Part 12

South Carolina Electric and Gas
V. C. Summer Nuclear Station, Units 2 & 3
COL Application

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V. C. Summer Nuclear Station, Units 2 and 3

COL Application

Part 12

COLA Enclosure 2 —
Seismic Technical Advisory Review Letter

Revision 0

Mr. Ronald B. Clary
General Manager, New Nuclear Deployment
South Carolina Electric & Gas Company
P. O. Box 88
Jenkinsville, South Carolina 29065

SUBJECT: *SEISMIC TECHNICAL ADVISORY GROUP REVIEW REPORT FOR THE SOUTH CAROLINA ELECTRIC & GAS COMPANY COMBINED OPERATING LICENSE APPLICATION FOR THE VIRGIL C. SUMMER NUCLEAR STATION UNITS 2 & 3*

Dear Mr. Clary:

The Seismic Technical Advisory Group (TAG) for preparation of the South Carolina Electric & Gas Company (SCE&G) Combined Operating License Application (COLA) for the Virgil C. Summer Nuclear Station (VCSNS) Units 2 & 3 has completed its review. We want to express our appreciation for the opportunity to participate in the very important VCSNS Units 2 & 3 COLA preparation. This letter report describes our participation and states our review conclusions.

TAG REVIEW PROCESS

We understand that to a significant degree seismic safety assurance is obtained through implementation of current standards of practice and our advice and recommendations for preparation of the VCSNS Units 2 & 3 COLA reflect this understanding. We participated in the preparation of the COLA as "participatory peer reviewers". Budnitz, et al., 1997[1] (now referred to as the SSHAC process) defined participatory peer review and contrasted this process to the historically more common practice of "late-stage peer review". In a participatory peer review process the reviewers interact frequently with the project throughout the work performance period. For the VCSNS Units 2 & 3 COLA preparation there was frequent interaction between the TAG and the COLA preparation team and the subject matter experts who provided inputs for the COLA. The process focused on providing timely TAG recommendations on scientific, technical, and regulatory aspects of the COLA preparation as well as on aspects of the project implementation. The very significant value of frequent TAG review is that problems are identified early when they can be corrected without the need to substantially redo work. The Nuclear Regulatory Commission (NRC) has recognized the significant benefit of a participatory review and has accepted this review process as part of the SSHAC process

[1] Budnitz, R. J., G. Apostolakis, D. M. Boore, L. S. Cluff, K. L. Coppersmith, C. A. Cornell, and P. A. Morris, 1997. *Recommendations for Probabilistic Seismic Hazard Analysis: Guidance on Uncertainty and the Use of Experts.* NUREG/CR-6372, U. S. Nuclear Regulatory Commission, Washington, DC

for assessing probabilistic seismic hazard and determination of the required site-specific seismic design basis parameters[2] [3].

Our review for the VCSNS Units 2 & 3 COLA preparation occurred primarily in four TAG review meetings, which were scheduled to coincide with specific completion stages of the work. Sequencing the review meetings in this way allowed the TAG to stay current with implementation of the work plan and to make timely recommendations. The schedule for the interactive reviews also allowed the Project and the TAG to fully consider evolving seismic practice and the seismic regulatory guidance that was being updated to reflect that practice. Activities to update seismic regulatory guidance involved Industry (through the Nuclear Energy Institute (NEI)) and NRC interactions for the purpose of updating NRC's seismic regulatory guidance with current technologies and the AP1000 Certified Design Design-Centered Working Group activities under NuStart to resolve generic seismic issues related to the AP1000 site-foundation interface. Also, we were aware that several COLA preparation activities for sites located in the Southeast were proceeding in parallel. We considered it necessary to establish a structure to manage active coordination with these important activities in order to provide fully informed recommendations for preparation of the VCSNS Units 2 & 3 COLA. Accordingly, in order to establish and maintain the needed level of coordination we recommended that SCE&G should seek to establish a formal structure that would implement broad coordination among the relevant activities.

SCE&G initiated discussions with Duke Energy, Progress Energy, Southern Nuclear Company, TVA, and NuStart for the purpose of establishing an appropriate coordination structure. These discussions resulted in formation of the AP1000 Seismic Review Committee (APSRC), a management and technical entity chartered to implement the needed coordination. APSRC established the process of combined TAG review meetings for the several affected AP1000 COLA preparation activities: Bellefonte Nuclear Station (BNS), William States Lee Nuclear Station (WSLNS), and Virgil C. Summer Nuclear Station (VCSNS). The Grand Gulf Nuclear Station (GGNS), although considering another reactor technology, also participated in these generic discussions. Through the participation of NuStart (BNS and GGNS), we were able to remain current with progress toward generic resolution foundation interface issues.

APSRC additionally established through the Nuclear Energy Institute (NEI), coordination with the New Plant Seismic Issues Resolution Program managed by the Electric Power Research Institute (EPRI). Progress toward resolution of generic seismic issues occurred in technical meetings between Industry (represented by NEI/EPRI, NuStart, and APSRC) and the NRC's seismic review staff. As resolution was reached, the NRC's meeting reports provided interim staff guidance for implementation of updated technical

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[2] NUREG-0800, *Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants*, Section 2.5.2, "Vibratory Ground Motion", U.S. Nuclear Regulatory Commission, Washington, DC

[3] Regulatory Guide 1.208, *A Performance-Based Approach to Define the Site-Specific Earthquake Ground Motion*, U.S. Nuclear Regulatory Commission, Washington, DC

procedures acceptable to the NRC. Through this multi-layered coordination we were able to participate in the resolution of technical issues related to implementation of current seismic hazard assessment and seismic design methods in regulatory practice and to factor these developments into our specific recommendations for preparation of the VCSNS Units 2 & 3 COLA. Our review of the VCSNS Units 2 & 3 COLA preparation significantly benefited from the APSRC's very effective coordination of these activities.

TAG REVIEW MEETINGS

In the first TAG meeting (June 7 - 8, 2006) we were able to review compilations and preliminary evaluations of geological, geophysical, and seismological information for the VCSNS site and region together with the planned additional site and region investigations and analyses for completing preparation of the COLA. We were able to visit the VCSNS site and observe the locations selected for the planned AP1000 units. Additionally, we were able to review the preliminary site geotechnical investigations, borehole core drills, and preliminary analysis results, together with the planned additional investigations and analysis for completing the geotechnical characterization for preparation of the COLA. Also during the first meeting we were able to review a number of technical issues related to the AP1000 foundation interface and to discuss SCE&G's planned use of a number of advances in seismic hazard and seismic analysis technologies that were then being considered by the NRC for generic updating seismic regulatory practice.

We made the following recommendations.

1. The performance goal-based method described in American Society of Civil Engineers (ASCE) Standard 43-05 is appropriate for determination of the site-specific Safe Shutdown Earthquake (SSE) ground motion for VCSNS Units 2 & 3. The performance goal-based method is a significant advancement that combines site-specific seismic hazard results with seismic design criteria to achieve a target seismic performance goal. Although not yet implemented at that time in NRC's seismic regulatory guidance, we considered the performance goal-based method to be current state of practice for determination of site-specific SSE ground motion. Also, we were aware that Exelon had recently used the performance goal-based method for determination of the site-specific SSE ground motion for the Clinton Early Site Permit (ESP) application. The NRC review staff and the Advisory Committee on Reactor Safeguards (ACRS) had accepted the method for the Clinton ESP and had recommended that the NRC initiate development of a new regulatory guide to provide guidance for generic implementation of the method.
2. Evaluation and characterization of seismic sources for the computation of probabilistic seismic hazard for the VCSNS Units 2 & 3 site should be coordinated with other utilities that are developing ESPs or COLAs for sites located in the Southeast. The goal of the coordination should be to develop consensus characterizations of seismic sources that contribute to the hazard at more than one of these sites. The consensus characterization should then be used for computation of seismic hazard at each of the affected sites.

3. The EPRI 04 Ground Motion model should be used for site-specific seismic hazard computation. This model has been used for recent ESP applications and NRC has accepted it on a site-specific basis. In addition, we expect the updated NRC regulatory guidance will include this model for generic application.
4. Rock level uniform hazard spectra should be computed for 10^{-4}, 10^{-5}, and 10^{-6} mean annual non-exceedance probabilities for use in site response analysis and for determining performance goal-based SSE ground motion at the free ground surface and the nuclear island foundation level.
5. NUREG/CR-6728 site response analysis Approach 2A/3 should be used to develop site response transfer functions. [The NRC subsequently accepted the more analytically accurate Approaches 3, and 4 for site response analysis, allowing this recommendation to be modified accordingly.]
6. Observations of microseismicity associated with the Monticello Reservoir impoundment should be updated. Microseismicity began shortly after the start of filling of the Monticello Reservoir late in 1977 and was monitored and documented through 1996. Using compilations and evaluations provided by SCE&G, the NRC had previously evaluated the safety significance of this microseismicity and found it to be negligible. We concur that microseismicity associated with the Monticello Reservoir has negligible safety significance. We recommend updating the compilation only for the purpose of continuity of documentation of the process to date.
7. SCE&G should initiate discussions with other utilities that are currently preparing COLAs for sites located in the Southeast for the purpose of establishing active formal coordination to achieve consistent implementation of updated technical methods. The coordination should ensure that momentum in addressing current generic technical issues is maintained and that closure of the issues with the NRC is achieved in a time frame that supports preparation of the COLA. The NuStart AP1000 Design-Centered Working Group is addressing many of the same generic issues and should participate in the coordination. We identified the following technical and implementation issues

    - Coordinated treatment of seismic source models for PSHA across sites
    - Consistent approaches for site geotechnical investigations and characterization
    - Consistent use of SSE ground motion response spectra for development of site control response spectra and response spectra for foundation levels of structures
    - Development of consistent approaches for treatment of high spectral amplitude values at high response spectra frequencies on structures and equipment
    - Consistent location of seismic instrumentation that will be used for determining Operating Basis Earthquake exceedance – compliance with regulatory requirements and guidance.

Based on our initial recommendations, the VCSNS TAG review meetings No. 2, 3 and 4 were held in combination with TAG meetings for the BNS, WSLNS, GGNS COLA preparations. In these meetings we were able to review progress toward preparation of the COLA together with progress toward resolution of AP1000 foundation interface

issues as well as progress toward resolving foundation interface issues for the ESBWR, the certified design technology selected for the GGNS COLA.

During TAG review meeting No 2 held on January 30, 2007, we were able to review the results of the site geotechnical characterization and the layout of the two units, the excavation and backfill plan, and presentations of draft Safety Analysis Report Sections 2.5.1 and 2.5.2. We additionally discussed plans for updating reservoir-induced microseismicity observations and documentation of shear fractures expected to be found in the Units 2 and 3 foundations based the results of the geotechnical site characterization and the shear fractures found in the existing VCSNS Unit 1 foundation. We observed that the Project team had satisfactorily implemented our prior recommendations as well as the NRC staff interim guidance on use of updated technical methods provided in their summaries of Industry-NRC staff generic issue resolution meetings held on September 12, 2006 and December 14, 2006.

Also during TAG review meeting No. 2 we were able to review progress toward resolution of foundation-site interface generic issues for the AP1000 Certified Design technology. Westinghouse proposed to perform an analysis using a recently developed site-specific ground motion response spectrum (GMRS[4]) for the BNS site and to use the analysis for the three hard rock sites: BNS, VCSNS, and WSLNS. The AP1000 units at these three sites will be founded on hard rock with very nearly the same seismic shear-wave velocity profiles, approximately 9200 fps at the foundation level. The BNS GMRS was selected for the analysis because it was determined to be the bounding spectra for the three sites. We agreed with the proposal to perform a generic analysis for the three hard rock sites, but we recommended that Westinghouse should perform the analysis using the GMRS more recently derived for the BNS COLA. We observed that while the three sites have nearly the same shear-wave velocity profiles there are some variations. We recommended that a sensitivity analysis should be performed to determine whether the variations are significant. We also observed that a number of AP1000 foundation interface generic issues remain open pending further planned interactions with the NRC staff.

During TAG meeting No. 3 on June 21, 2007, we were able to review content presentations of the geology, seismology, and geotechnical engineering sections of the COLA Safety Evaluation Report (SRP) Sections 2.5.1 through 2.5.5. We observed that the assessments described in these sections appropriately implement NRC's updated seismic regulatory guidance (Regulatory Guide 1.208 and SRP Chapter 2.5) and the TAG implementation recommendations, and we endorse the proposed presentations of these sections and the conclusions. For determination of Operating Basis Earthquake (OBE)

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[4] In the Industry-NRC staff meeting on New Plant Seismic Issues Resolution on December 14, 2006, NRC agreed with the need for a distinction between the performance goal-based site-specific ground motion and site-independent certified seismic design response spectra (CSDRS) that have been approved for standard design certification. The GMRS satisfies the site-specific SSE Ground Motion requirements of 10 CFR Part 100.23.

exceedance based on CAV, appropriate seismic instrumentation placed in a light structure within the controlled area of the plant adequately meets the NRC's regulatory guidance as well as the interim guidance provided by the staff following the Industry-NRC generic seismic issue resolution meeting on May 31, 2007 for free-field instrumentation. We noted that several items remain to be completed: dynamic testing of soil samples, foundation input response spectra (FIRS) for the Annex Building, and sensitivity of the GMRS to the New Madrid Seismic Source.

During the fourth (and final) TAG review meeting on August 31, 2007, we were able to review the several incomplete items from TAG meeting No. 3. We concur with the results developed to complete these items for preparation of the COLA. The sensitivity study showed that the New Madrid Seismic Source has a non-negligible contribution to the GMRS at the VCSNS site and the source was included in the analysis. We consider the planned number of dynamic soil tests for the site to be sufficient. We recommend however, that these site-specific testing results should be compared with Industry generic test results..

CONCLUSIONS

- Preparation of the VCSNS Units 2 & 3 COLA properly implemented state of practice technical methods and procedures in compliance with NRC's updated seismic regulatory guidance and interim staff guidance.

- Coordination of the VCSNS Units 2 & 3 COLA preparation with concurrent preparation of COLA for Bellefonte Nuclear Station (BNS), William States Lee Nuclear Station (WSLNS), and Grand Gulf Nuclear Station (GGNS) and with Industry-NRC generic seismic issue resolution activities was particularly effective and productive.

- We concur with the results and conclusions presented in the Safety Analysis Report supporting the COLA and consider them to be appropriately and adequately supported by the data and analysis presented.

Sincerely,

C. Allin Cornell

Martin C. Chapman

Robert P. Kennedy

Donald P. Moore

J. Carl Stepp

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South Carolina Electric and Gas
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SCE&G® A SCANA COMPANY

Quality Assurance Program Description

Title: South Carolina Electric & Gas Co.
V. C. Summer Units 2 and 3 Quality Assurance Program Description

Process/Program Owner: **Senior Vice President, Nuclear Operations**

	Version Number	Effective Date
	Revision 2	

Revision Summary

Document revised to incorporate RAI responses and changes to NEI 06-14A, Rev 7 and its SER, dated November 03, 2009.

Prepared By/Date:

_____ / 8/9/2010
Manager, Quality Systems, New Nuclear Deployment

Reviewed By/Date:	Approved By/Date:
_____ / 8/9/10	_____ / 8/9/10
Vice President, New Nuclear Deployment	Senior Vice President, Nuclear Operations

SOUTH CAROLINA ELECTRIC & GAS CO.

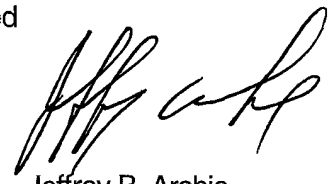
POLICY STATEMENT

South Carolina Electric & Gas Co. (SCE&G) shall design, procure, construct and operate the nuclear plants in a manner that will ensure the health and safety of the public and workers. These activities shall be performed in compliance with the requirements of the Code of Federal Regulations (CFR), the applicable Nuclear Regulatory Commission (NRC) Facility Operating Licenses, and applicable laws and regulations of the state and local governments.

The SCE&G New Nuclear Deployment Quality Assurance Program (QAP) is the Quality Assurance Program Description (QAPD) provided in this document and the associated implementing documents. Together they provide for control of SCE&G activities that affect the quality of safety-related nuclear plant structures, systems, and components (SSCs) and include all planned and systematic activities necessary to provide adequate confidence that such SSCs will perform satisfactorily in service. The QAPD may also be applied to certain equipment and activities that are not safety-related, but support safe plant operations, or where other NRC guidance establishes program requirements.

The QAPD is the top-level policy document that establishes the manner in which quality is to be achieved and presents SCE&G's overall philosophy regarding achievement and assurance of quality. Implementing documents assign more detailed responsibilities and requirements and define the organizational interfaces involved in conducting activities within the scope of the QAP. Compliance with the QAPD and implementing documents is mandatory for personnel directly or indirectly associated with implementation of the SCE&G QAP.

Signed



Jeffrey B. Archie
Senior Vice President, Nuclear Operations
SCE&G

Date 8/9/10

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FIGURES

PART I INTRODUCTION

SECTION 1 GENERAL

South Carolina Electric & Gas Co. New Nuclear Deployment Quality Assurance Program Description (QAPD) is the top-level policy document that establishes the quality assurance policy and assigns major functional responsibilities for COL/construction/pre-operation and operation activities conducted by or for SCE&G. The QAPD describes the methods and establishes quality assurance (QA) and administrative control requirements that meet 10 CFR 50, Appendix B and 10 CFR 52. The QAPD is based on the requirements of ASME NQA-1-1994, "Quality Assurance Requirements for Nuclear Facility Applications," Parts I, II and III, as specified in this document.

The QA Program (QAP) is defined by the NRC-approved regulatory document that describes the QA elements (i.e. the QAPD), along with the associated implementing documents. Procedures and instructions that control New Nuclear Deployment activities will be developed prior to commencement of those activities. Policies establish high level responsibilities and authority for carrying out important administrative functions which are outside the scope of the QAPD. Procedures establish practices for certain activities which are common to all SCE&G organizations performing those activities so that the activity is controlled and carried out in a manner that meets QAPD requirements. Procedures specific to a site, organization, or group establish detailed implementation requirements and methods, and may be used to implement policies or be unique to particular functions or work activities.

1.1 Scope/Applicability

The QAPD applies to COL, construction/pre-operation and operations activities affecting the quality and performance of safety-related structures, systems, and components, including, but not limited to:

Designing	Testing	Operating	Repairing	Refueling
Constructing	Pre-operational activities (including ITAAC)	Maintaining	Training	Shipping
Procuring		Receiving	Decommissioning	
Fabricating	Licensing	Storing	Modifying	
Cleaning	Startup	Erecting	Inspecting	
Handling		Installing		

Safety-related SSCs, under the control of the QAPD, are identified by design documents. The technical aspects of these items are considered when determining program applicability, including, as appropriate, the item's design safety function. The QAPD may be applied to certain activities where regulations other than 10 CFR 50 and 10 CFR 52 establish QA requirements for activities within their scope.

The policy of SCE&G is to assure a high degree of availability and reliability of the nuclear plants while ensuring the health and safety of its workers and the public. To this end, selected elements of the QAPD are also applied to certain equipment and activities that are not safety-related, but support safe, economic, and reliable plant operations, or where other NRC guidance establishes quality assurance requirements. Implementing documents establish program element applicability.

The definitions provided in ASME NQA-1-1994, Part I, Section 1.4, apply to select terms as used in this document.

PART II QAPD DETAILS

SECTION 1 ORGANIZATION

This Section describes the SCE&G organizational structure, functional responsibilities, levels of authority and interfaces for establishing, executing, and verifying QAPD implementation. The organizational structure includes support/off-site and on-site functions for New Nuclear Deployment including interface responsibilities for multiple organizations that perform quality-related functions. Implementing documents assign more specific responsibilities and duties, and define the organizational interfaces involved in conducting activities and duties within the scope of the QAPD. Management gives careful consideration to the timing, extent and effects of organizational structure changes.

SCE&G Manager, Quality Systems is responsible to size the Quality Assurance organization commensurate with the duties and responsibilities assigned.

The SCE&G New Nuclear Deployment (NND) organization is responsible for new nuclear plant licensing, engineering, procurement, construction, startup and operations development activities. There are several organizations within SCE&G which implement and support the QAPD. These organizations include, but are not limited to NND, V. C. Summer Nuclear Station Unit 1 Procurement Group, Engineering, Training, Security, Emergency Preparedness, and SCANA Corporate Services.

Engineering, Procurement and Construction services are provided to the SCE&G NND organization by two primary contractors in accordance with their QAPDs. These two contractors are Shaw Stone & Webster and Westinghouse.

The following sections describe the reporting relationships, functional responsibilities and authorities for organizations implementing and supporting the NND QA Program. The SCE&G Corporate Organization, NND Management Organization, NND Management Organization during Construction, and the Operating Plant Management Organization are shown in Figures II.1-1 through Figure II.1-4, respectively.

1.1 SCE&G Corporate Management Organization

1.1.1 SCANA Chief Executive Officer (CEO)

The Chief Executive Officer (CEO) has the ultimate responsibility for the safe and reliable operation of each nuclear unit owned and/or operated by SCE&G. The CEO is responsible for the overall direction and management of the corporation, and the execution of the company policies, activities, and affairs. The CEO is assisted by the Executive Vice President, Generation (EVPG), and other executive staff in the nuclear division of the corporation.

1.1.2 SCE&G President & Chief Operating Officer (COO)

As delegated from the CEO, the President & Chief Operating Officer (COO) is responsible for the design, construction and operations of SCE&G's nuclear plants. The COO directs the EVPG, who in turn directs the Senior Vice President of Nuclear Operations.

1.1.3 Executive Vice President, Generation (EVPG)

The EVPG reports to the CEO through the COO. The EVPG serves as the Chief Nuclear Officer (CNO) and is responsible for electric generation, overall plant nuclear safety, and takes the measures needed to provide acceptable performance of the staff in operating, maintaining, and providing technical support to the nuclear site. The EVPG/CNO delegates authority and responsibility for the operation and support of the site through the SVPNO. It is the responsibility of the EVPG/CNO to provide guidance and direction such that safety-related activities, including engineering, construction, operations, operations support, maintenance, and planning, are performed following the guidelines of the quality assurance program. The EVPG/CNO is responsible for new nuclear plant licensing, design, and construction through the SVPNO.

1.1.4 Senior Vice President, Nuclear Operations (SVPNO)

The SVPNO reports to the EVPG. The SVPNO is responsible for the safe operation of all current nuclear plant operations along with the design, licensing, and construction of new nuclear plants. The SVPNO delegates authority and responsibility for the operation and support of the operating nuclear plants through the VPNO. The SVPNO is responsible for new nuclear plant licensing, design, and construction via the VPNND who maintains control of nuclear plant construction through construction completion.

1.1.5 Vice President, New Nuclear Deployment (VPNND)

The VPNND reports to the SVPNO and directs the planning and development of the NND staff and organizational resources. The VPNND is responsible for establishing and managing the Engineering, Procurement and Construction contract (EPC) for the development of new nuclear power plants.

1.1.6 Vice President, Nuclear Operations (VPNO)

The Vice President, Nuclear Operations reports to the SVPNO and is responsible for the overall safe and efficient operation of the nuclear operating plant(s) and for the implementation of quality assurance requirements in the areas specified by the QAPD.

1.2 New Nuclear Deployment (NND)

SCE&G, New Nuclear Deployment organization is responsible for new nuclear plant licensing, engineering, procurement, construction, quality assurance, startup and operational development activities for the V.C. Summer Units 2 and 3. The NND Management Organization is shown on Figure II.1-2.

1.2.1 NND Manager, Design Engineering

The NND Manager, Design Engineering reports to the VPNND and is responsible for new nuclear plant engineering activities, including standardized plant engineering and site specific engineering activities. The NND Manager, Design Engineering is responsible for the implementation of the QAPD with regards to all new nuclear plant engineering activities.

1.2.2 NND Manager, Construction

The NND Manager, Construction reports to the VPNND and directs the Engineering, Procurement, and Construction (EPC) Contractor in all activities regarding the construction of new nuclear plants. The NND Manager, Construction is responsible for the effective implementation of the QAPD for all new nuclear plant construction activities.

1.2.3 NND Manager, Nuclear Licensing

The NND Manager, Nuclear Licensing reports to the VPNND and is responsible for all new nuclear power plant licensing activities, including COL application development and environmental permitting. The NND Manager, Nuclear licensing is responsible for the effective implementation of the QAPD for all new nuclear plant licensing activities.

1.2.4 NND Manager, Quality Systems

The NND Manager, Quality Systems reports to the VPNND for all Quality Assurance activities and is responsible for developing and maintaining the SCE&G QAPDs, evaluating compliance to the programs and managing the QA organization resources. The NND Manager, Quality Systems is also responsible for the development and verification of implementation of the QAPD described in this document. The NND Manager, Quality Systems is responsible for assuring compliance with regulatory requirements and procedures through audits and technical reviews; for monitoring organization processes to ensure conformance to commitments and licensing document requirements; for ensuring that vendors providing quality services, parts and materials to SCE&G are meeting the requirements of 10 CFR 50, Appendix B through Nuclear Procurement Issues Committee (NUPIC) or SCE&G vendor audits. The NND Manager, Quality Systems has sufficient independence from other NND priorities to bring forward issues affecting safety and quality and makes judgments regarding quality in all areas necessary regarding SCE&G's NND activities. The NND Manager, Quality Systems may make recommendations to the NND management regarding improving the quality of work processes. If the NND Manager, Quality Systems disagrees with any actions taken by the NND organization and is unable to obtain resolution, the NND Manager, Quality Systems shall inform the VPNND and bring the matter to the attention of the Executive Vice President, Generation who will determine the final disposition.

1.2.5 NND Manager, Business & Financial Services

Reporting to the VPNND, the NND Manager, Business & Financial Services is responsible for financial matters related to NND and new plant construction. When handling certain financial matters, the NND Manager, Business & Financial Services periodically interfaces with SCANA Corporate Services.

1.2.6 NND Manager, Nuclear Training

The NND Manager, Nuclear Training reports to the VPNND and is responsible for the development and implementation of all training activities for new nuclear plants.

1.2.7 NND Manager, Plant Test & Operation (PT&O)

The NND Manager, PT&O reports to the VPNND during construction. As the plant transitions into operations, the Manager, PT&O then reports General Manager, Nuclear Plant Operations (GMNPO). The Manager, PT&O is responsible for staffing the PT&O organization and managing the initial test program (ITP) including personnel, scheduling and contracts associated with the ITP. The Manager, PT&O is responsible for the effective implementation of the QAPD for all PT&O activities.

1.3 V.C. Summer Units 2 and 3 Operating Plant Management Organization

At an appropriate time, SCE&G will implement an operating organization for V.C. Summer Units 2 & 3. The proposed organizational structure is shown in Figure II.1-4 and is discussed in the sections below. The operating organization is responsible for keeping the VPNO abreast of plant conditions and verifying that the day to day operations of the plant are conducted safely and in accordance with all administrative controls including the QAPD.

1.3.1 General Manager, Nuclear Plant Operations (GMNPO)

The GMNPO reports to the VPNO, is responsible for overall safe operation of the plant, and has control over those onsite activities necessary for safe operation and maintenance of the plant including operations, maintenance and modification, and planning/outage management. Additionally, the GMNPO has overall responsibility for occupational and public radiation safety. The GMNPO is also referred to as the Plant Manager.

1.3.1.1 Manager In Charge of Units 2 and 3 Operations

The manager in charge of operations has overall responsibility for the day-to-day operation of the plant. The manager in charge of operations reports to the GMNPO and is assisted by the operations supervisor and operations support supervisor. The manager in charge of operations or the operations supervisor is SRO licensed.

1.3.1.2 Manager In Charge of Units 2 and 3 Maintenance

The manager in charge of plant maintenance is responsible for the performance of preventive and corrective maintenance and modification activities required to support operations, including compliance with applicable standards, codes, specifications, and procedures. The manager in charge of plant maintenance reports to the GMNPO and provides direction and guidance to the maintenance discipline supervisors and maintenance support staff.

1.3.1.3 Manager In Charge of Units 2 and 3 Planning / Outage

The manager in charge of planning/outage support reports to the GMNPO and is responsible for planning and scheduling refueling, maintenance, and forced outages as well as providing direction and guidance to staff members in establishing outage activities.

1.3.2 General Manager, Nuclear Support Services (GMNSS)

The GMNSS reports to the VPNO and is responsible for support functions including training, chemistry, radiation protection, emergency preparedness, and licensing. The GMNSS delegates authority and responsibility through managers in charge of each of these support functions.

1.3.2.1 Functional Manager In Charge of Nuclear Licensing

The functional manager in charge of nuclear licensing reports to the GMNSS and is responsible for providing technical direction and administrative guidance to the licensing staff for licensing activities including: maintaining the licensing basis, monitoring industry issues, tracking commitments and answering generic letters, and probabilistic risk assessment studies. The functional manager in charge of nuclear licensing is also responsible for preparing the site for special NRC inspections, interfacing with NRC inspectors, and interpreting NRC regulations.

1.3.2.2 Functional Manager In Charge of Nuclear Training

The functional manager in charge of nuclear training supervises a staff of training supervisors who coordinate the development, preparation, and presentation of training programs for nuclear plant personnel and reports directly to the GMNSS. The functional manager in charge of nuclear training is responsible for training programs at the site required for the safe and proper operation and maintenance of the plant.

1.3.2.3 Functional Manager In Charge of Emergency Services

The functional manager in charge of emergency services reports to the GMNSS and is responsible for developing and implementing the plant emergency response plan with state and local agencies. The functional manager in charge of emergency services is also responsible for developing and planning emergency drills and interfacing with the NRC for all emergency reporting matters.

1.3.2.4 Functional Manager In Charge of Chemistry / Environmental

The functional manager in charge of chemistry and environmental is responsible for developing, implementing, directing, and coordinating the chemistry, radiochemistry, and non-radiological environmental monitoring programs. This area includes overall operation of the hot lab, cold lab, and non-radiological environmental monitoring. The functional manager in charge of chemistry is responsible for developing, administering, and implementing procedures and programs that provide for effective compliance with environmental regulations. The functional manager in charge of chemistry reports to the GMNSS and directs the chemistry supervisors and chemistry technicians as assigned.

1.3.2.5 Functional Manager In Charge of Health Physics / Safety (RP)

The functional manager in charge of health physics / safety (HPS) has the direct responsibility for providing adequate protection of the health and safety of personnel working at the plant and members of the public during activities covered within the scope and extent of the license. The functional manager in charge of HPS is responsible for establishing, implementing, and enforcing the RP program; providing RP input to facility design and work planning; and supporting the plant emergency preparedness program and assigning emergency duties and

responsibilities within the RP organization. The functional manager in charge of HPS reports to the GMNSS and is assisted by the supervisors in charge of RP.

1.3.3 General Manager, Engineering Services (GMES)

The GMES is the onsite lead position for engineering and reports to the VPNO. The GMES is responsible for engineering activities related to the operation or maintenance of the plant and design change implementation support activities. The GMES directs functional managers responsible for plant support engineering, design engineering, and materials and procurement engineering.

1.3.3.1 Functional Manager In Charge of Design Engineering

The functional manager in charge of design engineering reports to the GMES and is responsible for resolving design issues, onsite development of design-related change packages and plant modifications, implementing effective project management methods and procedures, including cost controls, for implementation of modifications and construction activities, managing contractors who may perform modification or construction activities, maintaining the configuration control program, and developing and maintaining accident analysis activities and programs.

1.3.3.2 Functional Manager In Charge of Plant Support Engineering

The functional manager in charge of plant support engineering reports to the GMES and supervises a technical staff of engineers and other engineering specialists and coordinates interfaces with other groups as necessary. The functional manager in charge of plant support engineering is responsible for providing direction and guidance to system engineers for monitoring the efficiency and proper operation of balance of plant and reactor systems, planning programs for improving equipment performance, reliability, or work practices; overseeing operational tests and analyzing the results; and maintaining engineering programs such as ISI/IST, valve testing, maintenance rule, piping erosion/corrosion, and equipment reliability.

1.3.3.3 Functional Manager in Charge of Materials & Procurement Engineering (M&PE)

The functional manager in charge of M&PE reports to the GMES and is responsible for all site purchasing activities. The functional manager in charge of M&PE is also responsible for providing sufficient and proper materials to support the needs of the plant and performing related activities including procedure development, procurement and materials storage, and supply system database management.

1.3.3.4 Engineer in Charge of Fire Protection

The engineer in charge of fire protection is responsible for the design, maintenance, surveillance, and quality assurance of plant fire protection features. The engineer in charge of fire protection oversees fire prevention activities including the fire brigade organization and training. The engineer in charge of fire protection reports to the GMES who has ultimate responsibility for the fire protection program of the plant.

1.3.4 General Manager, Organizational Effectiveness (GMOE)

The GMOE reports to the VPNO and is responsible for support functions including quality services, nuclear protection services (security), and organizational development and performance.

1.3.4.1 Functional Manager In Charge of Organizational Development & Performance (OD&P)

The responsibilities of the functional manager in charge of OD&P include establishing processes and procedures to facilitate identification and correction of conditions adverse to quality and implement corrective actions. The functional manager in charge of OD&P also manages the Operating Experience and Human Performance programs. The functional manager in charge of OD&P reports to the GMOE.

1.3.4.2 Functional Manager In Charge of Quality Systems

The functional manager in charge of quality systems reports to the GMOE. The functional manager in charge of quality systems directs the activities of the quality assurance (QA) and quality control (QC) organizations. The QA activities include maintaining the QAPD, coordinating the development of audit schedules, and supporting the general QA indoctrination and training for nuclear station personnel. The QC organization is responsible for inspection/testing activities to support plant operation, maintenance, and outages.

1.3.4.3 Functional Manager In Charge of Nuclear Protection Services

The functional manager in charge of nuclear protection services is responsible for the administration of the security program, the day-to-day supervision of the security guard force, and implementing and enforcing security directives, procedures, and instructions received from appropriate authorities. The functional manager in charge of nuclear protection services reports directly to the GMOE.

1.3.5 Manager in Charge of Business and Financial Services (BFS)

The manager in charge of site business is responsible for business and financial services and project management activities and reports to the VPNO.

1.4 Corporate Services

The SCANA/SCE&G Corporate Services organizations are responsible for supporting the NND organization by performing activities related to accounting, safety and health, and environmental services where applicable. These organizations will serve the NND organization through a "dotted-line" report to NND managers.

1.5 Westinghouse Electric Company, LLC

Westinghouse Electric Company, LLC provides engineering services for plant design and licensing of Units 2 and 3. These engineering services for new nuclear generation include site specific engineering and design necessary to support development of COL applications, preconstruction and construction activities.

1.6 Engineering, Procurement and Construction (EPC) Contractor

Westinghouse and Shaw Stone and Webster have formed a consortium and will serve as the Engineering, Procurement and Construction contractor for the construction of Units 2 and 3. The EPC Contractor organization and its reporting relationship to the NND Management Organization is shown on Figure II.1-3. The EPC Consortium Project Director reports to the VPNND for all matters concerning the construction of the plants. The EPC Contractor operates under an NRC approved Quality Assurance Program that meets the requirements of 10 CFR 50, Appendix B and ASME NQA-1 (1994). Major Subcontractors performing 10 CFR 50, Appendix B work are required to have appropriate quality assurance programs in place for their respective work. SCE&G provides quality oversight of the EPC Contractor and subcontractors through audits and program reviews.

The EPC Contractor is responsible for performing quality control and inspection activities. The individuals performing quality assurance and control functions for the EPC Contractor have sufficient authority and organizational independence to identify quality problems; to initiate, recommend, or provide solutions; and to verify implementation of solutions. Individuals performing quality assurance and control functions have independence from cost and schedule when opposed to safety considerations.

1.7 License Application

Bechtel Power Corporation provides engineering services for the development of the COL application. These engineering services include site specific license engineering, and design activities necessary to support development of the COL application, and planning and support for preconstruction and construction of new nuclear generation.

1.8 Authority to Stop Work

Quality assurance and inspection personnel have the authority, and the responsibility, to stop work in progress which is not being done in accordance with approved procedures or where safety or SSC integrity may be jeopardized. This extends to off-site work performed by suppliers furnishing safety-related materials and services to SCE&G.

1.9 Quality Assurance Organizational Independence

For the COL and construction, independence shall be maintained between the organization or organizations performing the checking (quality assurance and control) functions and the organizations performing the functions. This provision is not applicable to design review/verification.

1.10 NQA-1-1994 Commitment

In establishing its organizational structure, SCE&G commits to compliance with NQA-1-1994, Basic Requirement 1 and Supplement 1S-1.

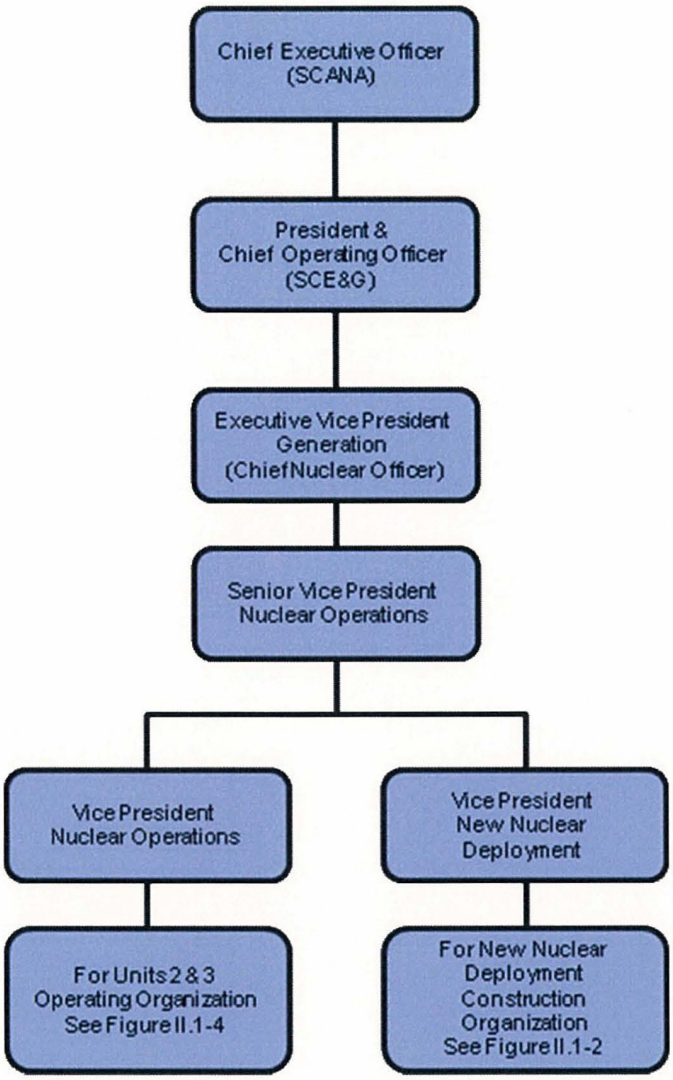
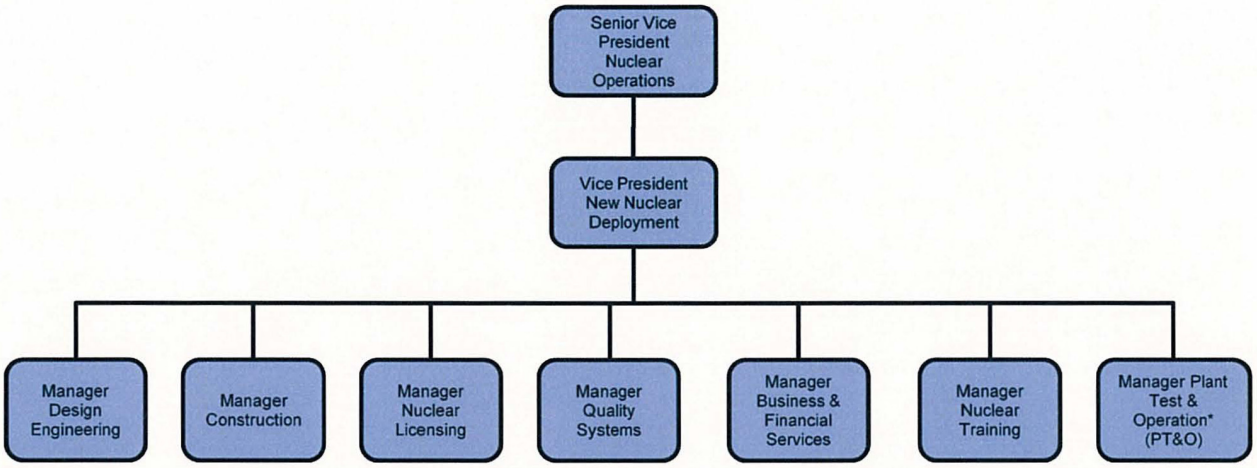
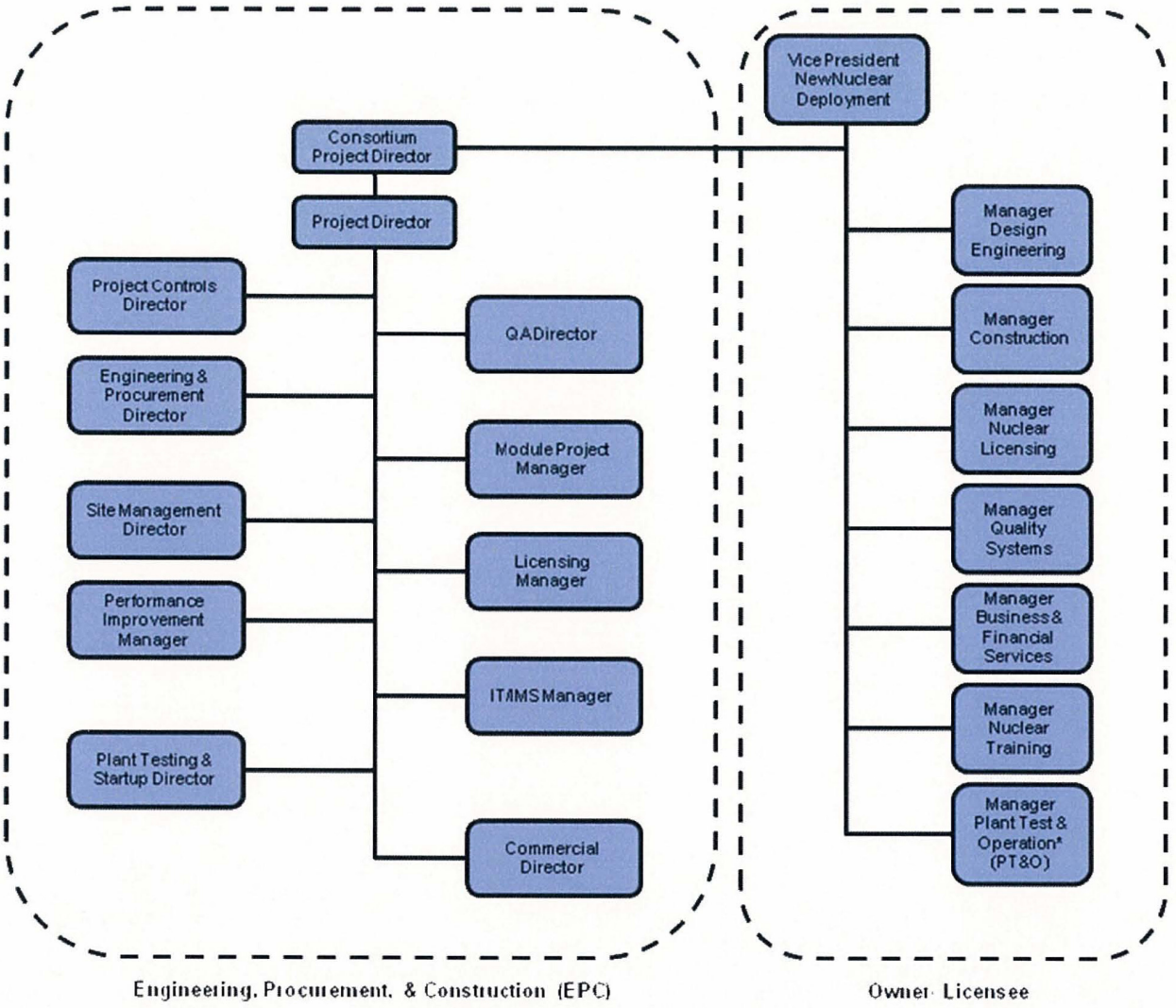


Figure II.1-1 SCE&G Corporate Organization



***During construction the functional manager, PT&O, reports to the VPNND. As the organization transitions into the operational phase, the functional manager, PT&O reports to the Plant Manager**

Figure II.1-2 NND Management Organization



*During construction the functional manager, PT&O, reports to the VPNND. As the organization transitions into the operational phase the functional manager, PT&O reports to the Plant Manager

Figure II.1-3 NND Management Organization during Construction

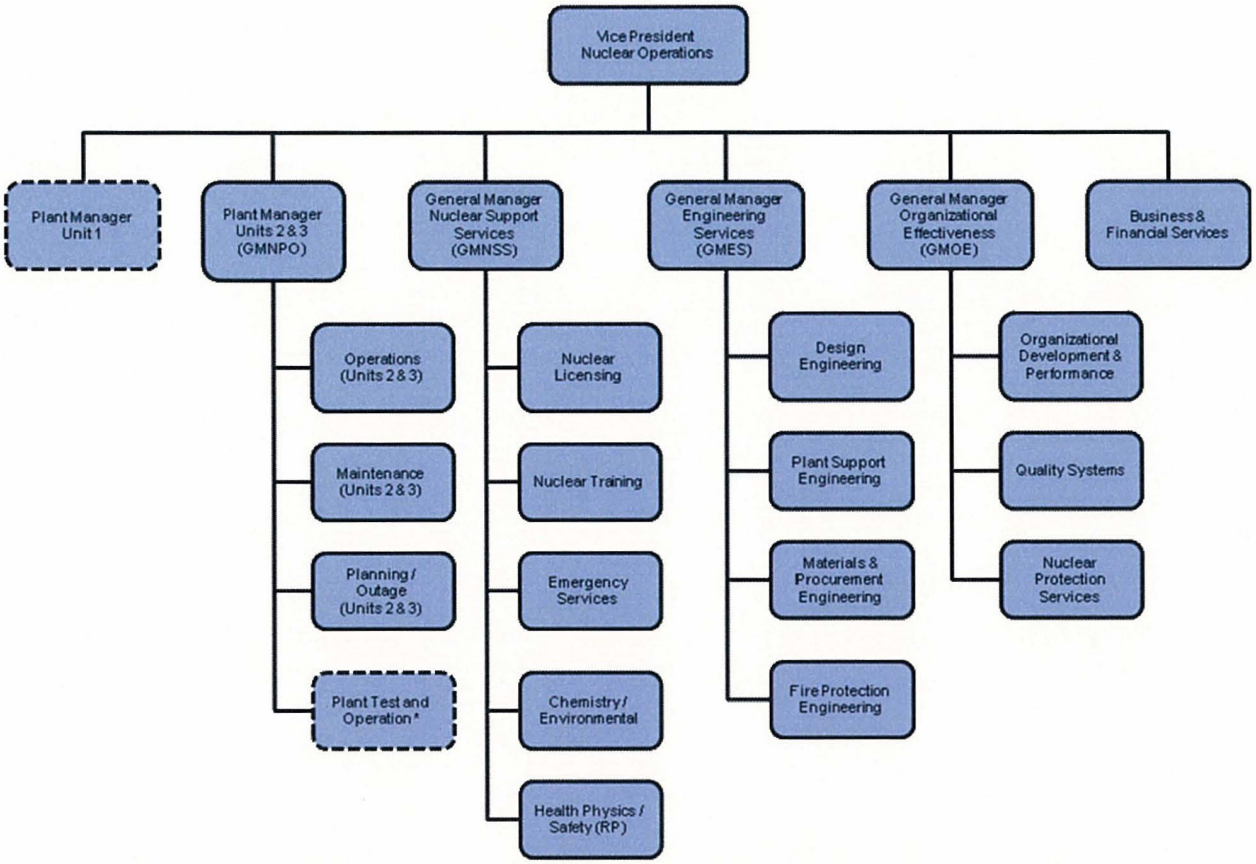


Figure II.1-4 Operating Plant Management Organization

SECTION 2 QUALITY ASSURANCE PROGRAM

SCE&G has established the necessary measures and governing procedures to implement the QAP as described in the QAPD. SCE&G is committed to implementing the QAP in all aspects of work that are important to the safety of the nuclear plants as described and to the extent delineated in the QAPD. Further, SCE&G ensures through the systematic process described herein that its suppliers of safety-related equipment or services meet the applicable requirements of 10 CFR 50, Appendix B. Senior management is regularly apprised of the adequacy of implementation of the QAPD through the audit functions described in Part II, Section 18.

The objective of the QAPD is to assure that SCE&G's nuclear generating plants are designed, constructed, and operated in accordance with governing regulations and license requirements. The program is based on the requirements of ASME NQA-1-1994, "Quality Assurance Requirements for Nuclear Facility Applications," as further described in this document. The QAPD applies to those quality-related activities that involve the functions of safety-related structures, systems, and components (SSCs) associated with the design (excluding Design Certification), licensing, fabrication, construction, testing of the SSCs of the facility, operation of new nuclear power plants, and managerial and administrative controls as described in the Final Safety Analysis Report. Examples of COL program safety-related activities include, but are not limited to, site specific engineering related to safety-related SSCs, site geotechnical investigations, site engineering analysis, seismic analysis, and meteorological analysis. A list or system that identifies SSCs and activities to which this program applies is maintained at the appropriate facility. The Design Certification Document is used as the basis for this list. Cost and scheduling functions do not prevent proper implementation of the QAPD.

As described in Part III of the QAPD, specific program controls are applied to non-safety related SSCs, for which 10 CFR 50, Appendix B, is not applicable, that are significant contributors to plant safety. The specific program controls consistent with applicable sections of the QAPD are applied to those items in a selected manner, targeted at those characteristics or critical attributes that render the SSC a significant contributor to plant safety. Delegated responsibilities may be performed under a supplier's or principal contractor's QAPD, provided that the supplier or principle contractor has been approved as a supplier in accordance with the QAPD. Periodic audits and assessments of supplier QA programs are performed to assure compliance with the supplier's or principle contractor's QAPD and implementing procedures. In addition, routine interfaces with the supplier's personnel provide added assurance that quality expectations are met.

For the COL application, the QAPD applies to those New Nuclear Deployment and SCE&G activities that can affect either directly or indirectly the safety-related site characteristics or analysis of those characteristics. In addition, the QAPD applies to engineering activities that are used to characterize the site or analyze that characterization.

New nuclear plant construction will be the responsibility of SCE&G's NND organization. Detailed engineering specifications and construction procedures will be developed to implement the QAPD and Westinghouse/Shaw Stone & Webster's QA programs prior to commencement of construction on site.

In general, the program requirements specified herein are detailed in implementing procedures that are either SCE&G implementing procedures, or supplier implementing procedures governed by a supplier quality program.

A grace period of 90 days may be applied to provisions that are required to be performed on a periodic basis unless otherwise noted. Annual evaluations and audits that must be performed on a triennial basis are examples where the 90 day general period could be applied. The grace period does not allow the "clock" for a particular activity to be reset forward. The "clock" for an activity is reset backwards by performing the activity early. Audits schedules are based on the month in which the audit starts.

2.1 Responsibilities

Personnel who work directly or indirectly for SCE&G are responsible for the achieving acceptable quality in the work covered by the QAPD. This includes the activities delineated in Part I, Section 1.1. SCE&G personnel performing verification activities are responsible for verifying the achievement of acceptable quality. Activities governed by the QAPD are performed as directed by documented instructions, procedures and drawings that are of a detail appropriate for the activity's complexity and effect on safety. Instructions, procedures and drawings specify quantitative or qualitative acceptance criteria as applicable or appropriate for the activity, and verification is against these criteria. Provisions are established to designate or identify the proper documents to be used in an activity, and to ascertain that such documents are being used. The Manager, Quality Systems is responsible to verify that processes and procedures comply with QAPD and other applicable requirements, that such processes or procedures are implemented, and that management appropriately ensures compliance.

2.2 Delegation of Work

SCE&G retains and exercises the responsibility for the scope and implementation of an effective QAPD. Positions identified in Part II, Section I, may delegate all or part of the activities of planning, establishing, and implementing the program for which they are responsible to others, but retain the responsibility for the program's effectiveness. Decisions affecting safety are made at the level appropriate for its nature and effect, and with any necessary technical advice or review.

2.3 Site Specific Safety-Related Design Basis Activities

Site-specific safety-related design basis activities are defined as those activites, including sampling, testing, data collection, and supporting engineering calculations and reports, that will be used to determine the bounding physical parameters of the site. Appropriate quality assurance measures are applied.

2.4 Periodic Review of the Quality Assurance Program

Management of those organizations implementing the QA program or portions thereof, assesses the adequacy of that part of the program for which they are responsible to assure its effective implementation at least once each year or at least once during the life of the activity, whichever is shorter.

2.5 Issuance and Revision to Quality Assurance Program

Administrative control of the QAPD will be in accordance with 10 CFR 50.55(f) and 10 CFR 50.54(a), as appropriate. Changes to the QAPD are evaluated by the Manager, Quality Systems to ensure that such changes do not degrade previously approved quality assurance controls specified in the QAPD. This document shall be revised as appropriate to incorporate additional QA commitments that may be established during the COL application development process. New revisions to the document will be reviewed, at a minimum, by the SCE&G NND Manager, Quality Systems, VPNND, and approved by the Executive Vice President, Generation.

Regulations require that the Final Safety Analysis Report (FSAR) include, among other things, the managerial and administrative controls to be used to assure safe operation, including a discussion of how the applicable requirements of Appendix B will be satisfied. In order to comply with this requirement, the FSAR references the QAPD and, as a result, the requirements of 10 CFR 50.54(a) are satisfied by and apply to the QAPD.

2.6 Personnel Qualifications

Personnel assigned to implement elements of the QAPD shall be capable of performing their assigned tasks. To this end, SCE&G establishes and maintains formal indoctrination and training programs for personnel performing, verifying, or managing activities within the scope of the QAPD to assure that suitable proficiency is achieved and maintained. Plant and support staff minimum qualification requirements are as delineated in each site's Technical Specifications. Other qualification requirements may be established but will not reduce those required by Technical Specifications. Sufficient managerial depth is provided to cover absences of incumbents. When required by code, regulation, or standard, specific qualification and selection of personnel is conducted in accordance with those requirements as established in the applicable SCE&G procedures. Indoctrination includes the administrative and technical objectives, requirements of the applicable codes and standards, and the QAPD elements to be employed. Training for positions identified in 10 CFR 50.120 is accomplished according to programs accredited by the National Nuclear Accrediting Board of the National Academy of Nuclear Training that implement a systematic approach to training. Records of personnel training and qualification are maintained.

The minimum qualifications of the Operational Manager, Quality Systems and the NND, Manager, Quality Systems are that each holds an engineering or related science degree and a minimum of four years of related experience including two years of nuclear power plant experience, one year of supervisory or management experience, and one year of the experience is in performing quality verification activities. Special requirements shall include management and supervisory skills and experience or training in leadership, interpersonal communication, management responsibilities, motivation of personnel, problem analysis and decision making, and administrative policies and procedures. Individuals who do not possess these formal education and minimum experience requirements should not be eliminated automatically when other factors provide sufficient demonstration of their abilities. These other factors are evaluated on a case-by-case basis and approved and documented by senior management.

The minimum qualifications of the individuals responsible for planning, implementing and maintaining the programs for the QAPD are that each has a high school diploma or equivalent

and has a minimum of one year of related experience. Individuals who do not possess these formal education and minimum experience requirements should not be eliminated automatically when other factors provide sufficient demonstration of their abilities. These other factors are evaluated on a case-by-case basis and approved and documented by senior management.

2.7 Independent Review

Activities occurring during the operational phase shall be independently reviewed on a periodic basis. The independent review program shall be functional prior to initial core loading. The independent review function performs the following:

a. Reviews proposed changes to the facility as described in the safety analysis report (SAR). The Independent Review Body (Plant Safety Review Committee (PSRC))/Independent Review Committee (Nuclear Safety Review Committee (NSRC)) also verifies that changes do not adversely affect safety and if a technical specification change or NRC review is required.

b. Reviews proposed tests and experiments not described in the SAR. Changes to proposed tests and experiments not described in the SAR that do require a technical specification change must be reviewed by the PSRC/NSRC prior to NRC submittal and implementation.

c. Reviews proposed technical specification changes and license amendments relating to nuclear safety prior to NRC submittal and implementation, except in those cases where the change is identical to a previously approved change.

d. Reviews violations, deviations, and events that are required to be reported to the NRC. This review includes the results of investigations and recommendations resulting from such investigations to prevent or reduce the probability of recurrence of the event.

e. Reviews any matter related to nuclear safety that is requested by the Vice President, Nuclear Operations, Plant Manager, or any PSRC/NSRC member.

f. Reviews corrective actions for significant conditions adverse to quality.

g. Reviews the adequacy of the audit program every 24 months.

Plant Safety Review Committee

The PSRC functions as an independent review body. In discharging its review responsibilities, the PSRC keeps safety considerations paramount when opposed to cost or schedule considerations. One or more organizational units may collectively perform this function.

1. PSRC reviews are supplemented as follows:

    a. A qualified person, independent of the preparer, reviews proposed changes in the procedures as described in the SAR prior to implementation of the change to determine if a technical specification change or NRC approval is required.

    b. Audits of selected changes in the procedures described in the SAR are performed to

verify that procedure reviews and revision controls are effectively implemented.

c. Competent individual(s) or group(s) other than those who performed the original design but who may be from the same organization verify that changes to the facility do not result in a loss of adequate design or safety margins.

2. The results of PSRC reviews of matters involving the safe operation of the facility are periodically independently reviewed. This review is intended to support management in identifying and resolving issues potentially affecting safe plant operation. This review supplements the existing corrective action programs and audits.

a. The review is performed by a team consisting of personnel with experience and competence in the activities being reviewed, but independent from cost and schedule considerations and from the organizations responsible for those activities. The PSRC supervisor or chairman has a minimum six (6) years combined managerial and technical support experience. The members of the PSRC should have a minimum of five years of experience in their own area of responsibility as applicable to the activities being reviewed (i.e., a minimum of five years of experience in one of the twelve areas listed below:
(1) Nuclear power plant operations
(2) Nuclear engineering
(3) Chemistry and radiochemistry
(4) Metallurgy
(5) Nondestructive testing
(6) Instrumentation and control
(7) Radiological safety
(8) Mechanical engineering
(9) Electrical engineering
(10) Administrative control and quality assurance practices
(11) Training
(12) Emergency plans and related procedures and equipment).

b. The review is supplemented by outside consultants or organizations as necessary to ensure the team has the requisite expertise and competence.

c. Results of the review are documented and reported to responsible management.

d. Management periodically consider issues they determine warrant special attention, such as deficient plant programs, declining performance trends, employee concerns, or other issues related to safe plant operations and determine what issues warrant the review.

e. Management determines the scheduling and scope of review and the composition of the team performing the review.

Nuclear Safety Review Committee

1. The NSRC is assigned independent review responsibilities.

2. The NSRC reports to a management level above the plant manager.

3. The NSRC is composed of no less than 5 persons and no more than a minority of members are from the on-site operating organization.

   For example, at least 3 of the 5 members must be from off-site if there are 5 members on the committee. A minimum of the chairman or alternative chairman and 2 members must be present for all meetings.

4. During the period of initial operation, meetings are conducted no less frequently than once per calendar quarter. Afterwards meetings are conduced no less than twice a year.

5. Results of the meeting are documented and recorded.

6. Consultants and contractors are used for the review of complex problems beyond the expertise of the off site/on site independent review committee.

7. Persons on the NSRC are qualified as follows:

   a. Supervisor or Chairman of the NSRC
      - Education: baccalaureate in engineering or related science
      - Minimum experience: 6 years combined managerial and technical support

   b. NSRC members

      Education: Baccalaureate in engineering or related science for those Independent review personnel who are required to review problems in
      - nuclear power plant operations,
      - nuclear engineering,
      - chemistry and radiochemistry,
      - metallurgy,
      - nondestructive testing,
      - instrumentation and control,
      - radiological safety,
      - mechanical engineering, and electrical engineering.

      High school diploma for those independent review personnel who are required to review problems in administrative control and quality assurance practices, training, and emergency plans and related procedures and equipment.

      Minimum experience: 5 years experience in their own area of responsibility (nuclear power plant operations, nuclear engineering, chemistry and radiochemistry, metallurgy, nondestructive testing, instrumentation and control, radiological safety, mechanical engineering, and electrical engineering, administrative control and quality assurance practices, training, and emergency plans and related procedures and equipment).

2.8 NQA-1-1994 Commitment / Exceptions

In establishing qualification and training programs, SCE&G commits to compliance with NQA-1-1994, Basic Requirement 2 and Supplements 2S-1, 2S-2, 2S-3 and 2S-4, with the following clarifications and exceptions:

- NQA-1-1994, Supplement 2S-1

  - Supplement 2S-1 will include use of the guidance provided in Appendix 2A-1 the same as if it were part of the Supplement. The following two alternatives may be applied to the implementation of this Supplement and Appendix:

    - (1) In lieu of being certified as Level I, II, or III in accordance with NQA-1-1994, personnel that perform independent quality verification inspections, examinations, measurements, or tests of material, products, or activities will be required to possess qualifications equal to or better than those required for performing the task being verified; and the verification is within the skills of these personnel and/or is addressed by procedures. These individuals will not be responsible for the planning of quality verification inspections and tests (i.e., establishing hold points and acceptance criteria in procedures, and determining who will be responsible for performing the inspections), evaluating inspection training programs, nor certifying inspection personnel.

    - (2) A qualified engineer may be used to plan inspections, evaluate the capabilities of an inspector, or evaluate the training program for inspectors. For the purpose of these functions, a qualified engineer is one who has a baccalaureate in engineering in a discipline related to the inspection activity (such as electrical, mechanical, civil) and has a minimum of five years engineering work experience with at least two years of this experience related to nuclear facilities.

- NQA-1-1994, Supplement 2S-2

  - In lieu of Supplement 2S-2, for qualification of nondestructive examination personnel, SCE&G will follow the applicable standard cited in the version(s) of Section III and Section XI of the ASME Boiler and Pressure Vessel Code approved by the NRC for use at SCE&G sites.

- NQA-1-1994, Supplement 2S-3

  - The requirement that prospective Lead Auditors have participated in a minimum of five (5) audits in the previous three (3) years is replaced by the following, "The prospective lead auditor shall demonstrate his/her ability to properly implement the audit process, as implemented by SCE&G, to effectively lead an audit team, and to effectively organize and report results, including participation in at least one nuclear audit within the year preceding the date of qualification."

SECTION 3 DESIGN CONTROL

SCE&G has established and implements a process to control the design, design changes, and temporary modifications (e.g., temporary bypass lines, electrical jumpers and lifted wires, and temporary setpoints) of items that are subject to the provisions of the QAPD. The design process includes provisions to control design inputs, outputs, changes, interfaces, records and organizational interfaces within SCE&G and with suppliers. These provisions assure that design inputs (such as design bases and the performance, regulatory, quality, and quality verification requirements) are correctly translated into design outputs (such as analyses, specifications, drawings, procedures, and instructions) so that the final design output can be related to the design input in sufficient detail to permit verification. Design change processes and the division of responsibilities for design-related activities are detailed in SCE&G and supplier procedures. The design control program includes interface controls necessary to control the development, verification, approval, release, status, distribution, and revision of design inputs and outputs. Design changes and disposition of nonconforming items as "use as is" or "repair" are reviewed and approved by the SCE&G design organization or by other organizations so authorized by SCE&G.

Design documents are reviewed by individuals knowledgeable in QA to ensure the documents contain the necessary QA requirements.

3.1 Design Verification

SCE&G design processes provide for design verification to ensure that items and activities subject to the provisions of the QAPD are suitable for their intended application, consistent with their effect on safety. Design changes are subjected to these controls, which include verification measures commensurate with those applied to original plant design.

Design verifications are performed by competent individuals or groups other than those who performed the original design but who may be from the same organization. The verifier shall not have taken part in the selection of design inputs, the selection of design considerations, or the selection of a singular design approach, as applicable. This verification may be performed by the originator's supervisor provided the supervisor did not specify a singular design approach, rule out certain design considerations, and did not establish the design inputs used in the design, or if the supervisor is the only individual in the organization competent to perform the verification. If the verification is performed by the originator's supervisor, the justification of the need is documented and approved in advance by management.

The extent of the design verification required is a function of the importance to safety of the item under consideration, the complexity of the design, the degree of standardization, the state-of-the-art, and the similarity with previously proven designs. This includes design inputs, design outputs, and design changes. Design verification procedures are established and implemented to assure that an appropriate verification method is used, the appropriate design parameters to be verified are chosen, the acceptance criteria are identified, and the verification is satisfactorily accomplished and documented. Verification methods may include, but are not limited to, design reviews, alternative calculations and qualification testing. Testing used to verify the acceptability of a specific design feature demonstrates acceptable performance under conditions that simulate the most adverse design conditions expected for item's intended use.

SCE&G normally completes design verification activities before the design outputs are used by other organizations for design work, and before they are used to support other activities such as procurement, manufacture, or construction. When such timing cannot be achieved, the design verification is completed before relying on the item to perform its intended design or safety function.

3.2 Design Records

SCE&G maintains records sufficient to provide evidence that the design was properly accomplished. These records include the final design output and any revisions thereto, as well as record of the important design steps (e.g., calculations, analyses and computer programs) and the sources of input that support the final output.

Plant design drawings reflect the properly reviewed and approved configuration of the plant.

3.3 Computer Application and Digital Equipment Software

The QAPD governs the development, procurement, testing, maintenance, and use of computer application and digital equipment software when used in safety-related applications and designated non-safety related applications. SCE&G and suppliers are responsible for developing, approving, and issuing procedures, as necessary, to control the use of such computer application and digital equipment software. The procedures require that the application software be assigned a proper quality classification and that the associated quality requirements be consistent with this classification. Each application software and revision thereto is documented and approved by authorized personnel. The QAPD is also applicable to the administrative functions associated with the maintenance and security of computer hardware where such functions are considered essential in order to comply with other QAPD requirements such as QA records.

3.4 Setpoint Control

Instrument and equipment setpoints that could affect nuclear safety shall be controlled in accordance with written instructions. As a minimum, these written instructions shall:

(1) Identify responsibilities and processes for reviewing, approving, and revising setpoints and setpoint changes originally supplied by Westinghouse, Shaw Stone & Webster, and the plant's technical staff.
(2) Ensure that setpoints and setpoint changes are consistent with design and accident analysis requirements and assumptions.
(3) Provide for documentation of setpoints, including those determined operationally.
(4) Provide for access to necessary setpoint information for personnel who write or revise plant procedures, operate or maintain plant equipment, develop or revise design documents, or develop or revise accident analyses.

3.5 NQA-1-1994 Commitment

In establishing its program for design control and verification, SCE&G commits to compliance with NQA-1-1994, Basic Requirement 3, and Supplement 3S-1, the subsurface investigations requirements contained in Subpart 2.20 and the standards for computer software contained in Subpart 2.7.

SECTION 4 PROCUREMENT DOCUMENT CONTROL

SCE&G has established the necessary measures and governing procedures to assure that purchased items and services are subject to appropriate quality and technical requirements. Procurement document changes shall be subject to the same degree of control as utilized in the preparation of the original documents. These controls include provisions such that:

- Where original technical or quality assurance requirements cannot be determined, an engineering evaluation is conducted and documented by qualified staff to establish appropriate requirements and controls to assure that interfaces, interchangeability, safety, fit and function, as applicable, are not adversely affected or contrary to applicable regulatory requirements.

- Applicable technical, regulatory, administrative, quality and reporting requirements (such as specifications, codes, standards, tests, inspections, special processes, and 10 CFR 21) are invoked for procurement of items and services. 10 CFR 21 requirements for posting, evaluating, and reporting will be followed and imposed on suppliers when applicable. Applicable design bases and other requirements necessary to assure adequate quality shall be included or referenced in documents for procurement of items and services. To the extent necessary, procurement documents shall require suppliers to have a documented QA program that is determined to meet the applicable requirements of 10 CFR 50, Appendix B, as appropriate to the circumstances of procurements (or the supplier may work under SCE&G's approved QA program).

Reviews of procurement documents shall be performed by personnel who have access to pertinent information and who have an adequate understanding of the requirements and intent of the procurement documents.

4.1 NQA-1-1994 Commitment / Exceptions

In establishing controls for procurement, SCE&G commits to compliance with NQA-1-1994, Basic Requirement 4 and Supplement 4S-1, with the following clarifications and exceptions:

- NQA-1-1994, Supplement 4S-1

  - Section 2.3 of this Supplement 4S-1 includes a requirement that procurement documents require suppliers to have a documented QAP that implements NQA-1-1994, Part 1. In lieu of this requirement, SCE&G may require suppliers to have a documented supplier QAP that is determined to meet the applicable requirements of 10 CFR 50, Appendix B, as appropriate to the circumstances of the procurement.

  - With regard to service performed by a supplier, SCE&G procurement documents may allow the supplier to work under the SCE&G QAP, including implementing procedures, in lieu of the supplier having its own QAP.

  - Section 3 of this supplement 4S-1 requires procurement documents to be reviewed prior to bid or award of contract. The quality assurance review of procurement documents is satisfied through review of the applicable procurement specification, including the technical and quality procurement

requirements, prior to bid or award of contract. Procurement document changes (e.g., scope, technical or quality requirements) will also receive the quality assurance review.

- Procurement documents for Commercial Grade Items that will be procured by SCE&G for use as safety-related items shall contain technical and quality requirements such that the procured item can be appropriately dedicated.

SECTION 5 INSTRUCTIONS, PROCEDURES, AND DRAWINGS

SCE&G has established the necessary measures and governing procedures to ensure that activities affecting quality are prescribed by and performed in accordance with instructions, procedures or drawings of a type appropriate to the circumstances and which, where applicable, include quantitative or qualitative acceptance criteria to implement the QAPD as described in the QAPD. Such documents are prepared and controlled according to Part II, Section 6. In addition, means are provided to disseminate to the staff instructions of both general and continuing applicability, as well as those of short-term applicability. Provisions are included for reviewing, updating, and canceling such procedures.

5.1 Procedure Adherence

SCE&G's policy is that procedures are followed, and the requirements for use of procedures have been established in administrative procedures. Where procedures cannot be followed as written, provisions are established for making changes in accordance with Part II, Section 6. Requirements are established to identify the manner in which procedures are to be implemented, including identification of those tasks that require: (1) the written procedure to be present and followed step-by-step while the task is being performed, (2) the user to have committed the procedure steps to memory, (3) verification of completion of significant steps, by initials or signatures or use of check-off lists. Procedures that are required to be present and referred to directly are those developed for extensive or complex jobs where reliance on memory cannot be trusted, tasks that are infrequently performed, and tasks where steps must be performed in a specified sequence.

In cases of emergency, personnel are authorized to depart from approved procedures when necessary to prevent injury to personnel or damage to the plant. Such departures are recorded describing the prevailing conditions and reasons for the action taken.

5.2 Procedure Content

The established measures address the applicable content of procedures as described in the introduction to Part II of NQA-1-1994. In addition, procedures governing tests, inspections, operational activities and maintenance will include as applicable, initial conditions and prerequisites for the performance of the activity.

5.3 NQA-1-1994 Commitment

In establishing procedural controls, SCE&G commits to compliance with NQA-1-1994, Basic Requirement 5.

SECTION 6 DOCUMENT CONTROL

SCE&G has established the necessary measures and governing procedures to control the preparation of, issuance of, and changes to documents that specify quality requirements or prescribe how activities affecting quality, including organizational interfaces, are controlled to assure that correct documents are being employed. The control systems (including electronic systems used to make documents available) are documented and provide for the following:

(a) identification of documents to be controlled and their specified distribution;

(b) a method to identify the correct document (including revision) to be used and control of superseded documents;

(c) identification of assignment of responsibility for preparing, reviewing, approving, and issuing documents;

(d) review of documents for adequacy, completeness, and correctness prior to approval and issuance;

(e) a method for providing feedback from users to continually improve procedures and work instructions; and

(f) coordinating and controlling interface documents and procedures.

The types of documents to be controlled include:

(a) drawings such as design, construction, installation, and as-built drawings;

(b) engineering calculations;

(c) design specifications;

(d) purchase orders and related documents;

(e) vendor-supplied documents;

(f) audit, surveillance, and quality verification/inspection procedures;

(g) inspection and test reports;

(h) instructions and procedures for activities covered by this QAPD including design, construction, installation, operating (including normal and emergency operations), maintenance, calibration, and routine testing;

(i) technical specifications; and

(j) nonconformance reports and corrective action reports.

During the operational phase, where temporary procedures are used, they shall include a designation of the period of time during which it is acceptable to use them.

6.1 Review and Approval of Documents

Documents are reviewed for adequacy by qualified persons other than the preparer. During the construction phase, procedures for design, construction, and installation are also reviewed by Quality Assurance to ensure quality assurance measures have been appropriately applied. The documented review signifies concurrence.

During the operations phase, documents affecting the configuration or operation of the station as described in the SAR are screened to identify those that require review by the PSRC prior to implementation as described in Part II, Section 2.

To ensure effective and accurate procedures during the operational phase, applicable procedures are reviewed, and updated as necessary, based on the following conditions:

(a) following any modification to a system;

(b) following an unusual incident, such as an accident, significant operator error, or equipment malfunction;

(c) when procedure discrepancies are found;

(d) prior to use if not used in the previous two years; or

(e) results of QA audits conducted in accordance with Part II, Section 18.1.

Prior to issuance or use, documents including revisions thereto, are approved by the designated authority. A listing of all controlled documents identifying the current approved revision, or date, is maintained so personnel can readily determine the appropriate document for use.

6.2 Changes to Documents

Changes to documents, other than those defined in implementing procedures as minor changes, are reviewed and approved by the same organizations that performed the original review and approval unless other organizations are specifically designated. The reviewing organization has access to pertinent background data or information upon which to base their approval. Where temporary procedure changes are necessary during the operations phase, changes that clearly do not change the intent of the approved procedure may be implemented provided they are approved by two members of the staff knowledgeable in the areas affected by the procedures. Minor changes to documents, such as inconsequential editorial corrections, do not require that the revised documents receive the same review and approval as the original documents. To avoid a possible omission of a required review, the type of minor changes that do not require such a review and approval and the persons who can authorize such a classification shall be clearly delineated in implementing procedures.

6.3 NQA-1-1994 Commitment

In establishing provisions for document control, SCE&G commits to compliance with NQA-1-1994, Basic Requirement 6 and Supplement 6S-1.

SECTION 7 CONTROL OF PURCHASED MATERIAL, EQUIPMENT, AND SERVICES

SCE&G has established the necessary measures and governing procedures to control the procurement of items and services to assure conformance with specified requirements. Such control provides for the following as appropriate: source evaluation and selection, evaluation of objective evidence of quality furnished by the supplier, source inspection, audit, and examination of items or services.

7.1 Acceptance of Item or Service

SCE&G establishes and implements measures to assess the quality of purchased items and services, whether purchased directly or through contractors, at intervals and to a depth consistent with the item's or service's importance to safety, complexity, quantity and the frequency of procurement. Verification actions include testing, as appropriate, during design, fabrication and construction activities. Verifications occur at the appropriate phases of the procurement process, including, as necessary, verification of activities of suppliers below the first tier.

Measures to assure the quality of purchased items and services include the following, as applicable:

- Items are inspected, identified, and stored to protect against damage, deterioration, or misuse.

- Prospective suppliers of safety-related items and services are evaluated to assure that only qualified suppliers are used. Qualified suppliers are audited on a triennial basis. In addition, if a subsequent contract or a contract modification significantly enlarges the scope of, or changes the methods or controls for, activities performed by the same supplier, an audit of the modified requirements is conducted, thus starting a new triennial period. SCE&G may utilize audits conducted by outside organizations for supplier qualification provided that the scope and adequacy of the audits meet SCE&G requirements. Documented annual evaluations are performed for qualified suppliers to assure they continue to provide acceptable products and services. Industry programs, such as those applied by ASME, Nuclear Procurement Issues Committee (NUPIC), or other established utility groups, are used as input or the basis for supplier qualification whenever appropriate. The results of the reviews are promptly considered for effect on a supplier's continued qualification and adjustments made as necessary (including corrective actions, adjustments of supplier audit plans, and input to third party auditing entities, as warranted). In addition, results are reviewed periodically to determine if, as a whole, they constitute a significant condition adverse to quality requiring additional action.

- Provisions are made for accepting purchased items and services, such as source verification, receipt inspection, pre- and post-installation tests, certificates of conformance, and document reviews (including Certified Material Test Report/Certificate). Acceptance actions/documents should be established by the Purchaser with appropriate input from the Supplier and be completed to ensure that procurement, inspection, and test requirements, as applicable, have been satisfied before relying on the item to perform its intended safety function.

- Controls are imposed for the selection, determination of suitability for intended use (critical characteristics), evaluation, receipt and acceptance of commercial-grade services or items to assure they will perform satisfactorily in service in safety-related applications.

- If there is insufficient evidence of implementation of a QA program, the initial evaluation is of the existence of a QA program addressing the scope of services to be provided. The initial audit is performed after the supplier has completed sufficient work to demonstrate that its organization is implementing a QA program.

7.2 NQA-1-1994 Commitment/Exceptions

In establishing procurement verification controls, SCE&G commits to compliance with NQA-1-1994, Basic Requirement 7 and Supplement 7S-1, with the following clarifications and exceptions:

- NQA-1-1994, Supplement 7S-1

  - SCE&G considers that other 10 CFR 50 licensees, Authorized Nuclear Inspection Agencies, National Institute of Standards and Technology, or other State and Federal agencies which may provide items or services to SCE&G plants are not required to be evaluated or audited.

  - When purchasing commercial grade calibration services from a calibration laboratory, procurement source evaluation and selection measures need not be performed provided each of the following conditions are met:

    (1) The purchase documents impose any additional technical and administrative requirements, as necessary, to comply with the SCE&G QA program and technical provisions. At a minimum, the purchase document shall require that the calibration certificate/report include identification of the laboratory equipment/standard used.

    (2) The purchase documents require reporting as-found calibration data when calibrated items are found to be out-of-tolerance.

    (3) A documented review of the supplier's accreditation will be performed and will include a verification of the following:

      - The calibration laboratory holds a domestic (United States) accreditation by any one of the following accrediting bodies, which are recognized by the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA):

        - National Voluntary Laboratory Accreditation Program (NVLAP), administered by the National Institute of Standards & Technology;

- American Association for Laboratory Accreditation (A2LA);
- ACLASS Accreditation Services (ACLASS);
- International Accreditation Service (IAS);
- Laboratory Accreditation Bureau (L-A-B);
- Other NRC-approved laboratory accrediting body.

- The accreditation encompasses ANS/ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories".
- The published scope of accreditation for the calibration laboratory covers the necessary measurement parameters, ranges, and uncertainties.

- For Section 8.1, SCE&G considers documents that may be stored in approved electronic media under SCE&G or vendor control not physically located on the plant site, but are accessible from the respective nuclear facility site as meeting the NQA-1 requirement for documents to be available at the site. Following completion of the construction period, sufficient as-built documentation will be turned over to SCE&G to support operations. The SCE&G records management system will provide for timely retrieval of necessary records.

- In lieu of the requirements of Section 10, Commercial Grade Items, controls for commercial grade items and services are established in SCE&G documents using 10 CFR 21 and the guidance of EPRI NP-5652 as discussed in Generic Letter 89-02 and Generic Letter 91-05.

  - For commercial grade items, special quality verification requirements are established and described in SCE&G documents to provide the necessary assurance an item will perform satisfactorily in service. The SCE&G documents address determining the critical characteristics that ensure an item is suitable for its intended use, technical evaluation of the item, receipt requirements, and quality evaluation of the item.

  - SCE&G will also use other appropriate approved regulatory means and controls to support SCE&G commercial grade dedication activities. SCE&G will assume 10 CFR 21 reporting responsibility for all items that SCE&G dedicates as safety-related.

SECTION 8 IDENTIFICATION AND CONTROL OF MATERIALS, PARTS, AND COMPONENTS

SCE&G has established the necessary measures and governing procedures to identify and control items to prevent the use of incorrect or defective items. This includes controls for consumable materials and items with limited shelf life. The identification of items is maintained throughout fabrication, erection, installation and use so that the item can be traced to its documentation, consistent with the item's effect on safety. Identification locations and methods are selected so as not to affect the function or quality of the item.

8.1 NQA-1-1994 Commitment

In establishing provisions for identification and control of items, SCE&G commits to compliance with NQA-1-1994, Basic Requirement 8 and Supplement 8S-1.

SECTION 9 CONTROL OF SPECIAL PROCESSES

SCE&G has established the necessary measures and governing procedures to assure that special processes that require interim process controls to assure quality, such as welding, heat treating, and nondestructive examination, are controlled. These provisions include assuring that special processes are accomplished by qualified personnel using qualified procedures and equipment. Personnel are qualified and special processes are performed in accordance with applicable codes, standards, specifications, criteria or other specially established requirements. Special processes are those where the results are highly dependent on the control of the process or the skill of the operator, or both, and for which the specified quality cannot be fully and readily determined by inspection or test of the final product.

9.1 NQA-1-1994 Commitment

In establishing measures for the control of special processes, SCE&G commits to compliance with NQA-1-1994, Basic Requirement 9 and Supplement 9S-1.

SECTION 10 INSPECTION

SCE&G has established the necessary measures and governing procedures to implement inspections that assure items, services and activities affecting safety meet established requirements and conform to applicable documented specifications, instructions, procedures, and design documents. Inspection may also be applied to items, services, and activities affecting plant reliability and integrity. Types of inspections may include those verifications related to procurement, such as source, in-process, final, and receipt inspection, as well as construction, installation, and operations activities. Inspections are carried out by properly qualified persons independent of those who performed or directly supervised the work. Inspection results are documented.

10.1 Inspection Program

The inspection program establishes inspections (including surveillance of processes), as necessary to verify quality: (1) at the source of supplied items or services, (2) in-process during fabrication at a Supplier's facility or at a Company facility, (3) for final acceptance of fabricated and/or installed items during construction, (4) upon receipt of items for a facility, as well as (5) during maintenance, modification, in-service, and operating activities.

The inspection program establishes requirements for planning inspections, such as the group or discipline responsible for performing the inspection, where inspection hold points are to be applied, determining applicable acceptance criteria, the frequency of inspection to be applied, and identification of special tools needed to perform the inspection. Inspection planning is performed by personnel qualified in the discipline related to the inspection and includes qualified inspectors or engineers. Inspection plans are based on, as a minimum, the importance of the item to the safety of the facility, the complexity of the item, technical requirements to be met, and design specifications. Where significant changes in inspection activities for the facilities are to occur, management responsible for the inspection programs evaluate the resource and planning requirements to ensure effective implementation of the inspection program.

Inspection program documents establish requirements for performing the planned inspections, and documenting required inspection information such as rejection, acceptance, and re-inspection results, and the person(s) performing the inspection.

Inspection results are documented by the inspector, reviewed by authorized personnel qualified to evaluate the technical adequacy of the inspection results, and controlled by instructions, procedures, and drawings.

10.2 Inspector Qualification

SCE&G has established qualification programs for personnel performing quality inspections. The qualification program requirements are described in Part II, Section 2. These qualification programs are applied to individuals performing quality inspections regardless of the functional group where they are assigned.

10.3 NQA-1-1994 Commitment / Exceptions

In establishing inspection requirements, SCE&G commits to compliance with NQA-1-1994, Basic Requirement 10, Supplement 10S-1 and Subpart 2.4, with the following clarification. In

addition, SCE&G commits to compliance with the requirements of Subparts 2.5 and 2.8 for establishing appropriate inspection requirements.

- Subpart 2.4 commits SCE&G to IEEE 336-1985. IEEE 336-1985 refers to IEEE 498-1985. Both IEEE 336 -1985 and IEEE 498-1985 use the definition of "Safety Systems " from IEEE 603-1980. SCE&G commits to the definition of Safety Systems in IEEE 603-1980, but does not commit to the balance of that standard. This definition is only applicable to equipment in the context of Subpart 2.4.

- An additional exception to Subpart 2.4 is addressed in Part II, Section 12 of the QAPD.

- Where inspections at the operating facility are performed by persons within the same organization (e.g. Maintenance group), SCE&G takes exception to the requirements of NQA-1-1994, Supplement 10S-1, Section 3.1, the inspectors report to quality systems management while performing those inspections.

SECTION 11 TEST CONTROL

SCE&G has established the necessary measures and governing procedures to demonstrate that items subject to the provisions of the QAPD will perform satisfactorily in service, that the plant can be operated safely and as designed, and that the coordinated operation of the plant as a whole is satisfactory. These programs include criteria for determining when testing is required, such as proof tests before installation, pre-operational tests, post-maintenance tests, post-modification tests, in-service tests, and operational tests (such as surveillance tests required by Plant Technical Specifications), to demonstrate that performance of plant systems is in accordance with design. Programs also include provisions to establish and adjust test schedules and to maintain status for periodic or recurring tests. Tests are performed according to applicable procedures that include, consistent with the effect on safety, (1) instructions and prerequisites to perform the test, (2) use of proper test equipment, (3) acceptance criteria, and (4) mandatory verification points as necessary to confirm satisfactory test completion. Test results are documented and evaluated by the organization performing the test and reviewed by a responsible authority to assure that the test requirements have been satisfied. If acceptance criteria are not met, re-testing is performed as needed to confirm acceptability following correction of the system or equipment deficiencies that caused the failure.

The initial start-up test program is planned and scheduled to permit safe fuel loading and start-up; to increase power in safe increments; and to perform major testing at specified power levels. If tests require the variation of operating parameters outside of their normal range, the limits within which such variation is permitted will be prescribed. The scope of the testing demonstrates, insofar as practicable, that the plant is capable of withstanding the design transients and accidents. For new facility construction, the suitability of facility operating procedures is checked to the maximum extent possible during the pre-operational and initial start-up test programs.

Tests are performed and results documented in accordance with applicable technical and regulatory requirements, including those described in the Technical Specifications and SAR. Test programs ensure appropriate retention of test data in accordance with the records requirements of the QAPD. Personnel that perform or evaluate tests are qualified in accordance with the requirements established in Part II, Section 2.

11.1 NQA-1-1994 Commitment

In establishing provisions for testing, SCE&G commits to compliance with NQA-1-1994, Basic Requirement 11 and Supplement 11S-1.

11.2 NQA-1-1994 Commitment for Computer Program Testing

SCE&G establishes and implements provisions to assure that computer software used in applications affecting safety is prepared, documented, verified and tested, and used such that the expected output is obtained and configuration control maintained. To this end SCE&G commits to compliance with the requirements of NQA-1-1994, Supplement 11S-2 and Subpart 2.7 to establish the appropriate provisions.

SECTION 12 CONTROL OF MEASURING AND TEST EQUIPMENT

SCE&G has established the necessary measures and governing procedures to control the calibration, maintenance, and use of measuring and test equipment (M&TE) that provides information important to safe plant operation. The provisions of such procedures cover equipment such as indicating and actuating instruments and gages, tools, reference and transfer standards, and nondestructive examination equipment. The suppliers of commercial-grade calibration services are controlled as described in Part II, Section 7.

12.1 Installed Instrument and Control Devices

For the operations phase of the facilities, SCE&G has established and implements procedures for the calibration and adjustment of instrument and control devices installed in the facility. The calibration and adjustment of these devices is accomplished through the facility maintenance programs to ensure the facility is operated within design and technical requirements. Appropriate documentation will be maintained for these devices to indicate the control status, when the next calibration is due, and identify any limitations on use of the device.

12.2 NQA-1-1994 Commitment / Exceptions

In establishing provisions for control of measuring and test equipment, SCE&G commits to compliance with NQA-1-1994, Basic Requirement 12 and Supplement 12S-1 with the following clarification and exception:

- The out of calibration conditions described in paragraph 3.2 of Supplement 12S-1 refers to when the M&TE is found out of the required accuracy limits (i.e., out of tolerance) during calibration.

- Measuring and test equipment are not required to be marked with the calibration status where it is impossible or impractical due to equipment size or configuration (such as the label will interfere with operation of the device) provided the required information is maintained in suitable documentation traceable to the device. This exception also applies to the calibration labeling requirement stated in NQA-1-1994, Subpart 2.4, Section 7.2.1 (ANSI/IEEE Std. 336-1985).

SECTION 13 HANDLING, STORAGE, AND SHIPPING

SCE&G has established the necessary measures and governing procedures to control the handling, storage, packaging, shipping, cleaning, and preservation of items to prevent inadvertent damage or loss, and to minimize deterioration. These provisions include specific procedures, when required to maintain acceptable quality of the items important to the safe operations of the plant. Items are appropriately marked and labeled during packaging, shipping, handling and storage to identify, maintain, and preserve the item's integrity and indicate the need for special controls. Special controls (such as containers, shock absorbers, accelerometers, inert gas atmospheres, specific moisture content levels and temperature levels) are provided when required to maintain acceptable quality.

Special or additional handling, storage, shipping, cleaning and preservation requirements are identified and implemented as specified in procurement documents and applicable procedures. Where special requirements are specified, the items and containers (where used) are suitably marked.

Special handling tools and equipment are used and controlled as necessary to ensure safe and adequate handling. Special handling tools and equipment are inspected and tested at specified time intervals and in accordance with procedures to verify that the tools and equipment are adequately maintained.

Operators of special handling and lifting equipment are experienced or trained in the use the equipment. During the operational phase, SCE&G establishes and implements controls over hoisting, rigging and transport activities to the extent necessary to protect the integrity of the items involved, as well as potentially affected nearby structures and components. Where required, SCE&G complies with applicable hoisting, rigging and transportation regulations and codes.

13.1 Housekeeping

Housekeeping practices are established to account for conditions or environments that could affect the quality of structures, systems and components within the plant. This includes control of cleanliness of facilities and materials, fire prevention and protection, disposal of combustible material and debris, control of access to work areas, protection of equipment, radioactive contamination control and storage of solid radioactive waste. Housekeeping practices help assure that only proper materials, equipment, processes and procedures are used and that the quality of items is not degraded. Necessary procedures or work instructions, such as for electrical bus and control center cleaning, cleaning of control consoles, and radioactive decontamination are developed and used.

13.2 NQA-1-1994 Commitment / Exceptions

In establishing provisions for handling, storage and shipping, SCE&G commits to compliance with NQA-1-1994, Basic Requirement 13 and Supplement 13S-1. SCE&G also commits, during the construction and pre-operational phase of the plant, to compliance with the requirements of NQA-1-1994, Subpart 2.1, Subpart 2.2, and Subpart 3.2, Appendix 2.1 with the following clarifications and exceptions:

NQA-1-1994, Subpart 2.2

- Subpart 2.2, section 6.6, "Storage Records:" This section requires written records be prepared containing information on personnel access. As an alternative to this requirement, SCE&G documents establish controls for storage areas that describe those authorized to access areas and the requirements for recording access of personnel. However, these records of access are not considered quality records and will be retained in accordance with the administrative controls of the applicable plant.

- Subpart 2.2, section 7.1 refers to Subpart 2.15 for requirements related to handling of items. The scope of Subpart 2.15 includes hoisting, rigging and transporting of items for nuclear power plants during construction.

NQA-1-1994, Subpart 3.2

- Subpart 3.2, Appendix 2.1: Only Section 3 precautions are being committed to in accordance with RG 1.37. In addition, a suitable chloride stress-cracking inhibitor should be added to the fresh water used to flush systems containing austenitic stainless steels.

SECTION 14 INSPECTION, TEST, AND OPERATING STATUS

SCE&G has established the necessary measures and governing procedures to identify the inspection, test, and operating status of items and components subject to the provisions of the QAPD in order to maintain personnel and reactor safety and avoid inadvertent operation of equipment. Where necessary to preclude inadvertent bypassing of inspections or tests, or to preclude inadvertent operation, these measures require the inspection, test or operating status be verified before release, fabrication, receipt, installation, test or use. These measures also establish the necessary authorities and controls for the application and removal of status indicators or labels.

In addition, temporary design changes (temporary modifications), such as temporary bypass lines, electrical jumpers and lifted wires, and temporary trip-point settings, are controlled by procedures that include requirements for appropriate installation and removal, independent/concurrent verifications and status tracking.

Administrative procedures also describe the measures taken to control altering the sequence of required tests, inspections, and other operations. Review and approval for these actions is subject to the same control as taken during the original review and approval of tests, inspections, and other operations.

14.1 NQA-1-1994 Commitment

In establishing measures for control of inspection, test and operating status, SCE&G commits to compliance with NQA-1-1994, Basic Requirement 14.

SECTION 15 NONCONFORMING MATERIALS, PARTS, OR COMPONENTS

SCE&G has established the necessary measures and governing procedures to control items, including services, that do not conform to specified requirements to prevent inadvertent installation or use. Controls provide for identification, documentation, evaluation, segregation when practical, and disposition of nonconforming items, and for notification to affected organizations. Controls are provided to address conditional release of nonconforming items for use on an at-risk basis prior to resolution and disposition of the nonconformance, including maintaining identification of the item and documenting the basis for such release. Conditional release of nonconforming items for installation requires the approval of the designated management. Nonconformances are corrected or resolved prior to depending on the item to perform its intended safety function. Nonconformances are evaluated for impact on operability of quality structures, systems, and components to assure that the final condition does not adversely affect safety, operation, or maintenance of the item or service. Nonconformances to design requirements dispositioned repair or use-as-is are subject to design control measures commensurate with those applied to the original design. Nonconformance dispositions are reviewed for adequacy, analysis of quality trends, and reports provided to the designated management. Significant trends are reported to management in accordance with SCE&G procedures, regulatory requirements, and industry standards.

15.1 Interface with the Reporting Program

SCE&G has appropriate interfaces between the QAP for identification and control of nonconforming materials, parts, or components and the non-QA Reporting Program to satisfy the requirements of 10 CFR 52, 10 CFR 50.55 and/or 10 CFR 21 during COL design and construction and 10 CFR 21 during operations.

15.2 NQA-1-1994 Commitment

In establishing measures for nonconforming materials, parts, or components, SCE&G commits to compliance with NQA-1-1994, Basic Requirement 15, and Supplement 15S-1.

SECTION 16 CORRECTIVE ACTION

SCE&G has established the necessary measures and governing procedures to promptly identify, control, document, classify and correct conditions adverse to quality. SCE&G procedures assure that corrective actions are documented and initiated following the determination of conditions adverse to quality in accordance with regulatory requirements and applicable quality standards. SCE&G procedures require personnel to identify known conditions adverse to quality. When complex issues arise where it cannot be readily determined if a condition adverse to quality exists, SCE&G documents establish the requirements for documentation and timely evaluation of the issue. Reports of conditions adverse to quality are analyzed to identify trends. Significant conditions adverse to quality and significant adverse trends are documented and reported to responsible management. In the case of a significant condition adverse to quality, the cause is determined and actions to preclude recurrence are taken.

In the case of suppliers working on safety-related activities, or other similar situations, SCE&G may delegate specific responsibilities for corrective actions but SCE&G maintains responsibility for the effectiveness of corrective action measures.

16.1 Interface with the Reporting Program

SCE&G has appropriate interfaces between the QAP for corrective actions and the non-QA Reporting Program to satisfy the requirements of 10 CFR 52, 10 CFR 50.55 and/or 10 CFR 21 during COL design and construction, and 10 CFR 21 during operations.

16.2 NQA-1-1994 Commitment

In establishing provisions for corrective action, SCE&G commits to compliance with NQA-1-1994, Basic Requirement 16.

SECTION 17 QUALITY ASSURANCE RECORDS

SCE&G has the necessary measures and governing procedures to ensure that sufficient records of items and activities affecting quality are developed, reviewed, approved, issued, used, and revised to reflect completed work. The provisions of such procedures establish the scope of the records retention program for SCE&G and include requirements for records administration, including receipt, preservation, retention, storage, safekeeping, retrieval, access controls, user privileges, and final disposition.

17.1 Record Retention

Measures are established that ensure that sufficient records of completed items and activities affecting quality are appropriately stored. Records of activities for design, engineering, procurement, manufacturing, construction, inspection and test, installation, pre-operation, start-up, operations, maintenance, modification, decommissioning, and audits and their retention times are defined in appropriate procedures. The records and retention times are based on Regulatory Position C.2 and Table 1, of Regulatory Guide 1.28, Revision 3 for design, construction, and initial start-up. Retention times for operations phase records are based on construction records that are similar in nature. In all cases where state, local, or other agencies have more restrictive requirements for record retention, those requirements will be met.

17.2 Electronic Records

When using electronic records storage and retrieval systems, SCE&G complies with NRC guidance Generic Letter 88-18, "Plant Record Storage on Optical Disks." SCE&G will manage the storage of QA Records in electronic media consistent with the intent of RIS 2000-18 and associated NIRMA Guidelines TG 11-1998, TG15-1998, TG16-1998, and TG21-1998.

17.3 NQA-1-1994 Commitment / Exceptions

In establishing provisions for records, SCE&G commits to compliance with NQA-1-1994, Basic Requirement 17 and Supplement 17S-1, with the following clarifications and exceptions:

- NQA-1-1994, Supplement 17S-1
  - Supplement 17S-1, Section 4.2(b) requires records to be firmly attached in binders or placed in folders or envelopes for storage in steel file cabinets or on shelving in containers. For hard-copy records maintained by SCE&G, the records are suitably stored in steel file cabinets or on shelving in containers, except that methods other than binders, folders or envelopes may be used to organize the records for storage.

SECTION 18 AUDITS

SCE&G has established the necessary measures and governing procedures to implement audits to verify that activities covered by the QAPD are performed in conformance with the requirements established. The audit programs are themselves reviewed for effectiveness as a part of the overall audit process.

18.1 Performance of Audits

Internal audits of selected aspects of licensing, design, construction phase and operating activities are performed with a frequency commensurate with safety significance and in a manner which assures that audits of safety-related activities are completed. During the early portions of NND activities, audits will focus on areas including, but not limited to, site investigation, procurement, and corrective action. Functional areas of an organization's QA program for auditing include, at a minimum, verification of compliance and effectiveness of implementation of internal rules, procedures (e.g., operating, design, procurement, maintenance, modification, refueling, surveillance, test, security, radiation control procedures, and the Emergency Plan), Technical Specifications, regulations and license conditions, programs for training, retraining, qualification and performance of operating staff, corrective actions, and observation of performance of operating, refueling, maintenance and modification activities, including associated record keeping.

The audits are scheduled on a formal preplanned audit schedule. The audit system is reviewed periodically and revised as necessary to assure coverage commensurate with current and planned activities. Additional audits may be performed as deemed necessary by management. The scope of the audit is determined by the quality status and safety importance of the activities being performed. These audits are conducted by trained personnel not having direct responsibilities in the area being audited and in accordance with preplanned and approved audit plans or checklists, under the direction of a qualified lead auditor and the cognizance of the NND Manager, Quality Systems.

SCE&G is responsible for conducting periodic internal and external audits. Internal audits are conducted to determine the adequacy of programs and procedures (by representative sampling), and to determine if they are meaningful and comply with the overall QAPD. External audits determine the adequacy of supplier and contractor quality assurance program.

The results of each audit are reported in writing to the Executive Vice President, Generation, or designee, as appropriate. Additional internal distribution is made to other concerned management levels in accordance with approved procedures.

Management responds to all audit findings and initiates corrective action where indicated. Where corrective action measures are indicated, documented follow-up of applicable areas through inspections, review, re-audits, or other appropriate means is conducted to verify implementation of assigned corrective action.

Audits of suppliers of safety-related components and/or services are conducted as described in Section 7.1.

18.2 Internal Audits

Internal audits of organization and facility activities, conducted prior to placing the facility in operation, should be performed in such a manner as to assure that an audit of all applicable QA program elements is completed for each functional area at least once each year or at least once during the life of the activity, whichever is shorter.

Audits may also be used to meet the periodic review requirements of the code for the Security, Emergency Preparedness, and Radiological Protection programs within the provisions of the applicable code.

Internal audits include verification of compliance and effectiveness of the administrative controls established for implementing the requirements of this QAPD; regulations and license provisions; provisions for training, retraining, qualification, and performance of personnel performing activities covered by this QAPD; corrective actions taken following abnormal occurrences; and, observation of the performance of construction, fabrication, operating, refueling, maintenance, and modification activities including associated record keeping.

18.3 NQA-1-1994 Commitment

In establishing the independent audit program, SCE&G commits to compliance with NQA-1-1994, Basic Requirement 18 and Supplement 18S-1.

PART III NON-SAFETY-RELATED SSC QUALITY CONTROL

SECTION 1 Non-safety-Related SSCs — Significant Contributors to Plant Safety

Specific program controls are applied to non-safety related SSCs, for which 10 CFR 50, Appendix B is not applicable, that are significant contributors to plant safety. The specific program controls consistent with applicable sections of the QAPD are applied to those items in a selected manner, targeted at those characteristics or critical attributes that render the SSC a significant contributor to plant safety.

The following clarify the applicability of the QA Program to the non-safety related SSCs and related activities, including the identification of exceptions to the QA Program described in Part II, Sections 1 through 18 taken for non-safety related SSCs.

1.1 Organization

The verification activities described in this part may be performed by the SCE&G line organization. The QA organization described in Part II is not required to perform these functions.

1.2 QA Program

SCE&G QA requirements for non-safety related SSCs are established in the QAPD and appropriate procedures. Suppliers of these SSCs or related services describe the quality controls applied in appropriate procedures. A new or separate QA program is not required.

1.3 Design Control

SCE&G has design control measures to ensure that the contractually established design requirements are included in the design. These measures ensure that applicable design inputs are included or correctly translated into the design documents, and deviations from those requirements are controlled. Design verification is provided through the normal supervisory review of the designer's work.

1.4 Procurement Document Control

Procurement documents for items and services obtained by or for SCE&G shall include or reference documents describing applicable design bases, design requirements, and other requirements necessary to ensure component performance. The procurement documents are controlled to address deviations from the specified requirements.

1.5 Instructions, Procedures, and Drawings

SCE&G provides documents such as, but not limited to, written instructions, plant procedures, drawings, vendor technical manuals, and special instructions in work orders, to direct the performance of activities affecting quality. The method of instruction employed provides an appropriate degree of guidance to the personnel performing the activity to achieve acceptable functional performance of the SSC.

1.6 Document Control

SCE&G controls the issuance and change of documents that specify quality requirements or prescribe activities affecting quality to ensure that correct documents are used. These controls include review and approval of documents, identification of the appropriate revision for use, and measures to preclude the use of superseded or obsolete documents.

1.7 Control of Purchased Items and Services

SCE&G employs measures, such as inspection of items or documents upon receipt or acceptance testing, to ensure that all purchased items and services conform to appropriate procurement documents.

1.8 Identification and Control of Purchased Items

SCE&G employs measures where necessary, to identify purchased items and preserve their functional performance capability. Storage controls take into account appropriate environmental, maintenance, or shelf life restrictions for the items.

1.9 Control of Special Processes

SCE&G employs process and procedure controls for special processes, including welding, heat treating, and nondestructive testing. These controls are based on applicable codes, standards, specifications, criteria, or other special requirements for the special process.

1.10 Inspection

SCE&G uses documented instructions to ensure necessary inspections are performed to verify conformance of an item or activity to specified requirements or to verify that activities are satisfactorily accomplished. These inspections may be performed by knowledgeable personnel in the line organization. Knowledgeable personnel are from the same discipline and have experience related to the work being inspected.

1.11 Test Control

SCE&G employs measures to identify required testing that demonstrates that equipment conforms to design requirements. These tests are performed in accordance with test instructions or procedures. The test results are recorded, and authorized individuals evaluate the results to ensure that test requirements are met.

1.12 Control of Measuring and Test Equipment (M&TE)

SCE&G employs measures to control M&TE use, and calibration and adjustment at specific intervals or prior to use.

1.13 Handling, Storage, and Shipping

SCE&G employs measures to control the handling, storage, cleaning, packaging, shipping, and preservation of items to prevent damage or loss and to minimize deterioration. These measures include appropriate marking or labels, and identification of any special storage or handling requirements.

1.14 Inspection, Test, and Operating Status

SCE&G employs measures to identify items that have satisfactorily passed required tests and inspections and to indicate the status of inspection, test, and operability as appropriate.

1.15 Control of Nonconforming Items

SCE&G employs measures to identify and control items that do not conform to specified requirements to prevent their inadvertent installation or use.

1.16 Corrective Action

SCE&G employs measures to ensure that failures, malfunctions, deficiencies, deviations, defective components, and nonconformances are properly identified, reported, and corrected.

1.17 Records

SCE&G employs measures to ensure records are prepared and maintained to furnish evidence that the above requirements for design, procurement, document control, inspection, and test activities have been met.

1.18 Audits

SCE&G employs measures for line management to periodically review and document the adequacy of the process, including taking any necessary corrective action. Audits independent of line management are not required. Line management is responsible for determining whether reviews conducted by line management or audits conducted by any organization independent of line management are appropriate. If performed, audits are conducted and documented to verify compliance with design and procurement documents, instructions, procedures, drawings, and inspection and test activities. Where the measures of this part (Part III) are implemented by the same programs, processes, or procedures as the comparable activities of Part II, the audits performed under the provisions of Part II may be used to satisfy the review requirements of this Section (Part III, Section 1.18).

SECTION 2 Non-safety-Related SSCs Credited for Regulatory Events

The following criteria apply to fire protection (10 CFR 50.48), anticipated transients without scram (ATWS) (10 CFR 50.62), the station blackout (SBO) (10 CFR 50.63) SSCs that are not safety-related;

- SCE&G implements quality requirements for the fire protection system in accordance with Regulatory Position 1.7, "Quality Assurance," in Regulatory Guide 1.189, "Fire Protection for Operating Nuclear Power Plants" as identified in FSAR Chapter 1.

- SCE&G implements the quality requirements for ATWS equipment in accordance with Part III, Section 1.

- SCE&G implements quality requirements for SBO equipment in accordance with Part III, Section 1. Regulatory Guide 1.155 is not applicable for the AP1000 design in accordance with certified design as shown in DCD Appendix 1A. Regulatory Guide 1.155 relates to the availability of safety related functions supported by AC power. Since AC power is not required to support the availability of safety-related functions, the guidance is not applicable.

PART IV REGULATORY COMMITMENTS

NRC Regulatory Guides and Quality Assurance Standards

This section identifies the NRC Regulatory Guides and the other quality assurance standards which have been selected to supplement and support the SCE&G QAPD. SCE&G commits to compliance with these standards to the extent described herein. Commitment to a particular Regulatory Guide or other QA standard does not constitute a commitment to the Regulatory Guides or QA standards that may be referenced therein.

Regulatory Guides:
See FSAR Chapter 1 for the SCE&G evaluation of conformance with the guidance in NRC Regulatory Guides in effect six months prior to the submittal date of the application.

Regulatory Guide 1.8, Rev. 3, May 2000, Qualification and Training of Personnel for Nuclear Power Plants

Regulatory Guide 1.8 provides guidance that is acceptable to the NRC staff regarding qualifications and training for nuclear power plant personnel.

SCE&G identifies conformance and exceptions for the applicable regulatory position guidance provided in this regulatory guide in FSAR Chapter 1, Appendix 1AA.

Regulatory Guide 1.26, Revision 4, March 2007 - Quality Group Classifications and Standards for Water-, Steam-, and Radioactive-Waste-Containing Components of Nuclear Power Plants

Regulatory Guide 1.26 defines classification of systems and components.

SCE&G identifies conformance and exceptions for the applicable regulatory position guidance provided in this regulatory guide in FSAR Chapter 1, Appendix 1AA.

Regulatory Guide 1.28, Rev. 3, August 1985, Quality Assurance Program Requirements (Design and Construction)

Regulatory Guide 1.28 describes a method acceptable to the NRC staff for complying with the provisions of Appendix B with regard to establishing and implementing the requisite quality assurance program for the design and construction of nuclear power plants.

SCE&G identifies conformance and exceptions for the applicable regulatory position guidance provided in this regulatory guide in FSAR Chapter 1, Appendix 1AA.

Regulatory Guide 1.29, Revision 4, March 2007 - Seismic Design Classification

Regulatory Guide 1.29 defines systems required to withstand a safe shutdown earthquake (SSE).

SCE&G identifies conformance and exceptions for the applicable regulatory position guidance provided in this regulatory guide in FSAR Chapter 1, Appendix 1AA.

Regulatory Guide 1.33, Rev. 2, February 1978, Quality Assurance Program Requirements (Operations)

Regulatory Guide 1.33 describes a method acceptable to the NRC staff for complying with the Commission's regulations with regard to overall quality assurance program requirements for operation phase of nuclear power plants.

SCE&G identifies conformance and exceptions for the applicable regulatory position guidance provided in this regulatory guide in FSAR Chapter 1, Appendix 1AA.

Regulatory Guide 1.37, Revision 1, March 2007 - Quality Assurance Requirements for Cleaning of Fluid Systems and Associated Components of Water-Cooled Nuclear Power Plants

Regulatory Guide 1.37 provides guidance on specifying water quality and precautions related to the use of alkaline cleaning solutions and chelating agents.

SCE&G identifies conformance and exceptions for the applicable regulatory position guidance provided in this regulatory guide in FSAR Chapter 1, Appendix 1AA.

Standards:

ASME NQA-1-1994 Edition — Quality Assurance Requirements for Nuclear Facility Applications

SCE&G commits to NQA-1-1994, Parts I, II, and III, as described in the foregoing sections of this document.

Nuclear Information and Records Management Association, Inc. (NIRMA) Technical Guides (TGs)

SCE&G commits to NIRMA TGs as described in Part II, Section 17.

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COLA Enclosure 4 —
Mitigative Strategies Description and Plans

Revision 3

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

V.C. Summer Nuclear Station, Units 2 and 3

LOSS OF LARGE AREAS OF THE PLANT DUE TO EXPLOSIONS OR FIRE

Mitigative Strategies Description and Plans

Required by 10 CFR 52.80(d)

Revision 3
February 2011

Security-Related Information - Withheld Under 10 CFR 2.390(d)
(See Part 9 of this COL Application)

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COLA Enclosure 5 —
Cyber Security Plan

Revision 1

South Carolina Electric and Gas

Virgil C. Summer Nuclear Station Units 2 & 3

Cyber Security Plan

Revision 1
June 2011

Security-Related Information - Withheld Under 10 CFR 2.390(d)
(See Part 9 of this COL Application)

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Special Nuclear Material (SNM) Material Control and Accounting Program Description

Special Nuclear Material (SNM) Material Control and Accounting Program Description

1. Scope

The Special Nuclear Material (SNM) Material Control and Accounting Program establishes guidelines concerning control of and accounting for SNM at V.C. Summer Nuclear Station (VCSNS), Units 2 and 3.

The criteria prescribed in the SNM Material Control and Accounting Program are applicable to SNM and various material mixtures containing SNM. Generally, the SNM involved is plutonium, ^{233}U, or uranium enriched in the isotope ^{235}U. The ^{235}U content will vary depending on various reactor parameters. SNM is typically in the form of pellets encapsulated in fuel rods. Criteria are established for the SNM control and accounting system, including criteria for the receipt, internal control, physical inventory, and shipment of SNM.

In addition to the information provided in this program description, the following VCSNS Units 2 and 3 licensing basis documents provide the regulatory basis that describes how the applicable requirements for material control and accounting under 10 CFR 74 will be met:

- Information related to amounts of SNM as reactor fuel required for reactor operation is provided in FSAR Section 4.1.
- Information related to storage of SNM as reactor fuel is provided in FSAR Section 9.1.
- Information related to the organizational structure of the applicant, including those responsible for SNM material control and accounting, is provided in FSAR Section 13.1.
- Information related to training of personnel, including those responsible for SNM material control and accounting, is provided in FSAR Section 13.2.
- Information related to development and implementation of this SNM MC&A Program is provided in FSAR Table 13.4-201.
- Information related to plant procedures, including those used to control special nuclear material, is provided in FSAR Section 13.5.

2. Definitions

In this program description, the following definitions shall apply:

2.1. book inventory (inventory of record). A master database or listing of all SNM currently possessed, reflecting the input of all material control records.

2.2. **dry storage canister.** The smallest structurally discrete item containing fuel assemblies or fuel components, which is stored on an ISFSI pad within the area controlled by the owner.

2.3. **fuel assembly.** The grouping of fuel components combined as an integral unit for use in a nuclear reactor.

2.4. **fuel component.** The smallest structurally discrete part of a fuel assembly that contains SNM. This is normally a fuel rod for intact components, but includes rod fragments, or pellets (or significant fraction thereof) if the rod structural integrity is not maintained.

2.5. **fuel component container.** A container that provides protection to fuel components comparable to that afforded by an intact fuel assembly and that is held to the same accounting standards as a fuel assembly, in that the container has the following attributes:

- The container is specifically designed to contain rods/rod fragments;
- The container is stored in the fuel storage racks; and
- The use of specialized handling tools and equipment is required to access the SNM stored in the container.

2.6. **Independent Spent Fuel Storage Installation (ISFSI).** A complex designed and constructed for dry interim storage of spent nuclear fuel.

2.7. **item.** Fuel assembly, fuel component container, non-fuel SNM container, sealed container, reassembled reactor vessel, dry storage canister, or a discrete piece of SNM (fuel or non-fuel) that is not stored in a container.

2.8. **item control area (ICA).** A defined area within the owner controlled area for which the SNM (fuel assemblies, fuel components, or non-fuel SNM) is maintained in such a way that, at any time, an item count and related SNM quantities can be obtained from the records for the SNM located within the area. ICAs have defined physical boundaries; these generally comprise fresh and irradiated fuel storage areas, including ISFSIs, reactor vessels, spent fuel pools, and non-fuel SNM storage areas.

2.9. **item count (piece count).** Visual verification that an item is in the location documented in the material control records. Verification of an item's identification number is not necessary for a piece count.

2.10. **material control records.** Records of SNM receipt, internal transfer, reconstitution, acquisition, inventory, and shipment (including disposal).

2.11. **non-fuel SNM.** Items containing SNM that are not intended for use as fuel, e.g., fission detectors.

2.12. **non-fuel SNM container**. A container used to store non-fuel SNM items, which has the following attributes:

- The container is specifically designed or evaluated for storage of SNM;
- The container is stored in an area with controlled access; and
- The use of specialized handling tools and equipment is required to access the SNM stored in the container.

2.13. **physical inventory.** Determination on a measured basis of the quantity of SNM on hand at a given time; a complete check of all material on hand. The methods of physical inventory and associated measurements will vary depending on the material to be inventoried and the process involved. The typical physical inventory at a power reactor plant consists of an item count (piece count) of SNM in each ICA.

2.14. **sealed container.** Container storing SNM that has been sealed with a tamper-safing device or other mechanical means, e.g., welding.

2.15. **special nuclear material (SNM).** Plutonium, uranium-233, uranium enriched in the isotope ^{233}U or in the isotope ^{235}U, and any other material which the Nuclear Regulatory Commission (NRC), pursuant to the provisions of Section 51 of the Atomic Energy Act of 1954, as amended, determines to be SNM.

2.16. **tamper-safing.** The use of a device on a container in a manner and at a time that ensures a clear indication of any violation of the integrity of the contents of the container.

3. Organizational Requirements

3.1. Delegation of Responsibilities and Authority

Material control functional and organizational relationships are set forth in writing in organizational directives, instructions, procedures, manuals, and other documents. Documentation includes position qualification requirements and definitions of authority, responsibilities, and duties. The assignment of SNM material control and accounting functions is such that the activities of one person or unit serve as a control over and a check of the activities of other persons or units. Activities involving handling, accounting, or control of SNM are verified by a second person. Specific assignments of responsibilities are prescribed for all facets of the SNM control system. Delegation of material control responsibilities and authority are in writing. Material control functions are assigned in accordance with 3.1.1 through 3.1.3.

Titles assigned to the positions are intended to be descriptive only. Organizations, specific titles, and related functions may vary.

3.1.1. Site VP

The site VP has overall physical control and physical inventory responsibilities for SNM at the plant site.

3.1.2. Plant Manager

The plant manager has overall responsibility for implementation of the SNM control and accounting function.

3.1.3. SNM Custodian

The SNM custodian is responsible for the performance of the functions that relate to the control of SNM.

3.2. Experience or Training

Personnel responsible for SNM control and accounting have experience or training applicable to their functions.

3.3. Accounting Group

The SNM accounting group maintains records for the SNM in the plant's possession as required in 10 CFR 74.19(b).

3.4. Vendor/Contractor Oversight

A program is established to provide adequate oversight of vendors/contractors conducting activities involving handling, accounting, and control of SNM.

4. Material Control and Accounting Program

4.1. Procedures

Written procedures are prepared and maintained covering the SNM control and accounting system, as required in 10 CFR 74.19(b). These procedures shall address, as a minimum, the following topics:

(1) Organization and personnel responsibilities and authorities;

(2) Designation and description of ICAs;

(3) Material control records and reporting;

(4) Notification for events concerning SNM;

(5) Receiving and shipping SNM;

(6) Internal transfer of SNM;

(7) Physical inventory of SNM;

(8) SNM element and isotopic calculation method; and

(9) Characterization and identification of items as SNM or non-SNM to preclude loss of control of SNM items.

4.2. Configuration Control

Provisions are made for written approval of revisions to the contents of the SNM material control and accounting procedures by the appropriate plant personnel, such as the plant manager.

4.3. Corrective Action Program

Discrepancies or program deficiencies are documented, investigated, reported, as required in 10 CFR 74.11 and 10 CFR 20.2201, and resolved using the plant corrective action program.

5. Input Control

5.1. Review of Fuel Supplier's Values

VCSNS or its representative reviews the adequacy of the fuel supplier's material control and accounting system used in establishing the quantities and assays of SNM. In the event of a significant discrepancy between the fuel supplier's values for SNM quantities and assays and those determined by VCSNS or its representative, the cause of such discrepancies are investigated with the fuel supplier and the differences are resolved and reconciled expeditiously.

5.2. Receipt of SNM

For SNM received at the plant site, VCSNS:

(1) Contacts the shipping vendor in the event the SNM does not arrive as scheduled; initiates an investigation and resolves, as required in 10 CFR 73.67 and 10 CFR 74.11;

(2) Verifies the integrity of the shipping container and tamper-safing devices and resolves any problems identified, as required in 10 CFR 73.67 and 10 CFR 74.11;

(3) Verifies that the quantity (item count) and unique identification numbers are in agreement with those indicated on the shipper's documents;

(4) Takes appropriate steps to resolve and reconcile any differences in quantities or identification numbers, as required in 10 CFR 73.67 and 10 CFR 74.11; and

(5) Notifies the regulatory body, as required in 10 CFR 73.67 and 10 CFR 74.11.

5.3. Documentation

The SNM custodian reports the receipt of each item containing SNM, by serial number or other unique identifier, to the accounting group. The receipt of SNM is documented in the material control records and the book inventory updated for the applicable ICA, as required in 10 CFR 74.19(a). A Nuclear Material Transaction Report is completed, as required in 10 CFR 74.15.

6. Internal Control

6.1. Unit of Control

Units of SNM that require control are the items defined in paragraph 2.7. Each of these units are identified in the material control records by its serial number or other unique identifier (e.g., a physical description of the item) and location, as required in 10 CFR 74.19(a).

6.2. Item Control Areas

ICAs are established for physical and administrative control of SNM. The number of ICAs is sufficient to establish control.

6.3. Internal Transfers

Transfers of SNM into, out of, or within an ICA are accomplished only upon written authorization of the SNM custodian or other individual(s) at the plant site responsible for the SNM program. Written authorization is obtained prior to the movement. All transfers of SNM are documented using a material control record by the responsible person involved in each operation, and the book inventory is updated for the applicable ICA.

6.4. Non-SNM items

Non-SNM items stored with items containing SNM are clearly identified as such to preclude SNM items from being mistaken for non-SNM items.

6.5. Sealed containers

A container with a tamper-safing device can be treated as a single item for inventory purposes; however, before the container is closed and the tamper-safing device is installed, the contents are physically inventoried. If the contents of a sealed container are accessed, the contents will be physically re-inventoried or administrative procedures

will be in place to establish the integrity of the contents before it can be treated as a single item for inventory purposes.

6.6. Damaged Cladding

Severe damage to cladding, where rod structural integrity has not been maintained, has the potential to result in inadvertent physical separation and dispersal of fuel components from the fuel rod. Upon visual identification of inadvertent physical separation, an estimate of the SNM quantity and an engineering judgment concerning the origin of the SNM will be made and documented. The amount of irretrievable or inadvertent loss will be reported, if the quantity is reportable, as required in 10 CFR 74.13. Methods used to estimate SNM quantities include, for example, engineering calculation, engineering judgment, physical measurement of length, destructive or non-destructive measurement, and count of the number of pellets retrieved or missing.

7. Physical Inventory

7.1. Conduct

Physical inventory is taken at intervals not to exceed 12 months, as required in 10 CFR 74.19(c). Physical inventory is conducted according to written inventory procedures, as required in 10 CFR 74.19(b).

7.2. Coverage

Physical inventory includes all SNM possessed under license and is conducted in all ICAs, including:

(1) New fuel storage areas;

(2) Irradiated fuel storage areas;

(3) Reactors;

(4) ISFSIs; and

(5) Areas containing non-fuel SNM.

7.3. Inventory Method

An item count is conducted of all SNM, as required in 10 CFR 74.19(c).

7.3.1. Assemblies and Fuel Component Containers

For fuel assemblies and fuel component containers, an item count is sufficient. If the contents of an assembly or a fuel component container are accessed, the contents are physically reinventoried before the assembly or container can be treated as a single item for inventory purposes.

7.3.2. Fuel Components

For fuel components that are not part of an intact assembly, physically captured in an assembly, stored in a sealed container, or stored in a fuel component container, each component is inventoried.

7.3.3. Sealed Containers

For sealed containers, verification of the integrity of the tamper-safing device is sufficient.

7.3.4. Reactor

Whenever fuel assemblies are loaded into a reactor, the unique identifier and location of each item is visually verified. When the reactor vessel is reassembled, the reactor is considered one item for inventory purposes.

7.3.5. Non-fuel SNM

For non-fuel SNM, the method of physical inventory depends on the method of storage and use:

- For installed components, verification is performed at the time of installation, and administrative procedures and controls are established so that records concerning the location and unique identity are accurate.
- For non-installed components stored in primary containment, administrative procedures and controls are established so that records concerning the location and unique identity are accurate when the reactor is at power, and verification is performed during refueling outages.
- For non-fuel SNM containers, item count of the containers is sufficient. If the contents of the container are accessed, the contents are physically re-inventoried or administrative procedures are in place to ensure the integrity of the contents before the container can be treated as a single item for inventory purposes.

7.4. Reconciliation and Resolution

The physical inventory is reconciled to the book inventory. Discrepancies between the physical inventory and the book inventory are investigated and addressed expeditiously. The book inventory shall be adjusted to agree with the result of the physical inventory.

7.5. Documentation

The results of the physical inventory of SNM are documented in the material control records of the applicable ICA and utilized as input to the isotopic calculations. A Material

Balance Report and Physical Inventory Listing Report are completed, as required in 10 CFR 74.13.

8. SNM Calculations

8.1. Element and Isotopic Computations

Methods of computation are established and utilized for determining the total element and isotopic composition of SNM in irradiated nuclear fuel assemblies and fuel components. The computed values are the basis for shipment documents, as required in 10 CFR 74.15, and material status reports, as required in 10 CFR 74.13.

8.2. Analysis of Results

Refinement of the element and isotopic computations used in determining the SNM content of irradiated fuel are considered as new technologies evolve. For reprocessed fuel, this may include a collection and comparison of reprocessing plant measurement data with computed data for fuel assemblies.

9. Output Control

9.1. Shipment

Procedures are established, as required by 10 CFR 74.19(b), to provide for:

(1) Verification and recording of the serial number or unique identifier of each item containing SNM;

(2) Recording of the quantities of SNM contained in each item;

(3) Reporting the quantity of SNM shipped, if the quantity is reportable, as required in 10 CFR 74.15;

(4) Verification of compliance with regulations, including licensing, transportation, and security requirements for shipment; and

(5) Reporting the completion of each shipment to the accounting group

Care is taken to assure that SNM contained in fuel is not shipped inadvertently with shipments of non-fuel SNM waste.

9.2. Documentation

The shipment of fuel assemblies, fuel components, or non-fuel SNM is documented in the material control records and the book inventory updated for the applicable ICA. Nuclear Material Transaction Reports are completed, as required in 10 CFR 74.15.

9.3. Review and Audit of Reprocessing (Recycling) Measurements

For SNM being reprocessed, VCSNS or its representative:

(1) Reviews the adequacy of the reprocessor's material control system used in establishing the quantities and assays of SNM, including written procedures;

(2) Audits the implementation of the reprocessor's material control system used in establishing the quantities and assays of SNM, including observation of measurement and material control activities;

(3) Audits the reprocessor's accounting activities, measurements, analyses, computations, and records affecting the determination of SNM quantities and assays; and

(4) In the event of a significant discrepancy between the reprocessor's values for SNM quantities and assays and those determined by audit, investigates and reconciles any differences expeditiously.

10. Records and Reports

Records are created and retained, as required in 10 CFR 74.19(a). The accounting records are the basis for the material control and accounting program. Quantitative data generated by VCSNS's calculations of changes in quantities and isotopic composition due to irradiation and decay are recorded and reported in accordance with VCSNS's standard recording and reporting procedures. The records and reports system include:

(1) An accounting system for maintaining the book inventory;

(2) Material control records maintained for each ICA;

(3) Reconciliation of the results of physical inventories to the book inventory;

(4) Recording the transfer of SNM into or out of each ICA;

(5) Recording movement of SNM between locations within an ICA, for ICAs where locations have been established;

(6) Recording the creation of items containing SNM, such as creation of a rod fragment;

(7) Recording the estimated quantity and origin of SNM which has been inadvertently separated from fuel upon the discovery of the separation;

(8) Reporting to the accounting group the transfer of SNM into, within, or out of an ICA, if applicable;

(9) Perpetual inventory records of each ICA, including the serial number or other unique identifier and location of each item in the ICA that contains SNM;

(10) Historical data of SNM in each nuclear fuel assembly, fuel component, or non-fuel SNM item while in VCSNS's possession; and

(11) Retention as required in 10 CFR 72 and 74.

11. System Review and Assessment

Reviews of the SNM program are conducted periodically. The results of the reviews are documented and reported in accordance with the requirements of the quality assurance or self-assessment program.

12. Physical Security

Protection of SNM is in accordance with the requirements of 10 CFR 73.67 and VCSNS's Physical Security Plan.

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COLA Enclosure 7 —
New Fuel Shipping Plan

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South Carolina Electric & Gas

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New Fuel Shipping Plan

This enclosure is a 2 page stand alone document.

New Fuel Shipping Plan

1. Scope of New Fuel Shipping Plan

   The reactor licensee on occasion may have to arrange for shipment of new fuel assemblies to the fuel manufacturer. Such shipments are infrequent and would require the reactor licensee to be subject to the regulations in 10 CFR 73.67 (Ref. 5.1), as clarified by guidance provided in NRC Regulatory Issue Summary (RIS) 2005-22 (Ref. 5.2). In lieu of the reactor licensee developing and submitting its own transportation security plan, arrangements may be made for a special nuclear material (SNM) qualified licensee to accept delivery of the fuel at the reactor licensee's site and for the SNM qualified licensee to perform the return shipment under its transportation security plan (TSP).

   This New Fuel Shipping Plan summarizes the procedures and the written agreement the reactor licensee shall have in place prior to a shipment of new fuel back to the fuel manufacturer. A written agreement acknowledges the responsibility of the reactor licensee and the SNM qualified licensee.

2. Definitions

   In this plan the following definitions apply:

   2.1 New fuel assembly - a group of fuel rods containing pellets of fissionable material that has not been irradiated in the nuclear reactor core.

   2.2 In-transit physical protection - protection provided by a licensee in accordance with a transportation security plan for special nuclear material that meets the requirements of 10 CFR 73.67(g)(3).

   2.3 SNM qualified licensee - an entity that is licensed pursuant to the regulations in 10 CFR Part 70 to transport, deliver to a carrier, or take delivery of a single shipment and has received NRC approval of a Transportation Security Plan (TSP) addressing the physical protection of special nuclear material in transit pursuant to 10 CFR 73.67(c).

   2.4 Receiver - the SNM qualified licensee that receives delivery of new fuel assemblies returned from the reactor licensee.

3. Reactor Licensee Responsibility

   3.1 The reactor licensee shall have a written agreement in place that arranges for the physical protection of special nuclear material in transit to and from the reactor licensee's facility that meets the requirements of 10 CFR 73.67(g)(3).

   The in-transit physical protection starts at the free on board (F.O.B.) point at which the new fuel is delivered to a carrier for transport. The agreement shall include acknowledgement by the SNM qualified licensee that its TSP includes

in-transit physical protection from the reactor licensee's site to the receiver's facility.

3.2 Reactor licensee procedures shall provide guidance regarding advance notification to the receiver of the new fuel shipment, confirmation the receiver is ready to accept shipment, performance of container integrity checks, and placement of tamper-safing devices prior to the commencement of planned shipment in accordance with 10 CFR 73.67(g)(1).

3.3 When the reactor licensee receives SNM from a shipper, procedures shall include inspections for the container integrity and tamper-safing devices and notifications to the shipper as required by 10 CFR 73.67(g)(2).

4. Documentation

The records created as a result of this plan activity shall be retained in accordance with reactor licensee records administration and applicable requirements of 10 CFR 73.67(g). Records that would be created and retained under this plan, in the event of new fuel return shipments, include:

- Written agreements between the reactor licensee and the shipper/receiver for in-transit physical protection of the new fuel shipment,
- Documentation of advance notifications and receipt,
- Documentation of container integrity and tamper-safing device checks, and
- Copies of superseded response procedure materials.

5. References

5.1 10 CFR 73.67 – Licensee fixed site and in-transit requirements for the physical protection of special nuclear material of moderate and low strategic significance

5.2 NRC Regulatory Issue Summary (RIS) 2005-22 Requirements for the Transportation of Special Nuclear Material of Moderate and Low Strategic Significance: 10 CFR Part 73 vs. Regulatory Guide 5.59 (1983)

Part 18

South Carolina Electric and Gas
V. C. Summer Nuclear Station, Units 2 & 3
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Part 18

COLA Enclosure 8 —
Supplemental Information in Support of 10 CFR Part 70
Special Nuclear Material License Application

Revision 0

Non-Fuel Special Nuclear Material for Use in Each AP1000 Unit

In accordance with the regulatory requirements of 10 CFR 70.22(a)(4), each application for a 10 CFR Part 70 Special Nuclear Material (SNM) License shall include the name, amount, and specifications (including the chemical and physical form and, where applicable, isotopic content) of the special nuclear material the applicant proposes to use or produce. The radioactive material identified below represents nominal values of known non-fuel special nuclear material specifically required for use in each AP1000 unit:

(a) Element and Mass Number	(b) Chemical or Physical Form	(c) Maximum Amount
Uranium 235 (approx. 93%) 234, 236 & 238 (approx. 7%) 233 (trace amounts)	Intermediate Range Neutron Detectors - Fission Chambers (5 detectors, including 1 spare)	4.99 grams of Uranium per fission chamber Five fission chambers – total of approx. 25 grams

Additionally, the AP1000 DCD identifies some components that may contain Part 70 special nuclear material as an alternate to the planned material for those components. Specifically, DCD Section 4.2.2.3.4 identifies that the primary source rods contain capsules of californium source material, with plutonium-beryllium as an alternate source material. Also, the source range neutron detectors are currently planned to be BF3 proportional counters, but an alternate future design may use fission chambers for the source range detectors; thereby resulting in a total amount of SNM for the intermediate and source range detectors that would be twice the amount of SNM as the currently designed intermediate range detectors. The radioactive material identified below represents the alternative materials that may be used in each AP1000 unit:

(a) Element and Mass Number	(b) Chemical or Physical Form	(c) Maximum Amount
Uranium 235 (approx. 93%)	Source Range Neutron Detectors - Fission Chambers Alternate design may use fission chamber design for source range detectors. The additional material identified here is for the source range detectors. (5 detectors, including 1 spare)	Approx. 5 grams of additional Uranium per fission chamber Five fission chambers – total of approx. 25 grams additional
Plutonium 238 (> 80%)	Primary Source Rods (2) (One PuBe alloy source rods per assembly; two assemblies per reactor)	Approx. 15 grams of Plutonium per source assembly – total of approx. 30 grams

The details relating to the alternate SNM components include assumed values based on previous designs, and have not been designed specifically for the AP1000 units.

Leak-Testing:

FSAR Section 12.2 includes the requirements for written procedures that address leak-testing of radioactive sources (byproduct material, source material, and devices that contain SNM, as appropriate). The leak-test will be consistent with 10 CFR 20.1501 survey and monitoring requirements for evaluating the quantities of radioactive material and the potential radiological hazard of the radioactive source.