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VOGTLE ELECTRIC GENERATING PLANT UNIT 1
READINESS REVIEW PROGRAM
MODULE 19
ELECTRICAL SUPPORTS

SUMMARY

The Readiness Review Program is being conducted at the initiative of Georgia Power Company (GPC) management to assure that all design, construction, and operational commitments have been properly identified and implemented at the Vogtle Electric Generating Plant Unit 1. Module 19, which was submitted on April 10, 1986, presents an assessment of the compliance of the Electrical Supports contained in Seismic Category I structures with Final Safety Analysis Report (FSAR) commitments and regulatory requirements. This evaluation was conducted to determine if the results of the program review of electrical supports design, fabrication and installation presented in this Module represent an effective and accurate assessment of the requirements, that the requirements were properly implemented, and that the resolutions of the findings identified in Module 19 were correct.

This evaluation was performed by NRC reviewers from the Office of Nuclear Reactor Regulation (NRR), the Office of Inspection and Enforcement (IE), and inspectors from Region II. The evaluation was accomplished through a detailed examination of all sections of the Module including:

1. Assuring the veracity of the information contained.

2. Verifying that the electrical support commitments identified in the Module are correct and in accordance with FSAR commitments and regulatory requirements.

3. Checking a sizeable and representative sample of the licensee audits and the other documents reviewed by the Readiness Review staff along with an independent sample of documents selected by the inspectors.

4. Inspecting a representative sample of the Electrical Support components currently installed in Unit 1.

5. Reviewing reports of past NRC inspections at Vogtle 1 that pertain to Module 19.

6. Reviewing the Module 19 findings and the licensee resolution thereof.

During this examination, it was apparent to the NRC reviewers and inspectors that GPC management supported the Readiness Review by active participation in the development and implementation of the program. This evaluation also indicates that the licensee's program review was comprehensive and provides adequate assurance that the plant electrical support components and systems will perform in accordance with NRC requirements and FSAR commitments (except for the findings which were identified by the NRC reviewers and inspectors).

These findings should be subject to continuing review and action until closed out in order to preclude the possibility of safety problem development. The findings identified during this evaluation are summarized in the three items listed below:

- Inspector Followup Item - Examine the Conduit Longitudinal Bracing Program (IFI 424/86-61-01). This finding was subsequently closed out.

- Inspector Followup Item - Examine Methods for Controlling 3-1/2 Inch Tube Steel Conduit Supports (IFI 424/86-61-02). This finding was subsequently closed out.

- Inspector Followup Item - Incomplete Verification on Six Commitments (IFI 424/86-61-03).

It does not appear that the foregoing represent significant programmatic weaknesses. This conclusion is made with the proviso that the foregoing open item for Vogtle 1 can be satisfactorily closed out. Resolution of all matters concerning this open item will be handled during future Region II inspections.

VOGTLE ELECTRIC GENERATING PLANT UNIT 1
READINESS REVIEW PROGRAM
MODULE 19
ELECTRICAL SUPPORTS

1. Scope of Review

This review consisted of an examination of each section of the Module and was performed by reviewers from the Office of Nuclear Reactor Regulation (NRR) and the Office of Inspection and Enforcement (IE) along with inspectors from Region II. The Region II review was assisted by one employee of EG&G Idaho, Inc., a prime contractor to the U.S. Department of Energy at the Idaho National Engineering Laboratory. Module Sections 1.0, 2.0, 4.0, 5.0, and 8.0 presented data on Module organization, project organization, program description, audits and special investigations, and conclusions. These did not require the review depth given to Module Sections 3.0 and 6.0 which covered Commitments and Program Verification. The review of Module Section 7.0, Independent Design Review, is the subject of a separate report. Sections 3.0 and 6.0 provide the more significant aspects concerning licensee commitments along with adequacy of commitment carry through into both program implementation and design execution. Review of these two sections included an examination of content; review of findings, concerns and observations; review of a sample of items reviewed by the Georgia Power Company (GPC) Readiness Review Team (RRT); and an examination of an independently selected sample of records and field construction. The methodology used and an evaluation of each section are presented in the following.

2. Methodology

a. NRR Review

The review and evaluation by the Office of Nuclear Reactor Regulation focused on the adequacy and accuracy of the commitments contained in Section 3.0 of the Module. This involved reviewing the Module Sections 3.5, 4.0, 6.0, 6.1, and 6.2 for commitment involvement and making a detailed examination of Module Subsections 3.4 (Commitment Matrix). The objective of this review was to determine the extent that the licensee recognized licensing commitments for Class 1E Electrical Supports and to determine whether or not all listed commitments were properly within the scope of Module 19. The primary review criteria for the foregoing included the acceptance criteria of NUREG-800 Standard Review Plan (SRP), the Vogtle Unit 1 Final Safety Analysis Report (FSAR), and the Safety Evaluation Report (SER). Other criteria used included selected letter correspondence, NRC Regulatory Guides, and related NRC staff positions.

b. IE Review

The review and evaluation by the Office of Inspection and Enforcement focused on the Independent Design Review (IDR) product which was not included in Section 7.0 of the Module. This was reported in Module 22 as a part of the integrated IDR. The results of the review of this by IE personnel are the subject of a separate report.

c. Region II Review

Review and evaluation by the Region II Evaluation Team was begun by reading the Module in its entirety in the offices of the team members during May 1986. The total Module was reviewed for organization and content at that time. This was supplemented by the summary of the Module content and the RRT Module preparation methodology which was presented by the Licensee at the Region II offices on April 14, 1986.

The first inspection was conducted at Vogtle 1 during June 2-6, 1986. The following activities were conducted and the findings documented in Inspection Report 50-424/86-61:

- Determining the RRT organizational element responsible for Module 19 and interviewing key staff members
- Verifying the Module 19 review boundary
- Making a general review of the material presented in Sections 1.0 through 5.0 of the Module 19 report.
- Obtaining supplemental documentation copies required for review use.

The Module 19 Commitment Matrix contained 18 individually numbered commitments pertaining to electrical supports. All 18 were used as the NRC sample for first order document verification to provide the basis for initially verifying the data reported in Sections 3.0, 4.0, and 6.0 of the Module and to spot areas or items potentially needing review emphasis.

Data had been gathered during the first inspection trip for office review prior to the second inspection trip. The sample commitments were traced backward into source documentation which was typically the Final Safety Analysis Report (FSAR). This was to check for proper RRT recognition of the actual commitments. The commitments were traced forward into the Subsection 3.5, Implementation Matrix to verify the implementation reported in the Module. Additional tracing of the sample commitments into the first order implementation documents (design criteria and procedures) and into second order implementation documents (calculations, drawings, specifications, and vendor submittals) was made to the extent possible with the materials gathered during the first inspection trip.

The second inspection at Vogtle 1 was conducted during June 23 - July 2, 1986. This inspection involved the following activities and is documented as part of this report.

- Continuing general Module review activities
- Completing commitment tracing
- Performing Design Program Verification review
- Performing Construction Program Verification review.

The commitment sample was traced into selected design calculations. This was done both for those items within the sample similarly traced by the RRT and for the additional items specifically selected outside of those looked at by the RRT.

Continued office review was made after the second inspection trip to evaluate data gathered, draft the Module Review Report, and identify any items requiring further field review and analysis. The review plan, Module report, and examination data gathered to date were checked for potential gaps and incomplete work. The results of the office review disclosed that sufficient information had been obtained during the site visits and that the data gathered would provide the basis for a coherent report for the Module review.

The NRC inspectors were at the site during July 21-July 25, 1986 for the review of other Readiness Review Modules. Additional documentation was provided by the licensee relative to two of the three findings listed in Section 4 of this report. The documentation was examined and found sufficient for closing out the two findings.

3. Evaluations

The evaluation of each Module section is provided in the remainder of this report using a Module section-by-section format. Included are a description of the section, what was reviewed, the basis for acceptance, and a statement of any required followup or evaluation.

a. Section 1.0 - Introduction

(1) Review Introduction and Section Examination

This section of the Module provides a description of the intent and content of Module 19. Also provided is a description of the Vogtle 1 hardware covered within the Module, an overview of the project status and an outline of the Module organization. This section was examined by the inspectors for content, background and veracity of information. Clarification of information concerning the Module boundary and project status was required. This was accomplished during discussion with RRT personnel.

(a) Boundary Definition. The information given in Module Table 1.1-1 was reviewed in detail with the RRT counterpart to verify the correctness of the boundary definition information presented. The information gained during the review did not disclose verification error. Figure 1.1-1 also was reviewed with the RRT counterpart. This figure provided a graphic illustration of typical conduit and cable tray supports. The following clarification was obtained for details shown in the figure:

- Concrete expansion anchor bolts for Electrical Supports are within Module 8 for design and Module 19 for installation
- Electrical support anchor welding to embeds and structural steel is within Module 19
- Bolts that attach conduit and cable trays to Electrical Supports are within Module 17.

(b) Module Organization. The Module organization portion of the section was examined by the inspectors and no instance of inaccuracy or need for clarification was found.

A specific question was asked concerning the existence of significant changes subsequent to the December 1, 1985 cutoff date for Module 19 data. The RRT counterpart responded with a statement that there are no changes to the information contained in the Module with the exception of minor increases in the percent complete numbers for the projects status. These were not recomputed but are expected to change with the ongoing construction progress. Evidence of significant Module-basis change since December 1, 1985 was not discovered during the review.

(c) Project Status. The status shown in Subsection 1.3 of the Module ranges from 80 to 92 percent. Review of the basis for these numbers disclosed that earned value is based on installation completion and satisfactory inspection of each individually numbered support. This information is maintained in the EE-580 Cable and Raceway Tracking and Control System.

(2) Inspection Results

The clarifications provided by the RRT, as noted above, correlated with other information reviewed by the inspectors. The examination did not disclose significant verification errors or a basis for programmatic concern. Followup or additional evaluation of Module Section 1.0 is not required.

b. Section 2.0 - Organization and Division of Responsibility

(1) Review Introduction and Section Examination

This section of the Module provides a description of the organizations employed for project design and field construction activities. The integration of these into the total project management matrix for the subject of Module 19 also is provided. This section was examined by the inspectors for content and background information. The information presented agrees with that obtained by the inspectors during past inspections at Vogtle 1. No instances of variance from the Section 2.0 information were found during the course of the total Module review.

(2) Inspection Results

The examination did not disclose significant verification errors or a basis for programmatic concern. Followup or additional evaluation of Module Section 2.0 is not required.

c. Section 3.0 - Commitments

(1) Review Introduction and Section Examination

This section of the Module describes the commitment selection and sources along with containing a list of commitments and implementing documents which are displayed in two matrices. The first is entitled "Commitment Matrix" and lists 18 commitments by the Georgia Power Company for Vogtle 1 along with the source document reference for each commitment. The second is entitled "Implementation Matrix" and lists source documents and requirement features referred to within each commitment along with the document reference where the feature has been implemented. The NRR identification review was directed at assuring that all required technical and regulatory requirements relating to Category I Electrical Supports had been included in the Module 19 Commitment Matrix listed in Section 3.4. The Region II review was directed at verifying the proper implementation of the listed commitments. This latter was accomplished by selecting all 18 commitments as a sample. The sample was examined by carefully checking the commitment source (typically the FSAR) for the exact requirement and verifying (within the documentation listed in the Implementation Matrix) that the requirement was accurately carried through.

(a) Identification Review. The NRR examination of Section 3.0 started with a reading of the Module for commitment involvement. This was followed by a detailed examination of the subsection 3.4, Commitment Matrix to determine the content and applicability of the 18 commitments contained therein.

Each was examined in the light of the applicable parts of the following documentation:

- NRC Standard Review Plan (NUREG-800)
- Vogtle Unit 1 Final Safety Analysis Report (FSAR)
- Safety Evaluation Report (SER)
- Vogtle related letter correspondence
- NRC Regulatory Guides (RG)
- NRC staff positions.

Each commitment was examined to determine if it properly reflected the source (FSAR or other document) requirement and was properly within the scope of Module 19. Also, the sources were examined to assure that all required commitments were properly reflected in the Commitment Matrix.

(b) Implementation Review. The Region II examination of Section 3.0 started with reading it for content. All of the 18 individually numbered commitments (listed in Subsection 3.4 Commitment Matrix) then were selected to be the review sample. The examination of this sample consisted of:

- Verifying correspondence between the Subsection 3.4 Commitment Matrix and the Subsection 3.5 Implementation Matrix for each commitment.
- Reviewing the referenced commitment source-documentation for a clear statement of requirement for each commitment within the sample.
- Checking the document listed in the Subsection 3.5 Implementation Matrix for proper first order implementation of the requirements embraced by the commitment.

The individual commitments reviewed along with the review results are listed in Table 1 of this report. Several anomalies were discovered and are outlined in the Table 1 footnotes.

It was noted that Module Subsection 3.5 listed second order type documents (calculations) for the first order document verification for 5 commitments as follows:

- X2CQ6.6 - Commitment 4273
- X2CK2.7.1.1 - Commitments 1249, 2283, 2284, 2285.

Review by the NRC inspectors disclosed that first order document implementation did exist for Commitments 1249, 2283, 2284, and 2285 in Design Criteria documents DC-1000-C and DC-1005. This resulted in first order document verification for 17, rather than 13, of the 18 commitments listed in the subsection 3.5 Implementation Matrix. Calculation X2CK2.7.1.1 was not available at the plant site and had not been reviewed by the RRT for the verification of the four related commitments. The design calculation X2CQ6.6 was listed as the first order document verification for Commitment 4273 (Main Control Room and Remote Shutdown Illumination Levels). This calculation was not available at the plant site early enough to permit verification by the NRC inspectors. It was noted that the calculation had not been available to the RRT at the time that the Module was prepared and was not reviewed later to substantiate the commitment verification. Further investigation disclosed that the calculation was received on June 30, 1986. The reviews by the inspectors resulted in a commitment by the RRT to have Project Field Engineering perform a verification review to assure that the field installation conforms to the foregoing design calculations. This is identified as Inspector Followup Item 424/86-61-03 listed in Section 4 of this report.

(2) Inspection Results

The review by NRR did not disclose regulatory omissions within the subsection 3.4 Commitment Matrix. Also, this review did not result in questions or clarification requirements. The Module listed commitments were determined to be within the defined scope of Module 19 and are consistent with the Vogtle licensing commitments.

The implementation review by RII did not disclose significant implementation omissions. The inability to view onsite evidence of the Module listed first order document verification for Commitments 1249, 2283, 2284, 2285, and 4273 is identified as Inspector Followup Item 424/86-61-03 listed in Section 4 of this report.

The examination of Module Section 3.0 did not disclose substantial verification errors, other than noted above, or programmatic concerns. Followup or additional evaluation, other than noted above is not required.

d. Section 4.0 - Program Description

(1) Review Introduction and Section Examination

This section of the Module describes work process and control for design; materials management; personnel training and qualification; and construction fabrication, installation, inspection, and documentation. The section was examined by the inspectors for content, background for the review of later sections (especially Section 6, Program Verification) and for the veracity of the information presented. A detailed examination of the section was not made by the inspectors since the material contained was largely descriptive and not in the nature of an assessment.

(a) Design. Subsection 4.1 entitled "Design" provides an overview of the design process and control discussed in more detail within subordinate paragraphs. The last sentence of that paragraph states that the direct mounting of electrical equipment to floors, walls, and/or embeds is discussed in Module 8. Table 1.1-1 entitled "Module Hardware" states that embed design for raceway and electrical equipment is covered in Module 8 and that electrical equipment directly mounted on structural steel and embed plates is covered in Module 6. A review of the boundary descriptions in both Modules 8 and 6 confirm the Table 1.1-1 information.

Subsection 4.1.2.3.1 entitled "Cable Tray Supports" advised that damping values up to 15% had been used for cable tray supports. Examination disclosed that this had received NRC approval and was properly accounted for in the FSAR Figure 3.7.B.1-7. Further examination disclosed that the response spectra published in design document DC-1005 provided damping values only from one to seven percent (of critical damping) for the various structures using the postulated design-basis earthquakes (OBE and SSE). The Module discussion of this topic did not disclose that use of the allowed 5 to 15% required either generating a supplemental set of response spectra curves or applying an appropriate analytical technique for values exceeding 7%. An analytical method had been developed by the Bechtel Power Corporation and was found to have been used for this during design. Review of this technique was made by the NRC inspectors while examining the commitment 4371 second order implementation in Calculation X2CQ2.4 (Rev. 1) Section 3.1. This review did not disclose verification error and the technique was considered to be an acceptable alternative to generating a supplemental family of response spectra curves.

General agreement was found among the Module description, procedures and observed practices for all other matters examined that related to Subsection 4.1.

(b) Materials. Subsection 4.2 refers to General Appendices C and E entitled "Procurement" and "Material Control" respectively. A detailed examination of the subject of those appendices was not performed due to absence of the related material from Module 19. The Materials subsection was reviewed for content and conformance to other elements of the review. General agreement between the Material Program description and implementation was found for all matters that related to Subsection 4.2.

(c) Training. Subsection 4.3 was read for content and general conformance with the other information contained in the Module. The subsection describes the project programs for the training and qualification of design engineers, field engineers, contractor staff, construction crafts, and QC inspectors. Discussion of the material contained in the Module with the RRT did not disclose information different from that presented in the Module or that gained by the inspectors during past inspections at plant Vogtle.

(d) Construction. Subsection 4.4 was examined by the inspectors for content and general agreement with the single Module 19 Construction Commitment, 4973. In addition, the flow charts contained in this subsection were reviewed for logic and veracity. The foregoing provided general agreement between commitments and the activities covered by the Fabrication, Installation and Inspection program.

(2) Inspection Results

The Section 4.0 examination did not disclose verification errors or further basis for programmatic concerns. Followup or additional evaluation is not required.

e. Section 5.0 - Audits and Special Investigations

(1) Review Introduction and Section Examination

This section provides a discussion of the audits of the Module 19 related activities and documents made by GPC, Bechtel and Southern Company Services Quality Assurance organizations along with the audits made by NRC, the Institute of Nuclear Power Operations (INPO) and the Licensee's Self-Initiated Evaluation Team. Also, included is a discussion of one past construction problem considered by GPC to be important although not reportable to NRC under 10 CFR 50.55(e).

It was noted that Readiness Review General Appendix I entitled "Project Quality Assurance Organization" provides the description and validation of the various audit programs used at plant Vogtle. Individual audits of design and construction activities had been

screened by the RRT for items applicable to Module 19. Section 5.0 of Module 19 provides specific information relative to those pertaining to Electrical Supports while the Audit Program verification was accomplished as a part of General Appendix I preparation.

The illustrative past construction problem outlined in Module Subsection 5.3 was examined to confirm the solution and to assure correspondence of reporting with that observed in the past by NRC inspectors.

The NRC portions of Subsection 5.1 (Design) and 5.2 (Construction) were selected for specific review in order to assess the thoroughness and accuracy of the section. The listing of the NRC Region II outstanding items was used as a benchmark to check the Readiness Review data base for Audits and Special Investigations. The list contains some 165 items applicable to plant Vogtle. These were screened for Module 19 applicability. Of the 4 so identified, one (IFI 83-12-08, Drawings for Cable Tray Supports) had specific NRC reference within the Module 19 Audit Matrices. One additional (CDR 83-50, Strut Channel Installation Deficiencies) was covered in Subsection 5.3 as an illustrative past-problem area. The two remaining were examined as follows from the GPC correspondence reviewed at plant Vogtle.

(a) CDR 85-76, Electrical Raceway Hangars and Supports. This deficiency was composed of (1) incorrect welding callout on the drawing for a support cap plate, (2) absence of stiffeners for a specific support design and (3) inadequate dimensions for bracing a special support. The results of an evaluation made by the design agent (Bechtel Power Corporation) were provided to NRC by letter dated September 5, 1985. The GPC finding communicated to NRC was that no adverse safety impact was involved and that the deficiencies were not reportable under the requirements of 10 CFR 50.55e. NRC Region II had not closed this item as of July 2, 1986. Further review of the GPC records disclosed that this deficiency was listed in the Subsection 5.3 Findings Matrix under GPC-QA audit number CP01-85/29, Finding Numbers 788 and 789.

(b) SL4 85-16-01, Inadequate Procedure for Installation and Inspection of Cable Supports for Electrical Penetrations. This violation was issued on May 28, 1985 to cover the lack of adequate procedures for designing and checking electrical cable supports required to be added within Electrical Penetration Boxes. The licensee advised the NRC on January 15, 1986 that a corrected area turnover procedure had been promulgated in response to this violation. NRC Region II had not closed this item as of July 2, 1986.

The unclosed status of foregoing two items is not considered to reflect incomplete reporting within the Module. Further identification for NRC followup is not required since both of the foregoing items are listed within the NRC Outstanding Items File .

No significant verification inaccuracy was found. Review of the illustrative past-construction problem listed in Subsection 5.3 of the Module did not disclose information differing from that previously obtained by the inspectors or indicate incorrect evaluation by the RRT.

(2) Inspection Results

The examination did not disclose significant verification errors or a basis for programmatic concern. Followup or additional evaluation of Section 5.0 is not required other than for the two open items listed within the NRC Outstanding Items File.

f. Section 6.0 - Program Verification

This section of the Module describes the activities undertaken (1) to ascertain whether the design and construction work processes has been adequately controlled in order to ensure implementation of licensing commitments and (2) that the results of these work processes conform to project procedures and design requirements. The section is further divided into two subsections covering Design Program Verification and Construction Program Verification. Both subsections received a detailed examination by the inspectors and are of such consequence as to be included under separate second order headings (3.g and 3.h) of this report.

g. Subsection 6.1 - Design Program Verification

(1) Review Introduction

The Design Program Verification subsection of the Module focused on the programmatic aspects of design with the objective of determining whether the design control process functioned effectively and whether it insured proper implementation of licensing commitments. The RRT verification was performed in three parts. Part I consisted of verifying implementation of all technical commitments that were within the scope of the Module. These were reviewed for proper implementation into the project design criteria and the procedures which were referred to as first order documents. A selected portion of the commitments were reviewed further by the RRT for implementation into specific second order documents including calculations, drawings, specifications and vendor submittals. No findings resulted from the Part I review. Part II consisted of the RRT review of selected design documents for compliance with project procedures

along with assuring that the technical requirements had been correctly incorporated, coordination was adequate and changes properly controlled. One RRT finding resulted from the Part II review. Part III consisted of a field walkdown to determine if selected features of the design were properly reflected in the as-built installation. Two RRT findings resulted from the Part III review.

(2) Part I Examination

The Part I examination of the Design Program Verification started first with an NRC selection of a sample of 18 commitments from the 18 listed in Subsection 3.4 of the Module. The selection was a 100% sample due to the relatively small number and broad range of commitments applicable to Module 19. This sampling included the 17 commitments identified for design cognizance within the Module 19 subsection 3.4 Matrix. The commitment sample and the results of the review are listed in Table 1 of this report. The 14 commitments shown on Table 6.1-4 of the Module were included in the examination since all of these were within in the sample of 18 selected by the NRC inspectors.

(a) First Order Verification. Verification of commitments was found in Module listed first order documents for 17 of the 18 listed in the Subsection 3.5 Implementation Matrix as discussed in 3.c.1(b) of this report. Verification of Commitment 4273 was not accomplished by the NRC inspectors due to the late availability of calculation X2CQ6.6 at the site. This is identified as Inspector Followup Item 424/86-61-03 as discussed in 3.c.(1)(b). It was noted that this calculation was not available to the RRT at the time that the Module was prepared and, accordingly, verification was incomplete at the time of Module preparation.

(b) Second Order Verification. The second part of the examination of Part I involved commitment verification in second order documents. This started with the inspectors' review of nine commitments (from the sample of 18) in second order documents. These nine included four of the five commitments listed by the RRT in Module Table 6.1-4 as having been found in second order documents only. Two of the nine examined by the inspectors were independent of the 14 previously reviewed by the RRT for second order verification. The results of the NRC examination are listed in Table 1 of this report. No cases of significant second-order document verification-error were found by the inspectors within the commitments checked. Several anomalies were found and are outlined in the footnotes of Table 1 of this report. It was noted that calculation X2CK2.7.1.1 was not available to the RRT at the time the Module was prepared and was not subsequently reviewed. Also, it was not available to the NRC inspectors

during the review at the plant site. This lack of availability for verifying Commitments 1249, 2283, 2284, and 2285 in second order documents is identified as Inspector Followup Item 424/86-61-03 listed in Section 4 of this report.

(3) Part II Examination

Part II of the RRT Design Program Verification involved a review of samples taken from the following project documentation categories:

- Bechtel Design Calculations and Drawings
- Procurement Specifications
- Construction Specifications
- Vendor Drawings and Documents
- Field Change Requests
- Deviation Reports
- Supplier Deviation Disposition Reports
- Construction Specification Change Notices.

All of these Module topics were examined. It was noted that the RRT used predeveloped check lists to review each of the foregoing documentation categories. These design document check lists had been omitted from the Module while those used for construction program verification were displayed as a part of Section 6.2. The examination of Part II included reviewing the design document check list formats against the description of the check list attributes listed in Subsection 6.1.3 of the Module. General conformance was found although some differences were apparent. The Module description reflected a somewhat more comprehensive check than what can be inferred from the actual check lists.

The NRC review of the foregoing Module topics is reported as follows.

(a) Bechtel Design Calculations and Drawings. A detailed examination of design calculations and drawings was not made in that this is more properly a part of the review of the Independent Design Review reported in Module 22. Calculations X2CQ2.4 and X2CQ6.0 were examined in conjunction with the commitment review described in 3.g.(2)(b) of this report. These were two of the 14 calculations listed in Table 6.1-3 of the Module as having been reviewed by the RRT. Also, these were the two of the 14 that were listed in the same

Module table as being associated with findings. Drawings depicting the 13 supports (examined during the walkdown described in 3.h.(4) and listed in Table 2 of this report) were reviewed for clarity of description for the specific supports examined. Verification errors were not found in the foregoing examinations.

Finding 19-4 relative to design calculations was included within the narrative for Module subsection 6.1.3.1. The NRC review of this finding is included in 3.g.(3)(1) of this report.

(b) Procurement Specifications. Procurement specification X2AH17 (Category 1 Electrical Cable Tray Supports) was examined. It was one of the three procurement specifications listed in Table 6.1-3 of the Module as having been reviewed by the RRT. This was selected for examination because it provided most of the prefabricated cable-tray support members used during construction. The examination of this specification did not disclose verification errors.

(c) Construction Specifications. Construction specification X3AR01 Section 8 (Electrical Raceway Systems) was examined. This was one of the four construction specifications listed in Table 6.1-3 of the Module as having been reviewed by the RRT. This was selected for examination because it was the one of the four that pertained most to the electrical supports installation. The bolting and welding aspects were given particular attention in connection with the commitment examination described in Section 3.c.(1)(b) of this report. The examination of this specification did not disclose verification errors.

(d) Vendor Drawings and Documents. The listing of 13 vendor documents in Table 6.1-6 was examined for applicability to the subject of Module 19. Although each had some relation to the cable supports, all appeared to be more closely related to Module 17, Raceways. It was noted that procurement specification X2AH17 (Category 1E Electrical Cable Tray Supports) was listed in Table 6.1-3 as having been reviewed by the RRT under the category of Procurement Specifications. Examination disclosed that it had specific documentation requirements and would have been a more representative specification for RRT vendor document review. The RRT response that the specific specifications examined provided adequate review of the systems for documentation review, approval and handling was accepted due to the general relation of the reviewed documents to Module 19.

(e) Field Change Requests. Thirty-eight Field Change Requests (FCRs) were reviewed by the RRT. These were examined to assure that a broad cross section of subject categories had been selected. A spot check of the filled in check lists was made to assure that a careful review of them had been made by the RRT. Verification errors were not discovered during this examination.

(f) Deviations Reports. Several Deviation Reports are referenced in the Findings described in the Module. The following were selected for examination:

Control No.	Subject
ED-12001	Missing Longitudinal Bracing
ED-12002	Incorrect Structural Sections
ED-12048	Inadequate Conduit Support
ED-12133	Improper Attachment and Incorrect Structural Sections
ED-12183	Missing Longitudinal Bracing

The foregoing were selected separately from those reviewed by the RRT. The sample examined was selected to coincide with certain of the RRT Findings which were examined as described in Section 3.h.(3) of this report. The Deviation Reports were examined for appropriate disposition of the deviations reported and for proper functioning of the documentation processing systems. Verification errors were not discovered in this examination.

(g) Supplier Deviation Disposition Requests. The following six Supplier Deviation Disposition Requests were selected for examination from the eight listed in Table 6.1-9 as having been reviewed by the RRT:

Identification No.	Subject
0241	End Plate Modification
0283	Material Size Substitution
0289	Material Size Substitution
0291	Location Tolerance
0381	Improper Welds and Unqualified Welding Procedures
0602	Requirements Clarification

These were examined for appropriate disposition of the deviations reported and for proper functioning of the processing system. Verification errors were not discovered in this examination.

(h) Construction Specification Change Notices. Twenty Construction Specification Change Notices were reviewed by the RRT. These were examined to assure that a broad cross section of subject categories had been selected. A spot check was made, using the filled in check lists, to assure that a careful review of them had been made by the RRT. Verification errors were not discovered during this examination.

(i) Finding. Module Subsection 6.1.3 included the following Finding pertaining to Design Program Verification:

19-4 Cable tray and conduit support calculations do not address the adequacy of embeds to resist imposed loads.

The Finding was examined by the inspectors for attributes that included:

- Problem statement clarity
- Backup documentation completeness
- Response statement adequacy
- RRT conclusion logic
- Finding conflict with other NRC information

It was noted that Finding 19-4 committed a licensee examination of calculation X2CQ5.1 relative to adequacy of embeds for electrical support attachment. This was to be available by April 25, 1986. This calculation had not been available at the plant site and was received too late to accomplish the review during the inspection. This lack of review is identified as Inspector Followup Item 424/86-61-03 listed in Section 4 of this report.

The examination of the Finding did not disclose verification errors other than listed above. With the exception of the need for calculation verification, the RRT conclusions concerning the Finding are supported.

(4) Part III Examination

Part III of the RRT Design Program Verification involved a field walkdown of safety related electrical supports located in the containment, auxiliary building, diesel generator building and the cable spreading room of the control building. The RRT walkdown resulted in two RRT findings as follows.

19-2 Calculations do not consider a condition where conduit is supported by only one support, as found in the field.

19-23 Junction box support was installed such that is does not conform to the junction box qualification report seismic test configuration.

These findings were examined for attributes that included:

- Problem statement clarity
- Backup documentation completeness
- Response statement adequacy
- RRT conclusion logic
- Finding conflict with other NRC information

The walkdown made by the NRC inspectors described in Section 3.h.(4) of this report included the support for conduit 1NE413RX074 listed in Deviation Report ED-12048 which was referenced in Finding 19-2. It was noted that the deficiency (lack of a second support) had not been corrected as of the date of the inspection. This was expected in that the deviation report had not been signed off for completed action. A similar walkdown was made for the support for the conduit 1AE51BRW219 listed in Deviation Report ED-12278 referenced in Finding 19-23. Field inspection disclosed that the required corrective action (relocation of support) had taken place.

The examination of the two findings did not disclose verification errors other than noted above. The RRT conclusions concerning the findings are supported.

(5) Inspection Results

The examination of the Design Program Verification subsection resulted in incomplete effort identified as Inspector Followup Item 424/86-61-03 for the reviews of calculation X2CK2.7.1.1 as described in Section 3.g.(2)(b) and calculation X2CQ5.1 as described in Section 3.g.(3)(i) of this report. The Module Subsection 6.1 examination did not disclose significant verification errors or further basis for programmatic concern. Followup or additional evaluation, other than noted above, is not indicated.

h. Subsection 6.2 - Construction Program Verification

(1) Review Introduction and Subsection Examination

The Construction Program Verification subsection of the Module focused on the programmatic aspects of construction. It had the objective of determining whether the construction control process functioned effectively and whether it insured proper implementation of licensing commitments. The RRT verification was performed in two parts. The first part consisted of verifying the implementation of the single construction commitment that was within the scope of the Module. This was reviewed for proper implementation in the appropriate construction process documentation. No findings resulted from the first part of the review. The second part of the review was an assessment of selected installed hardware to verify that installation was in conformance with design requirements and to note whether the associated documentation complied with specification and procedural requirements. The hardware verification was done during a field walkdown and the documentation verification involved visual inspection. Fourteen RRT findings resulted from this review.

(2) Commitment Implementation Assessment Examination

The commitment part of the Construction Program Verification was examined by the inspectors using the 18 commitment sample selected and checked as described in Section 3.c.(1)(b) of this report. This sampling had included the single commitment (4973) listed for construction cognizance within the Module 19 Subsection 3.4 matrix. This examination resulted in no verification errors being found within the single commitment examined and which had been listed in the Module Section 3.4 as the only construction responsibility commitment.

(3) Construction Assessment Examination

The second part of the RRT Construction Program Verification involved a documentation review and field walkdown for the following hardware and programmatic activity categories:

- Conduit Supports
- Box Supports
- Equipment Supports
- Tray Supports
- Inspector Certification
- Welder Qualification

- Deficiency Reports
- Measuring and Test Equipment
- Material Traceability

This review resulted in 14 findings that were arranged by the RRT under the following five classifications. It should be noted that a specific finding number may appear under more than one classification:

Finding	Description
	Installation/Documentation Discrepancies
19-9	Broken conduit strap attachment bolt
19-10	1. Duplicated support numbers 2. Unnumbered support
19-11	2. Incorrect supporting member size 3. Incorrect attachment method 4. Added welds
19-15	Support reworked without Rework Request
19-17	1. Missing end return weld 2. Missing alternate weld 4. Incorrect intermittent weld 5. Excessive undercut on two welds
19-19	Documentation incomplete/incorrect
	Drawing Interpretation
19-2	Single-support conduits
19-6	Tolerance for end connection
19-11	1. Missing brace on type 4 and 5 conduit supports
19-14	Welding into the 1-in. border on embed plates
19-16	Skewed weld undersized
19-17	3. Undersized welds
19-23	Junction box support/conduit attachment

	Completion Status
19-12	Tray supports only partially turned over/accepted
	Spring/Stud Nuts
19-8	1. Strut nut not engaged 2. Strut nut bottomed out against channel
19-13	Indicator line not perpendicular
	Inspector Certification
19-20	Inspectors not certified as Level II.

These findings were examined by the NRC inspectors for attributes that included:

- Problem statement clarity
- Backup documentation completeness
- Response statement adequacy
- RRT conclusion logic
- Finding conflict with other NRC information

The examination of the 14 findings did not disclose significant verification errors.

The review of Deficiency Reports ED-12,001 and ED-12,183 referenced in Finding 19-11 disclosed that certain conduit longitudinal bracing had been found missing in the field by the RRT. The independent walkdown described in Subparagraph 3.g.(4) of this report disclosed that corrective action to install this is incomplete. An inspection of the foregoing deficiency reports did not provide complete assurance of adequacy for the program used by the licensee to locate all other missing longitudinal braces. This resulted in opening Inspector Followup Item 424/86-61-01, Examine the Conduit Longitudinal Bracing Program, listed in Section 4 of this report.

The licensee subsequently provided a copy of GPC letter V-A 14.138/LSV-NSV-238 dated June 26, 1986. This letter provided additional documentation that outlined the investigation made to discover missing longitudinal braces for conduit runs. It also provided a copy of Deficiency Evaluation Report (DER) 145 related thereto. The latter gave evidence of the formal evaluation of the

deficiency for purposes of reporting under 10 CFR 55(e). The information furnished by the licensee was examined and found to offer satisfactory evidence that an acceptable program had been followed to determine the locations where longitudinal bracing had been omitted from conduit supports. The documentation offered by Deficiency Reports ED-12,001 and ED-12,183 provided evidence that missing braces were documented in an acceptable system for assuring timely installation. Accordingly, IFI 424/86-61-01 was closed out.

The review of Deficiency Reports ED-12,002 and ED-12,133 referenced in Finding 19-11 disclosed that certain supports had been installed with 3-1/2 inch rather than 4 inch square-section tubular steel. The NRC inspectors reviewed those calculations which resulted in "use as is" determinations. The "use as is" determination was appropriate for Electrical Support Zone I (lower structural levels) but would not be justified for the heavier acceleration-loading of Zones II and III (mid and higher levels) should the same undersizing of support members have occurred. The adequacy of the program to locate other undersize support members was not apparent to the NRC inspectors. The narrative for Finding 19-11 reported that a random walkdown had been made and Deficiency Report ED-12,133 indicated that 3 of the 15 looked at had undersized tube steel members. The foregoing resulted in Inspector Followup Item 424/86-61-02, Examine Methods for Controlling 3-1/2 inch Tube Steel Conduit Supports, listed in Section 4 of this report.

The licensee subsequently provided a copy of the evaluation report for Finding 19-11 entitled Final Response (Revised) dated April 9, 1986. This report documents the investigation made relative to the discovery of undersized tube steel support members disclosed in Deficiency Reports ED-12,002 and ED-12,133. The evaluation report was examined by the NRC Inspectors and was found to offer acceptable evidence that a satisfactory program had been followed to locate undersized members in the supports installed in Seismic Zones II and III of Vogtle 1. A total of 11 supports having the specific detail were installed in Zone II and III areas. All were found to have the correct tube steel section. The documentation offered by Deficiency Reports ED-12,002 and ED-12,133 provided evidence that the actual cases of undersized tube steel had been dispositioned in an acceptable manner. Accordingly IFI 424/86-61-02 was closed out.

(4) Independent Walkdown

An independent sample of 13 electrical supports was selected for field walkdown. The sample was selected to provide a broad range of support types and Category I locations. Notes were made from current drawings and each support was examined for conformance in the field. Three of the 13 were selected from Deviation Reports

listed in Module 19 findings. Two of the 13 were selected to check documentation where conduits had been attached to cable tray supports in violation of the original design criteria of the project. The results of the foregoing walkdown are shown in Table 2 of this report.

An additional walkdown was made with a random selection of 18 support assemblies at various locations in the field. These were examined primarily for bolt tension (torque), welding, and general suitability based on visual appearance. No deficiencies were found during this second walkdown.

(5) Inspection Results

The examination of the Construction Program Verification subsection of the Module resulted in Inspector Followup Item 424/86-61-01 and Inspector Followup Item 424/86-61-02. Details for both of these, and the subsequent close out of them, are presented in Subparagraph 3.h.(3) preceding. The subsection examination did not disclose substantial verification errors, other than noted above, or further basis for programmatic concern. Followup or additional evaluation, other then noted above, is not required.

i. Section 7.0 - Independent Design Review

The results of the Independent Design Review (IDR) were not included in Module 19. A brief narrative of the IDR process was provided. This included a statement that an independent engineering consulting company had made a review of the design documents (such as design criteria, calculations, specifications and drawings) to ascertain whether these documents correctly implemented licensing commitments. A team of technical and professional experts assessed the adequacy of the design work for this Module while assessing that for other Modules. The product of this review is included in Module 22. A specific review of the adequacy of the Electrical Supports was made. The integrated Independent Design Review has been examined by the NRC Office of Inspection and Enforcement. The results of this NRC examination are the subject of a separate report.

j. Section 8.0 - Program Assessment/Conclusions

(1) Review Introduction and Section Examination

This section of the module provides a summary of open corrective actions, five certifications from review managers or participants, and brief resumes for the various RRT members. No introductory paragraph was provided to explain the significance of the information as had been given in the other sections.

The examination of the section by the inspectors involved reviewing both for content and background information. The GPC open corrective action listing presents one action item and five finding followup items. These are summarized as follows along with the GPC completion due dates and the status as of July 2, 1986.

(a) Information Request 112--Completion of Lighting and Communications Supports Calculation X2CQ6.6 due June 30, 1986. The calculation was delivered to the RRT on July 1, 1985. Review of it is covered under Inspector Followup Item 424/86-61-03 as discussed in Section 3.c.(1)(b) of this report.

(b) Finding 19-2--Disposition of Deviation Report (DR) ED-12048 and process of Deficiency Evaluation Report (DER) 144 both due April 15, 1986. A review of the documentation relative to this finding disclosed that field work to install second conduit supports was incomplete. The walkdown discussed in Section 3.h.(4) of this report confirmed this for the sample selected to verify field status. Bechtel Power Corporation provided its analysis report of DER 144 to GPC on June 12, 1986 along with a finding of reportability under 10 CFR 50.55(e).

(c) Finding 19-4--Review and revision of cable tray and conduit calculations due April 30, 1986. The calculation was delivered to the RRT on July 1, 1986. Review of it is covered under Inspector Followup Item 424/86-61-03 as discussed in Section 3.g.(3)(i) of this report.

(d) Finding 19-11--Evaluation of missing braces on DR-ED-12183 and evaluation of DER-145 due April 15, 1986. The potential existence of undersized electrical support structural members is a concern and is covered under Inspector Followup Item 424/86-61-02 as discussed in Section 3.h.(3) of this report. An examination of documentation relative to this finding disclosed that field work to install longitudinal bracing was incomplete. This is covered under Inspector Followup Item 424/86-61-01 as discussed in Section 3.h.(3) of this report. Bechtel Power Corporation provided its analysis report of DER 145 to GPC on June 12, 1986 along with a finding of reportability under 10 CFR 50.55(e).

(e) Finding 19-12--Issue of Field Procedure ED-T-33 due April 25, 1986. Procedure ED-T-33 (Rev. 0), entitled Electrical Room and Area Turnover, was issued on June 20, 1986.

(f) Finding 19-14--Revision of Drawing AX2D94V006 due April 18, 1986. The revision, which clarifies edge limits for embed welding, was accomplished by Design Change Notice (DCN) 58 which was issued against Revision 25 of the drawing on April 10, 1986.

(2) Inspection Results

The Section 8.0 examination did not disclose substantial verification errors or the basis for programmatic concern. Followup or additional evaluation, other than noted above, is not required.

4. Findings

The following three findings were identified during the NRC evaluation of the Module. All of the deficiencies noted are considered to have minimal safety significance at this point of review but should be evaluated further to preclude safety problems. These have been identified as Inspector Followup Items (IFIs) based on the nature of the followup action required. These will be addressed by the NRC during the routine inspection program unless designated as closed in the finding.

a. Inspector Followup Item (IFI 424/86-61-01) - Examine Conduit Longitudinal Bracing Program--Incomplete field work for installing design-required longitudinal bracing and potentially inadequate program for locating missing bracing. Details for this, and the subsequent close out, are provided in Section 3.h.(3) of this report.

b. Inspector Followup Item (IFI 424/86-61-02) - Examine Methods for Controlling 3-1/2 inch Tube Steel Conduit Supports--(1) Potential "use as is" dispositions of undersized tubular steel sections in electrical support Zones II and III where loading may exceed designed strength and (2) lack of assurance of adequacy of the program to locate the use of undersized structural sections for electrical supports. Details for these, and the subsequent close out thereof, are provided in Section 3.h.(3) of this report.

c. Inspector Followup Item (IFI 424/86-61-03) - Incomplete Verification on Six Commitments--(1) Review of calculation X2CQ6.6 to assure first order document verification of Commitment 4273 and to determine potential inadequate anchorage requiring field modification; (2) review of calculation X2CK2.7.1.1 to assure second order document verification of Commitments 1249, 2283, 2284, and 2285; and (3) review of calculation X2CQ5.1 to determine potential requirements for correcting inadequate strength of embeds used for electrical support attachment. Details for these are provided in Sections 3.c.(1)(b), 3.g.(2)(b), and 3.g.(3)(i) of this report.

5. Conclusions

The NRC has reached the following conclusions for Electrical Supports at Vogtle 1 based on the review of Module 19.

a. Summary of Specific Conclusions

The following Module sections have been determined to be acceptable with the exception of items and areas discussed earlier in this report.

(1) Section 1.0 - Introduction--The boundary between Module 19 and the related Modules is generally clear and well defined as presented in Section 1.0. Minor clarification of the data presented in Table 1.1-1 was required for definition completeness. The Module Organization and Project Status were correct as of the date of Module publication.

(2) Section 2.0 - Organization and Division of Responsibilities--The organization description and responsibility presented in Section 2.0 of the Module were reviewed and verified as being correct.

(3) Section 3.0 - Commitments--The commitments listed in Section 3.0 were reviewed and determined to be complete and correctly identified. Implementation was verified in first order documents except for commitment 4273 which is verifiable only in a second order document (calculation). The calculation required for second order document verification of the commitment was not available at the site in time for NRC verification review. This is identified as IFI 424/86-61-03.

(4) Section 4.0 - Program Description--The design program description presented in Section 4.0 was verified as being correct after clarification of the boundary statement relative to Module 6. Investigation disclosed a minor omission of the description of the method used to account for seismic damping factors in design calculations. The information presented concerning materials, training and construction was verified as being correct.

(5) Section 5.0 - Audits and Special Investigations--The audits and special investigations information presented in Section 5.0 was reviewed and verified as being correct.

(6) Section 6.0 - Program Verification--The design program verification reported in Subsection 6.1 of the Module was verified as being generally adequate. Commitments 1249, 2283, 2284, and 2285 were not verified in the second order documents (calculations) listed in the Module due to receipt of the calculations at the site too late for NRC review. This is identified as IFI 424/86-61-03. The examination of a wide range of documents provided verification of adequate documentation-system and programmatic functioning. The examination of the one RRT finding relative to design program verification resulted in concurrence with the finding. Incomplete GPC followup action on this is identified as IFI 424/86-61-03 for the nonreview of the related calculation. The examination of the RRT walkdown and resulting

two findings did not result in verification errors. The design program verification performed by the RRT is considered to have been sufficient to provide a conclusion of adequate programmatic functioning.

The construction program verification reported in Subsection 6.2 was verified as being adequate. The single construction commitment was verified. The RRT walkdown resulted in 14 findings. These were reviewed and are concurred with. Two walkdowns were made by the inspectors to view a variety of electrical supports in a broad cross section of Class 1E plant locations. The hardware viewed reflected appropriate construction practices or were covered with adequate documentation for followup by GPC personnel. Two NRC findings resulted in opening IFI 424/86-61-01 and IFI 424/86-61-02 relative to potentially inadequate programs for detecting missing conduit bracing and undersize support members. Satisfactory evidence of adequate programs for both was provided later by the licensee and these have been closed out. The construction program verification performed by the licensee is considered to have been sufficient to provide a conclusion of adequate program functioning.

(7) Section 7.0 - Independent Design Review--The licensee engaged the Stone & Webster Company to perform an independent review of the design. This review was made in conjunction with the design review of other related Modules. The product of the integrated IDR was published as Module 22 and was not incorporated into Module 19. The results of the NRC examination of Module 22 is the subject of a separate report.

(8) Section 8.0 - Program Assessments/Conclusions--The summary of corrective actions presented in Section 8.0 of the Module was examined and the current status determined. The report of pending actions was verified with information contained in the earlier sections of the Module. The certifications and mini resumes did not conflict with information contained elsewhere in the Module. The section lacked an introductory statement to define the significance of the information contained. An examination of the status disclosed that appropriate action is being taken by the licensee to close the two remaining open items which also are covered by IFI 424/86-61-03.

b. General Conclusions

The examination performed by the NRC indicated that GPC management supported the Readiness Review by active participation and adequate resources. No evidence of coercion or attempt to dilute either the effort or the findings was disclosed. The RRT displayed the requisite competence and professionalism for a review of this nature. The licensee's program was comprehensive and provided adequate assurance that the plant's electrical supports will perform in accordance with

NRC requirements and FSAR commitments. Possible exception to this is the one remaining open Inspector Followup Item (IFI) resulting from the NRC examination and which is listed in Section 4 of this report.

It does not appear that the foregoing represent significant programmatic weakness provided that additional licensee response is sufficient to enable closure for currently open NRC items for Vogtle 1. Pending resolution of the open item identified above, the NRC concludes that the GPC program for Electrical Supports complies with NRC requirements and FSAR commitments. This conclusion is based on information currently available to the inspectors and reviewers. Should subsequent contradictory information become available, it will be evaluated to determine what effect it may have on the above conclusion.

6. References

(1) Vogtle Electric Generating Plant, Readiness Review, Module 19, Electrical Supports.

(2) April 10, 1986, letter for D. O. Foster, Vice President and Project General Manager, Vogtle Project, Georgia Power Company, forwarding Module 19 for NRC evaluation.

TABLE 1
COMMITMENT VERIFICATION BY RII INSPECTORS

Ref No. Verified	Commitment Source Second Order	Commitment Section Document	Commitment Subject	Document Feature	Verified First Order Document	
109	FSAR	1.5.9	Bechtel Generic Programs	Verified Cable Tray Spt Damping Value	Yes	Yes
126	FSAR	1.9.29	Seismic Design Classification	Reg. Guide 1.29 Rev. 3 9/78	Yes	
174	FSAR	1.9.92	Combine Modal Resp. & Spatial Comp. in Seismic Resp. Analysis	Reg. Guide 1.92 Rev. 1 12/76	Yes	
843	FSAR	3.2.2-1	Class. of Struct. Components & Sys.	Reg. Guide 1.29 Note (e) Seismic Category	Yes	
886	FSAR	3.2.2-1	Prin. Codes & Stds. for Table	AISC-1969	Yes (1)	Yes
893	FSAR	3.2.2-1	Prin. Codes & Stds. for Table	AISI-1968	Yes (1)	
981	FSAR	3.7.B.1.3	Seismic Damping Values, other than Cable Trays & Spt. Sys.	Reg. Guide 1.61	Yes (2)	Yes (3)
1013	FSAR	3.7.B.3.5	Seismic Subsys. Analysis	Equivalent Static Load Method	Yes	Yes
1249	FSAR	3.10.N.4.2	Std. Rev. Plan Eval., Comb. of Multimodal Resp. for B.O.P. Eqpt.	BC-TOP-4A	Yes (4)	
1497	FSAR	3.7.B.1.3	Cable Tray Spt. Damping Values	Max. 15% Damping	Yes	Yes
2188	FSAR	1.9.61	Seismic Des. Damping Values	Reg. Guide 1.61 10/73	Yes	Yes (5)

TABLE 1 (continued)
COMMITMENT VERIFICATION BY RII INSPECTORS

Ref No. Verified	Commitment Source Second Order	Commitment Section Document	Commitment Subject	Document Feature	Verified First Order Document	
2283	FSAR	3.10.B.1	Seismic Qual. & Doc. for Safety Rel. Eqpt. & Spts.	IEEE 344-1975	Yes (6)	No (6)
2284	FSAR	3.10.B.1	Seismic Qual. & Doc. for Safety Rel. Eqpt. & Spts.	Reg. Guide 1.100	Yes (6)	
2285	FSAR	3.10.B.4.2	SRP Eqpt. Qual. Eval., Multimodal Resp. Comb. Guidance	BC-TOP-4A	Yes (4)	
4273	NRC Question	Q430 5-1	Main Control Rm. & Remote Shutdown Illumination Levels	Fixtures mounted per per Seismic Cat. I Reqts.	No (7)	
4370	FSAR	3.7.B.1-1	Fixed Base Struct. & Comp. Damping Values	Seismic Damping Percent of Critical per Mode	Yes	Yes
4371	FSAR	3.7.B.1-7	Cable Tray & Spt. Damping Values	Damping Values	Yes	Yes
4973	Generic Letter	C/85/04/29	Visual Welding Acceptance Criteria	AWS D1.1	Yes	Not applicable

NOTES:

(1) FSAR Table 3.2.2-1 item 35 erroneously lists AISC-68 for AISI-68.
(2) Section 3.5 (Implementation Matrix) shows verification for both conduit and cable tray supports while Section 3.4 (Commitment Matrix) listed the commitment for "other than cable tray supports."
(3) Module Table 6.1-4 lists both calculations X2CQ2.4 and X2CQ6.0 for second order verification. Calculation X2CQ2.4 does not apply to the subject of commitment 981.
(4) Module 1st order verification used calculation X2CK2.7.1.1 in lieu of the 1st order document DC-1005 Section 3.6.4 which implements FSAR requirement.
(5) RG 1.61 Table lists SSE damping as 4% for welded and 7% for bolted structures. Design calculation X2CQ6.1 used 5% based on conduit supports being a combination of welded and bolted structures.
(6) Indirectly verified in DC-1000-C Section 5.6.8 and the DC-1005 Section 3.6.3 rather than calculation X2CK2.7.1.1 which had been listed in Module Section 3.5.
(7) Calculation X2CQ6.6 was listed by RRT as future 1st order verification but was not available at the site early enough to permit verification by NRC inspectors.

TABLE 2
WALKDOWN OF PRESELECTED ELECTRICAL SUPPORTS

Support Number	Location	Support Type	Fabrication	Observation (1)
CS503B10171	Containment	Conduit	Strut	Conforms
TS01C005104	Containment	Cable Tray	Tubular Steel	Conforms
BS503B10105	Containment			
CS40308135	Fuel Handling Building	Conduit	Strut	Conforms
TS31188	Control Building	Cable Tray	Tubular Steel	Conforms--some bolts slightly undertorqued
BS30153010	Control Building	Transformer	Tubular Steel	Conforms
1HY0943A (2)	Control Building	Instrument	Strut	Conforms
CS41161001	Auxiliary Building	Conduit	Strut	Longitudinal brace not installed
1AE51BRW219 (2)	Control Building	Conduit	Strut	Seismic support break correction completed
CS31445118	Control Building	Conduit	Tubular Steel	Conduit attached to cable tray support
CS31448003	Control Building	Conduit	Tubular Steel	Conduit attached to cable tray support

NOTES:

(1) Word conforms indicates conforms to applicable drawing.
(2) Number listed is item supported rather than support number.

ACRONYMS

AISC	-	American Institute of Steel Construction
AISI	-	American Iron and Steel Institute
AWS	-	American Welding Society
BOP	-	Balance of Plant
BPC	-	Bechtel Power Corporation
DCN	-	Design Change Notice
DR	-	Deviation Report
FCR	-	Field Change Request
FSAR	-	Final Safety Analysis Report
GDC	-	General Design Criteria
GPC	-	Georgia Power Company
IDR	-	Independent Design Review
IE	-	Office of Inspection and Enforcement
IEEE	-	Institute of Electrical and Electronic Engineers
INPO	-	Institute of Nuclear Power Operations
NRC	-	Nuclear Regulatory Commission
NRR	-	Office of Nuclear Reactor Regulation
NSSS	-	Nuclear Steam Supply System
OBE	-	Operating Basis Earthquake
QA	-	Quality Assurance
QC	-	Quality Control
RG	-	Regulatory Guide
RRT	-	Readiness Review Team
SRP	-	Standard Review Plan
SSE	-	Safe Shutdown Earthquake