November 16, 2007

Ms. Amy M. Monroe
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SUBJECT: NRC AUDIT REPORT FOR THE SOUTH CAROLINA ELECTRIC AND GAS (SCE&G) VC SUMMER NUCLEAR PLANT COMBINED LICENSE APPLICATION REVIEW

Dear Ms. Monroe:

On September 24-27, 2007, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an audit of the South Carolina Electric and Gas (SCE&G) VC Summer Nuclear Plant (Summer) combined license application (COLA) development program at the Bechtel Power Corporation facility in Frederick, Maryland. The enclosed audit report presents the details of that activity.

The NRC auditors reviewed the implementation of selected portions of the SCE&G and its contractors' quality assurance programs related to the Summer COLA development program, and reviewed quality activities performed to support the Summer COLA development. During this audit, the NRC audit team did not identify any issues associated with the implementation of Summer COLA development program that should be addressed prior to completion of the application.

In accordance with §2.390, "Public Inspections, Exemptions, Requests for Withholding," of 10 CFR Part 2, "Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders," a copy of this letter, and its enclosures will be made available electronically for public inspection in the NRC Public Document Room (PDR) or from the NRC's document system (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

Sincerely,

/RA/

Jin W. Chung, Senior Project Manager
USAPWR Project Branch
Division of New Reactor Licensing
Office of New Reactors

Enclosure: As stated

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U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NEW REACTORS

Audit Report No:	PROJ0743-2007-001
Organization:	South Carolina Electric and Gas (SCE&G)
Applicant Contacts:	Amy Monroe Licensing Engineer New Nuclear Deployment VC Summer Nuclear Plant (Summer) P.O. Box 88 MC P-40 Jenkinsville, SC 29065-0088
Nuclear Industry:	Bechtel Power Corporation (Bechtel) is contracted to supply the combined license application (COLA) to SCE&G for the VC Summer plant, for submittal to the NRC for review and approval. Bechtel is an engineering, construction, procurement, and project management firm providing a broad range of professional services to private and government sector clients throughout the United States.
Audit Dates:	September 24 through 27, 2007
Auditors:	Kerri A. Kavanagh, Lead Inspector, CQVP/DCIP/NRO Kenneth Heck, Inspector, CQVP/DCIP/NRO Milton Concepcion-Robles, Inspector, CQVP/DCIP/NRO Dori Votolato, Inspector, CQVP/DCIP/NRO Michael Morgan, Inspector, CQVB/DCIP/NRO Suresh Chaudhary, Health Physicist, RI Jin Chung, Senior Project Manager, DNRL/NRO Malcolm Patterson, Reliability and Risk Engineer, DSRA/NRO
Approved by:	Juan Peralta, Chief Quality and Vendor Branch 1 Division of Construction Inspection & Operational Programs Office of New Reactors

ENCLOSURE 1

1.0 AUDIT SUMMARY

The purpose of this audit was to determine if quality activities were adequately established, documented, and implemented to support the development of the combined license application (COLA) for the VC Summer (Summer) nuclear plant units 2 and 3.

The audit was conducted at the Bechtel Power Corporation facility in Frederick, Maryland. The audit bases were:

- Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to Title 10 of the *Code of Federal Regulations,* (10 CFR), Part 50, Appendix B,
- Part 21, “Reporting of Defects and Noncompliance,” to Part 50 of 10 CFR and,
- 10 CFR 50.9, “Completeness and Accuracy of Information.”
- Regulatory Guide 1.206 “Combined License Applications for Nuclear Power Plants (LWR Edition).”

2.0 STATUS OF PREVIOUS AUDITS

There were no previous NRC audits in support of the Summer COLA development.

3.0 AUDIT OBSERVATIONS AND OTHER COMMENTS

3.1 QUALITY ASSURANCE PROGRAMS

a. Audit Scope

The NRC audit team reviewed the quality assurance (QA) program requirements and the implementation process for Summer COLA activities. Specifically, the NRC audit team reviewed the quality assurance program manuals that govern the implementation of quality activities performed for Summer COLA activities by South Carolina Electric and Gas (SCE&G), and its contractors.

b. Observations

The NRC audit team reviewed the SCE&G, and its contractors’ policies governing quality assurance programs to assure those policies provided an adequate description of the implementation requirements consistent with the applicable requirements of Appendix B.

b.1 SCE&G Quality Assurance Program

Revision 27 of the SCE&G “Operational Quality Assurance Plan (OQAP),” dated February 21, 2005 provides the basis for the control and performance of safety-related and quality-related activities associated with Summer COLA activities. The OQAP is used in-part or entirely to develop and submit a COL application. The use and proper implementation of the existing

programs at Summer are the responsibility of the New Nuclear Deployment (NND) group. The SCE&G "New Nuclear Deployment, Quality Assurance Plan," Revision 0, dated April 2006, describes the processes and procedures to be used in the implementation, control and oversight of activities related to the NND project in order to meet the intent of 10 CFR Part 50, Appendix B.

b.2 Bechtel Quality Assurance Program

Revision 2 of the Bechtel "SCE&G Combined License (COL) Project Bechtel Job Nos. 25242 Quality Assurance Program Plan (QAPP)," dated September 24, 2007, establishes the quality program interface between the Bechtel Nuclear Quality Assurance Manual (NQAM), Revision 4, and the SCE&G OQAP. The QAPP is based on the NQAM, and in most cases such as QA program requirements, organization, design control and verification, and QA records, the QAPP simply refers to the NQAM. The QA program policies contained in the NQAM were designed to meet the requirements of Appendix B. The NQAM was developed for the full scope of Bechtel's services, while the QAPP specifically identified QA policies applicable to Bechtel's scope of work on the Summer COLA project. The QAPP specified the QA policies and requirements applicable to the project, consistent with Bechtel's scope of work. Bechtel implemented modifications to the QA policies as appropriate to reflect unique project or SCE&G requirements.

b.3 MACTEC Engineering and Consulting Quality Assurance Program

Bechtel subcontracted to MACTEC to provide geotechnical field investigation, laboratory testing, and engineering analysis associated with site characterization activities. Bechtel qualified the MACTEC quality assurance program for the execution and delivery of geotechnical field investigation and laboratory testing. The general format of the MACTEC Quality Assurance Manual (QAM) followed the criteria for quality assurance outlined in Appendix B and ASME NQA-1-1994.

b.4 Risk Engineering, Inc. Quality Assurance Program

Bechtel subcontracted to Risk Engineering, Inc. (REI) to obtain computational and expert consulting services in performing probabilistic seismic hazard and sensitivity analyses for the Summer site. The audit team reviewed the REI QA manual and Software Quality Assurance Plan (SQAP). These quality documents covered all activities related to REI's services that were important to safety as specified in the Bechtel service contract.

b.5 William Lettis & Associates, Inc.

Services for geotechnical evaluation of the Summer site and engineering analysis were provided by William Lettis and Associates (WLA) under a subcontract with Bechtel. Because WLA did not possess a quality assurance program that met the requirements of Appendix B, WLA performed work in accordance with Bechtel's quality assurance program for any geotechnical field work and engineering analysis.

c. Conclusions

The NRC audit team concluded that the QA program requirements for quality activities to support the Summer COLA development program were consistent with the requirements of Appendix B. The NRC audit team also concluded that the applicant's and/or its sub-supplier's QA program requirements were appropriately translated into implementing procedures to support the Summer COLA development program. The NRC audit team did not identify any issues in this area requiring additional action by the applicant prior to completion of the COLA.

3.2 DESIGN CONTROL PROCESS

a. Audit Scope

The NRC audit team reviewed the implementation of the SCE&G and Bechtel design control processes for the Summer COLA. Specifically, the NRC audit team reviewed the policies and procedures governing the implementation of the Bechtel design control process, and reviewed selected draft completed portions of the FSAR, which are in various stages of review by SCE&G.

b. Observations

The NRC audit team reviewed the Bechtel policies and procedures governing the design process to assure those guidelines provided an adequate description of the process and implementation consistent with the requirements of Criterion III, "Design Control," of Appendix B.

b.1 Design Control Policy and Procedures

SCE&G Administrative Procedure NND-AP-008, "NND COL Application Reviews," Revision 0, dated October 6, 2006, describes the methodology by which NND licensing personnel coordinate the review, comment, and approval of the various documents which constitute, or support the development of the Summer COLA.

Bechtel NQAM states, in part, that the Bechtel developed design criteria shall include identification of the codes, standards, regulations, client requirements, and other technical requirements applicable to the scope of work.

Bechtel Engineering Department Procedure Instruction (EDPI) 25242-001-3DP-G04G-00022, "Licensing Document Review and Approval for the SCE&G COL Project," Revision 0, dated June 6, 2007, provides guidance on licensing documents prepared for direct submittal to the appropriate regulatory agencies, as well as those prepared to provide input to clients for their submittal to the regulatory agencies, in support of nuclear plant siting, design construction, testing, startup, or operation.

Bechtel EDPI 25242-001-3DP-G04G-00023, "Preparation of the Combined License Application," Revision 1, dated September 19, 2007, states, in part, that the procedure establishes the process for creating the combined operating license application and supporting documentation for the VC Summer Nuclear Station Units 2 and 3. Section 4, states, in part, that Bechtel is responsible for submitting the first draft shells and basis documents prepared to define the scope and outline the expected content for each section. A second draft of a COLA section is

prepared by expanding and building upon the first draft or by inserting site-specific content into the industry/NuStart sections.

Bechtel procedure 3DP-G04G-00037, "Design Calculations," Revision 007, dated April 10, 2007, defines the requirements for preparing, checking, and approving design calculations. The procedure requires design calculations to include input data, assumptions, equations used for calculations, and a concise statement addressing the calculation results and conclusions. The procedure specifies the responsibilities of individuals performing verification functions, and responsibilities of the engineering group supervisor.

b.2 Implementation of Design Controls

The NRC audit team reviewed Bechtel's design control process, and the implementing procedures and policy guidelines governing Bechtel's design process applied to the Summer project. The NRC audit team verified that the guidance was consistent with the requirements for design control described in Criterion III of Appendix B. The NRC audit team verified that both EDPI 25242-001-3DP-G04G-00022 and EDPI 25242-001-3DP-G04G-00023 were being used in the development of draft FSAR sections, as required. The NRC audit team verified that once a COLA/FSAR section was completed, proper internal and external reviews were performed.

At the time of the audit, the applicant was evaluating two departures from the AP1000 Design Certification Document (DCD) Revision 16: 1) DCD Section 18.8 of Tier 2, "Human System Interface Design," the location of the Technical Support Center will be at a different location than that described in the DCD; and 2) DCD Chapter 2 of Tier 2, numbering cannot be maintained in the Summer final safety analysis report (FSAR) sections.

The NRC audit team also reviewed selected packages associated with the draft COLA/FSAR sections that were in the process of being reviewed by SCE&G engineering and licensing group. These packages included 1) Section 9.2.13, "Raw Water System," 2) Section 8.2, "Offsite Power System," and 3) Section 8.3, "Onsite Power System."

The following calculation packages were reviewed:

- Calculation 25242-K-021, "Conceptual Hydraulic Design of Raw Water Pump Intake Structure." This calculation was used as part of Section 9.2.13 of the FSAR.

- Calculation 25242-M-001, "Calculation for Water Use." This calculation established the plant water use at both the normal and the maximum operating conditions based on Westinghouse's AP1000 proposed units. This calculation was used as input for Chapter 9 of the FSAR.

- Calculation package 25242-000-EGC-EG-00001, "Site Main Ground Grid Calculation." This calculation provided a preliminary design of the ground grid for Summer, Units 2 and 3. This calculation was used as input for Section 8.3 of the FSAR.

- Calculation 25242-000-EGC-EG-00002, "Lightning Protection Risk Assessment Calculation." This calculation assessed the risk of lightning and supported a

determination of whether lightning protection will be required for new AP1000 units at Summer. This calculation was used as input for Section 8.2 of the FSAR.

For each section, the NRC audit team verified that calculation packages contained the bases and assumptions, the methodology utilized to develop the calculations, and results and conclusions. The samples reviewed have been reviewed by SCE&G and comments are being incorporated by Bechtel. The NRC audit team noted that the samples reviewed were consistent with the procedural guidance contained in Bechtel procedure 3DP-G04G-00037, described above.

c. Conclusions

The NRC audit team concluded that the design control process requirements have been appropriately translated into implementing procedures and, for those activities reviewed by the NRC audit team, implemented as required by the applicant's and its sub-supplier's procedures to support the Summer COLA development program. The NRC audit team did not identify any issue requiring additional action by the applicant prior to completion of the COLA.

3.3 PROCUREMENT DOCUMENT CONTROL

a. Audit Scope

The NRC audit team reviewed SCE&G and Bechtel procedural controls for assuring those applicable regulatory requirements, design bases, and other requirements which are necessary to assure adequate quality are suitably included or referenced in procurement documents. The scope of the evaluation included review of SCE&G and Bechtel procedures, specific requirements of contractor quality assurance programs, purchase orders, quality vendor lists, quality and technical requirements, and other related documents.

b. Observations

The NRC audit team reviewed the SCE&G and Bechtel policies and procedures governing the procurement document control processes to assure those guidelines provided an adequate description of the process and implementation consistent with the requirements of Criterion IV, "Procurement Document Control," of Appendix B.

b.1 Policies and Procedures for Procurement Document Control

SCE&G OQAP governs the process for procuring safety-related material, equipment, and services for SCE&G. Section 8.0 of the SCE&G QA program establishes the requirements for the generation of the procurement requisition, which identifies the scope of work, the technical requirements, and the quality requirements. Section 8.0 also describes the processes for proposal review, purchase order issuance, manufacturing surveillance, control of shipment and shipment and receipt, and maintenance of vendor qualification.

SCE&G Engineering Services Procedure ES-321, "Procurement of Material and Services," Revision 8, dated July 21, 2005, provides the QA program requirements and Procurement Engineering activities in the procurement of safety-related, quality-related, and non-safety

materials, equipment, components and services. Procedure ES-321 establishes program responsibilities and references related implementing procedures related to specific areas of procurement. SCE&G Procedure ES-343, "Supplier Qualification," Revision 7, dated April 18, 2005, provides instructions for the scheduling, performance and tracing of methods for determining the acceptability and effectiveness of the QA programs of external suppliers and contractors.

Policy number Q-4.1 of the Bechtel NQAM defines the responsibilities and processes for the preparation of procurement documents. Policy number Q-4.1 also establishes the minimum requirements for determining the quality program requirements for suppliers/contractors. These requirements include (1) provisions for access by Bechtel and client personnel to conduct surveillances/inspections and/or audits; (2) designated hold and witness points; (3) provisions for control and approval of supplier nonconformances to procurement requirements; (4) provisions for subcontractors to submit their QA programs for Bechtel review/approval, as appropriate; and (5) QA provisions to extend the applicable requirements to sub-tier procurements.

Virtually all of the contracts prepared by Bechtel are project-specific, ranging from complex furnish and erect contracts to Technical Service Contracts. The subcontracts associated the development of the COLA are Technical Service Contracts; Project Engineering is responsible for preparing those portions of procurement documents that define the technical and quality requirements for all safety-related procurements. These requirements are generally incorporated as Exhibit D, Scope of Work, Technical Specifications, in accordance with corporate procurement policy.

b.2 SCE&G Master Contract

The NRC audit team reviewed the SCE&G contract for the preparation of the Summer COLA. SCE&G purchase order (PO) NU-02SR725727 was authorized on January 26, 2006 for the development of the COLA. The NRC audit team reviewed Revisions 2 and 3 to the purchase order for completeness and adequacy of the contract change process.

The scope of work authorized by the purchase order is incorporated in an SCE&G request for proposal (RFP), dated December 3, 2005, for preparation of a COLA for an existing site consisting of two Westinghouse AP1000 units. A more complete description of the work scope is provided by Bechtel letter dated December 20, 2005, which responds to the SCE&G RFP. The NRC audit team reviewed the Bechtel work plan and schedule in conjunction with the purchase order and found them to provide an adequate description of the quality and technical requirements of the SCE&G contract.

The SCE&G purchase order was prepared in accordance with the SCE&G policy and procedures described above. For the purpose of qualifying Bechtel as a supplier of nuclear safety related services, SCE&G relied on the results of a Nuclear Procurement Issues Committee (NUPIC) audit, conducted at Bechtel's Frederick, MD facility the week of May 23, 2005.

The quality assurance requirements for the COL project are imposed in Attachment 4 of the SCE&G RFP. These requirements include development of the COLA under a QA program that

complies with the requirements of Appendix B to 10 CFR Part 50. Additionally, work performed under the contract shall be performed under a program that complies with 10 CFR Part 21. Section 4.1 of the RFP identifies the applicable regulatory requirements. Section 4.4 requires that appropriate documentation be provided to SCE&G to validate each statement of fact in the COLA.

b.3 Bechtel Subcontracts

The principal Bechtel subcontractors are MACTEC Engineering, William Lettis, Associates, and Risk Engineering, Inc. The NRC audit team reviewed the associated contracts with these companies. The NRC audit team also reviewed the Bechtel Evaluated Supplier List (ESL), current as of August 2007, for the purpose of verifying the status of these subcontractors as suppliers of nuclear safety related services.

MACTEC and REI have QA programs that have been approved by Bechtel; controlled copies of their QA programs are maintained in the ESL file. Bechtel audits of MACTEC (Atlanta) and MACTEC (Charlotte) were conducted in August 2005 and May 2006, respectively. Associated audit findings have been closed. A Bechtel audit of REI was conducted in January 2006.

b.4 MACTEC Purchase Order

MACTEC performed work associated with preparation of the SCE&G COLA under Bechtel Technical Services Contract #25242-102-HC4-CY06-001, authorized on May 13, 2006. The scope of work performed, described in Exhibit D of the PO, consists of those activities associated with obtaining rock and soil samples necessary to characterize the proposed reactor sites. The scope of work includes installation of ground water observation wells and performance of field permeability tests, and other specified activities necessary to prepare a Data Report containing the data generated by the subsurface investigation and laboratory testing activities. MACTEC shall provide quality assurance inspection of field and laboratory work activities and submit original QA records documenting these activities.

The NRC audit team determined that the Bechtel PO was prepared in accordance with the Bechtel policy and procedures. Specific quality specifications include the requirement that the work be performed under the MACTEC QA program and a QA plan that meets the requirements of NQA-1-1994, Subpart 2.20, “QA Requirements for Subsurface Investigations for Nuclear Power Plants.” Additionally, the subcontractor shall comply with the requirements of 10 CFR Part 21.

b.5 William Lettis Purchase Order

WLA performed work associated with preparation of the SCE&G application under a Bechtel Technical Service Contract, authorized on February 6, 2006. The scope of work performed is associated with geological mapping and characterization of seismic sources, which is addressed in Section 2.5 of the FSAR. WLA prepared FSAR input related to the geology of the site, i.e., basic geologic and seismic information and surface faulting. WLA will provide input to an analysis of vibratory ground motion, under the guidance of Bechtel seismologists.

The NRC audit team determined that the Bechtel PO was prepared in accordance with the Bechtel policy and procedures. The work is classified as safety related and performed under the Bechtel QA Program and Project QA Plan. Additionally, the requirements of 10 CFR Part 21 applies to all activities.

b.6 REI Purchase Order

REI performed work associated with preparation of the SCE&G COLA under Bechtel Technical Services Contract #25242-102-HC4-HPYK-00001, authorized on May 11, 2006. The scope of work performed, described in Exhibit D of the contract, is to provide a probabilistic seismic hazard assessment and/or sensitivity analysis for FSAR Section 2.5.

The NRC audit team determined that the Bechtel PO was prepared in accordance with the Bechtel policy and procedures. The work is classified as safety related and performed under the REI QA Program. Additionally, work performed under the contract shall comply with the requirements of 10 CFR Part 21.

c. Conclusions

The NRC audit team concluded that the procurement document control process requirements have been appropriately translated into implementing procedures and, for those activities reviewed by the NRC audit team, implemented as required by the applicant's and/or its sub-supplier's procedures to support the Summer COLA development program. The NRC audit team did not identify any issues in this area requiring additional action by the applicant prior to completion of the COLA.

3.4 DOCUMENT CONTROL

a. Audit Scope

The NRC audit team reviewed the implementation of the SCE&G and Bechtel processes of document control for the Summer COLA development program. Specifically, the NRC audit team verified that quality-related documents were developed, reviewed, approved, issued, used, and revised under an established program and verified the overall extent and effectiveness of their programs.

b. Observations

The NRC audit team reviewed the SCE&G and Bechtel policies and procedures governing the document control processes to assure those guidelines provided an adequate description of the process and implementation consistent with the requirements of Criterion VI, "Document Control," of Appendix B.

b.1 Policies and Procedures for Document Control

SCE&G "New Nuclear Deployment, Quality Assurance Plan," establishes the requirements of document control. SCE&G Administrative Procedure NND-AP-001, "Document Review and Approval Process," Revision 0, dated April 6, 2006, describes the process for creation, revision,

changes, review, and approval of quality related documents. The procedure for distribution, control, and issuance of approved documents are described in SCE&G procedure NND-AP-004, "Document Control," Revision 0, dated April 21, 2006. The general guidance for formatting and storing of electronic documents are provided in SCE&G procedure DCP-104, "Electronic Document Control Program," Revision 6, dated August 25, 2007.

Policy number Q-6.2 of the Bechtel NQAM establishes the policy and identifies requirements and responsibilities for the control of documents used in the activities affecting quality within Bechtel's scope of work. The NQAM policies established for document control are implemented though Administrative Procedures and Project Administration Instructions (AP & PAI).

Bechtel Administrative Procedure 2KP-K01G-00012, Revision 6, implements the Bechtel document control policy and provides detailed requirements for procedure format, development, approval, revision, and distribution of approved procedures and instructions. Procedure 2KP-K01G-00012 states, in part, that procedures are revised by the same process as the original approval, and only the electronic version of the procedure is the current and approved version.

b.2 Implementation of Document Control Programs

The NRC audit team reviewed the Bechtel policies and procedures related to document control. Bechtel uses an electronic system for the control and management of documents. The Bechtel NQAM and approved procedures are stored in electronic database which can be accessed by authorized users. Procedure 2KP-K01G-00012 requires that a Master Index, a listing of all controlled documents that identifies the document number, title, current revision, issue date, and approval signature, be maintained for all the currently approved procedures. The Table of Contents of the NQAM serves as the master index for the manual. The electronic database stores and maintains the history of policy and procedure revisions for historical reference.

The Bechtel Reference Library (BecInfo) provides each Bechtel organization the ability to set-up web pages and to establish links to the BecInfo database for access to stored information. The NRC audit team verified that control of revisions to approved documents is maintained by controlling write access to the database, such that the latest approved version of the document is the default document in the database. A user must deliberately select an earlier version to view historical data. The NRC audit team reviewed selected document packages in the BecInfo database and did not identify any issue in this area that required additional action by the applicant.

SCE&G audited Bechtel's document control program by audit report dated September 7, 2007, and found it adequate to meet the regulatory requirements. Additionally, Bechtel performed an audit of its document control and record management program and practices. The audit, as documented in Bechtel Project Audit Report No. 25242-QSHA-06-001, dated December 13, 2006, found the Bechtel documents control and record management program and practices to be satisfactory.

c. Conclusions

The NRC audit team concluded that the document control process requirements have been appropriately translated into implementing procedures and, for those activities reviewed by the

audit team, implemented as required by the applicant's and its contractor's procedures to support the Summer COLA development program. The NRC audit team did not identify any issues in this area requiring additional action by the applicant prior to completion of the COLA.

3.5 CONTROL OF PURCHASED MATERIAL, EQUIPMENT, AND SERVICES

a. Audit Scope

The NRC audit team reviewed the implementation of the SCE&G and Bechtel process of controlling purchased material, equipment and services for the Summer COLA development program. Specifically, the NRC audit team reviewed the policies and procedures governing the process to verify the quality of suppliers providing engineering services for Summer COLA development activities.

b. Observations

The NRC audit team reviewed the Bechtel policies and procedures governing the control of design engineering services and activities to assure those guidelines provided an adequate description of the process and implementation consistent with the requirements of Criterion VII, "Control of Purchased Material, Equipment, and Services," of Appendix B.

b.1 Policies and Procedures for Control of Purchased Material, Equipment and Services

Bechtel NQAM states, in part, that it is their policy to select suppliers who have or who can demonstrate the ability to furnish services that comply with the requirements of Bechtel's services procurement documents. The NQAM further states, in part, that prior to any selection of a supplier of services, the supplier must meet the following technical and quality requirements:

- A determination by Bechtel Engineering that the source is responsive to the technical requirements of a particular specification.

- A determination by Bechtel Engineering and Bechtel Quality Services that the supplier's Quality Assurance program is capable of meeting specified requirements.

Bechtel's NQAM also states, in part, that the supplier's QA program will be determined to be acceptable for selection based upon the following elements:

- QA program manuals previously submitted and evaluated.

- A review (by Bechtel) of the QA manuals being submitted for a specific procurement.

- Evaluation of the supplier's performance on previous procurements.

- A quality performance history of the supplier from other sources.

- A source audit performed previously or in connection with the specific procurement.

Policy number Q-7.1 of the Bechtel NQAM provides the actual guidance to complete the above elements while V.C. Summer Engineering Procedure ES-343 provides similar guidance for the applicant.

b.2 Review of Activities

The NRC audit team reviewed the above program and various implementing procedures that govern Bechtel's control of purchased engineering services for the Summer COLA programs. The NRC audit team verified that the guidance was consistent with the requirements for Control of Purchased Material, Equipment and Services as described in Criterion VII of Appendix B to 10 CFR Part 50. The NRC audit team verified that the Bechtel process adequately specified the requirements for procurement of material, equipment and services, including the appropriate application of Bechtel invoked technical, engineering, and quality requirements on the POs. This also applied to Bechtel performed supplier audits for a supplier to be listed on their Approved Supplier List (ASL).

As part of the implementation review, the NRC audit team verified that Bechtel had included an appropriate level of quality requirements in the purchase orders, in addition to the quality requirements needed for sub-suppliers. The NRC audit team did not identify any deficiency in this area.

The NRC audit team reviewed Bechtel's control of purchased materials, equipments and services process, policy guidelines, and implementing procedures applied to the Summer COLA project. For the development of the Summer COLA, Bechtel sub-contracted services for site-specific activities, including site characterization tests and calculations. Overall guidance on Bechtel's control of such subcontractor activities is contained in policy number Q-7.6 and periodic auditing, by Bechtel, of an accepted supplier is accomplished using Bechtel policy number Q-7.2. Bechtel also uses quality assurance policy numbers Q-7.1 and Q-7.3 to document verification and acceptance of these purchased services. Acceptance of contracted services will be documented when the final package is sent to the applicant/client. The NRC audit team discussed, with a member of Bechtel's Quality Services group, this process for documentation. The NRC audit team was also able to verify through conversations with the Bechtel staff that proper review of documents produced by the sub-contractors is performed before the documents are used. In addition, the NRC audit team found that based on the nature of the services procured and the design control process applied by Bechtel for the development of the Summer COLA, any unacceptable services would be captured during the progress of the development of the application.

The NRC audit team reviewed other quality records such as the ASL information, Audit Reports, supplier responses to audit findings, and Bechtel corrective action forms related to audit findings. The NRC audit team did not identify any deficiency in this area.

c. Conclusions

The NRC audit team concluded that the control of material, equipment, and services process requirements, including the oversight of suppliers, have been appropriately translated into implementing procedures and, for those activities reviewed by the NRC audit team, implemented as required by the applicant's' and its contractor's procedures to support the Summer COLA

development program. The NRC audit team did not identify any issues in this area requiring additional action by the applicant prior to completion of the COLA.

3.6 TEST CONTROL

a. Audit Scope

The NRC audit team reviewed the implementation of quality assurance measures related to test control associated with site characterization activities. Specifically, the NRC audit team reviewed procedures that described the controls implemented by contractors and suppliers to ensure that testing related to COLA activities, such as site boring evaluations, were adequately identified and controlled.

b. Observations

The NRC audit team reviewed the Bechtel policies and procedures governing the test control process to assure those guidelines provided an adequate description of the process and implementation consistent with the requirements of Criterion XI, "Test Control," of Appendix B.

b.1 Policies and Procedures for Test Control

Bechtel Power Corporation

The NRC audit team reviewed Bechtel's NQAM and procedures describing the requirements and responsibilities for the control of tests.

Policy number 11.1 of the Bechtel NQAM describes the control of tests within Bechtel's scope. Additionally, Bechtel Technical Specification 25242-000-3PS-CY00-00001, "Engineering Specification for Subsurface Investigation and Laboratory Testing for SCE&G," Revision 5, dated April 6, 2007, describes the controls for test activities in support of the COLA. These documents provide the interface responsibilities between Bechtel and its subcontractor, MACTEC, QA requirements, applicable test requirements and prerequisites, standards and acceptance criteria, including the use of calibrated instruments and suitable test equipment, and documentation and turnover of test results. The NRC audit team confirmed that these controls were consistent with Appendix B requirements.

The Bechtel QAPP establishes testing requirements applicable to the SCE&G COLA activities. Bechtel states in the QAPP that, for test control, quality-related activities associated with the preparation of the COLA are to be performed in accordance with the Bechtel NQAM with no additional modifications.

MACTEC Engineering and Consulting, Inc.

The NRC audit team reviewed the MACTEC QAM and procedures describing the requirements and responsibilities for the control of tests. The NRC audit team reviewed Section QS-11, "Test Control," of the MACTEC QAM, which establishes and defines the measures for controlling tests performed on materials or equipment and verifying test conformance to specified requirements. The NRC audit team noted that measures were provided to ensure that: (1) tests are conducted in accordance with written procedures or instructions; (2) procedures are reviewed and approved

by responsible personnel; and (3) test results are documented and reviewed for accuracy and completeness. The Project Manager and/or the Resource Manager were responsible for ensuring that the performance of tests was in accordance with specified requirements, evaluating the test results, and corrective actions.

Section 11 of the MACTEC QAM describes the measures to control the tests of soil samples for use in preparation of information that was included in the COLA. MACTEC states in the QAM that tests are to be performed using acceptable industry standard methods such as American Society for Testing and Materials (ASTM). The NRC audit team noted that controls were in place to: (1) designate the individual responsible for the activities conducted in the field; (2) ensure that testing criteria and requirements were followed; (3) evaluate exceptions to these criteria and requirements; (4) notify the client for consultation and permission before tests were conducted; and (5) documentation requirements for field and laboratory tests.

Risk Engineering, Inc.

The REI QA Manual and the SQAP describes the overall process for conducting safety-related calculations and establishes software testing requirements that were applied to the SCE&G COLA. Appendix A to the SQAP describes the testing controls implemented by REI to ensure that particular software used complied with the software design requirements and that it returned the results in a correct and accurate manner.

b.2 Review of Test Control Procedures

The NRC audit team reviewed a sample of testing procedures used by MACTEC for site characterization activities, including drilling, collection of data, and chain of custody of soil samples. Below is a list of the procedures reviewed:

- Slug Testing Permeability procedure.
- Procedure for seismic borehole velocity measurements.
- Televiewer Logging procedure.

The NRC audit team confirmed that these procedures were based on ASTM standards for the particular tests, as required by the MACTEC "SCE&G COL Geotechnical Work Plan," Revision 4, dated December 12, 2006.

The NRC audit team also reviewed documents used by REI to perform testing on software. The NRC audit team reviewed REI's verification and validation plan (VVP) and verification and validation results report (VVRR). These reports were generated during the testing of one of the software codes utilized for data analysis in support of the COLA. These documents described the tasks used to verify and validate the software and a VVRR that documented the results of the software V&V activities. The NRC audit team noted that the VVP included provisions for test requirements and prerequisites, test acceptance criteria, documentation and evaluation of test results, and handling of test deviations, as required by the SQAP.

The NRC staff also conducted a site visit on June 22, 2006, to observe COL pre-application subsurface investigation activities being conducted by MACTEC and its subcontractors at the Summer site. The NRC staff observed drilling, soil sample collection, and other investigation activities performed to obtain geotechnical/seismic data to support the Summer COLA. As

noted in the site visit report, the NRC staff confirmed that drilling operations were adequately being overseen by MACTEC or WLA geotechnical personnel. The NRC site visit report documented that the MACTEC activities were controlled by adequate procedures and standards with an appropriate level of supervisory and QA oversight.

c. Conclusions

The NRC audit team concluded that the test control process requirements have been appropriately translated into implementing procedures and, for those activities reviewed by the NRC audit team, implemented as required by the applicant's and/or its sub-supplier's procedures to support the Summer COLA development program. The NRC audit team did not identify any issues in this area requiring additional action by the applicant prior to completion of the COLA.

3.7 CONTROL OF MEASURING AND TEST EQUIPMENT

a. Audit Scope

The NRC audit team reviewed the implementation of quality assurance measures associated with the control of measuring and test equipment (M&TE). Specifically, the NRC audit team reviewed procedures that described the controls implemented by contractors and suppliers to ensure that M&TE utilized in site characterization activities were adequately controlled.

b. Observations

The NRC audit team reviewed the Bechtel policies and procedures governing the control of measuring and test equipment to assure those guidelines provided an adequate description of the process and implementation consistent with the requirements of Criterion XII, "Control of Measuring and Test Equipment," of Appendix B.

b.1 Policies and Procedures for M&TE

Bechtel Power Corporation

Policy number 12.1 of the Bechtel NQAM defines responsibilities for the maintenance, control, calibration, documentation, and identification of M&TE used in activities affecting quality. Controls require the use of calibrated tools, gages, instruments, and other M&TE used for laboratory or field testing activities. In addition, Bechtel stated in the QAPP that M&TE activities associated with the preparation of the COLA are to be performed in accordance with Bechtel's NQAM with no additional modifications. The NRC audit team reviewed the Bechtel NQAM, QAPP, and procedures describing the requirements and responsibilities for the control of M&TE and noted that the controls described for M&TE were consistent with Appendix B requirements.

MACTEC Engineering and Consulting, Inc.

Section QS-12 of the MACTEC QAM describes the requirements and methods for control and calibration of measuring and test equipment. The requirements state that procedures shall be established and implemented to provide the required control, calibration and maintenance for tools, gages, instruments, and other M&TE used. The QAM also assigns responsibility for the

selection, use, and calibration of M&TE and maintenance of records of calibration to the Project Manager. The NRC audit team noted that these controls were consistent with Appendix B requirements.

Section 2, Item 12, of the MACTEC QAM invoked additional measures for the control of measuring and test equipment. Specifically, these measures include provisions for evaluating the measurement and test results obtained from equipment that is found to be out of calibration. MACTEC stated that it will calibrate, adjust, and maintain its M&TE in accordance with the MACTEC Calibration Manual. Additionally, any results determined to be invalid due to calibration errors were required to have a nonconformance written and processed as specified in the applicable portions of the MACTEC QAM. The NRC audit team noted that M&TE equipment utilized was required to be listed on the test data sheet and meet the criteria as specified in the chosen test method.

b.2 Implementation of Sub-Supplier Programs for M&TE

The NRC audit team reviewed sample records of MACTEC to verify that procedures related to M&TE were implemented. The sample of documents reviewed by the NRC audit team included:

- Calibration procedures and calibration records for equipment used in initial staking for subsurface investigation location sites.

- Calibration records of equipment utilized in the RCTS testing.

The NRC audit team also reviewed a sample of test data sheets and noted that the equipment utilized was identified on the test record. Also, the NRC audit team confirmed that calibration was conducted on the equipment used in the field. The NRC audit team did not identify any issue requiring additional action by the applicant prior to completion of the COLA.

During the site visit conducted on June 22, 2006, the NRC staff reviewed calibration records of equipment used for the standard penetration tests. The NRC staff did not identify any issues.

c. Conclusions

The NRC audit team concluded that the M&TE requirements have been appropriately translated into procedures and for those activities reviewed by the NRC audit team, have been properly implemented as required by the applicant and/or its sub-supplier to support the Summer COLA development program. The NRC audit team did not identify any issues in this area requiring additional action by the applicant prior to completion of the COLA.

3.8 HANDLING, STORAGE, AND SHIPPING

a. Audit Scope

The NRC audit team reviewed implementation of the Bechtel and their subcontractor's processes of handling, storage, and shipping for the Summer COLA development. Specifically, the NRC audit team reviewed policies and procedures governing these processes to verify the overall extent and effectiveness of their programs.

b. Observations

The NRC audit team reviewed the Bechtel policies and procedures governing handling, storage and shipping to assure those guidelines provided an adequate description of the process and implementation consistent with the requirements of Criterion XIII, “Handling, Storage and Shipping,” of Appendix B.

b.1 Policies and Procedures for Handling, Storage, and Shipping

Policy number Q-13.1 of the Bechtel NQAM describes the responsibilities for housekeeping, and for control and protection of materials, components, and equipment during handling, storage, and shipping. Also, Bechtel stated in its QAPP that quality-related activities associated with handling, storage, and shipping were required to be performed in accordance with the Bechtel NQAM, with no additional modifications. The NRC audit team noted that these controls were consistent with Appendix B requirements.

Section QS-13 of the MACTEC QAM establishes requirements for assuring that methods are used in the handling, storage, preservation, packaging, and shipping of items or samples in accordance with industry standards such as ASTM.

The MACTEC QAM contained additional controls for the handling, storage and shipping of items. Samples are to be stored in a building provided by SCE&G until transferred to the laboratory for testing. The NRC audit team verified that MACTEC maintained custody of the soil samples until they were transferred to the laboratory for analysis. The NRC audit team reviewed the MACTEC geotechnical work plan. Attachment 7 of the geotechnical work plan describes the controls for the handling, shipping and storage of soil samples. The NRC audit team noted that MACTEC required the use of ASTM D4220, “Standard Practices for Preserving and Transporting Soil Samples,” to control and preserve, transport, and handle the samples.

b.2 Implementation of Sub-Supplier Programs for Handling, Storage, and Shipping

The NRC audit team also verified the controls implemented by MACTEC’s laboratory and one of MACTEC’s subcontractors, Severn Trent Laboratories. Review of two MACTEC Nonconformance and Corrective Action Reports (NCARs) showed that MACTEC had identified deficiencies concerning documentation and labeling of samples and implemented corrective actions to correct the deficiencies in accordance with the applicable procedures. The NRC audit team determined that controls had been implemented for handling and storage of soil samples.

The NRC staff also observed during the site visit conducted on June 22, 2006, that disturbed and undisturbed samples were properly stored and sealed in accordance with ASTM D4220. The NRC staff did not identify any issues.

c. Conclusions

The NRC audit team concluded that handling, storage, and shipping requirements have been appropriately translated into implementing procedures and, for those activities reviewed by the NRC audit team, implemented as required by the applicant’s and/or its sub-supplier’s procedures to support the Summer COLA development program. The NRC audit team did not

identify any issues in this area requiring additional action by the applicant prior to completion of the COLA.

3.9 CORRECTIVE ACTIONS

a. Audit Scope

The NRC audit team reviewed the corrective action process associated with the preparation of the SCE&G COLA. Specifically, the NRC audit team reviewed the policies and controlling procedures associated with the project, and reviewed the status of all corrective actions, which are predominately identified through the audits and surveillances.

b. Observations

The NRC audit team reviewed the SCE&G, Bechtel, MACTEC, and REI policies and procedures governing the corrective action process to assure those guidelines provided an adequate description of the process and implementation consistent with the requirements of Criterion XVI, "Corrective Action," of Appendix B.

b.1 Policies and Procedures for Corrective Actions

SCE&G NND QAP stated that the NND project will develop a problem identification and resolution program using the existing database at the V.C. Summer Nuclear Station. SCE&G Procedure NND-AP-002, "Corrective Action Program," Revision 0, dated April 6, 2006, contained the requirements for the corrective action program. The responsibility for initiating condition evaluation reports belonged to all personnel and the general manager had the responsibility to ensure timeliness and completeness of corrective actions.

Bechtel Procedure No. 2QP-Q01N-1611, "Corrective Action," Revision 3, dated September 2006, prescribed the controls to ensure correction of conditions adverse to quality of safety-related items or services within Bechtel. Responsibility for determining the significance of a condition or event, initiating actions to correct adverse conditions, and determining controls to prevent reoccurrence belonged to the Quality Services department. The responsible Project Engineer performing the corrective action evaluation was responsible for evaluating whether the adverse condition was reportable under 10 CFR Part 21. Verification of the acceptability and completion of corrective actions were the responsibility of the Quality Services department.

Documentation of corrective action(s) included: (1) description of the identified deficiency; (2) recommended actions; (3) actions taken to correct the deficiency; (4) potential reportability; and (5) verification of actions. Upon verification that immediate actions and applicable recurrence controls had been completed, the Corrective Action Report could be closed out by the Quality Services department. The report and related correspondence were retained in accordance with Quality Services procedure.

Requirements for the corrective action programs for both MACTEC and REI were contained in the sub-contractors respective Quality Assurance Manuals.

b.2 Corrective Action Status

The NRC audit team reviewed corrective action tracking logs for SCE&G, Bechtel, MACTEC, and REI. Twenty corrective action reports out of the 92 completed and in-process corrective actions were reviewed by the NRC audit team. None of the corrective action reports identified deficiencies as significant or reportable under 10 CFR Part 21. The NRC audit team determined that these corrective action reports were adequately addressed; the reports were found to adequately document the issues; corrective actions were determined to appropriately address the identified conditions; and closure and verification were adequately documented.

At the time of the audit, all corrective action reports had been closed or were in the response process in accordance with the applicable procedures. For two corrective actions issued by Bechtel, the corrective action status was listed as open on the tracking log after the assigned due date. In both instances, responses to the corrective action report by the personnel responsible for the corrective action indicated later due dates, however, the official due date was not updated in the database. The NRC audit team concluded that, in both instances, the incorrect due date for corrective actions in the database did not affect the quality of the COLA.

The NRC audit team reviewed one open corrective action issued by Bechtel that referenced an issue in which a subcontractor had not submitted the required nonconformance and corrective action reports (NCAR) to Bechtel for review and approval prior to proceeding to use item in a “use-as-is” or “repair” condition. The NRC audit team conducted interviews with Bechtel personnel which indicated that 17 NCARs were submitted to Bechtel by the subcontractor in response to this issue. At the time of the audit, Bechtel had reviewed 13 of the NCARS and all were found to be acceptable and did not create a challenge to quality of the COLA. The NRC audit team concluded that Bechtel’s response and further planned corrective actions to the issue identified were adequate and in accordance with procedures.

c. Conclusions

The NRC audit team concluded that the requirements for corrective actions have been appropriately translated into implementing procedures and, for those activities reviewed by the NRC audit team, implemented as required by the applicant’s and/or its sub-supplier’s procedures to support the Summer COLA development program. The NRC audit team did not identify any issues requiring additional action by the applicant prior to completion of the COLAs.

3.10 QUALITY ASSURANCE RECORDS

a. Audit Scope

The NRC audit team reviewed Bechtel’s QA program record controls to verify that the QA program provides for the preparation of sufficient records to furnish documentary evidence of activities affecting quality. Specifically, the NRC audit team verified that the QA program provides for the administration, identification, receipt, storage, preservation, safekeeping, retrieval, and disposition of all records. Also, the audit team verified that the procedures and policies were developed to adequately implement the requirements for record retention.

b. Observations

The NRC audit team reviewed the Bechtel policies and procedures governing quality assurance records to assure those guidelines provided an adequate description of the process and implementation consistent with the requirements of Criterion XVII, "Quality Assurance Records," of Appendix B.

b.1 Policies and Procedures for Quality Assurance Records

At the time of the audit, SCE&G did not have an approved record management program for NND. The NRC audit team conducted interviews with SCE&G personnel and determined that SCE&G was developing a record-management system to address the plant operations and regulatory requirements for Summer Units 2 and 3. At the time of the audit, SCE&G did not control or maintain any quality assurance records related to the Summer COLA. All records for the Summer COLA project were controlled and maintained by Bechtel within the Bechtel document control and records management system. SCE&G will receive the relevant QA records for storage and management after its record management program and procedures have been established and implemented.

The Bechtel NQAM describes the quality assurance record control and management policies in policy numbers Q-17.1, Q-17.2, and Q-17.3. These policies establish three distinct responsibilities in this area: 1) control and maintenance of QA records generated by Bechtel's in-house activities, e. g., engineering, home office procurement, and related services, 2) acceptance, and management of QA records generated by sub-tier suppliers and contractors, and 3) control, maintenance, and storage of QA records at the job site.

The Bechtel records management system is implemented though three different procedures. Procedure 2KP-K01G-00017, Revision 0, provides guidelines to ensure that records are clear, consistent, and conform to established Bechtel policy and regulatory requirements. The procedure includes checklists to assess the effectiveness of the program. Procedure 2KP-K01G-00021, Revision 4, establishes the process for the development and execution of a records retention plan, and for assuring the quality of electronic records in the Document Management System. The procedure includes tables identifying the type of document, its ownership, medium (electronic or hard copy), and required retention period. Items that are not identified or included within scope of official records, e.g., convenience files, reference materials, and drafts, are not required to be retained. Procedure 2KP-K01G-00022, Revision 0, establishes the processes and responsibilities in the development and execution of the Records Turnover Plan. This procedure is applicable to all projects under the purview of Bechtel's Frederick Execution Unit. The procedure clearly states that a turnover of records to client or other entities does not eliminate Bechtel's record retention program responsibility.

b.2 Review of Quality Assurance Records

The NRC audit team reviewed the BecInfo data related to the document control of design control packages and engineering specifications for the Summer COLA development. The NRC audit team verified that Bechtel's records management program is effectively implemented in accordance to the Bechtel policy and procedures and is consistent with the requirements of Appendix B.

c. Conclusions

The NRC audit team concluded that the QA record control requirements have been appropriately translated into implementing procedures and, for those activities reviewed by the NRC audit team, implemented as required by the applicant's and/or its sub-supplier's procedures to support the Summer COLA development program. The NRC audit team did not identify any issues requiring additional action by the applicant prior to completion of the Summer COLAs.

3.11 AUDITS

a. Audit Scope

The NRC audit team reviewed a representative sample of audits conducted by the applicant and its contractors to determine the effectiveness of the audit process and timely completion of audits. Audit findings reported by the audits were reviewed for any adverse significance they may have on the results of the COLA. Corrective actions to resolve deficiencies identified by the findings and observations were reviewed for reasonableness and timely resolution.

b. Observations

The NRC audit team reviewed the SCE&G and Bechtel policies and procedures governing the audit process to assure those guidelines provided an adequate description of the process and implementation consistent with the requirements of Criterion XVIII, "Audits," of Appendix B.

b.1 Audit Policies and Procedures

The SCE&G program for external audits and surveillances is established in section 15.4 of the SCE&G OQAP. The SCE&G Quality Supplier organization conducts external audits and surveillances of vendors and contractors to determine the conformance of their QA program with Appendix B to 10 CFR Part 50 and contract requirements. Each vendor which is required to have a formal written QA program will be audited at least once during the performance of the work, and vendors performing work over an extended period of time will be evaluated at least annually and audited on a triennial basis. Audits performed by other utilities or qualified agents may be used to satisfy these requirements provided the audits are evaluated for adequacy of scope and effectiveness. For the development of a COLA for the Summer site, SCE&G used a NUPIC audit as a basis for the contract with Bechtel Power Corporation.

The Bechtel program for quality assurance audits is established in policy number Q-18.1 of the NQAM. This policy applies to audits, conducted by the Quality Services Department, of activities performed by Bechtel personnel, subcontractors, and design consultants. QA program audits are conducted in accordance with in accordance with N45.2.12, "Requirements for Auditing of QA Programs for Nuclear Power Plants," or ANSI/ASME NQA-1, Supplement 18S-1, "Supplementary Requirements for Audits." The Bechtel program for quality assurance supplier surveillances and audits is established in policy number Q-7.2 of the NQAM. This policy applies to surveillance of supplier work when the surveillance requirement is identified in the procurement documents.

Bechtel project plans summarize and translate client procurement requirements and Bechtel policies and procedures into a controlling document for implementing safety-related activities. The QAPP for the Summer COLA plan specifies applicable corporate standards and procedures, and industry and regulatory documents that govern activities to be conducted in accordance with Appendix B to 10 CFR Part 50.

b.2 Review of Audit Activities

b.2.1 SCE&G Qualification Audit

At the time of the COL contract, Bechtel was not on the SCE&G approved supplier list as a supplier of nuclear safety related services. For the purpose of awarding the contract to Bechtel, SCE&G selected NUPIC Audit No. 19211, conducted at Bechtel's Frederick, Maryland facility from May 23-27, 2005. With the exception of three identified deficiencies, the quality program defined in the Bechtel NQAM was found to be satisfactorily implemented and to be in compliance with Appendix B to 10 CFR Part 50. The three deficiencies, in the areas of corrective actions, procurement, and design control, were determined not to have an adverse impact on products/services provided by Bechtel.

b.2.2 SCE&G Project Surveillances

SCE&G documented its observations of subsurface investigations at the Summer site during the period from April 4 through September 19, 2006. These surveillances included observations of boring, transfers of rock and soil samples, and participation in Bechtel surveillance at the MACTEC Charlotte office in May 2006, where the boring samples were being tested and analyzed. No deficiencies were documented by SCE&G personnel.

SCE&G conducted a surveillance at the Bechtel Frederick facility from July 30 - August 2, 2007 to evaluate selected COL project activities. These activities included audits and surveillances, corrective action reports, the Bechtel process for handling requests of information and the Bechtel plan for turning over records to SCE&G.

The surveillance report states that Bechtel's principal means of receiving information from SCE&G and support organizations is through requests for information (RFIs). The surveillance report found that part of the RFI process did not have guidance for revision/update to RFIs, leading to potentially inaccurate information being incorporated into the COLA. The NRC audit team asked as to the extent of the issue identified by SCE&G and the corrective actions taken to resolve the deficiencies and prevent recurrence. The NRC audit team learned that Bechtel had processed the SCE&G finding as an observation, which did not require entering it into the corrective action program and, consequently, this information was not available. Bechtel explained that its project software InfoWorks was programmed to make only the revised (i.e., current) RFI available to users and that the RFI procedure had been revised on September 17, 2007. In response to the request of the NRC audit team, the database of 207 RFIs was examined and a four other RFIs, in addition to the ten identified by the SCE&G surveillance, were identified as suspect. Based on Bechtel's evaluation of all 14 of the RFIs that had been revised or updated, SCE&G project personnel concurred that the deficiency had created no significant impact to the accuracy of the information in the COLA.

b.2.3 Bechtel Internal Audits and Surveillances

Bechtel conducted an audit of COL project activities at the Frederick office from December 13-20, 2006. The scope of the audit included review of Project Engineering, Engineering Staff, and Project Administrative activities identified as follows:

- design control and design change control,

- design input control and design interface control,

- document control,

- control of procedures, instructions, and manuals,

- procurement document control,

- corrective actions,

- QA records, including retention, retrieval, and turnover.

The audit concluded, based on scope of review, that Bechtel quality program requirements had been effectively implemented with the exception of issues documented by four corrective action reports and four observations, which did not require a formal response. The corrective action reports were related to timeliness of procedure review, completeness of and deficiencies in issuance of specifications.

Four Bechtel surveillances of activities performed at the Frederick office were reviewed by the NRC audit team. These surveillances, conducted over the period from May through September, 2007, reviewed geotechnical and hydraulic service calculations, engineering activities, and resolution of deficiencies previously identified by Bechtel audit reports, surveillance reports, and subcontractor documents. No corrective action reports were initiated as a result of these surveillances.

b.2.4 Bechtel Oversight of Subcontractors

Bechtel conducted a triennial audit at the MACTEC Charlotte facility on May 3-5, 2006 for the purpose of retaining MACTEC on its evaluated supplier list as a provider of nuclear safety-related geotechnical subsurface investigation, sampling, and laboratory testing activities. With the exception of one finding, Bechtel found that MACTEC was effectively implementing its Appendix B QA program and recommended retaining MACTEC on the Bechtel evaluated supplier list. The finding, related to contract specifications, was subsequently closed.

Bechtel conducted a triennial audit of REI on January 5-7, 2006 for the purpose of retaining REI on its evaluated supplier list as a provider of nuclear safety-related computational and expert consulting services in support of Bechtel COL projects in performance of probabilistic seismic hazard and/or sensitivity analyses. With the exception of three findings, Bechtel found that REI was effectively implementing its Appendix B QA program and recommended retaining REI on

the Bechtel evaluated supplier list. The findings, related to internal auditing, design change control, and software documentation, were subsequently closed. A Bechtel surveillance of REI COL-related activities from November 15-16, 2006, was also reviewed by the audit team.

The NRC audit team also reviewed Bechtel surveillances of MACTEC COL site activities during the period from May 1 - May 12, 2006 and MACTEC laboratory testing activities at the MACTEC Charlotte laboratory in August 2006 and at the MACTEC Atlanta laboratory in September 2006. The NRC audit team reviewed Bechtel surveillances at the Savannah River National Laboratory in April 2007, where K_d partition coefficients were determined, and at Fugro Consultants, Houston, TX, where testing was conducted related to resonant column and torsional shear tests. The NRC audit team also reviewed the Bechtel surveillance of WLA in November 2006. All deficiencies resulting from the above surveillances were closed at the time of the NRC audit.

c. Conclusions

The NRC audit team concluded that the audit process requirements have been appropriately translated into implementing procedures and, for those activities reviewed by the NRC audit team, implemented as applicable by the applicant and its sub-suppliers. Audits, surveillances, and surveys conducted by SCE&G and Bechtel were satisfactory and resolution of identified deficiencies were adequately documented, tracked, and resolved in a timely manner. The NRC audit team did not identify any issues in this area requiring additional action by the applicant prior to completion of the COLA.

3.12 TRAINING AND QUALIFICATION

a. Audit Scope

The NRC audit team reviewed the QA program to verify that it provided for the indoctrination and training of personnel performing activities affecting quality to assure that proficiency was achieved and maintained. Specifically, the NRC audit team verified that the applicant, Bechtel, and associated vendors adequately implemented and maintained personnel training and qualification processes.

b. Observations

The NRC audit team reviewed the SCE&G and Bechtel policies and procedures governing training and qualification to assure those guidelines provided an adequate description of the process and implementation consistent with the requirements of Criterion II, “Quality Assurance Program,” of Appendix B.

b.1 Policies and Procedures for Test Control

SCE&G utilized its OQAP for activities related to the development of the COLA. The SCE&G OQAP provides the overall requirements for qualification, training, and certification of personnel whose activities may affect structures, systems, components and activities at SCE&G. The NRC audit team reviewed Section 13 of the SCE&G OQAP and the SCE&G NND QA Plan. These documents describe requirements for indoctrination and training of plant personnel.

Policy number Q-1.3 of the Bechtel NQAM prescribes the controls and responsibilities for the indoctrination and training of personnel performing activities affecting quality. The NQAM also states that the program shall include controls to ensure that personnel performing activities that affect quality have proficiency levels commensurate with their work requirements.

Bechtel Procedure 3DP-G05G-00034, "Quality Indoctrination/Orientation and Training," Revision 2, dated February 28, 2005, provides quality indoctrination/orientation and training requirements to ensure engineers are familiar with the Bechtel NQAM, procedures that govern the specific tasks they are expected to accomplish, and to maintain training records. Training records consist of a record of course completion, or a matrix with the individual's name, employee number, title of document, revision number, and date of training. Records are to be signed by the employee and retained as a quality record or retain a hard copy in the discipline or engineering management files.

Bechtel Procedure NOPS-3DP-G05-034, "Indoctrination and Training," Revision 1, dated May 8, 1998, defines requirements for indoctrination and training of engineering personnel assigned to or performing work under the direction of Nuclear Operating Plant Services (NOPS) projects. This procedure supplements Procedure 3DP-G05G-00034.

Section QS-20 of the MACTEC QAM establishes the requirements and the procedures for developing, implementing, and maintaining programs for training and qualification of personnel. This section provides guidance for training for project managers, engineers and scientists, and individuals involved in project-specific activities. The QAM states that training activities, including training plans, records of qualifications and certifications are to be maintained.

MACTEC QA Project Document Number 6234-06-3534, Revision 0, dated March 29, 2006, provides additional contract requirements for training and qualification of personnel. MACTEC procedure QAP 20-1, Revision 0, dated January 20, 2006, contains requirements for the qualification of personnel conducting inspections, examinations, and testing at nuclear power plants, or on materials destined for use at these plants.

Section 2.3 of the REI QA Manual provides qualification requirements of personnel involved in safety-related activities. The QA Manual also states that REI personnel working on QA-related work must attend QA training before performing QA-related activities and job responsibilities and authorities. The QA training scope included applicable codes, standards and company procedures, and applicable QA program elements.

b.2 Review of Training Activities and Records

The NRC audit team reviewed a sample of training and qualification records for SCE&G, Bechtel, MACTEC, REI, and WLA. The NRC audit team verified that individuals were properly qualified and indoctrinated to perform safety-related work. Records reviewed included training record forms, checklists, and attendance sheets. All training was documented in the appropriate training record forms in accordance with procedures. No issues were noted.

c. Conclusions

The NRC audit team concluded that the training process requirements reviewed by the NRC audit team were implemented as applicable by the applicant and its sub-suppliers. The NRC audit team did not identify any issues in this area requiring additional action by the applicant prior to completion of the COLA.

3.13 10 CFR PART 21 IMPLEMENTATION

a. Audit Scope

The NRC audit team reviewed the process for implementing 10 CFR Part 21 regulations for reporting defects and noncompliances. The review included contractual provisions imposed by SCE&G and Bechtel concerning Part 21 reporting, policy and procedures, and imposition of Part 21 requirements on sub-suppliers.

b. Observations

b.1 Contractual Imposition of Part 21 Requirements

The procurement documents associated with the preparation of the COLA for Summer impose explicit 10 CFR Part 21 requirements on the primary contractor Bechtel and its sub-suppliers. The contracts classify the procured services associated with the COLA as "nuclear safety-related" and impose standard terms and conditions for the quality program to be applied to this class.

Section 2.5 of the SCE&G QAPP states the applicable contractual requirement as follows:

> Reporting of defects and noncompliance to the NRC, in accordance with 10 CFR Part 21, shall be per the latest revision of Bechtel Power Corporation Instruction A14-01, “Reporting of Defects and Noncompliance to the Nuclear Regulatory Commission (10 CFR 21)”, Revision dated August 2007.

Bechtel Power Corporation Instruction A14-01, further states:

> Any Bechtel employee or non-Bechtel personnel seconded to a Bechtel Project and under Bechtel’s direction, supervision and control who becomes aware of a deviation or failure to comply to what may be considered a reportable defect under 10 CFR 21 must initiate the reportability evaluation process by notifying cognizant supervision.

Procurement of all safety-related services shall be in accordance with the Bechtel NQAM. All services important to safety shall be supplied under the Bechtel approved NQAM or shall be procured from sub-suppliers whose QA program has been acceptably audited and evaluated as being effectively implemented by Bechtel. Bechtel procurement documents to sub-suppliers must impose applicable QA requirements, including 10 CFR Part 21.

The NRC audit team reviewed the SCE&G procurement documents and found that they impose the above conditions on the COLA services provided by Bechtel. In addition to the above contractual requirements, the SCE&G procurement documents impose right of access conditions to contractor and subcontractor facilities and records for inspection. Also imposed are provisions for identification and disposition of nonconformances in accordance with the Bechtel NQAM.

b.2 Bechtel Program for 10 CFR Evaluating Defects and Noncompliances

Requirements and responsibilities for evaluating defects and noncompliances in accordance with the requirements of 10 CFR Part 21 are established in Bechtel Instruction A14-01, "Reporting of Defects and Noncompliance to the Nuclear Regulatory Commission (10 CFR 21)," dated August 2007. The methodology used by the Bechtel engineering group to evaluate such defects and noncompliances is contained in Bechtel Corporation Engineering (Engineering Department) Procedure 3DP-G04-0006, "Reporting Deviations, Defects, and Noncompliances to the NRC," Revision 1, dated April 2001. These procedures require evaluation and reporting to the NRC in accordance with 10 CFR Part 21, any defects and noncompliances related to a basic component or service when:

- Any Bechtel employee or non-Bechtel employee seconded to a Bechtel Project and under Bechtel's direction, supervision and control becomes aware of a deviation/failure.

- A deviation or failure to comply associated with equipment or services that is furnished by either suppliers or sub-suppliers is brought to Bechtel's attention.

- In the course of a Bechtel audit or evaluation (of services) it is determined that a deviation or failure to comply is reportable under 10 CFR Part 21.

The NRC audit team evaluated the assignment of responsibilities for reporting, evaluating, and documenting potential 10 CFR Part 21 defects and noncompliances. The NRC audit team also reviewed the processes for identifying potentially reportable problems through design review, audit reports, corrective action reports, Bechtel Engineering Deliverable Error Reports, client and subcontractor feedback, or by other methods. Reporting and record keeping requirements were also reviewed and found to be consistent with 10 CFR Part 21 requirements. Based on review of Bechtel Instruction A14-01 and Bechtel Corporation Engineering Procedure 3DP-G04-0006, the NRC audit team determined that the Bechtel 10 CFR Part 21 program met the applicable regulatory requirements, including the time requirements for evaluation and reporting.

A14-01 acknowledges that the services of design, inspection, test or consultation associated with a basic component are within the scope of 10 CFR Part 21. A14-01 further recognizes Bechtel's obligations to comply with 10 CFR Part 21 extend beyond completion of their contracted services.

The NRC audit team observed that posting requirements of 10 CFR Part 21, Section 21.6 were met and that notices were placed in various conspicuous places located in the Bechtel Frederick corporate offices. Nonconformances and corrective actions are processed through the Bechtel corrective action program, discussed in Section 3.9 of this report. Various Bechtel Engineering

Deliverable Error Reports, issued in 2007, were sampled to determine if Bechtel personnel had made a determination concerning the reportability of defects and nonconformances. The NRC audit team found that Bechtel had determined that none of the deficiencies had reached the threshold of "substantial safety hazard." The NRC audit team found determinations to be reasonable and in accordance with A14-01.

c. Conclusions

The NRC audit team concluded that the Part 21 requirements have been appropriately translated into implementing procedures and, for those activities reviewed by the audit team, implemented as required by the applicant's and/or its sub-supplier's procedures to support the Summer COLA development program. The NRC audit team did not identify any issues requiring additional action by the applicant prior to completion of the COLA.

3.14 CONSISTENCY WITH REGULATORY GUIDE 1.206, "COMBINED LICENSE APPLICATIONS FOR NUCLEAR POWER PLANTS," JUNE 2007

a. Audit Scope

The NRC audit team reviewed selected parts of the draft COLA, specifically the draft of changes to the reference COLA to create the FSAR for Summer. The NRC audit team compared the draft with the guidance contained in Regulatory Guide 1.206, Section C, Part I, "Standard Format and Content of Combined License Applications for Nuclear Power Plants - Light-Water Reactor Edition" and Part III, "Information Needed for a Combined License Application Referencing a Certified Design" (RG 1.206). The NRC audit team discussed the development of this draft with the staff of SCE&G and Bechtel.

b. Observations

The NRC audit team reviewed the SCE&G COL Project Quality Assurance Program Plan, Revision 2, dated September 29, 2007, and selected engineering department procedure instructions (EDPIs) from the Bechtel 25242-001-GPP-GGG-00001, "Project Engineering Procedures Manual (PEPM)," Revision 4, dated June 8, 2007 for the SCE&G project. Bechtel EDPI 25242-001-3DP-G04G-00022 describes the process for preparing, reviewing, and approving licensing documents. Bechtel EDPI 25242-001-3DP-G04G-00023 describes the specific processes and content for preparing the COLA and identifies the regulatory guidance on its format and content.

The NRC audit team also reviewed the SCE&G NND QAP as well as its procedures for reviewing the preparation of COLAs, including administrative procedures NND-AP-008 and NND-AP-009, "Validation Packages," Revision 1, dated December 20, 2006.

The NRC audit team reviewed the Bechtel procedure for creating each FSAR section as well as the coordination between SCE&G and Bechtel for review and acceptance of the product. These were discussed with members of SCE&G and Bechtel staff who are responsible for the work. The NRC audit team reviewed Bechtel EDPI 25242-001-3DP-G04G-00023 Section 2.1.1 for content of the COLA, Section 3.1 for completeness and accuracy of information, Section 3.2 for the framework of the COLA, Exhibit A for COL preparation, and Exhibit B for COLA FSAR preparation and DCD incorporation guidance. The NRC audit team also reviewed Bechtel

EDPI 25242-001-3DP-G04G-00022 Exhibit C for comment resolution and Exhibit D for compliance evaluation.

The NRC audit team examined samples of draft revisions to the COLA, comment sheets, basis documents, and Bechtel evaluations of compliance with regulatory guidance and requirements including RG 1.206.

Consistent with other AP1000 COL applicants, SCE&G plans to submit a COL with an expanded left margin. Annotations are inserted in this margin to identify standard and plant-specific responses to COL information items identified in the design certification document (DCD), standard and plant-specific supplemental information, and standard and plant-specific deviations from the DCD.

The NRC audit team reviewed a draft of the reference COL. Chapters of the draft Summer COLA that required either plant-specific information or additional information that is consistent for all applicants referencing the AP1000 DCD were selected for audit. The review included plant-specific changes to FSAR Chapter 2, "Site Characteristics," Chapter 8, "Electric Power," Chapter 9, "Auxiliary Systems," Chapter 10, "Steam and Power Conversion System," and Chapter 11, "Radioactive Waste Management." For most of these chapters, sections that contain deviations from or additions to the DCD were reviewed for completeness and consistency with the guidance of RG 1.206.

The NRC audit team found that SCE&G draft changes to FSAR Chapter 2 are consistent with the format and content specified in RG 1.206 while draft changes to the other chapters were consistent in format with the DCD as required by 10 CFR Part 52. The audit team reviewed Part 7 of the draft COLA, the report of departures from the DCD, which documented SCE&G's decision to follow RG 1.206 in preference to the DCD.

The NRC audit team noted that SCE&G plans no deviations from RG 1.206 or the guidance of NUREG-0800, "Standard Review Plan," other than those taken in the certified design.

At the time of this review, on the basis of project reports and confirmed by review of draft COLA material, the NRC audit team found the Summer COLA to be approximately 90 percent complete.

c. Conclusions

The NRC audit team concluded that the FSAR chapters and other parts of the Summer COLA reviewed are consistent with the format and content prescribed in RG 1.206 and will support NRC staff review in accordance with the SRP. The NRC audit team did not identify any issue related to RG 1.206 compliance that requires correction prior to COLA submittal.

4.0 ENTRANCE AND EXIT MEETINGS

In the entrance meeting on September 24, 2007, the NRC audit team discussed the scope of the audit, outlined the areas to be reviewed, and established interfaces with SCE&G, and its sub-supplier's staffs and management involved in the Summer COLA development. In the exit meeting on September 27, 2007, the NRC audit team discussed the audit activities conducted during the audit with representatives of SCE&G and its sub-supplier's management and staff.

5.0 PARTIAL LIST OF PERSONS CONTACTED

Name	Position	Organization
Cal Reid	Bechtel Licensing	Bechtel*
Amy Monroe	SCE&G Licensing	SCE&G*
Al Paglia	UGR Licensing	SCE&G***
Jim Robertson	Project Manager	Bechtel*
Tim Franchuk	QA Supervisor	SCE&G*
Rich Gallegher	Manager Quality Services	Bechtel*
Bob Whorton	Sr. Structural Engineer	SCE&G***
Christopher Gleason	Sr. QA Engineer	Bechtel*
Raj Jolly	Project QA Manager	Bechtel*
Michelle Clay	Project Administrator	Bechtel*
Thomas Hornyak	Subcontracts Manager	Bechtel*
James Claborde	SCE&G Engineering	SCE&G***
Mark Reimnitz	Bechtel Mechanical EGS	Bechtel***
L. Jan Renfro	Project Engineer	Bechtel*
Richard Louie	Licensing ER	Bechtel***
Courtney Smyth	Licensing FSAR	Bechtel***
Brian Reilly	VP Manager of Operations	Bechtel**
Lou Kummer	Sr. QA Engineer	Bechtel**
Chris Roache	QA Engineer	Bechtel**
Eugene W. Thomas	Engr. Mgr, Nuclear Projects	Bechtel**
Jeff Misner	Quality Engineer (Engr. Mgmt)	Bechtel**

* Attended entrance and exit meeting
** Attended exit meeting
*** Attended entrance meeting