design control and computer software.

S&L "Acceptance Plan for Procurement of Computer Software ACS SASSI," Revision 0, dated June 16, 2008, states the following:

> The Advanced Computer Software – System for Analysis of Soil-Structure Interaction (ACS SASSI) software shall be validated and documented in accordance with procedure SOP-0204 and guideline GAG-0204-01 prior to use. The test problems used in Ghiocel Predictive (GP) Technologies, Inc., verification and validation (V&V) shall be reviewed against S&L's intended application of the software. If S&L intends to apply the software to conditions outside the range of GP Technologies test problems, the problems shall be modified and/or supplemented to encompass the range of S&L's intended applications.

Contrary to the above, as of September 17, 2009, S&L failed to modify and/or supplement GP Technologies test problems to include the full range of S&L applications for South Texas Project (STP) Units 3 & 4. Specifically, S&L identified that a 94-soil layer model was required to perform the Soil-Structure Interaction (SSI) analysis for the STP Units 3 & 4 control building. S&L performed V&V of the ACS SASSI program using no more than 20-soil layer models.

This has been identified as Nonconformance 99900507/2009-201-01.

Please provide a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001 with a copy to the Richard Rasmussen, Chief, Quality and Vendor Branch B, Division of Construction Inspection and

Operational Programs, Office of New Reactors, within 30 days of the date of the letter transmitting this Notice of Nonconformance (NON). This reply should be clearly marked as a "Reply to a Notice of Nonconformance" and should include for each noncompliance: (1) the reason for the noncompliance, or if contested, the basis for disputing the noncompliance; (2) the corrective steps that have been taken and the results achieved; (3) the corrective steps that will be taken to avoid non-compliances; and (4) the date when your corrective action will be completed. Where good cause is shown, consideration will be given to extending the response time.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html, to the extent possible, it should not include any personal privacy, proprietary, or Safeguards Information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If Safeguards Information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

Dated this 27th day of October 2009.

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NEW REACTORS
DIVISION OF CONSTRUCTION INSPECTION & OPERATIONAL PROGRAMS
VENDOR INSPECTION REPORT

Docket No.:	99900507
Report No.:	99900507/2009-201
Vendor:	Sargent & Lundy LLC 55 E. Monroe Street Chicago, Illinois 60603-5780
Vendor Contact:	Randall L. Kurtz Quality Assurance Director 312-269-6562
Nuclear Industry:	Sargent & Lundy LLC (S&L) provides consulting, engineering, design, and analysis for electric power generation and power delivery projects. Currently, S&L is involved with new nuclear plant Combined Operating License (COL) and Early Site Permit (ESP) preparation, as an Owners Engineer, and in various engineering, design, and procurement support activities S&L is performing nuclear island detailed engineering and design, including analysis and structural design of the reactor building, the control building, the radwaste building, and the ultimate heat sink for South Texas Project (STP) Units 3 & 4.
Inspection Dates:	September 14–17, 2009
Inspectors:	Richard P. McIntyre, NRO/DCIP/CQVB — Team Leader George Lipscomb, NRO/DCIP/CQVB Aida Rivera-Varona, NRO/DCIP/CQVB Andrea Keim, NRO/DCIP/CQVB
Approved by:	***/RA/*** Richard Rasmussen, Chief Quality & Vendor Branch 2 Division of Construction Inspection & Operational Programs Office of New Reactors

10/27/2009
Date

ENCLOSURE 2

EXECUTIVE SUMMARY

Sargent & Lundy LLC
99900507/2009-201

The purpose of this U.S. Nuclear Regulatory Commission (NRC) inspection was to verify that Sargent & Lundy LLC (S&L) implemented an adequate quality assurance (QA) program that complies with the requirements of Appendix B to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50 (Appendix B), "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants." The inspection was also to verify that S&L implemented a program for reporting defects and nonconformances consistent with the requirements of 10 CFR Part 21, "Reporting of Defects and Noncompliance." This was a limited scope inspection during which the NRC inspectors reviewed selected portions of S&L's QA program implementation of safety-related activities. The NRC inspection team's main focus was on S&L's engineering and procurement activities in support of Toshiba America Nuclear Energy (TANE) Corporation (prime contractor) and Fluor Power (Fluor) Corporation (constructor) for South Texas Project Nuclear Operating Company (STPNOC) STP Units 3 & 4. The inspection was conducted at S&L's Headquarters in Chicago, IL.

The NRC inspection bases were the following:

- 10 CFR Part 21
- Appendix B to 10 CFR Part 50

The NRC inspectors utilized Inspection Procedure 43002, "Routine Inspections of Nuclear Vendors" and Inspection Procedure 36100, "Inspection of 10 CFR Part 21 and 50.55(e) Programs for Reporting Defects and Nonconformance," while conducting this inspection.

The last NRC inspection conducted at S&L's Headquarters in Chicago, IL, occurred in December 2002. During that inspection, the NRC inspectors identified three nonconformances; a summary of each is included below:

- Nonconformance 99900507/2002-201-01 was issued because S&L failed to properly store in-process quality assurance records in a security box that was fire-rated.
- Nonconformance 99900507/2002-201-02 was issued because S&L had not conducted the required QA audits in the prescribed time periods.
- Nonconformance 99900507/2002-201-03 was issued because S&L closed a performance improvement process report (PIP) without implementing the recommended corrective action.

The NRC inspectors took the December 2002 findings into consideration while planning the current inspection.

During the NRC inspection at S&L, daily meetings were conducted between the NRC inspectors and S&L staff to discuss observations and/or findings and to share ongoing inspection activity with the S&L staff.

The NRC inspection team reviewed S&L's implementation of its 10 CFR Part 21 program for evaluating deviations and reporting of defects that could cause a substantial safety hazard. The NRC inspectors did not identify any issues with the policies and procedures implementing the S&L 10 CFR Part 21 program. However, the NRC staff did identify one nonconformance while reviewing S&L's 10 CFR Part 21 evaluation and supporting documentation related to the Advanced Computer Software – System for Analysis of Soil-Structure Interaction (ACS SASSI) Part 21 notification to the NRC dated September 11, 2009.

ACS-SASSI is a program that performs seismic soil-structure interaction (SSI) analysis and was used to perform SSI analysis of the control building, reactor building, and the ultimate heat sink/reactor service water pump house for STP Units 3 & 4. During the SSI analysis of the control building, S&L observed a certain irregularity in the results obtained from the use of the ACS-SASSI code and initiated a PIP to evaluate, correct and determine the extent of this issue. S&L's initial screening of this PIP found it to be a significant issue leading to the initiation of a root cause analysis and Part 21 notification to the NRC.

The NRC inspectors reviewed S&L's Part 21 notification, evaluation, and supporting documentation during the inspection and concluded that S&L failed to include the full range of S&L's intended applications during verification and validation (V&V) ACS SASSI software. This resulted in Nonconformance 99900507/2009-201-01.

The NRC inspectors also reviewed S&L's QA program and implementation for safety-related design control activities for detailed engineering and design, corrective action, document control, training and qualification, internal S&L audits, and external supplier audits. The NRC inspectors concluded that these portions of S&L's QA program were appropriately controlled and implemented.

REPORT DETAILS

1. 10 CFR Part 21 Program

a. Inspection Scope

The NRC inspectors reviewed S&L's policies and implementing procedures that govern the 10 CFR Part 21 program to verify compliance with the requirements of 10 CFR Part 21, "Reporting of Defects and Noncompliances." Specifically, the NRC inspectors reviewed the following S&L Standard Operating Procedures (SOPs) and Part 21 reports:

- SOP-1405, "Reporting of Defects and Noncompliances," Revision 5, dated November 12, 2007.
- SOP-1401, "Performance Improvement Process," Revision 9B, dated September 9, 2009.
- S&L 10 CFR Part 21 Report, "ACS SASSI Computer Program," dated September 11, 2009.

The NRC inspectors evaluated S&L's 10 CFR Part 21 postings for compliance with the requirements of 10 CFR 21.6, "Posting Requirements," and S&L's implementing procedures for evaluating and notifying the NRC of potential defects and noncompliances. In addition, the NRC inspectors reviewed the S&L Part 21 report dated September 11, 2009, and supporting documentation.

b. Observations and Findings

b.1 Postings

The NRC inspectors evaluated S&L's compliance with the posting requirements of 10 CFR 21.6. The NRC inspectors verified that S&L had posted notices that included a copy of Section 206 of the Energy Reorganization Act of 1974, a description of 10 CFR Part 21 and the procedure that implements the regulation, the location where the 10 CFR Part 21 regulation and implementing procedures may be examined, and a notice that included the telephone number of S&L's 10 CFR Part 21 contact: the Quality Assurance Manager. The NRC inspectors concluded that S&L's 10 CFR Part 21 postings were in compliance with the requirements of 10 CFR 21.6.

b.2 10 CFR Part 21 Procedure and Implementation

The NRC inspectors reviewed and discussed S&L's 10 CFR Part 21 program with S&L's Quality Assurance Manager. SOP-1405 described the method for evaluating and notifying the NRC of potential defects and noncompliances as required by 10 CFR Part 21. SOP-1405 also provided the process for evaluating and notifying affected licensees or purchasers of potential defects and noncompliances as required by 10 CFR 50.55(e). The NRC inspectors determined that SOP-1405 contained adequate procedural guidance to initiate S&L's 10 CFR Part 21 process when a PIP determined that a reportable defect may exist.

In accordance with 10 CFR 21.21, the NRC inspectors requested copies of any 10 CFR Part 21 evaluations that S&L had completed for STP Units 3 & 4. During discussions with S&L staff, the

NRC inspectors found that S&L had completed a 10 CFR Part 21 evaluation and had submitted a notification on September 11, 2009. This notification is discussed in detail in Section b.3. The NRC inspectors verified that S&L's staff was knowledgeable about the conditions that would warrant a 10 CFR Part 21 evaluation. The NRC inspectors also determined that S&L's 10 CFR Part 21 procedure included all the requirements of Part 21 for evaluating and reporting defects and failures to comply.

b.3 10 CFR Part 21 Report related to ACS SASSI Computer Program

In a letter dated September 11, 2009, S&L submitted a Part 21 report notification to the NRC regarding the ACS-SASSI program related to STP Units 3 and 4 safety related analysis. The NRC inspectors reviewed the following documents related to this Part 21 evaluation and report notification:

- Project 12188-010, "ACS SASSI Version 2.2.1 Software Verification and Validation Report," dated October 6, 2008.
- "Acceptance Plan for Procurement of Computer Software ACS SASSI," Revision 0, dated June 16, 2008.
- SOP-0204, "Computer Software Quality Policies and Requirements," Revision 8, dated December 10, 2008.
- General Administrative Guideline (GAG)-0204-01, "Computer Software Development, Procurement, Verification and Validation, and Submission for Configuration Control," Revision 9, dated September 9, 2009.
- Root Cause Analysis PIP No. 2009-1281, "Possible Numerical Instability of ACS SASSI Program," dated September 17, 2009.
- PIP No. 2009-1281, "Possible Numerical Instability of ACS SASSI Program," initiated on July 30, 2009.
- PIP No. 2009-1574, "Improve Soil/Structure Interaction Sub-process," initiated on September 17, 2009.
- PIP No. 2009-1579, "Acceptance of ACS SASSI Software," initiated on September 17, 2009.

Initially, the NRC inspectors reviewed PIP No. 2009-1281 that addressed the issue of numerical instability in a computer software program used at S&L. ACS-SASSI, is a software program that performs SSI analysis. The program was procured from Ghiocel Predictive (GP) Technologies. S&L purchased licenses to use ACS SASSI from GP Technologies in 2008 and verified and validated the software under S&L's QA program. S&L stated that the ACS SASSI User Manual for S&L Version 2.2.1 allowed for modeling up to 100 soil layers. S&L and GP Technologies performed verification and validation using no more than 20 soil layer models due to the limitation of such problems with known solutions in published literature.

S&L used the ACS SASSI software for STP Units 3 and 4 SSI analyses of structures such as the control building, reactor building and the ultimate heat sink/reactor service water pump

house. During the SSI analysis of the control building, S&L observed a certain irregularity in the results obtained from the use of the ACS-SASSI code. The response spectra using a 94 soil layers model is very different than using 74 layers model or and 80 layers model. PIP No. 2009-1281 was initiated to evaluate, correct and determine the extent of this issue. S&L's initial screening of this PIP found it to be a significant issue that was potentially reportable to the NRC under the provisions of 10 CFR Part 21. In accordance with SOP-1401, S&L initiated a root cause analysis (RCA).

The NRC inspectors reviewed the RCA of PIP No. 2009-1281 that focused on the verification and validation testing of the ACS SASSI program and the Part 21 evaluation and report as required by SOP-1405.

The S&L Part 21 Report dated September 11, 2009, stated that their investigation, including a review of other uses of the software, indicated that numerical instability may occur with high numbers of soil layers, even when soil layer properties and number of soil layers (<100) were within the parameters stated in the User's Manual. It also stated that investigations indicated 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, were not reliable.

S&L recommended to STPNOC that work performed using ACS SASSI 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 and S&L committed to complete reanalysis activities for all affected SSI analyses by November 24, 2009.

Finally, the S&L Part 21 Report stated that S&L was no longer using ACS SASSI Version 2.2.1 for production work and investigated whether SASSI 2000 Version 3.0 had similar irregularities. The S&L investigation concluded that the SASSI 2000 Version 3.0 did not have similar irregularities and was fundamentally sound.

The NRC inspectors reviewed supporting documentation to support V&V activities for the ACS SASSI 2.2.1. SOP-0204, described the processes to be followed by S&L for the procurement, development, V&V, maintenance, documentation, configuration control, and error reporting for computer software used by S&L. SOP-0204 also stated that the V&V methodology shall be based on one or more of the following: comparison with classical solutions, experimental test data, or analytical results published in technical literature; comparison of results with those obtained from manual calculations using an established computational procedure; comparison of the results with those from other software V&V'd by S&L; or performance of a detailed review of the software.

GAG-0204-01 is a guideline that described the documentation required for computer software development, procurement, V&V, and submission for configuration control.

The NRC inspectors reviewed the ACS SASSI Version 2.2.1 Software Verification and Validation Report and the Acceptance Plan for Procurement of the Computer Software ACS SASSI.

During the review of the Acceptance Plan for Procurement of the Computer Software ACS SASSI, the inspectors indentified the following statement:

> ACS SASSI software shall be validated and documented in accordance with procedure SOP-0204 and guideline GAG-0204-01 prior to use. The test problems used in Ghiocel

Predictive (GP) Technologies, Inc., verification and validation (V&V) shall be reviewed against S&L's intended application of the software. If S&L intends to apply the software to conditions outside the range of GP Technologies test problems, the problems shall be modified and/or supplemented to encompass the range of S&L's intended applications.

The NRC inspectors determined that S&L performed calculations using the ACS SASSI software outside of the range of the test problems used by GP Technologies. As a result of this review, the NRC inspectors determined that S&L V&V of the ACS SASSI software did not encompass the full range of S&L's intended applications. This issue was identified as Nonconformance 99900507/2009-201-01.

As a result of discussions with the NRC inspectors during the inspection, S&L initiated PIP No. 2009-1579 on September 17, 2009, to address the NRC concerns. Also on September 17, 2009, S&L completed the RCA that supports PIP No. 2009-1281 and initiated PIP No. 2009-1574. This RCA documents past activities conducted by S&L related to "possible numerical instability of ACS SASSI Program." PIP No. 2009-1574 added a caution to the Earthquake Engineering related to SSI processes by stating that issues have been noted regarding numerical instability in SSI software particularly in the transfer functions.

c. Conclusions

The NRC inspectors concluded that S&L's program requirements for 10 CFR Part 21 were consistent with the regulatory requirements of 10 CFR Part 21 and were being effectively implemented. The NRC inspectors did not identify any issues with the policies and procedures implementing the 10 CFR Part 21 program at S&L. However, the staff did identify Nonconformance 99900507/2009-201-01 while reviewing S&L's 10 CFR Part 21 Report dated September 11, 2009 and supporting documentation.

2. Design Control

a. Inspection Scope

The NRC inspectors reviewed S&L's QA policies and implementing procedures that govern the design control process to verify compliance with the requirements of Criterion III, "Design Control," of Appendix B as applied to the STP Units 3 & 4 project. Specifically, the NRC inspection team reviewed the policies and procedures governing the implementation of S&Ls design control process related to the development of component specifications, system piping & instrumentation diagrams (P&ID), and component calculations that supported the procurement control and bid evaluation process for selected components and systems. The procedures, documents, and records reviewed within the scope of the inspection in this area included:

- SL-TR-1A, "Sargent & Lundy Nuclear Quality Assurance Program Topical Report," Revision 20, dated April 17, 2009.

- STPNOC STP Units 3 & 4 Project Manual, Revision 2, dated July 24, 2009.

- Project Requirements Document (PRD) A10-0311-0002, "Engineering Plan," Revision B, dated June 5, 2008.

- PRD 7A10-0301- 0005, "Plant Design Guidance," Revision C, dated February 13, 2009.

- SOP-0401, “Preparation, Review, and Approval of Design Drawings,” Revision 5, dated December 3, 2008.

- SOP-0402, “Preparation, Review, and approval of Design calculations,” Revision 7B, dated November 11, 2007.

- SOP-0407 “Specifications,” Revision 1, dated August 3 2009.

- SOP-0601, “Project Procurement,” Revision 14, dated August 3 2009.

- Project Instruction (PI)-STP34-115, “Procurement Process,” Revision 1, dated July 14, 2009.

- PI-STP34-116, “Preparation and Control of ASME Section III Design, Safety Related and Non-safety Related and Generic Specifications,” Revision 7, dated September 15, 2009.

- PI-STP34-120, “Piping & Instrumentation Diagram (P&ID) Preparation,” Revision 1, dated May 29, 2009.

- Project Administrative Guidelines (PAG)-STP34-004, “S&L Internal Project Distribution Guidelines for Technical, Commercial and Project Management Documents,” Revision 2, dated June 30, 2009.

- PAG-STP34-002, “Matrix Depicting Design Input Responsibility,” Revision 0, dated February 14, 2008.

- PAG-STP34-002.1, “Design Input Responsibility Matrix by Deliverables,” Revision 0.

- Project Work Plan (PWP) No. 12188-all, Revision 2, dated May 22, 2009

- U7-SLC-M-SPEC-ASME-PUMP-7386, “Design Specification ASME Section III, Div.1 Class 2, Safety Related Standby Liquid Control Pumps,” Revision B, dated May 27, 2009.

- U7-SLC-M-SPEC-HOLD-PUMP-7386, “HOLD Tabulation.” Attachment to SLC pump specification.

- U7-SLC-M-SPEC-PUMP-7386, “Standby Liquid Control Pumps and Motors, Safety Related Specification,” Revision B, dated May 27, 2009.

- U7-STP34-CAL-DESN-6001, “Hydraulic Analysis of the Standby Liquid Control (SLC) System,” Revision A, dated March 20, 2009.

- U7-EDG-M-SPEC-DG-7300, “Emergency Diesel Generator Safety Related Specification,” Revision F, dated May 29, 2009.

- SL-ID-111, “Internal Project Distribution List for Technical Documents (Engineering Deliverables) STP Units 3 & 4, Specification, Safety Related Standby Liquid Control Pumps,” dated April 8, 2009.

- NT-5103096 Sh-1, “STP Unit 3 Emergency Diesel Generator Lubricating Oil System P&ID,” Revision A, dated June 10, 2009.

- U3-EDG-M-DWG-PID-001, “EDG Lubricating Oil System Piping and Instrumentation Diagram Sheets 1-5,” Revision C, dated June 2009.

b. Observations and Findings

b.1 Specifications

The process for the development of specifications was defined in SOP-0407 and PI-STP34-116. S&L was developing several specifications for STP Units 3 & 4 components at the time of the inspection. The NRC inspectors selected to review the specifications developed for the standby liquid control (SLC) pump and the emergency diesel generator (EDG), since they were the closest to completion.

SOP-0407, described the processes to be followed by S&L for the development of specifications for use in support of procurement activities performed by S&L or on behalf of its clients. Specifications were typically utilized in conjunction with SOP-0601, but may be developed as a specific client objective. SOP-0407 provided the overall processes to be used for single and multi-discipline specifications and was very specific on requirements for certification of specifications by one or more registered professional engineers. Finally, SOP-0407 included additional requirements for nuclear projects such as qualification of personnel, QA, and American Society of Mechanical Engineers (ASME) technical requirements.

PI-STP34-116 defined the processes used for preparing, reviewing, issuing, maintaining control, and Professional Engineer (PE) sealing of specifications. This included safety related and non-safety related specifications, generic specifications and ASME Section III division 1 & 2 design specifications (collectively referred to as Specifications) issued externally for the purchase of safety related and non-safety related structures, systems, and components (SSCs). It further required that Specifications be prepared using all applicable inputs from TANE, STPNOC, S&L, Westinghouse, and Fluor.

b.1.a Standby Liquid Control (SLC) Pump

The NRC inspectors reviewed the ASME Section III design specifications (U7-SLC-M-SPEC-ASME-PUMP-7386) and safety related specifications (U7-SLC-M-SPEC-PUMP-7386) for the SLC pumps. The NRC inspectors verified that the specifications met the requirements specified in SOP-0407 and PI-STP34-116.

The engineer responsible for coordinating the development of the Specification or the Specification preparer identified any interfacing disciplines required to provide input and comments on the Specification. The NRC inspectors verified that the development of the SLC pump Specification included adequate interface with other engineering disciplines as required by PAG-STP34-004 and PAG-STP34-002.

PAG-STP34-004 provided directions regarding the internal distribution of S&L prepared technical documents (Engineering Deliverables) and Commercial/Project Management Documents. PAG-STP34-004 referred the preparer to PAG-STP34-002 for technical document distribution guidance to determine appropriate reviewers.

PAG-STP34-002 included a table (Figure PAG-STP34-002.1) that identified those S&L groups responsible for the preparation of design engineering and plant physical design deliverables, such as component specifications, and those organizations responsible for providing design input and comments for the deliverables. PAG-ST34-002 stated that all groups responsible for preparation of the design deliverable must solicit design input and comments from other groups identified in the table.

The NRC inspectors reviewed the transmittal document SL-ID-111 that requested review and comments on the SLC pump specification documents (U7-SLC-M-SEC-PUMP-7386 and U7-SLC-M-SPEC-ASME-PUMP-7386) from other work groups. The NRC inspectors noted that the specification documents were developed by the mechanical group, and the transmittal document SL-ID-111 requested review and comments from the following groups: component engineering, Instrumentation and Control (I&C), electrical, QA, and mechanical.

Figure PAG-STP34-002.1 directed that the development of mechanical specification be prepared by the mechanical group with input and comments from Nuclear Plant Analysis (NPA), component engineering, I&C, and electrical groups. The NRC inspectors noted that the SL-ID-111 did not include the NPA group as instructed by Figure PAG-STP34-002.1.

The NRC inspectors met with the S&L mechanical supervisor to inquire why the transmittal of the speciation did not included the NPA group. The S&L mechanical supervisor informed the NRC inspectors that the NPA group is a system group that would not be involved in the development of any individual components. The S&L mechanical supervisor noted that the NPA would provide input that the mechanical group, as preparer of the specification, would use for the development. Since NPA was not required to review and provide comments on the SLC pump specification, the NRC inspectors did not identify this as an issue. S&L opened PIP No. 2009-1564 to revise PAG-STP34-004 to require documentation in the transmittal document when a determination was made that responsible engineering groups identified in PG-STP34-002.1 were not required to review and provide comments on the specification.

Additionally, the NRC inspectors verified that all Revision A specification comments provided by other groups had been incorporated into Revision B. The NRC inspectors did not identify any issues related to the SLC pump.

b.1.b <u>Emergency Diesel Generator</u>

The NRC inspectors reviewed the procurement control process as it related to generation of technical documents, such as the component specification and specific design documents related to STP Units 3 & 4 systems and components. The NRC inspectors reviewed the EDG and supporting systems since it was the furthest along in system design, preparation of supporting design documentation, and development of the procurement specification.

The NRC inspectors reviewed the EDG component specification development and bid evaluation documentation, then selected the EDG Lubricating Oil System to sample the development of EDG system specific documents, such as the P&ID.

The NRC inspectors reviewed the EDG Safety Related Specification, U7-EDG-M-SPEC-DG-7300. S&L stated that the specification had been provided to several solicited suppliers as part of the bid evaluation process for ultimate supply of the EDGs for STP Units 3 & 4. The NRC inspectors reviewed the S&L process and procedures used to develop EDG component specification and the interfaces involved with this process.

S&L PWP No. 12188 described the STP Units 3 & 4 Advanced Boiling Water Reactor (ABWR) Nuclear Island design project requirements for S&L as a direct qualified supplier to Fluor as part of the STP Units 3 & 4 engineering, procurement, and construct (EPC) team. This PWP included such areas as scope of work, S&L external interfaces, management expectations, project team organization and personnel, and project unique quality control requirements. In addition, it described the interdisciplinary design review process, design, and V&V expectations. It also discussed the document and data control methods, the project procurement plan, and all requirements of the various S&L SOPs, including SOP-0407 and SOP 0601.

SOP-0601 described the S&L process for procuring items or services (i.e. deliverables) directly from S&L suppliers, or indirectly when S&L was authorized to procure on behalf of a client. Control of procurement interfaces with non-S&L project participants was also addressed. This activity has increased importance since the STP Units 3 & 4 Project includes direct interfaces with other EPC team members (STPNOC, Fluor, TANE) for development of procurement specifications.

PI-STP34-115 described the process to be used for the STP Units 3 & 4 project procurement activities. This PI described S&L's procurement scope and responsibility as a supplier to Fluor for (1) preparation and issuance of specifications for components, systems and structures; (2) performing technical bid evaluations; (3) Fluor purchase order support; and (4) performing other associated activities. This PI also incorporated and supplemented the requirements of SOP-0601 and controls project procurement activities of both safety-related and non-safety-related equipment and components.

The NRC inspectors reviewed documentation related to development of the EDG specification, including the electronic transmittal of the specification to EPC partners for review and comment. The NRC inspectors also reviewed the Document Comment Resolution Forms and verified that S&L had appropriately reviewed and addressed the comments received related to the EDG specification. Additionally, the NRC inspectors verified that all comments provided by the other EPC groups had been incorporated into the latest revision of the specification. This information was included as part of the EDG Purchase Specification, Revision 1, that was sent to potential suppliers as part of the bid solicitation. No issues were identified in this area.

EDG Bid Solicitation and Evaluation Process

The EDG system procurement for STP Units 3 & 4 consisted of three EDGs per unit along with the respective combustion air intake system, starting air system, fuel oil system, lubricating oil system, cooling water system, engine exhaust system and silencer, governor system, and generator with its excitation & voltage regulation systems. Each generator was classified as 1E and safety related. Specified mechanical components were in accordance with ASME Section III Class 3 design requirements.

The procurement process was governed by PI-STP34-115, as described above, with respect to the overall process description and included: preparation of specifications; interface with Fluor and other EPC team members, as appropriate, for review and comment on quality and technical issues; preparation of all bid evaluation review documentation and documentation; meeting with selected bidders on technical issues; and the approval for use "conformed specification." Fluor was responsible for finalizing and issuing purchase orders with the conformed specification.

The NRC inspectors reviewed the S&L documentation for their technical evaluation of the bids received from two potential suppliers. The commercial evaluation of the bids will be performed by Fluor. The NRC inspectors also reviewed the Document Comment Resolution Forms to verify that S&L had appropriately reviewed and addressed comments received related to the EDG purchase specification, and that all comments provided by the other EPC groups had been incorporated into the latest revision of the specification. Finally, the NRC inspectors verified that the draft letter to Fluor included the required technical justifications and resolution to comments provided by Flour, TANE, and STPNOC to support the EDG purchase specification development. No issues were identified in this area.

b.2 SLC Pump Calculations

The process for preparing, documenting, reviewing, and approving all calculations for supporting engineering, design, and analysis was defined in SOP-402 and PI-STP34-106.

The NRC inspectors reviewed U7-STP34-CAL-DESN-6001 to verify that adequate review and approval had been performed. This calculation was performed to obtain a preliminary, independent evaluation of the SLC system hydraulic pressure losses, and to confirm that the SLC pumps were adequately sized with appropriate margin to meet system flow requirements. The NRC inspectors noted that the calculation adequately incorporated the purpose, inputs, assumptions, methodology and acceptance criteria, calculations, results and references.

The NRC inspectors noted that U7-STP34-CAL-DESN-6001 had not been approved at the time of the inspection and had been only issued to external organizations, such as Flour and TANE, for comments. The NRC inspectors also noted that U7-STP34-CAL-DESN-6001 adequately included a note that the calculation would be revised later based on final, detailed pipe routing and design components pressure losses for the equipment purchased for the STP Units 3 & 4 project. As such, the calculation was marked with 14 unverified assumptions.

The NRC inspectors reviewed the comments provided by the reviewer. The NRC inspectors noted that the comments were incorporated using a copy of the calculation, and verified that the cover sheet adequately documented the detailed review as the verification method. No issues were identified in this area.

b.3 EDG Lubricating Oil System P&ID

The NRC inspectors reviewed PI-STP34-120 that prescribed the methodology to prepare P&IDs for STP Units 3 & 4. The NRC inspectors reviewed the PI requirements for P&IDs controlled by S&L to establish the process requirements for the EDG lubricating oil system.

The NRC inspectors reviewed Toshiba NT-5103096 (redline P&ID) sheets 1-5 and S&L drawing U3-EDG-M-DWG-PID-001, and discussed the various revisions with S&L staff. At the time of the inspection, a final contract had not yet been awarded to a vendor for the supply of the STP Units 3 & 4 EDGs. The NRC inspectors reviewed the Toshiba EDG system P&ID as well as the draft S&L P&ID issued to make the system drawings consistent with S&L P&ID format and nomenclature. Since a vendor had not been chosen, the S&L P&ID was a reference document developed using a Toshiba generic P&ID. This S&L document had not yet been approved or issued for use. S&L explained that the EDG vendor selected to provide the EDGs would develop the official system P&ID based upon their specific EDG design requirements.

The NRC inspectors reviewed documentation related to development of the EDG Lubricating Oil System P&ID including the electronic transmittal of the P&ID to EPC partners for review and comment. This included review of the Transmittal form used to send the P&ID to Fluor for review and comment. The NRC inspectors also reviewed the Document Comment Resolution Forms and verified that S&L had appropriately reviewed and addressed the comments received related to the EDG P&ID. Comment resolution information was eventually included as part of the EDG Purchase Specification, Revision 1, that was used for bid solicitation. No issues were identified in this area.

c. Conclusion

The NRC inspectors concluded that S&L's program requirements for design control were consistent with the regulatory requirements of Criterion III of Appendix B to 10 CFR Part 50. Based on the limited sample of design documentation reviewed, the NRC inspectors also determined that S&L's QA program and associated design control implementing procedures were being effectively implemented for the areas reviewed. The NRC inspectors did not identify any issues in this area.

3. Document Control

a. Inspection Scope

The NRC inspectors reviewed S&L's QA policies and implementing procedures that govern the document control process to verify compliance with the requirements of Criterion VI, "Document Control," of Appendix B to 10 CFR Part 50. Specifically, the NRC inspectors reviewed the following policies and procedures established by S&L:

- SL-TR-1A, "Sargent & Lundy Nuclear Quality Assurance Program Topical Report," Revision 20, dated April 17, 2009.
- U7-PROJ-G-PM-0001, "STP Units 3 & 4 Project Manual," Revision 1.
- SOP-1602, "Records Control," Revision 11, dated March 16, 2009.
- PI-STP34-113, "Document Control and Record Retention," Revision 5, dated August 14, 2009.

b. Observations and Findings

U7-PROJ-G-PM-0001 described the document processing system that the STP Units 3 & 4 EPC team used for circulating documents among team members for review, comment, and approval. The EPC team processing system included an optional collaborative tool to provide an opportunity to review, comment, and have comments resolved before submitting the document for final review and approval.

This project collaboration system was Fluor's Project OnLine (POL) system. S&L used this system for transmitting documents to Fluor and TANE, and "posting" the document in POL. Before "posting" a document in POL, S&L developed a transmittal letter with a unique correspondence number. S&L had converted documents uploaded into POL in Adobe Acrobat PDF form. S&L retained copy in the native file format (e.g., Word or Excel) in S&L's internal

document processing system, “Document Management System.” Flour has overall responsibility for managing documents placed in POL.

The S&L administrative assistant group was the only group that had access rights to upload documents into POL. For each document posted in POL, the administrative assistant group updated the Transmittal Log that included all documents that had been transmitted outside of S&L for review and comments. The distribution of documents (to and from TANE or STPNOC) was maintained by Fluor. When Fluor responded to a transmittal of S&L, they initiated a new transmittal letter and posted documents in POL. The system automatically generated an email notifying S&L that comments from Fluor had been received. The administrative assistant group recorded the Fluor transmittal number in a separate Receiving Log maintained within administrative assistant group file. The administrative assistant group distributed the document as described in the distribution list included in the transmittal received by Fluor.

In addition to POL, another optional tool, “Certrec,” was introduced into the document control system to reduce the time to review and resolve comments from all EPC team members. This tool is maintained by STPNOC and provides access to all EPC team members. Certrec was used to upload documents for review and comment from all EPC team members at the same time. It also allowed all EPC members to view and review everyone’s comments and reduced the review and comment time period.

Once comments had been resolved using Certrec, documents followed the formal review and approval process through POL. After S&L documents were sent to Fluor through POL, documents were uploaded into the Portal system for submittal to STPNOC for final review/comment/acceptance. S&L did not have access to Portal. All S&L’s documents were placed into the Portal by Fluor after acceptance through POL.

PI-STP34-113 described the S&L internal document control process for the STP Units 3 & 4 project. The procedure applied to both S&L generated documents and those documents and data received from others for use in project data. The NRC inspectors verified that the latest SOPs and PIs developed for STP Units 3 & 4 project were posted electronically on the internal S&L web page (SLWeb) in a read only format. Additionally, the NRC inspectors verified that S&L was keeping documents in their internal document processing system, “Document Management System.” NRC inspectors noted that all documents and records reviewed during the inspection related to the development of specifications and technical documents were adequately numbered, identifiable, legible and retrievable.

c. Conclusion

The NRC inspectors concluded that S&L’s program requirements for document control were consistent with the regulatory requirements of Criterion VI, “Document Control,” of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspectors also determined that S&L’s QA Program and associated document control implementing procedures were being effectively implemented. The NRC inspectors did not identify any issues in this area.

4. Corrective Action Process

a. Inspection Scope

The NRC inspectors reviewed S&L's QA policies and implementing procedures that govern the corrective action process to verify compliance with the requirements of Criterion XVI, "Corrective Action," of Appendix B. Specifically, the NRC inspectors reviewed the following policies and procedures established by S&L:

- SL-TR-1A, "Sargent & Lundy Nuclear Quality Assurance Program Topical Report," Revision 20, dated April 17, 2009.
- SOP-1401, "Performance Improvement Process," Revision 9B, dated September 9, 2009.
- PIP No. 2008-1304, "Unverified Inputs & Assumptions Not Clearly Identified," dated September 15, 2008.
- PIP No. 2008-0999, "Insufficient Design Margin for Ultimate Heat Sink Inventory," dated July 11, 2008.
- PIP No. 2009-0463, "Procurement Specifications were not in Accordance with Project Instruction," dated March 25, 2009.
- PIP No. 2009-0711, "Omission of Digital I&C Requirements in EDG Specification," dated May 1, 2009.
- PIP No. 2009-1402, "Errors in the Computation of Structural Model Properties," dated August 18, 2009.

b. Observations and Findings

SL-TR-1A, Section 16.0, "Corrective Action," defined the measures for generating, tracking, and closing PIPs. S&L's performance improvement process provided measures to assure that conditions adverse to quality were identified, documented, dispositioned, and corrected.

SOP-1401, "Performance Improvement Process," defined the process for identifying and addressing improvement opportunities, quality problems, lessons learned and best practices. This SOP provided: (1) the processes for determining the effectiveness of corrective actions taken for quality problems and nonconformances; (2) identifying precursors to nonconformances and significant conditions adverse to quality and for determining and implementing appropriate action to prevent these quality problems; and (3) issuing and controlling technical alerts and best practice notices.

The NRC inspectors examined the log for STP Units 3 & 4 PIPs generated between January 1, 2008, and September 12, 2009. The NRC inspectors reviewed the PIP packages for PIP Numbers 2008-1304, 2008-0999, 2009-0711, 2009-0463, and 2009-1402. Three of the selected PIPs were related to calculation errors while the other two were related to procurement specification errors. The NRC inspectors found that actions taken by S&L were fully appropriate for these PIPs, including determining whether these conditions needed evaluation in

accordance with 10 CFR Part 21. In addition, the NRC inspectors reviewed: (1) how the problems were identified; (2) if they were adequately dispositioned in accordance with S&L's approved procedures; (3) if appropriate technical justifications were presented for each disposition; and (4) if adequate actions were taken by S&L.

c. Conclusions

The NRC inspectors concluded that S&L's program requirements for corrective actions were consistent with the regulatory requirements of Criterion XVI of Appendix B. Based on the limited sample of documents reviewed, the NRC inspectors also determined that S&L's QATR and associated corrective action procedure were being effectively implemented. The NRC inspectors did not identify any issues in this area.

5. Audits

a. Inspection Scope

The NRC inspectors reviewed S&L's QA policies and implementing procedures governing audits to verify compliance with the requirements of Criterion XVIII, "Audits," of Appendix B to 10 CFR Part 50. In addition, the NRC inspectors reviewed a sample of S&L audits, surveillances, and audit schedules to ensure compliance with regulatory requirements. Specifically, the NRC inspectors reviewed the following S&L policies, procedures, and audit-related documents:

- SL-TR-1A, "Sargent & Lundy Nuclear Quality Assurance Program Topical Report," Revision 20, dated April 17, 2009.
- SOP-1701, "Audits and Surveillances," Revision 7A, dated September 7, 2007.
- Quality Assurance Standard (QAS)-1700, "Audit, Surveillance, and Evaluation Planning and Scheduling," Revision 9, dated September 11, 2009.
- QAS-1702, "Audits and Surveillances," Revision 1, dated September 11, 2009.
- QA Division Overview Schedule for a period of 01/01/2009 through 06/30/2011 (2009 Revision 3) dated September 11, 2009.
- STP Project Audit Reports 2008-035 and 2009-037 dated August 26, 2008, and April 1, 2009.
- Approved Suppliers List (ASL), "Nuclear Suppliers," Revision 44, dated September 11, 2009.
- Ghiocel Predictive Technologies Audit Report 2008-045 dated April 10, 2008.
- Ghiocel Predictive Technologies Surveillances 2009-049 and 2009-062 dated February 20, 2009, and June 22, 2009.
- PIP 2009-1568, "Enhancements and Improvements Resulting from QA COP," dated September 16, 2009.

b. Observations and Findings

SL-TR-1A, Section 18.0, “Audits,” outlined the requirements for planned audits and surveillances. The requirements, which applied to both internal S&L groups and external suppliers, ensured compliance with and assessed the effectiveness of all aspects of the S&L Nuclear QA Program and implementing procedures. Section 18.02 of SL-TR-1A required audits and surveillances to be carried out by QA in accordance with the requirements of S&L’s SOPs.

SOP-1701 defined general requirements for the scheduling, planning, preparing, performing, reporting, and follow-up of quality audits and surveillances. Section 4.1 required development of an oversight schedule of audits and planned surveillances in accordance with QAS-1700. Section 5.1 required planning and performance of audit activities in accordance with QAS-1702. SOP-1701. Section 6.1 required audit and surveillance report preparation in accordance with QAS-1702.

QAS-1700 described mandatory requirements for planning and scheduling of S&L audits, surveillances, and evaluations. Section 3.1 required the Audit Coordinator to maintain an internal and external audit schedule and that it provide coverage for a 24-month period. Section 3.2 required Overview Schedule preparation to allow verification of 10 CFR requirements.

QAS-1702 defined specific requirements for the scheduling, planning, preparing, performing, reporting, and follow-up of quality audits and surveillances. Section 5, “Audit Planning and Performance (Nuclear-related Activities),” provided detailed requirements for preparing and executing nuclear–related audits including development of audit plans. Section 7, “Audit/Surveillance Reporting (Nuclear-related Activities),” provided detailed requirements for reporting for nuclear–related audits and surveillances.

The NRC inspectors reviewed a GP Technologies external audit, two STP program internal audits, and two GP Technologies surveillances. The NRC inspectors found that GP Technologies Surveillance 2009-062 was missing several report elements required by QAS-1702, Section 7.1. Missing elements included date of the surveillance, surveillance team members, list of personnel attending entrance /exit meetings, and the specific Appendix B criteria reviewed. S&L personnel mentioned that S&L’s internal Audit 2009-025 had previously identified this deficiency and had been documented in PIP 2009-1110. The NRC inspectors noted that the report requirements of QAS-1702, Section 7, had been updated and clarified in the latest revision of QAS-1702, as the result of the PIP.

The NRC inspectors noted that QAS-1702, Section 5.8, required checklists for nuclear audits, and specified a Nuclear Procurement Issues Committee (NUPIC) or equivalent checklist for external audits. S&L QA personnel stated the Standard Project Audit Checklist was used for internal audits. The NRC inspectors reviewed one NUPIC and one internal audit checklist associated with STP Units 3 & 4 activities. The NRC inspectors noted that the S&L Standard Project Audit Checklist was divided into the five general areas of evaluation: Project Management, Design, Administrative, Procurement, and QA Software Controls, and that the applicable SOPs were listed as references for the individual audit elements. The NRC inspectors determined that the sample of audit checklists reviewed used the appropriate checklists and contained sufficient detail to meet S&L and NRC requirements.

In addition, the NRC inspectors reviewed one Overview Schedule, the S&L ASL, and various revisions of two internal and one external audit plans to ensure compliance with regulatory requirements. The NRC inspectors noted that the Overview Schedule depicted a two and a half

year period and was updated on a quarterly basis. The NRC inspectors did not identify any issues related to ASL maintenance, or audit scheduling and preparation.

c. Conclusions

The NRC inspectors concluded that S&L's audit program requirements and its implementation for activities affecting quality were consistent with the regulatory requirements of Criterion XVIII of Appendix B to 10 CFR Part 50. Based on the limited sample of audits and surveillances reviewed, the NRC inspectors also determined that S&L's QATR and associated audit procedures were being effectively implemented. The NRC inspectors did not identify any issues in this area.

6. Training and Qualifications

a. Inspection Scope

The NRC inspectors reviewed S&L's QA policies and implementing procedures that govern the control of training and qualification of personnel performing activities affecting quality to verify compliance with the requirements of Criterion II, "Quality Assurance Program," of Appendix B to 10 CFR Part 50. The NRC inspectors also reviewed a sample of internal S&L personnel training and qualification records to verify compliance with S&L requirements. In addition, the NRC inspectors sampled S&L external supplier training requirements that were imposed by S&L purchase orders and acceptance plans for the STP Units 3 & 4 project. Specifically, the NRC inspectors reviewed the following S&L policies, procedures, procurement documents, and qualification-related records:

- SL-TR-1A, "Sargent & Lundy Nuclear Quality Assurance Program Topical Report," Revision 20, dated April 17, 2009.

- SOP-1801, "Process Definition and Associated Personnel Qualifications," Revision 5C, dated January 15, 2008.

- SOP-1803, "Personnel Training," Revision 4, dated February 6, 2007.

- QAS-1701, "Qualification of Audit Personnel," Revision 6, dated September 11, 2009.

- PI-STP34-104, "STP Units 3 & 4 Project Training," Revision 1, dated May 20, 2009.

- Ghiocel Predictive Technologies purchase orders 23726, 24393, and 24707, Revisions 0, dated May 22, 2008, September 22, 2008, and November 20, 2008.

- Project 12188-010, "Acceptance Plan for Seismic Soil-Structure Interaction (SSI) Analysis Performed by Ghiocel Predictive Technologies Inc. In Support of the South Texas Project," Revision 0, dated September 17, 2008.

- Project 12188-010, "Acceptance Plan for Reactor Building Seismic Soil-Structure Interaction (SSI) Analysis Performed by Ghiocel Predictive Technologies Inc. In Support of the South Texas Project," Revision 0, dated November 1, 2008.

b. Observations and Findings

SL-TR-1A, Section 02.06, provided general policy that assured appropriate skills were utilized by S&L personnel in the performance of quality-related activities.

SOP-1803, Section 3, described the general requirements for indoctrination and training of personnel performing activities affecting quality. SOP-1803, Sections 4, 5, and 6, respectively, described specific requirements for quality process, technical, and project unique training.

SOP-1801, Section 3, "Process Definition," described the responsibilities and methodology for identifying and defining processes, while Section 5, "Personnel Qualification," described requirements for qualifying personnel to perform work within defined processes.

QAS-1701, Section 3, "Qualification of Personnel Performing Audits of Quality Activities Based on 10CFR50, 10CFR71, 10CFR72, ASME NQA-1(1994), 10CFR76, or CSA N286," established training and qualification requirements for auditors and lead auditors performing audits of quality activities based on NRC requirements or ASME NQA-1 (1994). Lead auditors are specifically evaluated in accordance with ASME NQA-1 (1994).

PI-STP34-104 supplemented SOP-1803 and provided requirements and guidelines for training STP Units 3 & 4 project team personnel.

The NRC inspectors examined a sample of eight training and qualification records for lead auditors, engineering personnel, and supplier personnel qualified to perform quality-related work under the S&L quality program. The NRC inspectors verified a sample of personnel performing activities affecting quality had completed the required training and met the specified requirements.

Since GP Technologies personnel were conducting safety-related work under the S&L QA program, the NRC inspectors reviewed the three GP Technologies purchase orders and two acceptance plans associated with STP Units 3 & 4 activities, referenced in Section 6a, to verify that imposed supplier personnel training and qualification requirements had been met. The NRC inspectors found that required GP Technologies personnel had been appropriately trained and qualified in accordance with S&L requirements. The NRC inspectors did not identify any issues related to S&L and contractually imposed supplier personnel training and qualification requirements.

c. Conclusions

The NRC inspectors concluded that S&L's program requirements for training and qualification of personnel performing activities affecting quality were consistent with the regulatory requirements of Criterion II of Appendix B to 10 CFR Part 50. Based on the limited sample of training and qualification records reviewed, the NRC inspectors also determined that S&L's QATR and associated training and qualification procedures were being effectively implemented. The NRC inspectors did not identify any issues in this area.

7. Entrance and Exit Meetings

On September 14, 2009, the NRC inspectors presented the inspection scope during an entrance meeting with S&L Chief Nuclear Officer (CNO), Brian Renwick, S&L QA Director, Randall L. Kurtz, and other S&L personnel.

On September 17, the NRC inspectors presented the inspection results during an exit meeting with S&L CNO, Brian Renwick, S&L QA Director, Randall L. Kurtz, and other S&L personnel.

See Attachment 1 for a list of attendees for the entrance and exit meetings.

ATTACHMENT 1

1. LIST OF ENTRANCE AND EXIT MEETINGS ATTENDEES AND KEY PERSONS CONTACTED

(1) Entrance Meeting Attendee September 14, 2009, (2) Exit Meeting Attendee on September 17, 2009, (3) Person Interviewed.

(1)	(2)	(3)	Name, Department/Organization
X	X		B. Renwick, CNO, S&L
X	X		D. Schopfer, Executive VP-NPT, S&L
X	X		G. Anderson, Executive VP-COO, S&L
X			D. Chaplin, CFO, S&L
X	X		T. Slay, NPT-Admin, S&L
X	X		G. Daley, NPT Operations Manager, S&L
X	X		C. Foster, ASD NPT Supervisor, S&L
X	X		R. Hooks, Building Design Director, S&L
X	X		C. Montgomery, Project Administrator, S&L
X	X		P. Agrawal, Senior Manager, S&L
X	X		A. Skaczylo, Computer Services Manager, S&L
X	X		P. Scholl, Director of Engineering, S&L
X			J. Moslemian, NPT, S&L
	X		J. Reyes, Procurement Contract Specialist, S&L
	X		P. Aschoff, Procurement Manager, S&L
X	X	X	R. Kurtz, QA Director, S&L
X	X	X	A. Neri, Director of Systems Engineering, S&L
X	X	X	M. Santschi, Design Director, S&L
X	X	X	M. Shewski, Project Manager, S&L
X	X	X	P. Sheppard, Project QA Associate, S&L
X	X	X	J. McIntyre, Quality Service Manager, S&L
	X	X	C. Ruth, Software Manager, S&L
	X	X	L. Dunn, QA Division-STP Quality Control, S&L
	X	X	C. Brouillette, QA Audit Coordinator, S&L
		X	K. Bratt, NPT Project Controls Manager, S&L
		X	T. Sato, NPT Administrator Assistant, S&L
		X	B. Pandit, Engineering Manager, S&L
		X	E. Martin, Quality Services Manager, S&L
		X	S. Singh, Senior Manager, S&L
		X	B. Slavin, Project Assistant, S&L
X			K. Richards, SVP, STPNOC
	X		S. Head, Regulatory Affairs Manager, STPNOC
X	X		T. Walker, Quality Manager, STPNOC
X	X		R. McIntyre, Inspection Team Leader, NRC/NRO
X	X		G. Lipscomb, Inspector, NRC/NRO
X	X		A. Rivera-Varona, Inspector, NRC/NRO
X	X		A. Keim, Inspector, NRC/NRO
	X		R. Rasmussen, Chief CQVB, NRC/NRO
X	X		R. Wild, Audit Manager, NRC-OIG
X	X		M. Zeitler, Senior Analyst, NRC-OIG

2. INSPECTION PROCEDURES USED

Inspection Procedure 43002, “Routine Inspections of Nuclear Vendors”

Inspection Procedure 36100, “Inspection of 10 CFR Part 21 and 50.55(e) Programs for Reporting

3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Item Number	Status	Type	Description
99900507/2009-201-01	Opened	NON	Criterion III - Failure to modify supplier software test problems to include the full range of intended applications for the STP Units 3 & 4 control building soil analysis as required by the S&L software acceptance plan