SCE&G
A SCANA Company

South Carolina Electric & Gas Company
P.O. Box 88
Jenkinsville, SC 29065
(803) 345-4344

Gary J. Taylor
Vice President
Nu[illegible] Operations

February 6, 1997
RC-97-0031

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Ladies and Gentlemen:

Subject: VIRGIL C. SUMMER NUCLEAR STATION (VCSNS)
DOCKET NO. 50/395
OPERATING LICENSE NO. NPF-12
REQUEST FOR INFORMATION PURSUANT TO 10 CFR 50.54(f)
REGARDING ADEQUACY AND AVAILABILITY OF DESIGN
BASES INFORMATION

Virgil C. Summer Nuclear Station (VCSNS) provides the following response to your request for information dated October 9, 1996. This request for information required that a written response regarding the adequacy and availability of design bases information be submitted under oath or affirmation in accordance with 10 CFR 50.54(f).

South Carolina Electric & Gas (SCE&G) is strongly committed to maintaining the performance and configuration of VCSNS consistent with the design bases. VCSNS was licensed for operation in 1982, at which time the NRC found that plant operation provided reasonable assurance of protection of public health and safety. Since the time of licensing, the VCSNS procedures governing operation, maintenance, testing and design control have been established and maintained to conform to NRC requirements, including 10 CFR Part 50, Appendix B. The overall adequacy of our procedures and programs has been confirmed during the NRC's ongoing regulatory oversight processes, as well as our own internal oversight activities.

VCSNS is recognized by the NRC as one of the top performing plants. In its most recent Systematic Assessment of Licensee Performance (SALP) report, dated December 6, 1996, the NRC rated VCSNS superior (Category 1) in the functional areas of Plant Operations, Engineering and Maintenance, and good (Category 2) in Plant Support. The NRC specifically recognized in the recent SALP report (at page 4) that the **"licensee's performance in the areas of design control and maintenance of the licensing basis was strong."**

Oversight of activities at VCSNS is provided by our line organizations as well as independent review groups. In-line oversight includes management and interdisciplinary reviews, testing and verification activities, and internal evaluations. Independent oversight includes the periodic audits and inspections under 10 CFR Part 50, Appendix B, as well as self-assessments of functional areas and activities and "vertical slice" assessments of major plant systems. The results of these

A074
1/1

oversight activities give us added confidence in the structure and functioning of our programs for maintaining design bases conformance. An important part of the safety culture at VCSNS is to encourage the identification of nonconformances, weaknesses and areas for improvement. When nonconformances are identified, they are processed through the 10 CFR Part 50, Appendix B corrective action program. This program calls for an appropriate review for the cause and the extent of the condition, and development of prompt and effective corrective actions. As summarized in the NRC's December 6, 1996 SALP report, the VCSNS problem identification and corrective action processes have functioned to achieve timely and effective resolution of issues.

SCE&G has also undertaken a number of significant initiatives since plant licensing to help maintain conformance with the design bases and to enhance the quality and availability of design bases information. These initiatives reflect SCE&G's management commitment to examine our own programs to ensure they are functioning reliably, and to incorporate improvements based on our own findings, industry experience and NRC expectations. The major activities have included the following:

- In 1985, VCSNS initiated a Design Basis Document (DBD) Program. The DBD program is aimed at compiling (or providing a guide to) plant design bases information that was originally developed by the Architect/Engineers, the NSSS vendor and equipment suppliers. The program consisted of the development of 43 individual DBDs covering the major plant systems, structures and components and relevant topical areas. The DBDs capture the basic design information and requirements or provide a guide (road map) to locate information in other design documents. This serves to facilitate informed engineering decisions on plant operation. The information contained in the DBDs is reviewed to ensure consistency with the plant as designed and operated.

- SCE&G has long appreciated the importance of performing Safety System Functional Inspections (SSFIs) on major safety-related or important to safety systems. Since 1987, the Independent Safety Engineering Group (ISEG) has performed SSFIs on eleven (11) major systems in the plant, including emergency feedwater, service water, emergency diesel generators, component cooling water, and residual heat removal. These SSFIs have generally involved vertical slice reviews covering the areas of system design, design changes, operations, surveillance testing, maintenance, training and Quality Assurance. Specifically, the SSFIs focus on determining whether the design bases is adequate, the existing configuration complies with the design requirements, and the documentation describing the design bases is consistent. The SSFIs also confirm that changes to the system have not adversely affected the system's ability to perform its design function.

- SCE&G has recently instituted a Configuration Management Plan aimed at continually improving our ability to access and control information in order to assure compliance with design and licensing basis requirements. Initial activities within the plan center on Design Engineering functions. Overall, the Plan is intended to incorporate areas of improvement

identified by VCSNS personnel, the Quality Assurance organization, regulatory bodies and industry experience.

- In 1993, SCE&G initiated a Design Control Re-engineering Program aimed at improving the efficiency and effectiveness of the design control process. As part of this Program, many design control and configuration management activities have been assessed, including modifications, FSAR changes, 10CFR50.59 processing, and drawings and calculations. An analysis was performed to identify process and management system improvements, along with performance measures against which the re-engineered processes should be compared. The development and implementation of improved procedures, instructions, and processes is currently in progress.

- Beginning in March 1996, SCE&G initiated an FSAR review effort which included (1) an Outage Review, (2) an MRF Review, and (3) an Overall FSAR Review. This FSAR review effort is described in detail in Section (d).

- The Overall FSAR Review is an ongoing, systematic and prioritized assessment focusing on discrete systems and programs which correlate with the Design Basis Documents. The approach includes a comprehensive assessment to assure consistency between the FSAR and the DBDs or other controlled documents, and a review of those aspects of the FSAR pertinent to safe operation for accuracy and consistency. Thus far, six systems have been reviewed under this approach. No findings to date have involved safety-significant concerns.

SCE&G is confident that our current programs, processes and procedures, combined with the continuing oversight activities and our initiatives to maintain design bases compliance, provide reasonable assurance that our plant is operated and maintained within the design bases and any deviations are reconciled in a timely manner.

This response contains the requested descriptions of our various programs and processes as they exist currently. These programs and processes are, of course, subject to change periodically in accordance with appropriate controls. In preparing this response, SCE&G utilized a dedicated team to compile the information contributed by the various responsible organizations. SCE&G also utilized an independent review and verification process by individuals familiar with the information to provide additional assurance that the information presented is accurate. This response has been reviewed by the Plant Safety Review Committee and the Nuclear Safety Review Committee.

SCE&G plans to continue the Overall FSAR Review described above. *[Note: This commitment is listed separately in order to avoid confusion as to what commitment is made under this letter. Any other descriptions or programs are subject to change in accordance with our normal review and change practices, and are not to be considered commitments.]*

We trust that the information provided is responsive to your request. Should you have any questions, please contact Mr. Michael J. Zaccone at (803) 345-4328.

Very truly yours,

Gary J. Taylor

Gary J. Taylor
Vice President, Nuclear Operations

MJZ:GJT
Attachment

c: J. L. Skolds
R. R. Mahan
R. J. White
L. A. Reyes
NRC Resident Inspector
W. F. Conway
NEI

J. B. Knotts
K. R. Jackson
A. R. Johnson
Central File System
RTS (MSP 960015)
File (810.32)

STATE OF SOUTH CAROLINA :
: **TO WIT** :
COUNTY OF FAIRFIELD :

I hereby certify that on the 6th day of February 1997, before me, the subscriber, a Notary Public of the State of South Carolina personally appeared Gary J. Taylor, being duly sworn, and states that he is the Vice President, Nuclear Operations of the South Carolina Electric & Gas Company, a corporation of the State of South Carolina, that he provides the foregoing response for the purposes therein set forth, that the statements made are true and correct to the best of his knowledge, information, and belief, and that he was authorized to provide the response on behalf of said Corporation.

WITNESS my Hand and Notarial Seal

Michael J. Zaccone
Notary Public

My Commission Expires

My Commission Expires July 13, 2005
Date

Information Request (a)

Description of engineering design and configuration control processes, including those that implement 10CFR50.59, 10CFR50.71(e), and Appendix B to 10CFR Part 50.

Management Directive 21, Design Change Program, and Management Directive 4, Statement of Responsibilities, Engineering Services Grou , specify the policy and responsibilities for the design change program for the V. C. Summer Nuclear Station (VCSNS). The implementation of this policy is through SAP-133, Design Control/Implementation and Interface, and various Engineering Services (ES) procedures. The design change program has the following objectives:

1. Maintenance of the Design and Licensing Bases.
2. Ensuring conformance of systems, structures, and components to approved design requirements.
3. Review of proposed changes to the facility to the original Design Bases.
4. Control of work activities, temporary changes, and permanent changes to ensure Design and Licensing Bases compliance.
5. Documentation which adequately reflects the plant as-built characteristics.
6. Ensuring conformance of the Design Basis through revision of Operating and Maintenance procedures, training, and updates of the plant simulator.

The requirements of 10CFR50, Appendix B, 10CFR50.54, 10CFR50.59 and 10CFR50.71(e) are integrated to ensure these objectives are accomplished.

The descriptions below focus on the common engineering design and configuration control processes at VCSNS which assure compliance with and maintenance of the approved Design and Licensing Bases. The descriptions are broken down into two major categories: those for processes which actually allow changes to the facility (Change Processes) and those that ensure documentation is maintained (Document Change Control Processes). The specific topics addressed in each are:

<u>Change Processes:</u>

- Design Change Control
- Procedure Development and Change Control
- Nonconformance Notice (NCN) Dispositioning
- Temporary Bypass, Jumper & Lifted Lead Control
- Motor Operated Valve (MOV) Change Program
- Software Change Control

<u>Documentation Change Control Processes:</u>

- Final Safety Analysis Report/Fire Protection Evaluation Report (FSAR/FPER) Changes
- Structure, System & Equipment Classification
- Cumulative Effects
- Design Basis Documents
- Calculations
- Drawing Control
- Database Change Control
- Specification Control
- Technical Reports
- Plant Lubrication Manual Change Processing

Change Processes:

Design Change Control

Purpose:

1. To screen, assess, design and implement changes to the facility in accordance with the station Licensing Basis, considering the original Design Basis of structures, systems, and components important to plant safety. In addition, the process serves as a mechanism to assess the impacts of non-safety activities on safety related structures, systems, and components through a variety of reviews by station personnel.
2. Development of design changes in accordance with this program is intended to provide consistent, complete, and thorough products in accordance with our regulatory commitments and good engineering practices.

Scope:

The scope of the process includes proposed building, system, equipment, core reloads and setpoint changes to the VCSNS. This includes documentation and hardware changes to the facility.

Process Description:

The program is initiated by station personnel via a request to Systems and Component Engineering personnel. This group assesses the validity of the request, together with the Originator, and determines the appropriate change process utilizing the screening criteria of ES-452. The Engineering Change processes considered include: 1)Administrative Changes, 2)Commercial Changes (Non safety), and 3) Nuclear Changes. Within each of these change processes a specific level of review and approval is required as described below:

Administrative Changes: The Responsible Engineer assesses the requested or identified change against criteria defined in the procedure to ensure that the requested change does not represent a change to the facility. These criteria include:

- Revisions to reflect minor changes that do not involve design information.
- Documents and/or database records that document existing design.
- Correction to the status of documents to reflect existing design.
- Issuance of drawings/documents for equipment purchased by SCE&G.
- "As-builting" of piping isometrics drawings to show field welds made as a result of non-Engineering Change Package maintenance activities.

For those activities meeting the criteria, the Responsible Engineer identifies all other impacted documents, including those external to the Engineering Services (ES) group. When required, written notification is provided to impacted departments identifying the document/database requiring revision.

The Administrative Change package is reviewed by Engineering Services personnel per ES-110 prior to release. Since an Administrative Change does not represent a change to the facility, a 10CFR50.59 screening review/safety evaluation is not required.

Commercial Changes: Commercial changes are changes to structures, systems or components that are outside the scope of a nuclear change, not safety or quality related, do not impact the plant design basis or safety analysis. The Responsible Engineer determines the scope of the

change and identifies the plant programs, documents and any codes/standards which are affected or must be considered in the implementation of the requested change. The Responsible Engineer identifies the groups which will be involved in the implementation and solicits input from the Supervisors from those groups. The input includes identifying any impacts to station procedures and training and any Return to Service considerations. A Commercial Change Package is developed based on these inputs. A 10CFR50.59 screening review/safety evaluation is then performed per step 6.8.2 of ES-453 in accordance with SAP-107.

Following package assembly, field work documents are generated and planned by the Maintenance/Operations Planners. Prior to initiating field implementation, essential drawings are posted in the Control Room to define In-Process changes. After implementation activities have been completed, package closure efforts are initiated including update of impacted controlled documents.

Revisions to the Commercial Change Package are reviewed to determine if the revision is within the scope of the 10CFR50.59 screening review/safety evaluation. For those within the scope of the existing evaluation, the revision scope is approved by the supervisor of the group which originated the change request and the revision is processed in a manner similar to the original commercial change package. For those revisions which are outside the scope of the 10CFR50.59 screening review/safety evaluation, the originating group supervisor requests a new Engineering Change.

Nuclear Changes: The scope of Nuclear Changes primarily includes work or activities that impact Quality Related and Nuclear Safety Related structures, systems, or components. The different processes which address these type changes include Equal To/Better Than Evaluations (Parts Replacements), Setpoint Changes, Core Reloads, Plant Enhancements and Plant Modifications. [Note: Setpoint changes and Core Reloads are processed as a Plant Modification]

Equal To/Better Than (ETBT): Safety and Quality Related ETBTs are processed through the Engineering Services organization via development of a ETBT evaluation identifying acceptable replacement items, end use restrictions, identification of controlled document impacts, and technical justification. Organizations external to Engineering Services are selected for review based on the potential to impact station procedures(based on scope of ETBT). A 10CFR50.59 screening review/safety evaluation is performed which is independently reviewed. Approval of the ETBT and 10CFR50.59 screening review/safety evaluation is obtained from an Engineering Services Supervisor. A second independent technical content review is performed by Procurement Quality.

The package is issued and field work documents are generated and planned by the Maintenance/Operations Planners. Prior to initiating field implementation, essential drawings are posted in the Control Room to define In-Process changes. After implementation activities have been completed, package closure efforts are initiated including update of impacted controlled documents.

Revisions to the ETBT Package are developed and reviewed in a similar manner.

For Plant Enhancements and Plant Modification, the System and Component Engineer develops the preliminary design and obtains his supervisors' approval. The change request and preliminary design package is reviewed by the Principal Engineer Review Group, composed of the Discipline Principal Engineers, to determine design inputs and potential impact to the station Design Bases. If it is determined that Design Bases impact is likely due to the scope or

complexity of the work, the design package is processed as a Plant Modification. The Plant Enhancement Process is the process followed for work that does not impact the Design Basis.

Plant Enhancements: The Responsible Engineer develops the enhancement instructions and performs a 10CFR50.59 screening review/safety evaluation in accordance with SAP-107. The Plant Enhancement is independently verified within Engineering Services. Enhancement package review is performed by affected station Operations, Maintenance, and Engineering Service personnel as required. Personnel performing reviews of the packages provide comments in addition to identifying Operability/Return to Service requirements and training/procedure impacts. Following resolution of comments, an Engineering Service approval is obtained and concurrence to implement the change is obtained from the General Manager, Nuclear Plant Operations (GMNPO, Plant Manager). The package is then issued and field work documents are generated and planned by the Maintenance/Operations Planners. Prior to initiating field implementation, essential drawings are posted in the Control Room to define In-Process changes. After implementation activities have been completed, package closure efforts are initiated including update of impacted controlled documents.

Revisions to the Plant Enhancement Package are reviewed to determine if the revision is within the original scope. For those within the scope of the existing evaluation, the Responsible Engineer determines if the revision is major or minor. A revision is considered major if it will result in a change to the 10CFR50.59 screening review/safety evaluation, change a plant procedure that was not previously identified, change training requirements, affect operability, affect the scope of post work testing, affect operability/return to service, or contain nuclear safety related (NSR) work in a non nuclear safety (NNS) package. Major revisions are processed in a manner similar to as the original enhancement change package. Minor revisions are processed similarly, except that the minor revision process allows for accumulating several minor changes prior to processing a final minor change Enhancement Package and do not require external reviews or approvals. For those revisions which are outside the original scope, the Responsible Engineer screens the revision in accordance with ES-452 to determine the appropriate change process to be utilized.

Plant Modifications: The Design Engineer prepares a conceptual design package based on the preliminary design. Further development of Design Inputs are solicited from department managers, ALARA planners, Principal Engineers and other affected groups. The Design Engineer compiles the responses and solicits additional input at a Design Input meeting. With this information, the Design Engineer finalizes and assembles the final conceptual design package for review by the General Manager, Nuclear Plant Operations. Following GMNPO approval, the Design Engineer prepares the detailed design package including a 10CFR50.59 screening review/safety evaluation. The package is independently verified within Design Engineering. The package is then reviewed by all Discipline Principal Engineers to ensure Design Basis impacts have been properly addressed. External reviews are performed by affected station personnel and include identifying Operability/Return to Service requirements and training/ procedure impacts. Following completion of these reviews, an Engineering Service approval is obtained from an Engineering Services Supervisor. Planning and Pre-implementation meetings are then conducted to support modification implementation and coordinate craft resources. Then the package is issued and field work documents are generated and planned by the Maintenance/Operations Planners. Prior to initiating field implementation, essential drawings are posted in the Control Room to define In-Process changes. After implementation activities have been completed, package closure

efforts are initiated including update of impacted controlled documents, including Design Basis information when required.

Revisions to the Plant Modification Package are reviewed to determine if the revision is within the original scope. For those within the scope of the existing evaluation, the Responsible Engineer determines if the revision is major or minor. Consideration of minor and major is as described in the Plant Enhancement section. Major revisions are processed in a manner similar to the original Modification change package. Minor revisions are processed similarly, except that the minor revision process allows for accumulating several minor changes prior to processing a final minor change Modification Package and do not require external reviews or approvals. For those revisions which are outside the original scope, the Responsible Engineer screens the revision in accordance with ES-452 to determine the proper processing.

Procedure Development and Change Control

Purpose:

1. To describe the process for the development, revision, change, review and approval of procedures specified by Sections 6.8.1 and 6.8.2 of Technical Specifications.
2. To ensure the procedural requirements outlined in ANSI N18.7-1976 and the Operational Quality Assurance Plan are implemented.

Scope:

The requirements of the process apply to all procedures and plans specified in Attachment III of SAP-139.

Process Description:

Requests for procedure changes or development are routed to the appropriate Discipline Supervisor for action. The Discipline Supervisor determines the validity of the request and either rejects the proposed change or assigns an Originator from his group. The Originator identifies any Procedure/Commitment Accountability Program (P/CAP) interface, determines the type of change to be processed and prepares a draft of the new procedure or the revision. The draft package is routed back to the Discipline Supervisor for his review, identification of required reviewers and assignment of the 10CFR50.59 evaluator. (At a minimum, the required reviewers are per Attachment III of SAP-139, however, the Discipline Supervisor may also assign additional reviewers as needed.) A 10CFR50.59 screening review/safety evaluation is performed for all procedures except those specifically identified per section 6.3.9 of SAP-139.

The draft procedure package is reviewed by a Qualified Reviewer. Next, the draft procedure package is routed for cross-disciplinary reviews as specified by the Discipline Supervisor. Upon cross-discipline review comment resolution completion, the package is sent back to the Discipline Supervisor to ensure all comments have been resolved and that the 10CFR50.59 screening review/safety evaluation has been performed when required. The Discipline Supervisor also identifies if the package must be reviewed by the PSRC and sends the package on for final approval. The Approval Authority determines whether PSRC review is required prior to implementation of the change. If PSRC review is required prior to implementation, the package is sent to PSRC and upon completion of the review, is approved. If PSRC review is not required at this time, the package is approved.

The process also allows for Temporary Approvals of procedures when expeditious processing of a procedure change is required. Temporary Approvals may only be granted if the proposed change:

1. Does not alter any P/CAP item or
2. Does not alter the intent of the procedure.

The processing is similar to a permanent change except:

1. A 10CFR50.59 screening review/safety evaluation is not required prior to the Temporary Approval since the proposed change does not alter the intent of the procedure.
2. The only required reviews are a Qualified Reviewer, the Shift Supervisor and Quality Assurance.
3. The procedure must receive Final Approval within 30 days from the date of the Temporary Approval or have documented correspondence of the reason it could not be accomplished.

NCN Dispositioning

Purpose:

1. To provide methods for dispositioning nonconforming conditions. A nonconformance is a deficiency in a material, part, component, service or activity which renders the quality of an item unacceptable. Nonconformance Notices (NCNs) are used to describe adverse safety, quality or non-safety related hardware or performance related conditions which do not conform to approved design requirements/documentation.
2. This process also addresses the test requirements to ensure that the implemented NCN disposition(s) resolves the nonconforming condition such that systems, structures or components are capable of performing their design function.

Scope:

This process applies to the activities performed by Engineering Services personnel in the processing of NCN's submitted or initiated for disposition and evaluation.

Process Description:

The NCN Dispositioning Process consists of an Engineering Services evaluation to address and resolve NCNs. This process may be implemented via multiple dispositions for a single NCN.

When a NCN is generated, it is reviewed by the Responsible Engineer. The Responsible Engineer develops and documents a disposition to resolve the NCN. The development of the disposition includes an identification of any affected documents as well as consideration of the need for a 10CFR50.59 screening review/safety evaluation.

NCN dispositions are classified into one of the following categories:

- Accept-As-Is
- Clarification
- Conditional Release
- Data Collection
- Reject
- Repair
- Rework

The Accept-As-Is disposition may be used when the nonconformance is determined to have no effect on the proper functioning of the items and will present no hazard to public safety. Accept-As-Is dispositions require a 10CFR50.59 screening review/safety evaluation unless they are minor in nature such as simple part number changes paperwork discrepancies which do not alter hardware, minor hardware discrepancies that are in "noncritical to function" attributes, or deviations that a qualified vendor can acknowledge as acceptable under the vendor's design control program via the subject purchase order or other appropriate documents.

The Clarification disposition is used to clarify any part of a previous disposition of that NCN that is vague, unclear, or confusing and results in the inability to fulfill the intent of the previous dispositions. A clarification disposition does not change the intent of the original disposition. Clarification dispositions do not require a 10CFR50.59 screening review/safety evaluation.

The Conditional Release disposition allows a nonconformance to be corrected after installation but prior to operation. The disposition must include a technical justification for the conditional release of the item for installation. Documentation related Conditional Release nonconformances must not impair the capability to determine that the item is able to fulfill its design function or meet its acceptance criteria for the item to be placed in service. Conditional Release dispositions do not require a 10CFR50.59 screening review/safety evaluation.

The Data Collection disposition requests specific data such as measurements or investigating results of activities requested by Engineering Services to support future dispositions to that NCN. Data Collection dispositions do not require a 10CFR50.59 screening review/safety evaluation.

The Reject disposition involves damage or a nonconformance that will make the component unacceptable for service. Rejection may occur during any phase of construction or operation. Reject dispositions do not require a 10CFR50.59 screening review/safety evaluation.

The Repair disposition is used for those nonconforming conditions requiring Engineering Services specific direction to restore a nonconforming characteristic to a condition such that the Design Basis and capability of an item and/or system to function reliably and safely is unimpaired even though that item and/or system still does not conform to the original requirement. Repair dispositions require a 10CFR50.59 screening review/safety evaluation.

The Rework disposition is used for those nonconforming conditions not requiring Engineering Services specific direction to make a nonconforming item conform to its original design configuration by replacement, remachining, reassembling or other corrective means. NCNs related to materials which could be corrected by the application of existing approved procedures are classified as Rework. Rework dispositions do not require a 10CFR50.59 screening review/safety evaluation.

In some cases, an NCN disposition may require an abnormal system or component arrangement or alignment which is not part of a normal or emergency plant operations procedure to maintain the Design Basis of the plant. Such a disposition represents a Repair that does not return the system to the original design condition, and a 10CFR50.59 screening review/safety evaluation is performed to address the impact of this abnormal system or component alignment on design aspects.

After the disposition is developed, a documented review is performed by the appropriate Engineering Services supervisor and the Quality Services (QA) department prior to field implementation of the disposition. The Responsible Engineer interfaces with Maintenance and/or Operations as applicable to determine what documentation is required to support the NCN disposition testing requirements. Implementation of the disposition, including identified testing, is then performed by Maintenance and/or Operations personnel with Quality Control inspections as necessary. NCN disposition testing is performed to ensure the affected equipment is capable of performing its Design Basis function. After the disposition action is complete, the Responsible Engineer ensures that all documentation changes have been completed. Quality Control (QC) reviews the documentation to assure no further work is required.

Temporary Bypass, Jumper, and Lifted Lead Control

Purpose:

1. To ensure that the installation of electrical jumpers and lifted leads and the bypassing of computer inputs for in service plant equipment will be properly identified, reviewed, and approved prior to implementation.
2. To ensure the review of Bypass Authorization Requests for temporary bypass, jumper, and lifted lead activities by Design Engineering for the concurrence or disapproval of Bypass Authorization Requests.

Scope:

This process applies to the use of electrical jumpers and lifted leads and the bypassing of computer inputs for all in service plant equipment. This program also provides for Design Engineering concurrence or disapproval of Bypass Authorization Requests.

Process Descriptions:

SAP - 148 provides for the processing of the Bypass Authorization Request (BAR) by Operations and the tracking of the installation and removal of jumpers and lifted leads. The BAR is processed through the Manager, Operations. A Shift Engineer (STA - a degreed engineer who holds at least SRO certification) is assigned to review and complete the BAR. The Shift Engineer performs a technical review, which addresses functional and operational impacts. The Shift Engineer also provides precautions, wire size, routing, and location criteria to consider channel separation, seismic movement, access, interferences, etc.

The Shift Engineer performs a 10CFR50.59 screening review/safety evaluation per SAP - 107 and marks up any affected drawings showing the installation of the electrical jumper or location of the lifted lead and places the drawing on the Control Room SAP-148 In-Process Drawing stick. The determination of an unreviewed safety question at this point precludes the use of this procedure in performing a Bypass Authorization Request. The duty Shift Supervisor provides the final pre-implementation review and approval.

The Plant Safety Review Committee (PSRC) reviews all changes conducted by this procedure for their possible impact on plant safety. The PSRC verifies the bypass does not constitute an unreviewed safety question and ensures the bypass does not require a change to the Technical Specifications.

Design Engineering reviews BARs for concurrence or disapproval in accordance with procedure ES - 403. The Design Engineer is responsible for technical review of the BAR activity and the Independent Review of the 10CFR50.59 screening review/safety evaluation. After completion of review, the completed BAR package is sent to the Manager, Nuclear Operations. BARs which are disapproved by Design Engineering are reviewed by the PSRC and the results submitted to the appropriate Manager.

The Associate Manager, Shift Operations, performs a review and audit every ninety days of all BARs in effect. A Shift Engineer tracks the status of all active BARs and provides the reason the bypass is still installed and not made permanent for all active BARs.

MOV Change Program

Purpose:

To establish, implement and maintain an overall program for motor operated valves (MOVs). This includes various maintenance and testing activities as well as engineering reviews and analyses.

Scope:

This program applies to all safety-related motor operated valves (MOVs), position-changeable MOVs as defined in Generic Letter (GL) 89-10 and Balance of Plant MOVs as determined by the MOV Coordinator.

This program applies to the following MOV activities:

- Engineering Evaluations
- Corrective Maintenance
- Preventive Maintenance
- Testing
- Tracking/Trending
- Training

Program Description:

The Design Basis information for the MOV Program is contained in design calculations and pertinent information has also been incorporated into a Design Basis Document (DBD). This information includes GL 89-10 scoping, Maximum Differential Pressure for MOV Operation, Required Opening and Closing Thrust, Maximum Allowable Thrust, MOV Design Review and Capability, for the applicable MOVs as well as the data necessary for the static diagnostic testing of these MOVs to ensure Design Basis capability is maintained.

The static and dynamic diagnostic testing is performed by qualified Electrical Maintenance test technicians. The static diagnostic testing verifies that the Design Basis requirements, as stated in the applicable Design Review and Capability calculation, are met based on analysis of the test signatures by a qualified test technician. The static diagnostic testing includes allowances for test equipment accuracy as well as actuator repeatability, consistent with vendor methodology. The static diagnostic testing also includes an independent review of the test signatures by a qualified MOV test technician. For dynamic diagnostic testing, the test signatures are analyzed by a qualified test technician and reviewed by another qualified test technician. Upon completion of static and/or dynamic diagnostic testing, the test signatures and data are reviewed by the MOV Coordinator.

The MOV Coordinator reviews all Preventive Maintenance Task Sheets (PMTS) and Maintenance Work Requests (MWRs) which could adversely impact GL 89-10 MOV Design Basis capability to ensure Design Basis capability is maintained. The MOV Coordinator or designee is also responsible for performing a documented review of the static and dynamic diagnostic testing which is then independently reviewed by another MOV team member from within Engineering Services. This review ensures that the MOV meets Design Basis requirements, including allowances for diagnostic test equipment and actuator repeatability, consistent with vendor methodology. If it is determined that an MOV does not meet Design Basis requirements, a Nonconformance Notice (NCN) is generated. If it is determined that certain parameters observed during the test are less conservative than that used in the MOV design calculations and that the calculation has sufficient margin to accommodate the new parameter, the affected calculations are revised. The overall review of tested MOV performance versus Design Basis values is

documented in the Generic Letter 89-10 Motor Operated Valve Setup, Test and Performance Validation Summary Report.

The Design Basis capability requirements for those MOVs within the MOV Program are based, in part, on review of Design Basis events as described in the FSAR. The MOV Program ensures that the Design Basis capability of these MOVs is maintained based on the MOV Coordinator or designee reviews of maintenance and test activities, which includes a comparison of tested parameters to Design Basis values. If the Design Basis capability for a Program MOV is not maintained, an NCN is generated.

Any MOV Program activities which require updating the FSAR are implemented in accordance with either the Engineering Change Control or NCN process. Each of these processes address the need for updating the FSAR.

Software Change Control

Purpose:

To control software used, software upgrades, or changes required for digital control and computer based monitoring system applications used to operate, control and monitor the plant.

Scope:

This process applies to the software systems for the Fire Service Simplex System and the Turbine Closed Cycle Cooling System. Other software systems are described in Computer Software Change Control later in this section.

Process Description:

Software used in digital control and computer based systems for operating, controlling , and monitoring the plant is controlled in accordance with SAP-1040. Through this process, quality assurance requirements in development, procurement, installation, maintenance, testing, and modification are maintained and controlled. This process also provides a concise method for developing software that ensures the system meets the requirements, that testing processes are sufficient, that the system performs accurately, and that there is sufficient documentation for operating and auditing purposes.

Software and modifications for digital control and computer based monitoring systems used for plant operation and control require a 10CFR50.59 screening review/safety evaluation. There are no nuclear safety related applications using software or digital controls at VCSNS.

Final Safety Analysis Report/Fire Protection Evaluation Report (FSAR/FPER) Changes

Purpose:

To outline the process for the preparation, revision, distribution and control of the Final Safety Analysis Report/Fire Protection Evaluation Report (FSAR/FPER).

Scope:

Applies to the processing of FSAR/FPER changes.

Process Description:

When a change to the FSAR/FPER is identified, a FSAR/FPER Revision Notice (RN) is submitted to Nuclear Licensing and Operating Experience (NL&OE). Events which could affect the FSAR/FPER are as follows: completion of a plant modification; completion and approval of an analysis; approval of a plant procedure or procedure change; approval of a programmatic change; identification of the need for an editorial change (changes that do not alter the meaning of the text or figures in the FSAR/FPER); effective date of a new regulation, Safety Evaluation Report (SER), license amendment, or NRC order; identification of any other change, correction, or technical error; and at the end of each refueling outage, partially implemented plant modifications.

The RN contains the following information: description of the FSAR/FPER change; reason and basis for the change; organizations affected by the change; the 10CFR50.54(a) review requirements; and a summary of the safety evaluation, including the effect on the margin of safety. The 10CFR50.59 Safety Evaluation and the FSAR affected pages, tables, and figures are attached to the RN, except for changes which are based on a NRC issued SER or changes that are strictly editorial in nature. These changes only require that a 10CFR50.59 Screening Review be attached to the RN.

NL&OE distributes the FSAR/FPER RN to the affected and/or required organizations for review. The RN will also be reviewed by the Plant Safety Review Committee (PSRC) if an unreviewed safety question is identified or if the change was not reviewed through another program., such as ECR package. Once the review cycle of the RN is complete, final approval by the Manager, NL&OE is required.

The FSAR/FPER is revised (amended) no less frequently than annually or within 6 months after each refueling outage and reflects all changes up to a maximum of 6 months prior to the date of filing. This meets the requirements of 10CFR50.71(e).

Structures, Systems, and Equipment Classification

Purpose:

Provides a mechanism for engineering personnel to define classifications to structures, systems, and equipment including parts thereof.

Scope:

This process covers the assignment of classifications for structures, systems, and equipment including parts thereof.

Process Description:

The Classification Process consists of two types of classifications: Equipment Classifications (Structures, Systems, and Equipment) and Materials Classifications (Spare/Replacement Parts and/or Consumable Items). The Equipment Classification data is stored in the Computerized History and Maintenance Planning System (CHAMPS). When additions, revisions, or deletions to the CHAMPS equipment classification fields are needed, Design Engineering assigns a Lead Engineer to perform the classification. The Lead Engineer researches and determines the required classification data (General Class, Mechanical Class, Electrical Class, Code Class, Environmental Class, and Seismic Class). The Lead Engineer also determines the affected engineering documents. The classification data, the basis for the classification determination, and the affected engineering documents are included on the Equipment Classification Data Sheet. A second engineer performs an independent review of the Equipment Classification and a Supervisor, Engineering Services approves the Equipment Classification. The equipment classification data is entered into CHAMPS and verified.

The Materials Classification data is stored in the Materials Management System (MMS). When additions, revisions, or deletions to the MMS classification fields are needed, a Lead Engineer is assigned to complete the classification. The Lead Engineer researches and determines the required classification data (General Class, Electrical Class, and Environmental Class). The Lead Engineer also determines the affected engineering documents. The classification data, the basis for the classification determination, and the affected engineering documents are included on the Classification of Materials Form. A second engineer performs an independent review of the Materials Classification and a Supervisor, Engineering Services approves the Materials Classification. The material classification data is entered into MMS and verified. When the Materials Classification is being performed to support the development of a vendor specific Procurement Technical Requirements Package (PTR), the Classification of Materials Form is not used. All the classification information is processed with the PTR package.

Cumulative Effects

Purpose:

1. To review changes being made to the plant against subject areas and the assessment of the individual and cumulative effect on the available margin contained in selected output documents.
2. To track minor impacts to the design output documents in lieu of revising or reissuing the document.

Scope:

This program applies to the following engineering activities:

- Cable Tray Fill and Weight Loading
- Electrical Load Monitoring
- Hydrogen Inside Reactor Bldg.
- Main Control Board/HVAC Board Load Change and Seismic Qualification
- Combustible Loading Materials
- HVAC and Chilled Water Loads
- Internal Flooding Flood Level Change
- Structural Floor Load Mapping

Items not specifically addressed above are outside the scope of this program and require updates to the calculations and/or subsequent drawing as-builting anytime changes are made.

Program Description:

The Cumulative Effects Program consists of a screening process and, if required, an evaluation process. The screening process is initiated for those activities which may involve changes to plant systems, services or structures to determine if any of these changes affect available margins documented in calculations that envelop the Design Basis of the plant. Design change activities whose screening results in all "NO" answers do not affect the available margins. Design change activities whose screening results in any "YES" answer are evaluated further to determine the impact on the available margin. For those activities determined to have a major impact, either the design is changed to eliminate the major impact or a detailed analysis is performed (and appropriate calculations, drawings, etc. updated) to evaluate and justify the acceptability of the change. The complete package, consisting of the Cumulative Effects Screening Worksheet, the design documentation, and the evaluation are then sent to the respective Discipline Principal Engineers for review. For those activities determined to have a minor impact, the basis for determination of minor impact is documented and sent with the Cumulative Effects Screening Worksheet to the respective Discipline Principal Engineers for review.

Each Discipline Principal Engineer reviews that portion of the package pertaining to his discipline. This review is performed to ensure the screening and evaluations were performed correctly and that the impact of the change was correctly identified. This review also includes ensuring that other outstanding Cumulative Effects have been properly identified and considered in the evaluation. Any package deemed unacceptable by any of the Discipline Principal Engineers' is returned to the originator for comment resolution. For packages deemed acceptable by all Discipline Principal Engineers, each Discipline Principal Engineer signs the Cumulative Effects Screening Worksheet indicating his concurrence. Additionally, if the Cumulative Effects Screening Worksheet contained any "YES" answers in a given discipline, the respective Discipline Principal Engineer would log the cumulative affect against the appropriate affected calculation.

The completed Cumulative Effects Screening Worksheet and applicable attachments generated are incorporated in the parent document. Copies of the Cumulative Effects Screening Worksheet and applicable attachments/evaluations are placed in the calculation file before the affected calculation so that others are aware that Cumulative Effects are impacting that calculation.

Outstanding Cumulative Effect Changes for which work is complete, are incorporated into the next revision of the document.

Design Basis Documents (DBDs)

Purpose:

To assemble and capture the Design Basis information for VCSNS which was originally developed by the Architect/Engineers, NSSS supplier and equipment vendors from the following documents: FSAR, Technical Specifications, calculations, drawings, technical reports, vendor manuals, design/construction specifications, files and correspondence.

Scope:

DBDs have been developed for key systems and topical areas for VCSNS. There are 43 DBDs that have been developed and controlled within the program. The DBDs provide a summarization of the plant Design Basis or a guide (road map) to locate the information in other design documents.

Program Description:

The goal of the DBD program is to have under the control of SCE&G pertinent Design Basis information and/or references to locate such information to aid in making informed engineering decisions to support plant operations in a timely manner. The information contained within the DBDs is assembled and reviewed by knowledgeable SCE&G personnel and contractors to ensure that the information is correct and consistent with the plant as designed and operated. The levels of review which are conducted ensure that the information is accurate in order to make informed decisions relative to plant design and operation. Additionally, use of the DBD information for design considerations normally requires that the user access the original design documents or sources of information in order to understand the original inputs and assumptions used to develop the design.

ES-423 provides guidance for the development and revision of DBDs. New DBDs will be developed under a review process similar to that used for the initial DBDs using the most knowledgeable SCE&G and contractor resources available. The primary process for revision of DBDs occurs via other controlled programs related to Engineering Changes. Discipline Principal Engineers review each ECR and identify omitted design documents (including DBDs) which may be affected. The actual DBD revision is subsequently reviewed by the Discipline Principal Engineer. The Originator also specifies other required reviews by Systems and Component Engineering, Operations and Maintenance. A secondary process of revision can also be initiated by any plant or contractor personnel when deficiencies, clarifications or corrections are identified. Either process requires a review of the proposed changes to the DBDs by knowledgeable and responsible plant personnel, including as a minimum the Discipline Principal Engineer, and the Manager, Design Engineering.

The DBD Program is a supporting process to other parent processes, such as plant modifications and nonconformances. The 10CFR50.59 screening review/safety evaluation is performed as part of these parent programs and therefore not required specifically for DBDs. Additionally, DBDs are primarily a summarization of the plant Design Basis which is extracted from other controlled documents, thereby not normally requiring a safety evaluation of their own.

Calculations

Purpose:

To control the identification, preparation, review, approval, revision and retention of Design Basis calculations and formal engineering analysis.

Scope:

This process applies to calculations developed in support of confirming the adequacy of or changing plant Design Basis.

Process Description:

New calculations are developed when existing calculations do not cover the topic being analyzed/evaluated. New calculations are developed to the format listed in section 6.2.1 of ES-412 which includes identification of Design Inputs and their sources, assumptions used requiring future confirmation, and a description of the methodology used.

The calculation package is verified and approved. The scope of verification is determined by the Lead Engineer. The individual is independent of the calculation preparation process and has sufficient knowledge in the subject area to determine that proper inputs and methodologies have been used and results are reasonable.

The approval of the scope of the verification and the calculation itself is performed by the appropriate Discipline Supervisor, Design Engineering.

Revisions to existing calculations are accomplished by making the necessary changes to the affected pages of the current calculation and completing a calculation cover sheet. The calculation package is verified and approved in the same manner as a new calculation.

Drawing Control

Purpose:

To define the process of generating, reviewing, revising, issuing, and maintaining drawings for VCSNS.

Scope:

This program is applicable to Nuclear Operations Department (NOD) personnel and contractors performing activities affecting drawings for VCSNS. The program applies to the following types of drawings:

1. Interim Drawing
2. As-Built Drawing

Process Description:

The Drawing Process consists of the methodology to identify, develop, add or revise, check, review, and issue a drawing at the VCSNS. Distribution of drawings is performed in accordance with procedure DCP-103. The identification of a drawing is determined by the assigned Responsible Engineer. "Holds" are placed on drawings, except for administrative changes, in the Drawing Control Database to alert other plant personnel of pending changes. (An alternate method is to place physical "Holds" on drawings utilizing a Drawing Change Notice). Any drawing conflicts identified in the Drawing Control Database are resolved with the appropriate engineering personnel.

Interim Drawings

The Responsible Engineer (RE) prepares a DCN form, marks up drawings, reviews the Drawing Control Database for holds against the drawings and resolves any conflicts.

The Computer Aided Drafting and Design (CADD) group determines if the package should be processed or rejected. If rejected, CADD documents the reason and returns the package to the Originator. For all others, CADD incorporates the changes, checks the drawings for drafting errors, and returns the drawings package to the originator for review.

The Responsible Engineer ensures the requested changes have been properly incorporated. For Main Control Board (MCB) or Control Room Emergency Panel (CREP) drawings, a "Human Factors" review is performed.

As-Built Drawings

Engineering identifies the drawings requiring as-builting to CADD. CADD revises the drawings, prepares any associated FSAR/FPER figures, and forwards the drawings to Document Control for further processing.

The Drawing Process is a supporting process to a parent processes such as ECRs or NCNs. The 10CFR50.59 screening review/safety evaluation is performed as part of the parent process and therefore is not required for the Drawing Process. Administrative changes to drawings normally represent an update to drawings to maintain consistent information to support previously approved design changes processed per parent processes. A 10FR50.59 screening review/safety evaluation is not required for administrative changes to drawings per the criteria set forth in ES-410.

Database Change Control

Purpose:

1. To control the processes of developing, modifying, and maintaining engineering database programs.
2. To provide a methodology to update Engineering controlled databases, and to provide Engineering Information to databases controlled by groups outside of Engineering Services.

Scope:

This process applies to the following activities:
1. The development, use, and maintenance of Design Engineering Database Management Systems.
2. Providing updates to "Controlled" and "Uncontrolled" databases.

Process Description:

Changes made to Engineering Services controlled databases are identified as either: 1)changes to be made upon receipt or, 2)pending changes for future incorporation. An Independent Review is performed for changes to "controlled" information. Technical approval is provided for both controlled and uncontrolled information by the Approval Authority. Changes are inputted by an Administrative Specialist and the data entry verified by another individual.

Changes to information contained in databases, that are not under the control of Engineering Services, are identified and forwarded to the appropriate groups.

The original packages and supporting information is forwarded to plant records.

A 10CFR50.59 screening review/safety evaluation per SAP-107 is performed for all initial applications and subsequent changes to computer databases except for those specifically identified per Section 6.3.9 of SAP-1040.

Specification Control

Purpose:

1. To control the identification, preparation/revision, review, certification (ASME Design Specifications), approval, and retention of ASME Design Specifications, Procurement Specifications and Construction Specifications performed at VCSNS.
2. To provide guidance to correctly specify requirements to control procurement of items or activities in the construction, repair, replacement, modification, or operation of structures, systems, or equipment at the VCSNS.

Scope:

The scope of the Specification Control program includes ASME Design Specifications for design, construction, and installation of ASME Code components and piping; Procurement Technical Requirements utilized in the procurement of equipment, material and/or services for use in plant operations; and procurement and construction specifications utilized in the procurement of equipment, material or services for use in plant operations, maintenance or modifications.

Process Description:

ASME Design Specifications, Procurement Specifications and Construction Specifications

The Specification Control process initiates with a determination of the need for a specification. If a replacement of existing equipment or a change to system requirements is to be performed and there is an existing specification, that specification is revised. For all other conditions, a new specification is developed. Design requirements are extracted and compared to operating parameters. Series 302/912 drawings, applicable calculations, component function, and change documentation are used to determine operating parameters. The established operating parameters are compared to the maximum parameters to ensure the values are not exceeded. If the values are exceeded, a revision notification to the initiating change process shall be generated and the parameters must be reconciled.

Design Specifications require an independent review by an Engineering Specialist in Design Engineering or by the Originator's Supervisor. A Professional Engineer review and certification is required in addition to the initial independent review. The Mechanical Supervisor of Design Engineering provides the final approval.

Procurement and Construction Specifications require an independent review by a qualified reviewer. Procurement Quality reviews all Safety Related and Quality Related specifications. The Manager, Design Engineering provides the final approval.

Procurement Technical Requirement

Procurement Technical Requirement (PTR) documents are initiated when it is determined that procured items and/or services are required in the construction, repair, replacement, modification, or operation of structures, systems, or equipment. PTR's are intended to be used for new equipment and replacement-in-kind procurements. In addition, spare and restock parts may have PTR's developed to aid in future reorders. Design and Construction Specifications may be incorporated into the PTR's and not issued as separate documents. Where a PTR serves as a technical design specification, other existing specifications may be affected and require deletion or revision. In this case, the Engineering Change Request process is used to delete or revise affected specifications since these specifications must reflect as-built conditions of the systems and equipment.

The Supervisor of Procurement Quality & Receiving Inspection is responsible for the review and approval of Safety Related and Quality Related PTR's.

Technical Reports

Purpose:

To record a wide range of engineering reports or studies.

Scope:

Technical reports typically document the results of an engineering study in a particular subject area, usually as a result of a regulatory issue. These documents may demonstrate continued compliance with regulatory commitments and require changes to be reviewed and approved accordingly.

Process Description:

ES-101 describes the process for preparation, review, level of use designation, and approval of controlled documents developed by Engineering Services.

A technical report is a design output document that is used to record a wide range of engineering reports or studies that may record positions on specific issues, summarize the results of calculations, or record the results of studies. It is not used to work on plant equipment, manipulate plant equipment, or conduct routine tests on plant equipment; therefore technical reports do not require 10CFR50.59 screening review/safety evaluations.

Technical reports can originate in Systems & Components Engineering (SCE) or in Design Engineering (DE). Typically , the responsible supervisor assigns an originator who prepares the document. If the technical report originates in Systems & Components Engineering, the required reviewer is a supervisor in Systems & Components Engineering, and the approval authority is the manager of Systems & Components Engineering. If the technical report originates in DE, the required reviewer is a discipline Principal Engineer in DE, and the Approval Authority is the Manager, DE.

Plant Lubrication Manual Change Processing

Purpose:

To control and maintain lubrication information to assure component reliability through the Preventive Maintenance Program.

Scope:

This change process applies to all plant equipment requiring lubrication for Preventive Maintenance.

Process Description:

Evaluation, maintenance and control of the Plant Lubrication Manual (PLM) are the responsibility of the Manager, Design Engineering. Changes and additions to the Plant Lubrication Manual are initiated per SAP-143. Changes or additions to the PLM can be initiated from within and outside of Engineering Services by submitting a marked-up copy of an existing Equipment Lubrication Data Sheet (SAP-143) for changes or a new Equipment Lubrication Data Sheet (ELDS) for additions. Evaluation of changes are performed in accord with ES-418. All approved Equipment Lubrication Data Sheets are sent to Document Control for controlled distribution to all PLM holders.

Significant changes, as described in ES-418, receive a 10CFR50.59 screening review/safety evaluation.

When required, revisions to the FSAR/FPER are processed in accordance with SAP-1163.

Information Request (b)

Rationale for concluding that design bases requirements are translated into operating, maintenance, and testing procedures.

Response:

SCE&G's rationale for concluding that that design bases requirements are translated into operating, maintenance, and testing procedures is based upon:

- Multi-discipline procedure reviews
- Systematic processes
- Internal reviews
    - Quality Systems activities
    - Safety System Functional Inspections (SSFIs)
- External inspections
    - Service Water System Operational Performance Inspection (SWSOPI)
    - Electrical Distribution System Functional Inspection (EDSFI)

The programs described in the response to information request (a) provide the bases for the establishment, maintenance, and documentation of the various design bases and configuration management sources. It is vital that the requirements contained therein are effectively translated into procedures which are used for the operation, maintenance and testing of the systems, structures and components (SSCs) which comprise the facility.

Multi-discipline Reviews:

The procedure development, review and control process is the vital tool to link the requirements specified in design bases sources to usable, functional procedures. These procedures provide personnel with a means to operate and maintain the facility in such a way as to minimize the risk to the public's health and safety. A systematic approach is taken to procedure development. Once the need for a new procedure is identified, a person in the responsible discipline is assigned the task, and the procedure is processed per SAP-139. A 10CFR50.59 screening review/safety evaluation is performed, which includes a detailed review of all applicable sections of Technical Specifications, the Final Safety Analysis Report, and the Fire Protection Evaluation Report. The discipline supervisor of the group responsible then assigns interface reviewers based on an established interface review matrix found in SAP-139.

The scope of reviewers varies with the type of procedure. After the screening review/safety evaluation is completed, it is independently reviewed by a knowledgeable Qualified Reviewer. The Qualified Reviewer reviews the content of the procedure and conducts an independent review of the 10CFR50.59 screening worksheet or safety evaluation. Additional levels of review are provided by independent Quality Control personnel. If the procedure requires a safety evaluation (any screening review question is answered yes), the procedure change/revision is also reviewed by the Plant Safety Review Committee (PSRC). If any safety evaluation question is answered yes, the activity may involve an unreviewed safety question and is not implemented unless/until NRC approval is obtained. All interface review comments are resolved prior to implementation of the change/revision.

Procedures that follow the described process include:

- Operations Department procedures which require manipulation of plant equipment, are used to work on or test plant equipment, or describe the administrative controls associated with plant operations.

- Test procedures which contain unique lineups or configurations to systems and include steps to ensure the test lineup is established, equipment is tested, and the system is returned to its original state in accordance with the plant's design bases. Testing of plant equipment is performed per General Test Procedures (GTPs) and Surveillance Test Procedures (STPs).

- Inservice Test Procedures which are developed with the intent of verifying that associated components are capable of satisfying their required design or licensing basis function. Required design minimum and maximum system flow rates, test pressures, inspection boundaries, stroke times, and differential pressure test limits as applicable and other related test acceptance criteria, are documented in the applicable Surveillance Test Procedures.

- Maintenance Procedures which are developed with the intent of verifying that plant components are repaired or refurbished, as required, to return the component to its original design configuration as defined by the vendor or by approved design documents.

Systematic Revision Process:

Revisions to these procedures follow essentially the same process as defined above. A primary initiator of changes to plant procedures are as a result of planned modifications to station equipment. The identification of impacts to these procedures takes place during the modification package interface review process. Once the need for a new procedure, change, or revision has been identified due to the plant modification, a person in the responsible discipline is assigned the task to develop the necessary documentation. For plant modification initiated changes a review by Design Engineering is required. A Qualified Reviewer reviews the content of the change/revision and performs an independent review of the 10CFR50.59 screening review/safety evaluation.

All engineering change packages are reviewed in detail by affected department representatives for procedure and testing impact. Meetings concerning engineering changes are attended by representatives from these affected organizations. Implementation of the new procedure or procedure change takes place in accordance with a preapproved schedule of activities.

Other initiators to procedure changes are proposed changes (Amendments) to the Technical Specifications, Final Safety Analysis Report, and Fire Protection Evaluation Report. Existing department procedures are reviewed for impact based on these changes. If any procedures are affected, the procedure changes are prepared, and implemented at the time the amendment is implemented.

Internal Reviews:

Internal reviews of these procedures by the VCSNS staff, both before approval and after implementation, represent a programmatic assessment of the effectiveness with which design bases sources have been incorporated into procedures. Vertical slice reviews of eleven (11) plant systems by the Independent Safety Engineering Group (ISEG) represent both an independent assessment of the effectiveness with which procedures incorporate design bases requirements as well as fostering an attitude of continuous self-evaluation and self assessment.

Significant examples of the type of problems identified in procedures during the performance of SSFIs are listed below:

1. System Operating Procedure (SOP-306), "Emergency Diesel Generator," Section IV-H, "Transferring Bus IDA from Offsite to Diesel Generator," was revised in February, 1988, to eliminate the possibility of loading ESF equipment onto the bus in a different sequence than designed.

2. Operations procedures and Technical Specification Logs did not list a maximum pressure for the service water pump discharge. The Service Water System Design Basis pressure was incorporated into operations procedures and the Technical Specifications Logs in January, 1988.

Maintenance of the VCSNS plant design basis has been enhanced by the SSFI reviews conducted by the ISEG group. Procedural discrepancies have been identified and resolved. However, no deficiencies have been identified to date that have actually prevented a system from performing its design function in its intended manner.

In addition, Quality Assurance reviews procedures/ plans/ documents to assure that proposed activities are adequately described and that they comply with interfacing procedures, applicable codes, FSAR commitments, standards and regulatory requirements. Quality Control performs additional inspections in the field to assure acceptable levels of quality are maintained.

Listed below are significant procedure deficiencies that were identified during Quality Systems inspections:

- Mechanical Maintenance Procedure MMP-250.001, "Encapsulated Valve Chambers, Removal/Installation," did not adequately address the installation method nor did it reflect the correct preloading of the flange toggle bolt assembly for the valve encapsulation chargers as described in Equal To Better Than (ETBT) 231. Quality Control personnel noted this deficiency during a May, 1996, inspection and wrote Nonconformance Notice (NCN) 5466.

- A special audit of the station maintenance program was performed in April, 1995. A configuration management problem was identified by Finding QA-AUD-95005-1. A Lubrication Manual change identified a frequency of six months to change the grease in the bearings of XFN0019A-M and XFN0019C-M. Since the CHAMPS preventive maintenance program was not revised concurrent with the Lubrication Manual change, the frequency identified in the CHAMPS database remained "annual", therefore, the lubrication was not performed at the specified frequency.

- A configuration control problem was noted during the station design activities audit which was performed in July, 1995. Finding QA-AUD-95011-1 was issued for Engineering's failure to obtain required interface reviews for a Modification Change Notice (MCN) during the implementation of Modification Request Form (MRF) 20951. Test procedure PTP-114.042 was affected by the MCN. The Fire Protection group was not notified regarding the modification change. This resulted in a declared unsatisfactory test when performing the quarterly flow test per PTP-114.042, due to modification work in progress.

Maintenance of the VCSNS plant design basis has been enhanced by Quality Systems' reviews. Procedural discrepancies including recommended enhancements are being identified and resolved. **No deficiencies have been identified to date that have prevented a system from performing its design function in its intended manner.**

External Reviews:

External reviews have also been conducted utilizing a "vertical slice" technique. These reviews are both independent and comprehensive in nature. The SWSOPI and EDSFI inspections provided additional confidence to VCSNS that the design bases requirements are translated into operating, maintenance and testing procedures.

The scope of the SWSOPI included verification that the SW System is capable of fulfilling its thermal and hydraulic performance requirements and is operated consistent with its design basis, and assessed the SW System operational controls, maintenance, surveillance and testing, and personnel training to ensure the SW System is operated and maintained so as to perform its safety-related functions. The SWSOPI concluded the following with regard to procedures:

1. Operating procedures reviewed accomplish their intended objectives.
2. Operating logs, with one minor exception, comply with surveillance requirements and are adequate and accurate.
3. The technical adequacy of the maintenance procedures reviewed is acceptable.
4. Review of a representative sample of STPs concluded that they are capable of being performed as written and found the test paths consistent with plant drawings.

The EDSFI conducted in March and April, 1992, similarly concluded the following:

1. The Electrical Distribution System has the capacity to perform its intended safety functions.
2. The inspection team's overall findings were positive, reflecting good design, maintenance and testing.

Summary:

The rationale that design bases requirements are translated into operating, maintenance and testing procedures is founded on thorough multi-discipline reviews, systematic processes and rigorous internal and external evaluations.

Information Request (c)
Rationale for concluding that system, structure, and component configuration and performance are consistent with the design basis.

Response:

SCE&G's rationale for concluding that system, structure and component (SSC) configuration and performance are consistent with the design basis is:

- Comprehensive Configuration Management Plan.
- Administrative controls for administrative changes, engineering change design and implementation, temporary changes, procedure verifications, plant operation including work control process, and other activities affecting plant configuration.
- Comprehensive system and component checkout, functional, and performance testing.
- Design Bases review, reconstitution and/or reanalysis.
- Self-assessments of safety system functional and performance characteristics.
- NRC and third party assessments such as EDSFI and SWSOPI.

As described in responses to information requests (a) and (b), VCSNS maintains design bases information within various programs and ensures that this information is appropriately translated into procedures in other programs. The programs which control the configuration of plant's SSCs, and those programs, processes and assessments which provide information on the performance of these items, are the assurance that the design bases of the plant continues to be preserved.

The broad spectrum of programmatic requirements designed to ensure this preservation ranges from engineering programs which manage the configuration of calculations, documents and drawings, to Operations programs which track the physical configuration of the plant components. Maintenance and testing programs are designed to ensure that SSC performance meets and will continue to meet certain standards of performance, such that their ability to carry out their design function is reasonably assured.

Configuration Management Plan:

The Configuration Management Plan currently includes Design Engineering activities related to self improvement initiatives. The document also includes selected initiatives related to interfacing departments and processes, as required, to enhance Design Engineering's' capability to assure continuing compliance with the Design and Licensing basis for the plant. This plan, along with the processes described in request (a), provide the appropriate controls for management of engineering programs.

Administrative Controls:

The following Operations Programs are used to track the physical configuration of plant components: Control of System Alignment and Operation, Status Control/Removal and Restoration, Temporary Bypass, Jumpers and Lifted Leads, Operating Logs, Special Instructions and Station Orders, and the Locked Valve Program.

Control of System Alignment and Operation

The normal vehicle for operating plant systems is the System Operating Procedure (SOP). Major evolutions such as reactor power changes, startups and shutdowns, and Mode changes are performed through the use of General Operating Procedures (GOP's), but individual system alignments or manipulations are made by the SOPs which are referenced throughout the GOP's. All GOP's and SOPs are written, reviewed, and approved through the SAP-139 procedure process, which ensures all Operating Procedures receive a 10CFR50.59 review as part of their

development or change. All Operating Procedures are required to be adhered to, as specified by SAP-123, Procedure Use and Adherence.

System lineups are performed and documented by qualified operators in accordance with operations standards requiring second verification. This ensures a redundant check on a system configuration change specified by the SOP. All SOP specified alignments are consistent with design bases references as a base configuration for the plant for a given plant state or mode.

Manipulations to the system to effect normal plant operation such as swapping running/idle trains of equipment, stopping and starting equipment, and placing subsystems in operation are accomplished utilizing subsections of the SOP.

Removal of plant equipment to perform maintenance, whether preventive or to effect necessary repairs, is done through the plant's approved tagging programs.

SAP-201, the Danger Tagging Procedure, specifies the guidelines under which plant equipment is removed from and returned to service. Although primarily concerned with equipment and personnel safety, it provides a framework for establishing and controlling the physical configuration of the plant. Documentation for the current operating cycle is archived in an area accessible to the Control Room, to provide a record of the status of the system and its components. The physical configuration of the plant, incorporating redundant trains and components, normally allows for the removal of equipment for maintenance while at the same time preserving the minimum level of required system performance as specified by the plant's design and licensing bases. Should more involved maintenance be necessary which would require longer term or greater portions of the system to be removed from service, the plant would need to be placed in a mode or state where the design and licensing bases configuration would not be impacted.

SAP-202, "Caution Tagging", is the procedure which establishes a uniform, reliable method for controlling plant equipment which is subject to certain precautions. In addition, it provides a method for evaluating both design change (ECR) and procedure change requirements for caution tagged equipment. Equipment is caution tagged to ensure that, prior to operation, certain pertinent information regarding its operation is communicated via the tag and associated documentation.

As part of the preparation of the caution tagout, two screening questions are asked to determine if other programmatic controls must be employed in addition to the tagout:

- Will installation of the Caution Tag require ECR initiation for permanent reposition of equipment that deviates from the FSAR?
- Will installation of the Caution Tag require revision to plant procedures?

If either question is answered, "yes", the appropriate programs for plant modification or procedure change must be initiated prior to the caution tag being hung. This ensures that the overall programmatic controls for plant configuration management are adhered to, and that the plant is not placed in a state which is outside the design bases, since these programmatic controls both require a 10CFR50.59 screening/safety evaluation be performed.

OAP-105.2, "Equipment Misalignment Status", is the Operations procedure which addresses short term equipment alignments which are different than specified by normal operating procedures. Due to the short term nature of those alignments, the procedure change program (SAP-139) and Danger Tagging Program (SAP-201) are not required.

Entries into the Equipment Misalignment Status Log must be approved by the Shift Supervisor or Control Room Supervisor. Their approval indicates that a condition which is unusual exists, and that a procedure change is not

required. Additionally, an evaluation is performed to ensure that the misalignment does not impact the component or system's ability to perform its design function.

All entries in the Equipment Misalignment Status Log are audited every 30 days to determine the need for continued misalignment. Continued misalignment in excess of 30 days results in the item being removed from the Equipment Misalignment Status Log and tracked via the Caution Tagging program, described above.

Surveillance testing of plant equipment is performed per Surveillance Test Procedures (STPs) which are developed, reviewed, and approved using the SAP-139 process which ensures a thorough 10CFR50.59 evaluation. Test procedures contain unique lineups or configurations to systems and include steps to ensure the test lineup is established, equipment is tested, and the system is returned to its original state in accordance with the plant's design bases.

Plant personnel are trained on the importance and impact of adherence to plant procedures while operating and testing equipment. Guidelines are established in SAP-139 for Temporary Approvals to procedures to provide a means for quick turnaround, but still incorporate a 10CFR50.59 review and an independent review by a qualified reviewer prior to approval by the Shift Supervisor.

System Status files are maintained to include documentation controlling the change in a system alignment since the last documented full system alignment. These documents include: Completed danger tagouts, locked valve tracking sheets, STPs, and Removal and Restoration checksheets. This documentation provides a history of any system changes and ensures that the system is kept in, or returned to a configuration necessary to perform its function as specified in the design bases.

Status Control/ Removal and Restoration

Station Administrative Procedure SAP-205, Removal and Restoration, specifies the methodology used to control system status for those systems required by plant Technical Specifications or other administrative programs.

Removal and Restoration (R&R) Checksheets are implemented any time a designated system which is required to be operable is found to be or made to be inoperable, except when done so for the purpose of testing per an approved STP.

The Duty Shift Supervisor has the responsibility for operability determinations on plant systems and components. When applicable, it is his responsibility for ensuring that appropriate Technical Specification Action Requirements are met and time frames are acknowledged such that equipment is restored in a timely manner.

All licensed shift positions, including the Shift Engineer (STA) are required to review the R&R log prior to assuming their normal shift positions so that they are aware of changes to the plant configuration.

The R&R checksheet provides all essential document references to allow for the coordinated return of the system or component to service. These documents referenced include: applicable Technical Specification numbers and action timeframes, maintenance work documents or work package numbers, danger tagout numbers, STP tasksheet numbers, and, where applicable, Modification Request Form (MRF) numbers. Depending on the pre-planning interface with Operations , an Operability/Return to Service form may also be required. This paperwork ensures that all post-modification testing, procedure development or changes, drawing changes, and training requirements are documented complete prior to the system being declared operable by the Shift Supervisor.

The R&R Checksheet is reviewed by the Licensed Operator at the Controls and the Senior Licensed Control Room Supervisor or Shift Supervisor to ensure all referenced documentation reflects that the system is aligned and has been tested satisfactorily prior to being declared operable.

R&R Checksheets are utilized by Engineering personnel to track and trend the performance of systems, structures and components to ensure their performance levels are consistent with the design bases. The checksheets are audited daily to ensure agreement between the R&R log, plant computer, and Main Control Board identifying tags. Any R&R which has been in effect for more than 30 days is further evaluated to determine if there is justification for the out of service interval and to assess whether an additional programmatic measure is necessary.

Temporary Bypasses, Jumpers, and Lifted Leads

In cases where it becomes necessary to lift electrical leads, open electrical links, or install electrical jumpers for in-service plant equipment, Station Administrative Procedure, SAP-148 is implemented. This procedure is utilized in cases which are not addressed by other existing Operating Procedures developed, reviewed, and approved under SAP-139 specifically for equipment status control. It is also not meant to supersede or duplicate those temporary modifications to the plant which are approved and installed under SAP-133 and ES-416. In all cases, the programmatic process utilized incorporates a 10 CFR 50.59 screening and review.

Bypass Authorization Requests (BARs) are submitted by the originator to Operations Management to determine the necessity and applicability of the request. If determined that the request is not addressed by an existing procedure, nor that it involves a temporary modification, it is assigned to a Shift Engineer (STA) for completion.

The Shift Engineer (STA) reviews the request for technical accuracy, and performs a 10CFR50.59 review to screen for any Unreviewed Safety Questions. The General Manager, Nuclear Plant Operations must give final concurrence prior to implementation of the BAR. The actual installation or bypass is accomplished through the controls of Plant Maintenance Procedures (SAP-300) and is coordinated by the Shift Engineer (STA).

The implemented BAR is reviewed by the Plant Safety Review Committee (PSRC) for its impact on plant safety. The PSRC verifies the bypass does not constitute an unreviewed safety question and ensures the bypass does not require a change to Technical Specifications. Design Engineering reviews BARs for concurrence or disapproval in accordance with ES-403.

Quarterly Audits are performed on each outstanding BAR to assess its continued applicability or whether a permanent design change to the plant is more appropriate.

Operating Logs

Operating logs are another mechanism used to periodically document surveillances on equipment and operating parameters which define the reference bounds for the design of the plant. These surveillances are normally defined by the Technical Specifications but also include equipment operating parameters which are essential to ensuring that equipment performance is consistent with the design basis.

Parameters monitored periodically per required logs are controlled by Operations Administrative Procedure OAP-106.1. Changes to the facility per the appropriate design processes are fed into the operator logs through revision to this procedure, which includes the logs themselves as Attachments. This is accomplished through the SAP-139 process and includes a 10CFR50.59 evaluation. Operations interface in the planning phase of the Modification process ensures timely recognition of certain specific logged parameters associated with the design bases such that necessary changes to the logs are identified.

Special Instructions and Station Orders

Special Instruction and Station Orders are a means of establishing policy or disseminating short term information to shift personnel tasked with operating the plant. These administrative controls are of an informational nature and are intended to supplement, not supersede, the bank of approved operating procedures.

Locked Valve Program

The locked valve program, as described in Operations Administrative Procedure OAP-106.3, provides the administrative controls for valves which are required, due to the extreme importance of their configuration, to be locked in position. These components are required for reasons specified in sources including the design bases, to be locked in a controlled position which may be open, closed, or throttled depending on the valve's design function. The act of locking the valve limits the chance of accidental operation by requiring a separate conscious action in order to change the valve's position, and, thus, the plant's configuration.

A locked valve tracking log provides the administrative mechanism for identifying all components within the program, as well as the current serial numbers for the locking devices.

Maintenance Work Requests

This process provides control of the maintenance and repair process and ensures that SSC configuration and performance remain consistent with the design basis.

Equipment repairs are accomplished under the Maintenance Work Request (MWR) process under the guidelines of SAP-300 and SAP-601. Activities are planned and controlled through the planning and scheduling department. Activities are scheduled to coincide with other work being performed on a system and reviewed by Operations to ensure designated protection train equipment is available to perform its safety function.

Prework reviews are required by SAP-601 to be performed by the responsible discipline planner, Quality Control, Health Physics, and Operations. Additionally, for activities associated with air operated valves, motor operated valves and modifications, an Engineering Services review is required.

Equipment is reworked to its original design condition. When rework has been completed a retest is performed to verify equipment performs its designed function. Post-maintenance retest is controlled by GTP-214. Retest requirements are determined by the responsible planner, performer and job supervisor. Operability retest requirements are determined by Operations.

Upon completion each package is reviewed by the Responsible Supervisor, Quality Control, Operations, Systems and Component Engineering, NPRDS Coordinator, and Planning and Scheduling.

Equipment problems and failures which require immediate attention are designated "priority" by the Shift Supervisor. Due to the necessity to work these items as soon as possible after they have been identified, they do not go through the normal planning and scheduling process. However, they still are reviewed, implemented, and retested in the manner described above.

Replacement parts are purchased as exact replacements. If a part is unavailable and substitution is required, the replacement part is certified by an "Equal To/Better Than" evaluation by Engineering Services. Quality Control verifies replacement on safety related and quality related components.

System and Component Testing:

Surveillance Testing and Preventive Maintenance Programs

These programs provide a means for surveillance tests, calibrations and preventive maintenance performed by the VCSNS Maintenance department to ensure that SSC configuration and performance remain consistent with the design bases.

System performance and accuracies are verified through periodic testing to meet the requirements of Technical Specifications, SAP-134 (Surveillance Tests) and SAP-143 (Preventive Maintenance).

Activities are planned and scheduled through the Planning and Scheduling group to ensure that the work is being performed during the proper train maintenance period, providing assurance that the designated protected train equipment is available to perform its required safety function. The work is coordinated through the Operations department to ensure that the current plant conditions allows the work to be performed, in a time frame not exceeding operability commitments.

The level of review is dependent upon the type of work performed. Surveillance tests are reviewed by the Operations Shift Supervisor, responsible discipline supervisor, Quality Control, and the outage scheduling supervisor. Preventive maintenance reviews are conducted by the responsible discipline supervisor, Operations, Quality Control, and Systems and Component Engineering. Test/calibration packages are reviewed for data accuracy. Test deficiencies are evaluated for operability impact and resolved commensurate with their safety significance.

IST Program

The following discussion presents the attributes of each individual program that makes up the IST Program, and how the associated testing verifies the ability of the systems and associated components to meet the design bases.

Pump Program:

The Pump IST Program, as described in GTP-301, incorporates the requirement that the "operability limits of pumps must always meet, or be consistent with, Licensing Basis assumptions in the plant safety analysis". Pump performance data is compared to IST limits as documented in the Surveillance Test Procedures for tested pumps. In addition, pump performance data is compared to both IST limits and licensing basis limits as documented in the Surveillance Test Procedures for the Charging/SI, Emergency Feedwater, and Residual Heat Removal Pumps.

Valve Program, GTP-302:

The Valve IST Program, as described in GTP-302, provides for inservice testing of specified valves to ensure operational readiness of the valve to perform its intended function. Acceptance criteria, for example, maximum stroke time allowable, are specified by valve type to ensure compliance with the Design Bases assumptions.

System Pressure Testing, GTP-304:

The implementation of the System Pressure Testing Program is documented in the associated Surveillance Test Procedures. These Surveillance Test Procedures document the required test boundaries and required test pressures. The selection of test boundaries and associated test pressures are based on the application of the associated code requirements in conjunction with the safety function of the system as described in the plant's design and licensing basis documents.

Inservice Examination Program

The Inservice Examination (ISE) Program is a 10 year plan maintained to schedule, implement and report the inspections performed for compliance with the ASME Code, Section XI, 1989 Edition. These inspections are for the purpose of monitoring the structural reliability of code systems.

In addition to the mandatory requirements of the ASME Code, the program also addresses piping and component inspections performed for compliance with regulatory documents such as Regulatory Guides, Bulletins and Plant Technical Specifications, where the inspections are similar to those required by the code.

The scope of the Inservice Examination (ISE) Program is limited to visual, surface and volumetric non-destructive examinations (NDE) of plant piping and components, with the exception of snubbers, which are also dynamically tested. The components that are subject to examination are, for the most part, defined by the ASME code. However, several examinations are performed on items in response to Technical Specifications or other regulatory documents.

The following describes the elements of the Inservice Examination Program:

Piping and components are monitored to assure pressure boundary integrity. NDE examinations are performed in accordance with the requirements of Section XI of the 1989 edition of the ASME Code. These requirements assign one or more methods of NDE to be performed on various populations and at frequencies which assure that the structural integrity of code boundaries are within design requirements.

Component supports are monitored to assure their design function is maintained. Visual examinations are performed on supports in accordance with the requirements of Section XI of the 1989 edition of the ASME Code. These requirements prescribe the population and area of interest of supports to be examined to assure supports are adequately providing their design function.

Visual examinations and dynamic testing are performed on snubbers as prescribed by Technical Specifications. These requirements also satisfy the requirements of the ASME Code and assure that snubbers are adequately providing their design function.

All inspections, including those associated with pressure testing, performed to satisfy the ISE program, are reported each refueling. Repairs and material replacements are also reported, when required by the code, each refueling.

All items identified as a result of the ISE program receive specific corrective actions or evaluations as prescribed by the code. These actions assure that the design parameters of the material are maintained prior to continuing service.

The ISE program (the 10 year plan) is reviewed and approved by Quality Systems and the Authorized Nuclear Insurance Inspector (ANII). The current, as well as the previous, ISE programs were submitted to, reviewed, and approved by the NRC.

The Inservice Examination Program reports are reviewed by the ANII agency, and a Level III NDE Inspector. The refueling inspection summary report (NIS-1) is submitted to the NRC for review.

Design Bases Review/Reconstitution Efforts:

SCE&G has performed a large amount of design basis review, reconstitution and/or reanalysis as a result of past projects. These efforts give added confidence to our rationale that our SSC configuration is consistent with the design basis.

Design Basis Documents (DBDs) were developed between 1985 and 1993 by the Architect/Engineers, NSSS supplier and equipment vendors from the following documents: FSAR, Technical Specifications, calculations, drawings, technical reports, vendor manuals, design/construction specifications, files, and correspondence. The program consists of 43 individual DBDs covering the major plant SSCs and relevant topical areas. The purpose of the DBD program was to assemble and capture the design basis information for VCSNS.

Each DBD was originated by the Architect Engineers or NSSS supplier using senior personnel who were involved and familiar with the original design of V. .SNS. Draft DBDs were reviewed externally by a multi-discipline task force of senior personnel at the originating organization, and internally by knowledgeable personnel in SCE&G's Engineering, Operations and Maintenance Departments.

Several assessments and inspections have been conducted since 1989 which have provided a continuous, comprehensive focus on design bases review and maintenance. Some examples are the Equipment Qualification Assessment, the IPEEE assessment, the Service Water System Operational Performance Inspection, and the Electrical Distribution System Functional Inspection. Reviews conducted for these efforts have resulted in the identification and performance of reconstitution and/or reanalysis of Design Bases.

From 1992 to 1996, Steam Generator Replacement, Low Pressure Turbine Rotor Replacement, and Plant Uprate changes served to reanalyze the entire FSAR Chapter 15, Accident Analysis. These comprehensive engineering projects revisited (either through reanalysis or reconstitution) all FSAR Chapter 6 and 15 accident analysis. Additionally, a review of supporting plant systems was conducted for impact due to these major plant projects. Due to changes in the design bases resulting from the above projects, reanalysis and/or reconstitution was performed on these systems.

Beginning in March 1996, SCE&G initiated an FSAR review effort which included (1) an Outage Review, (2) an MRF Review, and (3) an Overall FSAR Review. This FSAR review effort is described in detail in Section (d).

The Overall FSAR Review is an ongoing, systematic and prioritized assessment focusing on discrete systems and programs which correlate with the Design Basis Documents. The approach includes a comprehensive assessment to assure consistency between the FSAR and the DBDs or other controlled documents, and a review of those aspects of the FSAR pertinent to safe operation for accuracy and consistency. Thus far, six systems have been reviewed under this approach. **No findings to date have involved safety-significant concerns.**

SCE&G plans to continue the Overall FSAR Review described above. *[Note: This commitment is listed separately in order to avoid confusion as to what commitment is made under this letter. Any other descriptions or programs are subject to change in accordance with our normal review and change practices, and are not to be considered commitments.]*

Self-Assessments:

VCSNS has conducted several self-assessment activities of safety system functional and performance characteristics. Self-assessment activities provide feedback to confirm that activities related to plant configuration and performance are satisfactorily accomplished. The following provides the type of self-assessment conducted, and examples of the issues identified.

Vertical slice reviews of eleven plant systems have been conducted by the ISEG group since 1987. These represent both an independent assessment of the operational readiness of a system to meet its design bases requirements (i.e., determine if the system is capable of performing its design basis function) as well as fostering an attitude of continuous self-evaluation and self assessment.

An indication of the type of comments generated from performance of an SSFI are listed below.

1) The minimum emergency feedwater flow control valve accumulator pressure listed on the Auxiliary Building Technical Specification log was inadequate to meet the post accident design requirements to maintain the valve closed for three hours after the event. To ensure adequate pressure, plant modification (MRF 21215) was implemented in 1987 to place full instrument air system pressure on the accumulator.

2) Adequate guidance was not provided for determining A) which HVAC components were necessary to support safety related equipment, nor B) the maximum equipment operability temperature limits. The HVAC DBD was revised in June, 1991, resolving this issue.

3) Inconsistencies between the CVCS DBD and Westinghouse calculation N4SA-CG-165 concerning instrument alarm setpoints were discovered for the:
   a. Boric Acid Tanks Temperature
   b. Reactor Coolant Pumps No. 1 Seal Differential Pressure
   c. Reactor Coolant Pumps No. 1 Seal Bypass Flow

   Completion of three plant modifications (MRFs 10673, 10734, and 22052) in 1991, 1991, and 1995 respectively, revised the setpoints addressed in this concern.

4) Reactor Vessel coupon surveillance requirements and Heatup and Cooldown curves in use did not match the FSAR specifications. The FSAR was revised in August, 1993, correcting these inconsistencies.

Maintenance of the VCSNS plant design basis has been enhanced by ISEG's reviews. Design discrepancies have been identified and resolved. **However, no design deficiencies have been identified that have actually prevented a system from performing its design function in its intended manner.**

The VCS Quality Assurance Organization performs routine audits of Design Engineering activities. The program includes measures necessary to verify conformance with the directions contained in the FSAR and the Operational Quality Assurance Plan. In the past, these audits tended to concentrate on procedure compliance areas. In the last two years, however, additional focus has been directed toward configuration management and how well our design documentation is maintained.

Examples of deficiencies that were identified during Quality Systems inspections:

1. During the Eddy Current inspection of Diesel Generator "A" Intercooler Heat Exchanger, indications revealed 405 of the 406 tubes reflected areas of wall thickness loss. As a result, Quality Control wrote NCN 5402 to identify the problem and have it resolved.

2. The QA audit of Design Engineering activities performed in 1995 resulted in four findings and a Corrective Action Request (CAR).

   The four findings were written against responsible organizations as described below:

   - Operations for the SAP 148 procedure not addressing drawing hold stamps
   - Licensing for not maintaining the FSAR current with respect to MRFs
   - Nuclear Support Services for status control of design documents
   - Systems Engineering for a troubleshooting MRF

   These items are resolved pending QA verification.

   The major areas in the Corrective Action Request can be summarized as follows:

   - Backfit old calculations to identify in progress work
   - Clearing/ Updating drawing hold stamps for closed design packages
   - Establish firmer controls on design calculations
   - Overview "Old Packages" for additional impacted documents

Corrective Action Request response action is approximately 95% complete for the identified deficiencies. Completion is expected in 1997.

QA audits provide an additional level of confidence that acceptable quality is maintained.

Third Party Assessments:

External reviews have also been conducted utilizing a vertical slice technique. These reviews are both independent and comprehensive in nature. The SWSOPI and EDSFI inspections provided additional confidence to VCSNS that system, structure and component (SSC) configuration and performance are consistent with the design basis.

The scope of the SWSOPI included verification that the SW System is capable of fulfilling its thermal and hydraulic performance requirements and is operated consistent with its design basis, and assessed the SW System operational controls, maintenance, surveillance and testing, and personnel training to ensure the SW System is operated and maintained so as to perform its safety-related functions. The SWSOPI concluded the following with regard to SSC configuration and performance:

1. The Service Water System meets it's thermal/hydraulic performance requirements.
2. Operating procedures reviewed accomplish their intended objectives.
3. Pump and valve surveillance and testing programs established for the SW System are thorough and continue to demonstrate the SW System will operate as designed.

The EDSFI similarly concluded the following:

1. The Electrical Distribution System has the capacity to perform its intended safety functions.
2. The inspection team's overall findings were positive, reflecting good design, maintenance and testing.

Summary:

The rationale for concluding that system, structure and component (SSC) configuration and performance are consistent with the design bases is founded on a Comprehensive Configuration Management Plan, Administrative controls for administrative changes, engineering change design and implementation, temporary changes, procedure verifications, plant operation including the work control process, and other activities affecting plant configuration. Comprehensive system and component checkout, functional, and performance testing, Design Bases review, reconstitution and/or reanalysis, self-assessments of safety system functional and performance characteristics, and NRC and third party assessments such as EDSFI and SWSOPI provide additional confidence that our SSC configuration and performance are consistent with the design bases.

Information Request (d)

(d) Processes for identification of problems and implementation of corrective actions, including actions to determine the extent of problems, action to prevent recurrence, and reporting to the NRC.

Oversight of activities at VCSNS is provided by our line organizations as well as independent review groups. In-line oversight includes management and interdisciplinary reviews, testing and verification activities, and internal evaluations. Independent oversight includes the periodic audits and inspections under 10 CFR Part 50, Appendix B, as well as self-assessments of functional areas and activities and "vertical slice" assessments of major plant systems. The results of these oversight activities give us added confidence in the structure and functioning of our programs to maintain design bases control and consistency. An important part of the safety culture at VCSNS is to encourage the identification of nonconformances, weaknesses and areas for improvement. When nonconformances are identified, they are processed through the 10 CFR Part 50, Appendix B corrective action program. This program calls for an appropriate review for the cause and the extent of the condition, and development of prompt and effective corrective actions.

VCSNS utilizes a number of site-wide, comprehensive programs for identifying problems at the station. In addition, independent reviews and assessments are used to provide added assurance that our problem identification is thorough and complete. These processes are comprised of the following:

- Continuing Program Overviews

    1. Condition Evaluation Reports (CERs)
    2. Nonconformance Notices (NCNs)
    3. Quality Assurance (QA) Audits

- Department Improvement Initiatives

- Independent Assessments/Overviews

    1. Vertical Slice Review

        - Electrical Distribution System Functional Inspection (EDSFI)
        - Service Water System Operational Performance Inspection (SWSOPI)
        - Safety System Functional Inspections (SSFIs)

    2. FSAR Review

The following pages in this section describe those activities associated with these reviews and assessments.

Program Overviews:

Condition Evaluation Reports

Purpose:

The purpose of this process is to provide a method for identifying, documenting, evaluating, reporting, and verifying resolution of conditions potentially adverse to quality and/or reliability of the plant.

Scope:

This process applies to any events, occurrences, activities, programs and/or hardware which may not be consistent with known practices and information. The process applies to all personnel working at the plant.

Program description:

SAP-1122 provides a single set of forms and administrative guidelines for plant personnel to identify plant related problems. The procedure provides guidelines on the threshold for identification, documentation, reporting, evaluation, disposition and completion of corrective action. Supporting this administrative procedure are several interfacing procedures which provide specific details on how to perform the various evaluations including: equipment operability, 10CFR50.72/73, Reportability, 10CFR50.59, Unreviewed Safety Evaluation, 10CFR21, Reporting of Defects and Noncompliances, etc.

Both hardware and non-hardware related problems are identified and processed by the program. Those conditions which affect or potentially affect equipment operability, reportability or could affect continued plant operation are evaluated by the Shift Supervisor, who is responsible for initiating appropriate compensatory action, as required. After the Shift Supervisor review, the CER is sent to Nuclear Licensing & Operating Experience for a reportability evaluation (if applicable), and then to an appropriate dispositioner where 10CFR21, 10CFR50.59, and/or any other evaluations are performed. The dispositioner then provides a disposition, identifying a cause and corrective action. The CER is then sent to the assigned action group where the disposition is implemented.

Trending & Root Cause Analysis:

Periodic trending is performed in accordance with Station procedures. Result of these trends are documented, reviewed by management and identified weaknesses tracked until corrective actions are completed.

Root Cause evaluations are performed per SAP-900. This procedure provides administrative guidelines on when a root cause should be done, how to perform an evaluation, how to document the results and tracking close out of the corrective actions identified.

Nonconformance Control Program: QA Review

Purpose:

Quality Control (QC) is responsible for identifying, reporting, and controlling nonconforming conditions. Quality Assurance (QA) reviews Nonconformance Notices (NCNs) to assure that the condition is adequately described, the disposition will not violate established FSAR requirements, and the quality requirements, methods, etc., are adequately addressed.

Scope:

QC is responsible for assuring that the plant's design bases are maintained following a Nonconformance, which include: physical defects, test failures resulting from a hardware defect, incorrect or inadequate documentation, and deviations from prescribed processing, inspection, or test procedures resulting in a hardware impact. QA review is required for all NCN dispositions prior to implementation as addressed by SAP-1141, "Nonconformance Control Program," and QSP-104, "Review of Nonconformances."

Program Description:

QC verification is required for all dispositions relating to Nuclear Safety Related and Quality Related components and/or systems. While not required for Non-Nuclear Safety Related dispositions, upon request by the dispositioning engineer, a verification is performed. The verification ensures that the disposition in its entirety is implemented. The methods of verification include, but are not limited to: monitoring the work activity, reviewing data, and performing NDE testing, as applicable. The NCN disposition may be questioned and returned to the engineering group for further dispositioning. For example, when the NCN requires the replacement of a component, QC will verify the material, configuration and/or installation. Any deviation from the original hardware or design, that has not been previously addressed, will be questioned, and resolution will be obtained prior to final acceptance. When a drawing or procedure requires revision by a disposition, QC initiates a Request for Document Hold or Revision Notice (SAP-1141, Attachment VI) and routes the notice to the responsible group ensuring proper notification of all affected plant personnel in a timely manner. Due dates are assigned and tracked.

Quality Assurance reviews NCN dispositions per QSP-104, "Review of Nonconformances," to ensure that:

1. The description of the nonconformance is the same as the condition addressed by the NCN disposition.
2. Cause and correction action is adequate, and common mode failures are considered.
3. All regulatory requirements, reportability reviews, design basis criteria, codes, etc., necessary to resolve the nonconformance and assure quality are considered.
4. All impacted documents are referenced on the NCN so that a Request for Revision Notice is generated.

The aforementioned reviews specifically consider a 10CFR50.59 review, a 10CFR50.72/50.73 review, and a 10CFR21 evaluation. The review of impacted documents not only considers applicable procedures/drawings, but data bases and programs such as the EQ Data Base, Erosion/Corrosion program, and the Plant Lubrication Manual. Any comments resulting from the above reviews require resolution prior to concurrence with the disposition. Concurrence with a disposition determination is indicated by the reviewers signature on the SAP-1141, Attachment 1 form.

In addition, Quality Assurance performs semi-annual audits of the NCN program per Technical Specifications section 6.5.2.8.c. The NCN program is assessed for compliance to regulatory and procedural requirements during

the performance of the audits. Surveillances of elements of the NCN program may be scheduled per QSP-15, "Scheduling of Quality Assurance Surveillances."

Quality Assurance (QA) Audit/Surveillance Program

Purpose:

Audits are programmatic evaluations to determine that applicable elements of the quality assurance program have been developed, documented, and effectively implemented. Surveillances are much narrower in scope (one or several program elements evaluated) and provide an in-depth evaluation of the particular activity being assessed. Surveillances are usually performed commensurate with work activities being conducted; surveillances employ performance based techniques which focus on the areas, activities, and elements that are most important to safety and reliability.

Scope:

Currently, Quality Assurance schedules audits to meet the requirements for the performance of audits within the areas identified by Technical Specifications section 6.5.2.8. Audits to ensure conformance to the Technical Specifications, Operational Quality Assurance Program, and Fire Protection Programs, for example, are required. If the results of monitoring indicate the need for more frequent audits and special audits, or if management requests the need for additional audits; they will be performed.

Surveillances are scheduled at a frequency commensurate with the work activities potential impact to the plant. As a minimum, one surveillance is performed per month within the Maintenance and Operations category, and one surveillance is performed per quarter within the Engineering category. An increased frequency may be prescribed for groups identified with areas of concern.

Program Description:

The audit/surveillance program is addressed by QSP-106, "Conduct of Quality Assurance Audits and Surveillances," QSP-107, "Conduct of Performance Based Activities," and QSP-15, "Scheduling of Quality Assurance Surveillances."

Section 17.2 of the FSAR addresses each of the eighteen criteria of 10CFR50, Appendix B. This section provides the Operational Quality Assurance Program (OQAP) for the plant and describes the actions to be taken by SCE&G to assure that the safe operation and installed quality of equipment in the plant are maintained throughout the operational life of the plant. The OQAP is the implementation document sub-tier to the FSAR, Section 17.2. As previously stated, Technical Specifications requires the audit of activities required by the OQAP. The areas of design, procurement, installation, inspection, testing, operation, maintenance, and refueling, for example, are assessed for conformance to previously established requirements which affect the installed quality and operational capability of the station. Audits/surveillances provide an evaluation of the adequacy and effectiveness of the program measures established for the areas being audited.

Audits and surveillances are conducted in accordance with the reference procedures which describe the methods used for preparing, conducting, and reporting audits/surveillances. QSP-106 and QSP-107 require an evaluation for program adequacy by the use of scope sheets and checklists, which consider design bases information in the FSAR. Reports must identify deficient conditions found (CARs, Findings, and QAIs) and recommendations for corrective action. The formal report is forwarded to management for evaluation, response, and, if necessary, the timely initiation of corrective action. Responses are evaluated for acceptability and corrective action is verified to be satisfactorily implemented prior to the closing of a deficiency.

Provisions are made to escalate the issues to the appropriate level of management to obtain resolution in a time frame commensurate with its safety significance.

Department Improvement Initiatives

Purpose:

Informal or formal procedures or instructions used to provide feedback to individual groups on clarifications of group responsibilities and field activities.

Program Description:

A number of mechanisms are in place to provide feedback to initiate procedure/ program improvements. The following are typical examples of such feedback mechanism to identify and update documents for the Mechanical Maintenance Department.

Rework Analysis: Used to identify conditions caused by a previous maintenance activity or a condition not resolved during previous activity (Maintenance Special Instruction 32).

Task Feedback form: Used to identify problems, deficiencies or situations not covered by the planning and scheduling process of a maintenance evolution (SAP-300).

Procedure Change Request form: Used to identify procedure errors, points of confusion or areas where enhancement can improve procedure performance. Note: Any error that will prevent performance of a procedure as written is processed as a change prior to procedure use (SAP-300).

Initiation of these requests are reviewed and incorporated into controlled documents, as required, to prevent recurring issues or undesirable activities from the workers point of view.

Independent Assessments:

Vertical Slice Review: Electrical Distribution System Functional Inspection

Purpose:

Assess the capability of the Electrical Distribution System to perform its intended functions and the adequacy of the engineering and technical support provided to maintain the operability of the system.

Scope:

1. A technical review was conducted by the licensee to provide an assessment of the readiness of the plant electrical design and its associated documentation to meet the requirements of an Electrical Distribution System Functional Inspection (EDSFI).
2. The NRC inspection consisted of a selective review of design calculations, relevant procedures, representative records, and installed equipment; including interviews with engineering and technical support staff.

Program Description:

The readiness technical review conducted by the licensee was performed by a team over a three week period at the plant. The items and concerns raised by the review were assigned to various individuals or groups for action and resolution. The response team resolved the items and concerns and followed the recommendations of the technical review to prepare for the EDSFI. The EDSFI reports for other plants were reviewed and concerns or findings documented. These concerns were each reviewed for applicability to the plant and the appropriate action taken to resolve the issue as applied to VCSNS. The self-initiated efforts and Design Engineering's level of preparation of design documents such as calculations, design basis documents, and licensing documents led to a successful NRC EDSFI inspection.

The NRC assessment of the capability of the Electrical Distribution System (EDS) was based on findings and conclusions obtained by examining and evaluating the design, installation, modification, operation, maintenance, and testing of the EDS and the other systems which support its functions. Considerations in assessing engineering and technical support included adequacy of modifications, problem identification and resolution, support provided in testing and analysis of results, etc.

Electrical components considered in the assessment included the off-site circuits from the 115 and 230 kV switchyard; the Emergency Diesel Generators (EDG); the 7.2 kV and 480 VAC transformers; the 7.2 kV switchgear and related equipment; the 480 VAC switchgear, load centers, and motor control centers; the 125 VDC batteries, chargers and distribution systems; the 120 VAC distribution systems; protective relaying; AC grounding; and electrical penetration protection. Additionally, the mechanical systems which are required to support the EDG and provide cooling for electrical components were specifically examined. These included the EDG engine, air start system, lube oil system, fuel oil system, and water cooling system; and the necessary HVAC for various EDS components.

EDSFI Results:

The readiness technical review identified several significant concerns in the mechanical, electrical, and surveillance areas. As a result of this review several calculations were updated and revised for the electrical loading and voltage drop, the diesel generator electrical loading and diesel fuel oil loading consumption, HVAC loading, and battery loading. The review revealed that Motor Control Center motor protection thermal overload devices as well as breaker and load information were not being tracked and properly recorded for the updating and revision of design drawings and calculations. Electrical maintenance procedures and methods were not adequate

to provide evidence for periodic inspection of various electrical items. Some operations procedures did not collect and document adequate data to support design considerations.

Corrective measures were taken to resolve the readiness team concerns. The team assessment concluded that based on the level of preparation activities and the availability of design documents such as calculation, design basis documents, and licensing basis document that the self-initiated efforts and ability to support an EDSFI were better that average.

The NRC inspection team assessed the adequacy of the engineering and technical support provided to maintain the Electrical Distribution System (EDS). The assessment was based on examination of the following areas: technical organizations and interfaces, problem identification and resolution, modifications, and engineering involvement in routine plant EDS activities.

The inspection team assessed the capacity of the EDS to perform it intended functions and the adequacy of the engineering and technical support provided to maintain the operability of the EDS. It was concluded that:

1. The EDS has the capacity to perform its intended safety functions
2. Engineering and technical support are adequate

The inspection team's overall findings were positive, reflecting good design, maintenance, and testing. Various strength were observed. Examples included the availability of a computer program to analyze the DC system, a generally good fuse control program, good monitoring of fuel oil quality, and knowledgeable engineering personnel.

Several matters of concern were identified, but their impact on the overall adequacy of the EDS and of engineering and technical support provided to maintain the EDS were limited. These matters included violations of regulatory requirements, a deviation from a commitment, and other negative findings. There were four violations, one deviation, and four findings identified in the audit.

All violations and findings have been resolved and the items closed in an NRC follow-up audit. There are no outstanding items or concerns as a result of the EDSFI.

Vertical Slice Review: Service Water System Operational Performance Inspection (SWSOPI)

Purpose:

Assess VCSNS' planned or completed actions in response to Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment," dated July 18, 1989.

Verify that the SW System is capable of fulfilling its thermal and hydraulic performance requirements and is operated consistent with its design basis.

Assess the SW System operational controls, maintenance, surveillance and testing, and personnel training to ensure the SW System is operated and maintained so as to perform its safety-related functions.

Assess VCSNS' preparatory actions taken and/or proposed to address issues identified as a result of their preparations prior to the SW System self assessment.

Provide technology and industry experience transfer through the inspection process. General areas of focus were:

- Recommendations for Design Bases Enhancement
- Walkdown and Planned Maintenance Programs
- I&C Setpoint Program
- Configuration Management Program
- Recommendations on the Design Control Program Self Assessment Methodology

Scope:

The scope of this assessment included selected SW System components and interactions of the SW System and supporting systems including modifications to these systems. Other plant programs and organizations were assessed as they applied to the SW System to determine whether these programs were implemented in a manner to operate, support and maintain the SW System consistent with the design basis. These other programs/organizations were: Operations, Maintenance, Surveillance and Testing, Training, Corrective Action and Quality Assurance. Nuclear Regulatory Commission (NRC) Inspection Manual Temporary Instruction No. 2515/118, Rev. 2, was used as guidance to perform this inspection.

Program Description:

The SWSOPI Inspection Team consisted of seven contract consulting engineers with 146 years cumulative nuclear power plant experience, at the Engineer level, as well as direct line management in Operations, Maintenance, Engineering and Chemistry. This inspection provided an independent assessment from outside individuals who had performed numerous SWSOPIs, EDSFIs, SSOMIs, SSFIs and HVAC Inspections.

Over 1,100 hours were expended fully assessing the areas of Operations, Design, Maintenance, Testing, Quality Assurance, and Corrective Action. Approximately 800 of these hours were actual onsite activities during the weeks of January 8, January 22, and February 5, 1996. All areas of the NRC Temporary Instruction 2515/118, Revision 2, with the exception of actually witnessing surveillance testing-in-progress (none scheduled) were evaluated

It is important to note that this SWSOPI Team assessment is only a part of the overall scope undertaken by VCSNS in their self assessment efforts related to Generic Letter 89-13. For example, there was an independent review of station activities related to GL 89-13 Recommended Action Items I and III in December 1989, an ISEG Service Water System SSFI in 1988, Open Cycle Cooling Systems Evaluation Team (OCCSET) review, and the internal

preparations and reviews for this team assessment have been ongoing since mid-September 1995. The conclusions of this assessment reflect the comprehensive actions of VCSNS.

During the assessment, a total of seventy-four (74) Information Requests, Questions, and Concerns were issued. A concern is issued when the response to an information request or question does not completely resolve the evaluator's question or a significant technical issue is identified. There were twenty-six (26) such concerns issued as part of this evaluation. At the time of the exit on February 9, 1996, nine (9) Concerns were closed, requiring no further actions. Proposed actions addressing the remaining seventeen (17) concerns were accepted by the assessment team. Five (5) issues required evaluation via the Off Normal Occurrence (now the CER) process.

Overall, there are no outstanding operability concerns, no NCNs were issued, and the complete scope of NRC TI 2515/118, Revision 2 was completed consistent with regulatory guidelines.

SWSOPI Results:

The Service Water System meets it's thermal/hydraulic performance requirements. The assessment team identified a concern with the current heat exchanger thermal performance testing program in that it establishes a new maximum SW inlet temperature per heat exchanger based on fouling factor. The establishment of a new maximum SW inlet temperature based on GL 89-13 and Supplement I was recorded and monitored by the System Engineer. ONO 96-26 was written during the Assessment to formalize notification of Operations regarding any temporary restrictions related to SW inlet temperature Technical Specifications (TS).

The design changes reviewed adequately maintain the design basis and drawings reflect the as-constructed configuration. A comprehensive single failure analyses had been performed that indicated no credible component failures would prevent the SW System from performing its design function, however it is recommended that this analysis be expanded consistent with GL 89-13, Supplement 1 to include the applicable closed cooling loops and supporting systems.

Setpoints are controlled through the design change process. Reactor Protection and Engineered Safety Features setpoints, their bases, and development methodology (including inaccuracies and uncertainties) are documented in a Design Basis Document. However, the bases, methodology (including inaccuracies and uncertainties), and supporting calculations for the balance of plant instrument setpoints are not similarly documented in all cases.

Normal operating procedures assure SW System operation within the design envelope. Maintenance history for the SW System indicates components have been very reliable. Overall material condition is impressive. Biofouling and corrosion monitoring programs are comprehensive and well coordinated. An area for improvement however is the level of documentation of inspection results and completed maintenance activities. Better documentation could provide the basis for extending cleaning, inspection, and testing intervals.

Pump and valve surveillance and testing programs established for the SW System are thorough and continue to demonstrate the SW System will operate as designed.

Completed actions taken in response to Generic Letter 89-13 were found acceptable. It is recommended that a comprehensive GL 89-13 Program document be developed to capture the appropriate information and programs being utilized by VCSNS to satisfy GL 89-13. The generic letter requires a long term program of monitoring, treatment, and testing. By compiling all the VCSNS commitments, procedures, etc. in one program document, the basis for the actions necessary to ensure long term compliance to the GL 89-13 requirements will be maintained.

Vertical Slice Review: Safety System Functional Inspections

Purpose:

To assess the operational readiness of a system (i.e., determine if the system is capable of performing its design basis function), and to identify and correct the causes of potential deficiencies.

Scope:

Safety System Functional Inspections (SSFIs) are performed on Nuclear Safety Related systems and systems which are important to safety. Since 1987, ISEG has performed an SSFI on each of the following systems:

- Emergency Feedwater
- Emergency Power
- Service Water
- Emergency Diesel Generator
- Component Cooling Water
- Residual Heat Removal
- Air Handling
- Chemical and Volume Control/Safety Injection
- Reactor Coolant
- Containment
- Fire Service

Program Description:

SSFIs at the VCSNS are performed utilizing the guidance provided in QSP-600, "Independent Safety Engineering Group" and NSAC-121, "Guidelines for Performing Safety System Functional Inspections."

An SSFI is generally a vertical slice review of a plant system that includes the areas of: System Design, Design Change, Operations, Surveillance Testing, Maintenance, Training, and Quality Assurance. The purpose of each of these major categories is provided below:

System Design: The purpose of the system design phase of the SSFI is to determine if the design basis is adequate, the existing configuration complies with the design requirements and the documentation which describes the design basis is consistent.

Design Change: The objective of the system design change review is to determine if changes made to the system design as a result of a planned modification, upgrade, or non-conforming condition have impacted the system in a manner that adversely impacts the ability of the system to perform its design related function.

Operations: The purpose of this section is to verify that procedures are technically adequate to ensure satisfactory performance of the system and to ensure that they provide proper guidance to allow operators to effectively operate the system. An additional purpose is to identify any problems with the system as perceived by Operations personnel.

Surveillance Testing: The purpose of this phase of the SSFI is to determine if the periodic surveillance tests performed on the system are adequate to verify that the system is capable of performing its safety-related function as defined in the design basis.

Maintenance: The primary objective of the Maintenance section is to determine if maintenance performed on the system is adequate to assure that the system would perform its safety-related function.
Training: The purpose of this phase of the inspection is to determine if plant personnel are trained adequately in the operations and maintenance of the safety-related system under review.

Quality Assurance: The primary objective of this review is to evaluate the effectiveness of the quality assurance program for the safety-related system under review.

Completed ISEG assessments are internally reviewed by the by the ISEG Team, and Manager, Quality Systems prior to issuing the final report. The final report is then issued and reviewed by the affected station mangers to address and implement, as required, the identified issues. Identified issues and recommendations are forwarded to the affected group(s) Manager for review, agreement, and corrective action implementation.

ISEG SSFI Findings:

The following are examples of the type of issues generated from performance of an SSFI, listed below is an example of a design basis and configuration issues made from each of the eleven SSFIs performed:

1. Component Cooling Water essential drawings and the Design Basis Document disagreed on the classification of two valves as containment isolation valves. The Design Basis Document was revised in October, 1989, to correctly list the valves as non-containment isolation components.

2. Status lights on the main control board indicated an RHR valve open at 10%, whereas the FSAR and Reg. Guide 1.97 require valves to be open 90% prior to providing open indication. As a result of ISEG's comment, Design Engineering conducted an evaluation and identified six additional valves which exhibited the same behavior. A plant modification (MRF 33475) was completed in October, 1991, adequately addressing the issue.

3. A review of design basis documentation identified discrepancies between FSAR Table 6.2-54, "Isolation Valve Summary," and plant essential drawings and as-built configurations. To address these concerns, the FSAR was revised in 1993.

4. During implementation of the Fire Detection and Alarm System Modification, essential drawings were not revised to reflect the in-process changes. A major modification change notice (MCN 20951E) was written in December, 1996, to incorporate the essential drawing revisions.

ISEG SSFI Results:

Maintenance of the VCSNS Plant Design Basis has been enhanced by ISEG's reviews. Design discrepancies have been identified and resolved. **However, no design deficiencies have been identified that could have actually prevented a system from performing its design function in its intended manner.**

FSAR Review

Purpose:

1. Provide a Refuel 9 (Spring 1996) outage review to investigate key outage related topics in the FSAR to identify and resolve issues which could impact the refueling outage.
2. To perform a Modification Request Form (MRF, now called ECR) review of Refuel 9 outage and other open modifications for FSAR impact.
3. To conduct an overall FSAR Review to assess, correct and improve the VCSNS FSAR.

Scope:

The Outage Review focused on key outage related topics defined in the FSAR.

The review of modifications included the identification and incorporation of FSAR changes for work that has been field completed, including recognition of the FSAR sections that would require revision after implementation. The review included modifications that were field complete, yet still open (not all relevant documentation as-built) and outage MRFs, including power uprate, scheduled for implementation during Refuel 9.

The Overall FSAR Review is an ongoing, systematic and prioritized assessment focusing on discrete systems and programs which correlate with Design Basis Documents (DBDs) and plant programs. The approach includes a comprehensive assessment to assure consistency between the FSAR, DBDs, and other controlled documents, including a focused review of those aspects of the FSAR pertinent to safe operation for accuracy and consistency.

Program Description:

Outage Review:

An Outage Review Plan provided guidelines for investigation of the following 10 high level subject areas:

Spent Fuel Handling	Reactivity
Instrumentation & Controls	Inventory
Outage MRF 50.59 Evaluations	Outage Planning
Power Uprate 50.59 Evaluations	Containment
Containment Tendon Testing	Decay Heat

These areas were then broken into 265 concepts, called "items". An item is defined as a significant aspect of the FSAR which may be affected by plant operations. Typical examples include:

- restrictions on reactivity conditions in mode 6
- reactor shut down time prior to moving fuel
- cooling down on natural circulation

Each item was characterized in terms of discussions in the FSAR, Technical Specifications, procedures, programs, or hardware, etc. Each of these aspects were evaluated for accuracy and for consistency between various documents. Any discrepancies were noted in a request form, and the dispositioning organization generated document changes, as necessary. **No findings were identified during this review that involved safety significant concerns.**

MRF Review:

An "MRF vs. FSAR Assessment Plan" was developed to provide a review process that focused on an independent comparison of the modification to the FSAR, verifying consistency and accurac

The major steps in the MRF Review process included:

1. Considering the subject of the MRF, and identification of applicable FSAR/FPER sections that could potentially contain commitments or require revision.

2. Reviewing the selected sections of the FSAR, including figures and tables, for commitments and configuration data.

3. Comparing the MRF package to the FSAR sections for the items below:

   - Did the MRF incorporate or consider the applicable FSAR commitments?
   - Does the MRF package list the FSAR sections, figures, and tables that will require revision after implementation as "Design Documents Affected" and does the 10CFR50.59 screening review/safety evaluation reference the applicable sections for reference?
   - If an FSAR/FPER Change Notice has been prepared for the MRF, is it complete?

Action items were identified to an appropriate dispositioning group to assess and support generation of document changes, as necessary. **No findings were identified during this review that involved safety significant concerns.**

Overall FSAR Review:

An Overall FSAR Review Plan was developed to provide a method of consistently comparing the FSAR against the DBD, Technical Specifications, plant procedures, etc., noting correlation for each aspect of the FSAR. Other controlled documents, particularly in cases where the DBD does not provide sufficient information, are used on a case by case basis to corroborate the FSAR. Regulatory documents (e.g., Technical Specifications) serve as higher level documents for assessing the accuracy of the FSAR. Discrepancies between the FSAR and any other document(s) leads to further investigation and resolution of the discrepancy.

Currently, 6 systems have been reviewed using the above approach. To date, 3 CERs have been generated. The following is a summary of those issues

- FSAR revision process (SAP-1163): information missing from a previous revision,
- Spent Fuel system for RWST level instrumentation did not specifically include instrument error
- FSAR Chapter 15 figures were missing from a previous revision.

No safety significant concerns have been identified to date.

Information Request (e)

The overall effectiveness of your current process and programs in concluding that the configuration of your plant(s) is consistent with the design basis.

SCE&G Management has confidence that the existing processes at VCSNS provide reasonable assurance that the plant configuration is consistent with the design bases and that the plant is fully capable of fulfilling its safety function. The primary reasons for reaching this conclusion are:

- Our current processes contain strict administrative controls and multi-level reviews to identify and correct errors and ensure Regulatory compliance. Our processes require multi-discipline participation which provides reasonable assurance that impacts to affected procedures, programs, and training are identified and considered in the change process.

- A significant number of internal and external audits and self assessments (including "vertical slice" reviews) have been performed since the plant began operation.

- SCE&G has performed a large amount of design basis review/reconstitution. Some examples are:
    - Design Basis Document Program
    - Equipment Qualification Assessment
    - IPEEE
    - Service Water System Operational Performance Inspection
    - Electrical Distribution System Functional Inspection
    - Steam Generator Replacement
    - Low Pressure Turbine Rotor Replacement
    - Plant Uprate
    - FSAR Review

- Our corrective action processes provide a comprehensive mechanism for identifying the cause of the problem and dealing with the problem in a time frame consistent with its safety significance.

- Our design control, configuration management, and corrective action processes are a product of continuous improvement. We have performed Re-engineering of our Design Control and Appendix R processes. Our corrective action process has continually "lowered the threshold" for reporting of plant problems which have the potential to adversely affect the quality or reliability of the plant. We have had our programs assessed to ensure we are remaining on a success path.

- The [illegible] any management fosters identification of problems by routinely promoting a questioning attitude. Programs such as the current S-T-A-R program are indicative of this attitude. This philosophy promotes self-identification and correction of problems discovered in the plant procedures and programs, independent of planned self-assessment activities.

SCE&G has exercised diligence throughout the life of the plant to keep design information current. Our programs are the result of continuous improvement and will continue to improve in the future. As problems occur, we are committed to using good engineering practices to assess and solve them, including expanding the solution to programmatic means when necessary. Periodic trips are made to the NRC for information exchange. Active participation in industry groups such as NEI, various utility groups, Westinghouse Owners Group, INPO, numerous peer visits, and review of industry Operating Experience aid in VCSNS benchmarking activities.