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REGION II  
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ATLANTA, GEORGIA 30323

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P. O. Box 4545  
Atlanta, GA 30302

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Facility Name: Vogtle Unit 1

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## TABLE OF CONTENTS

<u>Topic</u>	<u>Page</u>
Summary	3
Scope of Review	5
Methodology	5
Evaluations	7
Findings	13
Conclusions	16

## SUMMARY

- o Deficiency - Retrievability of Records

- Deficiency - Purchase of Superplasticizer as a non-Q Material
- Deficiency - Timeliness of Writing and Addressing a Deficiency Report on Cadweld Failures
- Deficiency - Acceptance of Response to Concern Number 3 Regarding Adequacy of Design of Shear Reinforcement Without Reviewing Calculations
- Unresolved Item - Review of Results of Testing Performed on Concrete Materials by the Independent Testing Laboratory
- Unresolved Item - Review of Civil Open Item Reports
- Unresolved Item - Maximum Allowable Water on Batch Tickets
- Unresolved Item - Certification of QC Inspectors on Concrete Pour
- Unresolved Item - Use of Shear Bars in the Auxiliary Building Base Mat

It does not appear that these deficiencies and unresolved items will represent significant programmatic weaknesses.

Details on these items are discussed in the main body of this report. More specific details for Region II identified items are provided in supporting Region II Inspection Report No. 50-424, 425/85-19. Resolution of these items will be handled in future Region II routine inspections.



## 1. Scope of Review

This review, which consisted of an examination of each section of the Module, was performed by reviewers from the Office of Nuclear Reactor Regulation, the Office of Inspection and Enforcement, and inspectors from Region II. Module Sections 1.0, 2.0, 4.0, 5.0, and 8.0, which present data on the Module introduction, company organization, division of responsibilities, work processes, results of audits, special investigations, and conclusions regarding the assessment of the Module, did not require as detailed a review or evaluation as the other sections. The more significant aspects of the Module appear in Sections 3.0, 6.0, and 7.0. These sections discuss licensee commitments, methods of implementing commitments, methods of design and construction program verification, and results of an independent design review. Review of these sections included a detailed review of the content; examination of items identified as findings, concerns, and observations; an examination of a sample of records reviewed by the GPC Readiness Review Staff; and an examination of an independently selected sample of records. Methodology used for this review and an evaluation of each section are presented in the following paragraphs.

## 2. Methodology

The review and evaluation by NRR focused on Sections 3.0, 6.0 and 7.0. The review was conducted in the Bethesda office commencing on April 2, 1985. Review of Section 3 was performed by comparing the applicant's licensing and project commitments and the corresponding source documents within Section 3.0 with the Standard Review Plan (SRP) positions, the Regulatory Guides, the provisions of the industrial codes, the NRC questions and answer records, the staff's SER and the Vogtle FSAR documents. The program verification activities (Sections 6.1 and 6.2) were reviewed to verify proper implementation of commitments and conformance to project procedures and design requirements. Review of the independent design activities (Section 7.0) focused on the findings of the independent review group and corrective actions taken to resolve adverse findings.

The review and evaluation by IE focused on Section 6.1, Design Program Verification, and Section 7.0, Independent Design Review. The review of both sections was performed by inspections at the Vogtle site and at the office of the staff's civil structural consultant. During the site visit of April 15-18, 1985, the IE inspection team interviewed the GPC Readiness Review Staff (viz., Paul W. Koss, John Curtin) associated with Sections 6.1 and 7.0. These interviews were held to determine the methodology and depth of review performed. Also, at the site the IE inspection team reviewed the referenced sections and related calculations. In addition to the site inspection, the IE team reviewed independently three calculations identified during the Independent Design Review that were determined to be representative of the subject being assessed. The purpose of this review was to determine the depth of the review performed by the Readiness Review Program Staff with respect to design aspects and supporting calculations.

The review and evaluation by Region II inspectors was accomplished by reviewing the Module in its entirety in the Atlanta Regional Office beginning on April 2, 1985, and by inspections at the Vogtle site on April 15-19, 1985 (Inspection Report No. 50-424, 425/85-15), May 6-10, 1985, and May 20-24, 1985 (Inspection Report No. 50-424, 425/85-19). Section 1.0, Introduction, which presents an introduction to the intent and content of the Module and Section 2.0, Organization and Division of Responsibility, which presents a description of the organization and responsibility for design and construction of concrete structures, were only reviewed for general content and needed background data. Review of Section 3.0, Commitments, centered around the construction commitments and implementation of these commitments. This was accomplished by reviewing the FSAR and verifying that the correct commitments were referenced in the implementation matrix. The inspectors also reviewed the commitment sources and implementing specifications and procedures to verify that the FSAR commitments were being correctly implemented in project documents. Commitment sources examined included American Concrete Institute (ACI) practices and codes, American Society for Testing and Materials (ASTMs) standards, Regulatory Guides, and American National Standard Institute (ANSI) standards. These were reviewed and compared with applicable specifications and procedures.

Review of Section 4.0, Program Description, was accomplished by examining the four subsections and comparing the program description with FSAR requirements, specifications, and procedure requirements. The inspectors also compared the described program with the inspectors' understanding of program requirements that have been inspected against and reported in inspection reports from 1977 to 1985. Review of Section 5.0, Audits and Special Investigations, was accomplished by examining the five subsections, NRC and INPO findings, and construction problems identified in Subsections 5.2, 5.4, and 5.5. Region II inspection reports were also reviewed to verify that the identified findings had previously been reviewed and addressed by the NRC. Audit findings identified in Section 5.1 were not examined in detail because similar type findings were examined and evaluated in review of Sections 6.1 and 6.2. Review of Section 6.0, Program Verification, centered around Subsection 6.2, Construction Program Verification. Subsection 6.1, Design Program Verification, was reviewed for content and verification of the inspectors' understanding of the design process. No in depth evaluation of Subsection 6.3, which covers a visual walkdown inspection of concrete structures, was done as credit was taken for the numerous walkdowns of concrete structures which have been performed by Region II inspectors during previous routine inspections. Review of Subsection 6.2 was accomplished by reviewing and examining the corrective actions associated with the resolution of the fifty-five findings and by reviewing pertinent records for two of the 26 vertical slices of concrete operations analyzed by the Readiness Review Staff. In addition Region II reviewed records of three randomly selected vertical slices and one horizontal slice of concrete operations in the Unit 1 Containment Building. A vertical slice takes into account the major attributes of a concrete pour. If problems are identified with any major attribute, an evaluation is performed of that attribute for several concrete pours (horizontal slice). Review of the fifty-five findings included examination of quality records, specifications, procedures, industry standards, and FSAR commitments associated with the items identified in the

findings. Records for the vertical slices were examined to ascertain whether the records were in conformance with established procedures and specifications and that the records reflect work accomplishment consistent with requirements in the following areas:

- Materials Acceptability - Cement, fly ash, fine and coarse aggregates, admixtures, reinforcing steel, and cadweld materials
- Rebar installation, cadweld splicing, and testing activities
- Preplacement, batch plant delivery, and placement operations
- Inprocess testing of fresh concrete
- Calibration of equipment
- Curing and post-placement activities
- Core drilling and grouting operations
- Qualification of QC inspection personnel
- Handling of deviation reports/nonconformance control

Examination of quality records of the horizontal slice of concrete operations consisted of examining records for the critical elements of 26 concrete placements made in the Unit 1 containment building between August 1981 and September 1984. Critical elements selected for review included slump, air temperature and strength. Review and examination of Section 7.0, Independent Design Review, was limited to reviewing and examining observations 11 through 14, identified by the Independent Design Reviewers in Section 7.5. This included examination of referenced commitments, procedures, records, interviews with QC inspectors and engineers, examination of QC inspector training records and quality records pertinent to the observations. Review of Section 8.0, Program Assessment/Conclusion, was reviewed primarily for content and background information. Evaluation of this section was effectively accomplished during review of the Module Sections identified earlier.

### 3. Evaluations

The evaluation of each section reviewed is provided below. For each section, a description of the section, what was reviewed, and the basis of acceptance is provided.

#### a. Section 1.0 - Introduction

This section of the module presents an introduction to the intent and content of the module organization, areas of evaluation, and status of

the project. This section was reviewed primarily for content and background information. No additional followup or evaluation of the section was required.

b. Section 2.0 - Organization and Division of Responsibility

This section presents a description of the organization and division of responsibility of Georgia Power Company, Bechtel, and Southern Company Services for design, procurement, and construction activities related to concrete structures. This section of the Module was reviewed for content only. No additional followup or evaluation of this section was required.

c. Section 3.0 - Commitments

- (1) This section of the Module contains a listing of commitments and implementing documents which are presented in two matrices. The first matrix is the commitment matrix which contains a listing of the sources and subject of licensee commitments. Commitments listed in this matrix were identified by the Readiness Review Staff through a review of the FSAR, responses to NRC questions, responses to generic letters, and responses to IE letters. The second matrix is the implementation matrix which contains a listing of documents and features discussed in the FSAR and implementing documents. The Readiness Review Staff reviewed these documents to verify compliance with the commitment requirements.
- (2) NRR reviewer's and Region II inspector's review and evaluation of this section was performed by comparing licensing commitments and corresponding source documents with the SRP, Regulatory Guides, the provisions of the industry codes and standards, the NRC question and answer records, the staff's SER and the FSAR documents. The review also included a review of commitment sources and implementing specifications and procedures to verify that the FSAR commitments were being correctly implemented in project documents.
- (3) This review resulted in three questions being generated concerning compliance with FSAR commitments.
  - (a) Question 1 pertained to compliance with Sections CC-2000, CC-4000, CC-5000, and CC-6000 of the ASME Section III, Division 2 code referenced by Section 1.9.136 of the FSAR. Discussions with licensee engineers in three conference calls (April 29, May 14, and May 28, 1985) and subsequent documentation provided as a followup to these discussions (reference letter - Foster to Grace - August 2, 1985) demonstrated that the deviations between ASME code requirements and Vogtle site practices are minor. Based on a review of the documents provided by the licensee, the staff concluded that the applicant has demonstrated compliance with the intent of the ASME Section III Division 2 code.



- (b) Question 2 was concerned with whether or not the design of the spent fuel storage facility complied with the referenced requirements of Appendix D to the SRP, Section 3.8.4. Section 3.4 of the Module does not reference the requirements of Appendix D to SRP Section 3.8.4. Discussions with licensee engineers in conference calls (April 29 and May 3, 1985) and a review of FSAR Section 9.1.2.3 showed that the applicant used "Review and Acceptance of Spent Fuel Storage Handling Application" (NRC guidance dated April 14, 1978) as guidance for the design of spent fuel racks. Review of this document showed that the current SRP criteria is based primarily on the position in the April 1978 guidance, and therefore, the intent of SRP requirements are being met.
- (c) Question 3 was concerned with whether or not the total soil damping used in the structural dynamic studies are represented by FSAR figures 3.7.B.1-8 through 3.7.B.1-10 and the tabulated damping values on FSAR Figure 241.12-1. Conference call discussions of July 1 and July 15, 1985 and the licensee's response of May 17, 1985 and July 5, 1985, (reference letter - Foster to Grace - August 2, 1985) verified that the strain-dependent damping curves in the above FSAR figures were the soil damping data used in the soil-structure interaction dynamic studies.

Review of this section by the reviewers and inspectors showed that the Vogtle licensing commitments and implementing documents comply with the FSAR, the SRP, Regulatory Guides, and industry codes and standards.

d. Section 4.0 - Program Description

- (1) This section of the module describes work processes and controls for design, procurement of materials, training and qualification of inspectors, fabrication and installation, and inspection and testing of reinforced concrete.
- (2) Review of this section by Region II inspectors included a detailed examination of the four subsections and a comparison of the program description with FSAR requirements, specification, and procedure requirements. The described program was also compared with the inspectors' understanding of program requirements that have been inspected against and reported in inspection reports from 1977 to 1985.
- (3) Review of this section indicated that the program described in the subsections is generally correct and is in agreement with FSAR and project requirements. One discrepancy in program requirements regarding the purchasing of the superplasticizing admixture as a non-Q item was identified. Subsequent review of supporting

test data showed that the material meets the requirements specified by the referenced ASTM C-494. This minor discrepancy was identified as a deficiency.

e. Section 5.0 - Audits and Special Investigations

- (1) This section contains a discussion of the QA audit process, NRC inspections, special inspections by INPO and a self-initiated inspection team, and past design and construction problems. This section was reviewed to confirm that the audit process, results of NRC findings and construction problems identified in this section are accurate and correspond to methods that have been observed by Region II inspectors and reported in previous Region II inspection reports.
- (2) Review of this section included a review of the five subsections, INPO and NRC findings, and construction problems identified in Subsections 5.2, 5.4 and 5.5. Region II inspection reports were also reviewed to verify that the identified findings had previously been reviewed and addressed by the NRC. Georgia Power audit findings identified in Subsection 5.1 were not examined as similar findings which appear in Sections 6.1 and 6.2 of the Module were examined and evaluated for correct resolution and significance.
- (3) Review of this section indicated that it is an accurate presentation of the audit process and previously identified construction problems and NRC inspection results. No findings were identified during the review of this section.

f. Section 6.0 - Program Verification

- (1) This section discusses methods used to verify conformance to design and construction requirements. The section is divided into Subsections 6.1, 6.2, and 6.3. Subsection 6.1 covers activities related to the design program verification. The design program verification was covered in two phases. In Phase I, the commitments, which were identified in Section 3 of the Module, were compared to project design criteria. The second phase involved the verification of FSAR commitments in calculations, drawings, specifications, change control records and training records. No findings were identified in Phase I. Five findings of a procedural nature were identified in Phase II. Section 6.2 which covered activities related to the construction program was also performed in two phases. Phase I was verification of implementation of 43 construction and 23 procurement commitments. Phase II was a technical review of construction records to verify that the work was performed in accordance with project specifications,

procedures, and drawings. Five findings were identified in Phase I and 50 findings were identified in Phase II. Section 6.3 covers a visual walkdown of concrete structures that was performed to observe the overall condition of the concrete.

- (2) Review of Section 6.0 was performed by reviewers from NRR, IE and inspectors from Region II. The review by NRR included a review of the program verification activities listed in Subsections 6.1 and 6.2 and the resolution of the five findings identified in Subsection 6.1. The review by IE included the methodology used as well as the depth of the review of the design program verification presented in Subsection 6.1. The IE review also included examination and resolution of the five findings identified by the Readiness Review Staff. Review of the construction verification program in Subsection 6.2 by Region II inspectors included a review and examination of the corrective actions associated with the resolution of the 55 findings, a review of pertinent records for two of the vertical slices of concrete operations analyzed by the Readiness Review Staff, and three randomly selected vertical slices and records for a horizontal slice of concrete operations in the Unit 1 Containment Building.
- (3) Review of this section indicated that the review conducted by the Readiness Review Staff for the design and construction verification program was comprehensive and adequate. Examination of the findings indicated that they were of minor significance and that the resolution of the findings was adequate. Examination of the quality records indicated they were representative evidence of quality controls for concrete operations and indicated that concrete operations were being controlled in accordance with applicable requirements.

The review of this section resulted in two questions being generated by NRR reviewers and some minor program discrepancies being identified by Region II inspectors.

Question 1 was related to the sampling method in the design program verification. The intent of the question was to determine how meaningful are the representative samples selected by the applicant to ensure the proper implementation of licensing commitments for the design of concrete structures. Subsequent discussions with licensee engineers (April 29, 1985) and further review of the Module indicated that the sampling methods were adequate.

Question 2 stemmed from the statement in Section 6.2.2.1 of the Module that prior to January 1980, there was no requirement to use certified personnel for inspection activities. This statement appeared to be in conflict with Regulatory Guide 1.58 and the requirements of ANSI N45.2.6. Resolution of this question was achieved by Region II inspectors by reviewing Section 17 of the FSAR, procedures for training inspectors, and inspector training

records. Review of section 17 of the FSAR showed that the licensee stated in the FSAR that they were not able to fully comply with the requirements of ANSI N45.2.6 because of a shortage of experienced personnel at the time and that a training program for engineers and inspectors was developed to meet the intent of the Regulatory Guide 1.58 which endorses ANSI N45.2.6. Review of training procedures showed that the procedures generally conform to the requirements of ANSI N45.2.6 (1978). One exception noted was that the procedures only required as little as one month on the job training to meet the requirements for Level I certification which is at variance with any combination of education and experience for Level I certification under the ANSI Standard. As a result of this variance, the records of the QC inspectors who were certified prior to 1980, were examined to establish the level of conformance to ANSI N45.2.6. Review of these records indicated that QC inspectors were trained and certified in accordance with the requirements of ANSI N45.2.6.

The minor program discrepancies identified by Region II inspectors were concerned with retrievability of records, review of test data on concrete materials, licensee review of civil open item reports, maximum allowable water on batch tickets exceeding design requirements, and certification of QC inspectors. These discrepancies are classified as either deficiencies or unresolved items. Details of these findings are presented in the findings paragraph and in Region II Inspection Report Number 50-424, 425/85-19.

g. Section 7.0 - Independent Design Review

- (1) This section describes the independent design review of reinforced concrete structures conducted by the Stone and Webster Engineering Corporation. The three key areas of civil structural design that the independent design review focused on included reinforced concrete structural design, materials specifications, and design change evaluation. Concrete structures selected for review included containment internal structures, auxiliary building, fuel handling building, and control building. Two levels of review were performed on the structures selected. Level I review which is overall analysis and load development was performed on all of the four buildings. Level 2 review, which is the detail design of structural components within the building, was performed on the containment internal structures and the auxiliary building. The review by the Independent Design Review team yielded three concerns and 14 observations.
- (2) Both levels of the design review were investigated by the IE inspection team as well as the observations and concerns identified by the Independent Design Review team. The IE inspection team also reviewed independently calculations to determine the



depth of review performed by the Independent Design Review team. Reviewers from NRR examined the findings identified in the Independent Design Review and corrective actions taken to resolve the findings. Region II inspectors reviewed the resolution of Observations 11 through 14 which dealt with material specifications and procedures.

- (3) Review of this section showed that adequate samples were inspected to determine the adequacy of the concrete structures and that the program developed by the Independent Design Review team was comprehensive and adequate. The reviewers agree with the Independent Design Review team findings and their disposition except for Concern Number 3. This concern deals with the use of shear bars in the auxiliary building mat which do not conform to the ACI 318-71 code. A review of Observation 14, Cadweld Deficiency, indicated that some cadweld failures were not addressed in a timely manner. These items are identified as an unresolved item and a deficiency in the findings paragraph. Review of Concern Number 1 in Section 7.5 resulted in a question from NRR reviewers concerning Bechtel's response on the use of dynamic load factors on jet impingement loads. Discussions with Georgia Power Company and Stone and Webster Engineering Corporation engineers (April 29 and May 31, 1985) as well as the licensee's response (reference letter - Foster to Grace - August 2, 1985) showed that the proper dynamic load factor was used and that the effects of dynamic loading on the Vogtle structures have been correctly incorporated in the design.

#### 4. Findings

The following findings were identified from the reviews by NRR and IE reviewers and Region II inspectors. The findings are identified as either a deficiency or an unresolved item. A deficiency is considered as an item having no safety significance but one that should be evaluated further to preclude safety problems. An unresolved item is a matter which requires further information and investigation to determine if it is acceptable or may involve a violation or deviation. Deficiencies will be pursued as an Inspector Followup Item (IFI) in future routine inspections.

Deficiency - (IFI 85-28-01)	<u>Purchase of Superplasticizer As Non-Q Material.</u> Module Subsection 4.2, Materials, indicates that superplasticizing agents (water reducing admixture used in concrete) are considered non-Q. Examination of specification X2AE07, Furnishing Admixtures for Concrete, which is identified as Project Class OIC (i.e., safety-related), indicates that admixtures are to be purchased and tested as Q materials. Followup of this item indicated that the Superplasticizer Melment, a water reducing admixture used in the concrete, was purchased as a non-Q material. However, examination of receipt documents did show that the material does meet the standard specification for concrete as specified by ASTM C-494. The statement in the module should have indicated that an error was made in the purchase and
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receipt of the superplasticizer Melment as a non-Q material.

- Deficiency -  
(IFI 85-28-02)      Retrievability of Records. Review of records identified several examples of problems with missing and misfiled records due to the filing system and lack of retrievability. Examples of this problem included the finding of the LA abrasion tests for aggregates and cadweld inspection records by NRC inspectors that were reported missing by licensee reviewers and the finding of cadweld tensile test reports filed with concrete strength records. These are examples of a problem concerning the filing and retrievability of records which were identified by the licensee in Section 6.2 of the Module. It is to be noted that the number of missing records are relatively small and other documentation exists to supplement missing records.
- Deficiency -  
(IFI 85-28-03)      Timeliness of Writing and Addressing a Deficiency Report on Cadweld Failures. Review of Deficiency Report Number DR CD-2276 showed that this deficiency was written in July 1982 to address four cadweld tensile test failures that had taken place in June and September of 1981. Further review of records did show that a stop work order was issued in September 1981 to address two of the failures and that additional testing was done. However, DR CD-2276 did not address the lack of timeliness in issuing a DR for these four tensile test failures.
- Deficiency -  
(IFI 85-28-04)      Acceptance of Response to Concern Number 3 Without Reviewing Revised Calculations Justifying Resolution of the Concern. The independent design reviewers accepted the response to Concern Number 3 in Section 7.0 without reviewing the revised calculations which justified the deviation from ACI 318-71 code requirements. For this and all similar concerns, the Independent Design Review team should verify the specifics of the response prior to accepting the resolution.
- Unresolved Item-  
(85-19-01)      Review of Results of Testing Performed on Concrete Materials by the Independent Laboratory. Examination of test data by Law Engineering Test Company for air entraining agents (AEA), fine aggregate, coarse aggregate and water showed numerous errors in test data results that were not identified by GPC Level II inspectors signing and approving the test results.
- Unresolved Item-  
(85-19-02)      Review of Civil Open Item Reports. Examination of civil open item reports on file in the vault disclosed that dispositions and final corrective actions for resolving problems were not indicated on the reports. The inspec-

tors could not determine from review of these reports whether or not the corrective actions had been completed, and whether or not the reports had been reviewed and accepted by engineering.

Unresolved Item-  
(85-19-03)

Maximum Allowable Water on Batch Tickets. Review of batch tickets on concrete pours for design mix 411-5 placed between January 1981 and February 1981 showed that the maximum allowable water listed on the tickets exceeded design requirements. Review of the amount of water actually used did show that design limits were not exceeded. However, it is felt that this matter should be investigated further to determine the cause of the discrepancy and to determine if a violation of water content occurred in this mix or other mixes.

Unresolved Item-  
(85-19-04)

Certification of QC Inspectors on Concrete Pours A-11B-004 and 008. Review of records concerning the qualifications and certification of QC inspectors involved in concrete placement A-110-004 and 008 disclosed the following problems: Records indicate that a Level I Fresh Tester of concrete on the subject pour failed his requalification test on February 26, 1980, and subsequently had his card revoked. No records were available to support that the individual was ever recertified. Records indicate that the Batch Plant Inspector on the subject pour, who evaluated and verified the acceptability of the concrete batch tickets is only a Level I Inspector. ANSI N45.2.6 requires persons evaluating inspection and test results to be certified as a Level II or higher.

Unresolved Item-  
(85-28-05)

Use of Shear Bars in the Auxiliary Building Base Mat. The use of shear bars in the auxiliary building base mat deviates from Section 12.13 of ACI 318-71 which is a FSAR commitment. This deviation from a licensing commitment should have been identified by the Independent Design Review team. This issue will be resolved through NRC followup activities.

Resolution of the above listed deficiencies and unresolved items will be pursued and addressed in Region II site inspections and inspection reports.

## 5. Conclusions

Based upon the review within the scope of this module, the NRC has reached the following conclusions for reinforced concrete structures for Vogtle Unit 1.

### a. Summary of Specific Conclusions

With the exceptions of those items/areas discussed earlier, we have determined the following to be acceptable:

- (1) Commitments - The NRC has reviewed the commitments as listed in Section 3.0 of the Readiness Review Module. We have determined that the licensing commitments and implementing documents comply with the FSAR, the SRP, Regulatory Guides, and industry codes and standards.
- (2) Program - The NRC reviewed the description of your program as given in Section 4.0 of the module. The following areas of your program were reviewed:

- Design Control
- Material Procurement
- Training and Qualifications
- Fabrication and Installation
- Inspection and Testing

We have determined that your program description in Section 4.0 is generally correct and is in agreement with FSAR and project requirements.

- (3) Audit and Special Investigations - We have reviewed Section 5.0 on audits and concluded that this section is an accurate presentation of the audit process and previously identified construction problems and NRC inspection results.
- (4) Program Verification - GPC performed a program verification in the following three parts: design process verification, receipt and construction verification, and a walkdown of concrete areas.

The design process verification examined the implementation of licensing commitments in the design documents. The verification of the procurement and construction processes addressed implementation of 43 construction and 23 procurement commitments and a technical review of construction records. The verification identified fifty-five findings, and these were categorized on the basis of their individual significance and cumulative programmatic effect. The review conducted by the Readiness Review Staff for the design and construction verification program was comprehensive



and adequate. Findings were of minor significance and the resolution of the findings were adequate. Quality records indicated they were representative evidence of quality controls for concrete operations and indicated that concrete operations were being controlled in accordance with applicable requirements.

The review of this section resulted in some minor program discrepancies being identified by Region II inspectors which are included in Paragraph 4 above as deficiencies or unresolved items.

GPC also performed a walkdown of concrete areas to determine the overall condition of the concrete and evaluate the workmanship evident in the concrete surfaces. No in depth evaluation was done as the NRC relied heavily on previous NRC inspections. The inspection reports and documentation relate to the batching, mixing, transporting, and placement of safety-related concrete.

- (5) Independent Design Review - GPC contracted an outside organization, Stone and Webster Engineering Corporation, to perform an Independent Design Review of the reinforced concrete structures. This review was performed to assess the technical adequacy of the civil/structural design. This is analogous on a smaller scale to an Independent Design Verification Program (IDVP) performed by other utilities and accepted by the NRC. With the exception of those items identified in Paragraph 4, the NRC concluded that the IDR program for reinforced concrete structures was comprehensive and adequate. The NRC agrees with the findings and their disposition except for those items listed in Paragraph 4.

b. General Conclusions

This module presents an adequate assessment of the GPC process for design and construction of reinforced concrete structures.

During the review, it was apparent to the NRC reviewers that GPC management supported the program by their active participation in the development and implementation of the program. Review and evaluation of Module No. 1 by the NRC indicates that the review performed by the GPC Readiness Review Staff was sufficiently comprehensive in scope and depth to identify problem areas, and that the dispositions of findings were proper and satisfactory, except as noted above. The NRC findings identified as deficiencies appear to be minor and do not represent a breakdown in the quality assurance program. The unresolved items must be evaluated to determine their significance and any subsequent corrective actions. The procedures for design, engineering, construction, and quality control were consistent with commitments and, therefore, acceptable. Based on the review of this module, it appears that construction was performed in accordance with the appropriate procedures and records reflect the quality of that construction.

Pending resolution of the findings identified above, the NRC finds that the Vogtle Program for the design and construction of Category 1 Concrete Structures complies with the Final Safety Analysis Report and that compliance is verifiable with existing documentation.

The NRC furthermore believes that Module 1 accurately assesses the status of design and construction activities for Category I Reinforced Concrete Structures. This conclusion is based on information currently available to the inspectors and reviewers. Should information subsequently become available which was not considered during this review or previous inspections and which conflicts with earlier information, it will be evaluated to determine what effect it may have on the above conclusion.