



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30323

Report No.: 50-424/85-35

Licensee: Georgia Power Company
P. O. Box 4545
Atlanta, GA 30302

Docket No.: 50-424

Construction Permit No.: CPPR-108

Facility Name: Vogtle Unit 1

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Engineering Branch
Division of Reactor Safety

SUMMARY

Scope: This special, announced inspection entailed approximately 1000 inspector-hours on site and in Region II office in the area of Readiness Review Module 4, Mechanical Equipment and Piping.

Results: No violations or deviations were identified.

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INTRODUCTION

This inspection report documents Region II inspection activities relative to the evaluation of Georgia Power Company's (GPCs) Readiness Review Module 4, Mechanical Equipment and Piping. The inspection activity was started during NRC Inspection 424/85-29 (reported August 5, 1985) and was completed during the inspection period described in this report.

The inspection was conducted to aid in determining whether Module 4 provided an acceptable basis for its reported conclusion - that the Vogtle Electric Generating Plant (VEGP) Unit 1 mechanical equipment and piping was in accordance with applicable licensing commitments. The inspection report contains a description of the inspectors' activities and of their preliminary findings. GPC will be afforded an opportunity to respond to this report and its findings before a final NRC evaluation of the GPC Module 4 Readiness Review is developed and reported.

Readiness Review Module 4 is one portion (module) of a many part review being conducted by GPC to aid in assuring that VEGP Unit 1 will be operationally ready in accordance with scheduled plans for obtaining an operating license. The GPC Module 4 review activities, data and results are summarized in their Module 4 report, which was submitted to the NRC June 25, 1985. The module report consisted of eight sections: 1.0, Introduction; 2.0, Organization and Division of Responsibility; 3.0, Commitments; 4.0, Program Description; 5.0, Audits; 6.0, Program Verification; 7.0, Independent Design Review; and 8.0, Program Assessments/Conclusions.

REPORT DETAILS

1. Licensee Employees Contacted

Licensee Employees

D. O. Foster, Vice President & Project General Manager
 W. T. Nickerson, Deputy Project General Manager
 P. D. Rice, Vice President & General Manager Quality Assurance, (QA)
 C. E. Belflower, Quality Assurance Site Manager, Operations
 G. Brockman, General Manager, Vogtle Nuclear Operations Division
 E. D. Groover, QA Site Manager, Construction
 C. W. Hayes, Project Quality Assurance Manager
 R. W. McManus, Readiness Review (RR) Discipline Manager, Construction
 G. McWhorter, RR Commitments Identification Leader

Other Organizations

W. C. Ramsey, Southern Company Services (SCS), RR Project Manager
 G. R. Trudeau, Bechtel Power Corporation (BPC), RR Special Assistant
 R. D. Andrews, BPC, RR Team Member
 G. C. Bell, BPC, QA Representative
 D. Bush, SCS, RR QA Representative
 D. L. Kinnsch, BPC, Project Field Engineer
 C. R. Myer, BPC, RR Mechanical Design Team Leader
 A. Nakashima, BPC, RR Discipline Manager (Appendices)
 R. C. Somerfeld, BPC, RR Mechanical Construction Team Leader
 J. Steele, Pullman Power Products (PPP) Quality Assurance Manager
 C. M. Summers, BPC, RR Team Member
 Z. G. Tucker, BPC, RR Team Member
 W. M. Wright, SCS, RR Discipline Manager (Design)

NRC Resident Inspectors

J. Rogge, Senior Resident Inspector (Operations)
 R. Schepens, Resident Inspector

2. Exit Interviews

The inspection scope and findings were summarized during exit interviews conducted on August 2, August 23, August 30, and September 6, 1985. Additional telephonic clarifications were conducted on August 15, September 18, and September 27, 1985. A summary of items identified during the inspection is listed below.

- a. Unresolved Item 424/85-35-01, Assurance of Adequate Readiness Review Coverage of Module 4 - paragraph 3.b.
- b. Inspector Followup Item 424/85-35-02, Omission of Westinghouse Offsite Activities from Readiness Review - paragraph 3.c.

- c. Unresolved Item 424/85-35-03, Design Control of Intermediate Pipe Breaks - paragraph 4.d.(4).
- d. Unresolved Item 424/85-35-04, Design Control of Moderate - Energy Class 1 Piping - paragraph 4.d.(5).
- e. Unresolved Item 424/85-35-05, Implementation of ANSI N45.2.11 - paragraph 4.d.(11).
- f. Unresolved Item 424/85-35-06, Adequacy of Preparation and Revision of Design Criteria (DCs) - paragraph 7.b.(3)(a).
- g. Inspector Followup Item 424/85-35-07, Calculation Corrective Actions - paragraph 7.b.(3).(b).
- h. Inspector Followup Item 424/85-35-08, Maximum Design Pressure Discrepancy - paragraph 7.b.(3)(c).
- i. Unresolved Item 424/85-35-09, Adequacy of Drawing and DCN Reviews - paragraph 7.b.(3).(c).2.
- j. Inspector Followup Item 424/85-35-10, Review of Construction Specifications and Procedures - paragraph 7.b.(3).(d).
- k. Unresolved Item 424/85-35-11, Inadequate Review of Procurement Specifications - paragraph 7.b.(3).(g).6.
- l. Unresolved Item 424/85-35-12, Inadequate Review of Vendor Drawings - paragraph 7.b.(3).(h).2.
- m. Unresolved Item 424/85-35-13, Inadequate Resolution of Readiness Review Design Verification Findings - paragraph 7.b.(3).(i).2.
- n. Unresolved Item 424/85-35-14, Undersized/Overground Welds - paragraph 7.c.(2).(c).1.
- o. Unresolved Item 424/85-35-15, Undocumented Piping Supports - paragraph 7.c.(2).(c).2.
- p. Inspector Followup Item 424/85-35-16, Inconsistency in the Use of Low Carbon Stainless Steel - paragraph 7.c.(2).(c).3.
- q. Inspector Followup Item 424/85-35-17, Inadequate Resolution of Readiness Review Findings - paragraph 7.c.(2).(d).4.

The licensee did identify as proprietary some of the materials provided to and or reviewed by the inspectors during this inspection; however, details from these materials are not included in this report.

3. Section 1.0, Introduction

- a. Section 1.0 of the report indicated that Module 4 covered design and construction commitments and activities for ASME Section III mechanical equipment and piping, with certain exceptions. It identified these exceptions in its Table 1.1-1 and stated they would be covered in other Readiness Review documents that would be submitted for NRC evaluation later.

From subsequent review of the module report, discussions with the Readiness Review staff, and examinations of Readiness Review documentation, the inspectors identified additional exceptions to the Module 4 scope description given in Section 1.0, Table 1.1-1. For example, the inspectors found that none of the offsite design, procurement or manufacturing activities of Westinghouse, who was responsible for the plant's Nuclear Steam Supply System (NSSS), were to be included in the Readiness Review.

In their previous onsite evaluation of Module 4, the inspectors had identified an Inspector Followup Item 424/85-29-01, Readiness Review Module 4 Boundaries, expressing their concern that the boundaries on Westinghouse activities to be assessed in Module 4 were unclear. The inspectors have determined that this item should be closed and replaced by two others.

- b. First, there apparently was not a sufficient GPC Readiness Review description of Module 4 scope or boundaries to assure that either the individuals who performed the Review or the NRC inspectors fully understood what commitments and activities were to be covered in Module 4. The inspectors identified this as Unresolved Item (UNR) 424/85-35-01, Assurance of Adequate Readiness Review Coverage of Module 4. This item will remain open pending further NRC examination of GPC Readiness Review submittals to determine the extent to which important activities and commitments for mechanical equipment and piping may have been omitted or inadequately treated in the Review. Relative to further NRC examination of GPC submittals that will be conducted for UNR 424/85-35-01, the inspectors have identified the following mechanical equipment and piping commitments and activities for which they believe adequate Readiness Review coverage should be verified:
 - (1) Readiness Review commitments associated with criteria for pressure relief devices that are described in Table 1, Note (3) in this report.
 - (2) Technical aspects of activities for design of mechanical equipment and piping (reportedly to be covered in the independent design review).
 - (3) Piping stress analysis (reportedly to be covered in Module 11).

- (4) Welding procedure and welder qualifications, as they relate to pipe welding (reportedly to be covered in Module 8).
- (5) Interface activities with Westinghouse (reportedly to be covered in Module 16).
- (6) Qualification of QC personnel responsible for inspection of mechanical equipment and piping (reportedly to be covered in Readiness Review Appendix F).
- (7) Control of design of mechanical equipment and piping (reportedly to be covered in Readiness Review Appendix B).
- (8) Document control (reportedly to be covered in Readiness Review Appendix D).

NOTE: Of particular interest are the review, approval, and issuance process for revisions to specifications and procedures; and assurance that all review parties understand the basis for drawing revisions.

- (9) Equipment qualification (reportedly to be covered in the independent design review and/or in Readiness Review Appendix J).
- (10) Valve operators (reportedly to be covered in Module 20).
- (11) Piping material controls and equipment maintenance (reportedly to be covered in Readiness Review Appendix E).
- (12) Procurement activities for piping and mechanical equipment (reportedly to be covered in Readiness Review Appendix C).

- c. Second, Readiness Review management informed the inspectors that the Westinghouse offsite activities had been omitted from the Review because Westinghouse had such extensive experience in the area covered by them and because their performance had been so often and extensively audited by the NRC and others. The inspectors are concerned that the omission of offsite Westinghouse activities from the Readiness Review is significant and that further evaluation will be required concerning this omission. This is identified as Inspector Followup Item 424/85-35-02, Omission of Westinghouse Offsite Activities from Readiness Review.

4. Section 3.0, Commitments

- a. Section 3.0 provides the commitments GPC identified for Module 4 and the verification of their implementation. This section of the Module 4 report was extensively evaluated by the NRC inspectors.

Subsections 3.1 through 3.3 of Section 3.0 provided brief introductory information - including a definition of a commitment, information regarding the sources of the commitments, and a listing of the typical documents that were determined to implement commitments.

Subsections 3.4 and 3.5 of Section 3.0 presented respectively, a matrix listing the commitments identified and a matrix listing the documents considered to implement the commitments. In addition to providing a listing of the commitments identified, Subsection 3.4 provides an identification of all the other Readiness Review modules to which each Module 4 commitment was assigned and a determination as to whether implementation of the commitment was a design organization responsibility, a construction organization responsibility or the responsibility of both. The Subsection 3.5 matrix includes, for each commitment, an identification of design and/or construction documents that were determined to implement the commitment.

Region II inspectors reviewed the material presented in Module 4, Subsections 3.4 and 3.5 matrices to determine whether the Readiness Review had satisfactorily identified commitments for the module and if it had satisfactorily determined their inclusion in implementing documents.

- b. Early in the performance of the inspection the inspectors held discussions with the Readiness Review personnel to determine how they had accomplished the identifications of commitments and verification of commitment implementation documented in the Module 4 report matrices. The Readiness Review personnel related that these activities were performed as follows:

- (1) Readiness Review program procedures were provided which included guidelines on commitment identification. These procedures define a commitment as an obligation to comply with an industry standard, Regulatory Guide (RG), Branch Technical Position (BTP), or owner plan of specific action.

NOTE: This definition differs from the commitment definition stated in Module 4 report Subsection 3.2, which did not include an "owner plan of specific action" as a commitment.

- (2) Readiness Review personnel were required to identify commitments from a review of the VEGP Final Safety Analysis Report (FSAR), GPC responses to Inspection and Enforcement Bulletins (IEBs), and GPC responses to NRC generic letters. The majority of commitments were taken from the FSAR. The first phase of commitment identification required a detailed search of each FSAR chapter to identify and subgroup (assign to a module or modules) all commitments within the chapter. A copy of the FSAR was annotated to indicate the boundaries, module assignments, and a reference number for each commitment. This information together with results from review of responses to IEBs and to generic letters was entered

into a computerized database (the master Readiness Review computer list). Database entries used key descriptive phrases to indicate the commitment subject and document feature involved. A tabulation of the master computer list was then completed for all commitments assigned to Module 4.

- (3) Follow-on phases of commitment identification were completed by teams of Readiness Review personnel who were actively involved in Module 4 Readiness Review work. There were two Readiness Review teams (RRTs) for Module 4, a design specialized RRT and a construction specialized RRT. The RRT members refined and completed final identification and assignment of Module 4 commitments and necessary corrections were entered into the master computer list. The commitment identification matrix included in Section 3.4 of the Module 4 report was completed by tabulating a listing from the master computer list of all commitments so assigned.
 - (4) Responsibility for verification of commitment implementation for Module 4 was assigned to either the design RRT, the construction RRT, or both, depending on the commitment involved. RRT members were required to verify objective evidence of commitment implementation from design and construction documents for all Module 4 commitments.
 - (5) The majority of design commitment implementation verification was accomplished by the design RRT through examination of system Design Criteria (DC) documents, procurement specifications, or design calculations for reference to or reflection of the commitment involved.
 - (6) The majority of construction commitment implementation verification was accomplished through construction RRT examination of construction procedures.
- c. The inspectors performed their evaluation by examining the Readiness Review identification and implementation for a sample of commitments which the inspectors independently selected. For their sample the inspectors chose 70 FSAR entries and all (nine) of the IEB responses that described safety-related commitments that appeared to apply to Module 4. (Note: Hereafter commitments identified and numbered by the Readiness Review will be underlined to differentiate them from other usages of the word.) The Module 4 commitment and implementation matrices were then checked to determine if the Readiness Review had identified commitments for the FSAR entry locations and for IEB responses, i.e., Readiness Review commitments that might represent the commitment material in the inspectors independently selected sample.

From the Module 4 commitment and implementation matrices, the inspectors identified 75 commitments that appeared to represent commitments from their selected sample. Commitments representing the remaining nine of the inspectors' selected sample could not be found in the Module 4

matrices. For seven of the missing nine, the inspectors accepted Readiness Review personnel explanations and rationales indicating they were addressed by commitments assigned to other Readiness Review modules. Of the two remaining, one was shown to have not been identified as a commitment by the Readiness Review; and the other, although identified as a commitment, had been erroneously omitted from assignment to Module 4. These latter two, together with the 75 already found in the Module 4 matrices, provide a total of 77 Module 4 commitments. These 77 and the seven (for a total of 84) of the inspectors' original sample that are ascribed to other Readiness Review modules are listed in Table 1 of this report. The 77 Module 4 commitments represent about 30% of the (260) commitments given in the Module 4 report (Subsections 3.4 and 3.5) matrices.

The inspectors examined the Readiness Review identification and verification of implementation of commitments through a process that included:

- (1) Detailed examination of the subject and feature descriptions provided for each commitment in the Module 4 (Subsections 3.4 and 3.5) matrices to determine if they addressed appropriate commitment material.
 - (2) Examination of the Readiness Review annotated FSAR to determine if all the commitment material was acknowledged.
 - (3) Review of the implementation documents identified in the (Module 4 Subsection 3.5) implementation matrix to determine if they completely implemented the commitments stated in the associated FSAR Sections or IEB responses.
- d. The inspectors found that 17 of the 77 Module 4 commitments (over 20%) associated with their independently selected sample were either inadequately identified, or inadequately verified as implemented, or both. These findings are indicated in Table 1. Because of their significance, the basis for each of these findings is summarized below by commitment:

(1) Commitment 332

This commitment was taken from FSAR Subsection 6.1.1.1.2 (Engineered Safety Features (ESF) Construction Materials) which requires that "no cold worked austenitic stainless steels having yield strengths greater than 90,000 psi are used for components of the ESF." The commitment was properly identified and assigned to Modules 16, 20, and 18A. However, it was improperly excluded from Module 4 as ESF components (mechanical equipment and piping) are covered by Module 4. Therefore, its identification was inadequate since it was not included in the Module 4 matrix and its implementation was not assessed. The inspectors brought the matter to the attention of Readiness Review management who agreed that the commitment should have been included in Module 4.

(2) Commitment 384

This commitment was taken from FSAR Table 9.2.1-3 (NSCW System Component Data) which requires that Nuclear Service Cooling Water (NSCW) pumps be designed to ASME III, Class 3 requirements. This commitment was correctly identified and assigned to Module 4. RRT verification of implementation was based on the reference to ASME III included in Section 2.0 of document DC-1202. However, the relevant ASME Class was not identified in Section 2.0 of DC-1202 and verification of implementation was incomplete.

(3) Commitment 950

This commitment was taken from FSAR Subsection 3.6.2.1 (Criteria Used to Define High/Moderate-Energy Break/Crack Locations and Configurations) and was assigned to Module 4. The commitment concerns ASME Class 1 piping outside the primary reactor coolant loops and requires the postulation of high-energy break locations at terminal ends and at intermediate locations. The boundaries of the commitment were identified by RRT in an annotated copy of the FSAR and confirmed by discussions with Readiness Review personnel. The boundaries were chosen so as to omit the requirements for postulation of breaks at terminal ends. Further, the requirements for postulation of breaks at intermediate locations were identified as separate Module 4 commitment 954.

The resultant was that commitment 950 was limited to the simple reference to ASME Class 1 piping in FSAR Subsection 3.6.2.1.1A. None of the actual requirements were identified as part of the commitment.

(4) Commitments 951, 954, 956, and 1543

Module 4 commitments 951, 954, 956, and 1543 address sections of the FSAR that provide criteria for postulating intermediate pipe break locations. They are included, respectively, in FSAR Subsections 3.6.2.1, 3.6.2.1.1A, 3.6.2.1.1B and 1.9.46. Exceptions to the pipe break criteria contained in them were requested by GPC by letter dated April 26, 1984, and granted by NRC by letter dated June 28, 1984. The NRC approval was conditioned upon GPC implementation of certain programmatic controls - including controls that would assure welded attachments would be at least five pipe diameters from postulated break locations. The exceptions to the FSAR criteria were used in certain design calculations and RRT was aware of their use as evidenced by RRT Finding 4-75. This Finding identified deviations from the intermediate pipe break criteria described in the FSAR and the response to the Finding pointed out the exceptions that had been granted by NRC. The exceptions and, especially, conditions on their application were not considered by the RRT in their verification of implementation for commitments 951, 954, 956, and 1543. The exceptions and the conditions on their use should have been considered portions of the commitments,

and, as they were not, RRT identification and verification of implementation for commitments 951, 954, 956, and 1543 was incomplete.

The inspectors questioned whether GPC had provided controls to assure that the five pipe diameter condition for application of the exceptions had been implemented. GPC's response indicated that the issue identified by the inspectors will be addressed in Module 11. The possible lack of controls is considered an unresolved item concerning possible inadequate design control of intermediate pipe breaks and is identified as Unresolved Item 424/85-35-03, Design Control of Intermediate Pipe Breaks.

(5) Commitment 959

This Module 4 commitment was taken from FSAR Subsection 3.6.2.1.2.4.C, which requires postulation of through-wall leakage cracks on moderate energy Class 1 piping where the maximum stress in the piping is greater than 1.2 Sm. The Module 4 report implementation matrix indicates that this commitment was verified as implemented by Table 1 in DC-1018. However, this commitment was not implemented by DC-1018 and GPC has indicated that DC-1018 will be revised to include it. This is considered an unresolved item concerning design control of moderate energy Class 1 piping and is identified as Unresolved Item 424/85-35-04, Design Control of Moderate-Energy Class 1 Piping.

(6) Commitment 1599

This Module 4 commitment was taken from in FSAR Subsection 1.9.148 which requires conformance to RG 1.148, March 1981, Functional Specification for Active Valve Assemblies in Systems Important to Safety in Nuclear Power Plants. FSAR Table 3.9.B.3-10 provides an evaluation of specifics of RG 1.148 requirements which are in addition to the ASME Code requirements versus conformance at Plant Vogtle. RRT verification of implementation of this commitment was based on conformance to the ASME Code as referenced in Table 1 of DC-1010.

Reference to the ASME Code did not ensure conformance to RG 1.148 and RRT verification of implementation of the commitment was inadequate.

(7) Commitment 1841 and 1842

These Module 4 commitments were taken from FSAR Subsection 3.6.2.3.2.2, which provide requirements associated with break propagation in large Reactor Coolant System (RCS) piping. The requirement that propagation of the break to the unaffected loops be prevented to ensure the delivery capacity of the accumulators

and low head pumps was identified as commitment 1841. The requirement that propagation of the break on the affected loop does not exceed 20% of the flow area of the line which initially ruptured was identified as commitment 1842. However, the following additional prerequisite criteria (FSAR Subsection 3.6.2.3.2.1) were not identified as part of commitments 1841 and 1842:

- (a) The minimum performance capabilities of the engineered safety systems are not reduced below that required to protect against the postulated break.
- (b) The containment leak tightness is not decreased below the design value.
- (c) Propagation of damage is limited in type and/or degree to the extent that:
 - 1. A pipe break which is not a Loss of Coolant Accident (LOCA) will not cause a LOCA, steam, or feedwater break.
 - 2. An RCS pipe break will not cause a steam or feedwater break, and vice versa.

Failure by RRT to correctly identify all commitments in commitments 1841 and 1842 caused their subsequent verification of implementation to be incomplete.

(8) Commitment 2486

This Module 4 commitment was taken from FSAR Subsection 5.4.7.2.5, which requires that the entire Residual Heat Removal (RHR) system be designed as Nuclear Safety Class 2 (ASME III, Class 2) with exceptions of the suction isolation valves, which are Safety Class 1 (ASME III, Class 1). The Module 4 report implementation matrix indicates that this commitment was verified as implemented by DC-1205. However, the exception that suction isolation valves be Class 1 is not included in DC-1205 and RRT verification was incomplete.

(9) Commitment 4675

This Module 4 commitment was obtained from GPC's response to IEB-83-06 (Nonconforming Materials Supplied by Tube-Line Corporation). It concerns the adequacy of piping materials supplied by a vendor. In the response letter, dated November 23, 1983, GPC committed to take the following actions to assure that the piping materials they had received from the subject vendor would comply with the applicable code requirements:

- (a) Conduct audits of the vendor and the vendor's suppliers to assure that there was satisfactory traceability for and welding performed on the materials which they supplied.
- (b) Perform physical and chemical property checks on samples of the materials supplied by the vendor to verify compliance with specifications.

A further commitment indirectly implied by the licensee's response was to determine what materials the vendor had supplied to Vogtle.

The RRT did not identify the above commitments but rather identified commitment 4675 as a commitment to invoke ASME Code Sub-article NX-2600 to accept the material. The inspectors found that, although GPC referenced NX-2600 in their response it was not a commitment. The reference to NX-2600 was simply a descriptive statement identifying the normal Code requirements that had been utilized. It was not a pledge to perform any special action in response to the IEB. Readiness Review management stated that the GPC pledge to perform property checks and audits was considered descriptive and not in accordance with their guidelines for commitments. The inspectors reviewed the Readiness Review commitment definition described in a (unsigned, unapproved, and undated) guidance document that Readiness Review personnel stated provided the commitment identification criteria utilized. The inspectors found the guidance somewhat unclear, but noted that it stated that the definition of a commitment included "an obligation to comply with owner plans of specific actions". The inspectors found that the audit and the material property checks proposed in response to the IEB were owner plans of action and that, even using the Readiness Review definition, they should have been considered commitments.

The RRT identified the normal material procurement specification as implementing the IEB response commitment. The inspectors found that this specification provided only normal Code requirements and did not invoke any requirement that would address concerns expressed by IEB-83-C6.

(10) Commitments 4890, 4891 and 4893

These three Module 4 commitments were obtained by GPC from their response to IEB-79-03 (Longitudinal Defects in ASME SA-312 Type 304 Stainless Steel Pipe Spools Manufactured by Youngstown Welding and Engineering Company). The concern addressed by the IEB was that undetected unsatisfactory weld defects were found in piping that had been supplied to the nuclear industry from an identified materials manufacturer. The defects were stated to be in longitudinal weld seams which had been welded without filler metal. The piping with the defective welds was reportedly manufactured and examined to meet ASME Section III criteria, which permitted weld

acceptance on the basis of ultrasonic examination as an alternative to radiography. The manufacturer was understood to have performed ultrasonic examinations in accepting the defective welds. Actions requested by the NRC in response to the IEB included (1) identification of longitudinally welded piping material supplied by the subject manufacturer for safety-related applications and (2) volumetric re-examination of longitudinal welds in the pipe to assure their acceptability. In their response letter, dated May 9, 1979, GPC stated their identification of related piping materials that had been installed in Vogtle safety-related piping systems. In describing the use of the pipe they stated that it had been used in pipe spools "designed in accordance with the 1974 edition of the ASME Code, Section III, Class 2 (including addenda through Summer 1975) and Code Case N-32". This information was incorrectly identified as commitments 4890 and 4891. In responding to the concern for the acceptability of the longitudinal welds in the piping material, GPC stated that the seam welds had received 100% radiographic examination, that the spools had been accepted by GPC's inspector, and that the piping material manufacturer identified in the IEB had been removed from the spool fabricator's approved bidders list. From the above, the Region II inspectors identified four actions which could be construed to be commitments:

- (a) Identification of related piping
- (b) 100% radiography of the longitudinal seam welds in the material
- (c) Acceptance by GPC's inspector
- (d) Removal of the manufacturer from the approved bidders list

Of the above, RRT recognized only the 100% radiography as a commitment (4891), and this was not sufficient identification to assure that the commitment was understood. The inspectors found, in examining the RRT implementation verification, that RRT had considered the radiography to be a standard code requirement. It was in fact, not a definite code requirement. As indicated in IEB-79-03, ultrasonic examination was a code acceptable alternative examination method. Ultrasonic examination was the method that apparently failed to detect defects in the defective welds described in the IEB.

The inspectors found that, even had commitments 4890 and 4891 been correctly identified as commitments, they were not adequately verified as implemented. The document entry referenced in Module 4 as implementing the commitments refers only to ASME Section III and does not address the other aspects of the stated commitments

(Code Class and revision and Code Case number). The identification and verification of implementation for commitments 4890, 4891 and 4892 is incomplete on the basis described above.

(11) Unidentified Commitment (ANSI N45.2.11)

FSAR Section 17.1.2 states that the GPC QA program will conform with ANSI N45.2.11 Draft 2, Rev. 2 (Quality Assurance Requirements for the Design of Nuclear Power Plants). FSAR Section 17A.3 states that the Bechtel (GPC's Architect and Engineer) QA program is responsive to the intent of ANSI N45.2.11 Draft 2, Rev. 2. RRT did not identify these statements as a commitment. The inspectors did note, however, that the Module 4 report, Section 6.1 indicated that ANSI N45.2.11 was applicable to the Vogtle design and portions of ANSI N45.2.11 were referenced in some RRT checklists for review of design documents. The inspectors consider that additional NRC examination of design program documents and discussions with GPC will be required to determine whether ANSI N45.2.11 was satisfactorily implemented. Pending completion of the examination and discussions, the matter is considered an unresolved item in that design control measures may not have assured implementation of the standard. This is identified as Unresolved Item 424/85-35-05, Implementation of ANSI N45.2.11.

5. Section 4.0, Program Description

Section 4.0 provides a summary description of VEGP program work activities for design and construction of mechanical equipment and piping. This section did not receive a detailed NRC review since it was essentially descriptive information rather than assessment data. It was represented as a summary description of the program as understood by the personnel performing the Readiness Review and it was examined by the NRC inspectors to determine if it appeared to be a satisfactory summary description. The inspectors judged the program description based on their knowledge of the program from their past inspections of VEGP (e.g., see NRC Inspection Reports 424/80-02, 83-12, 84-12, 84-23, 84-36 and 85-14), which were mainly inspections of construction activities; and on the basis of experience gained in their review of program procedures and other documents during performance of the inspection described herein. The inspectors are aware of no concerns with regard to the adequacy of GPC's program other than those which are documented in NRC reports or/and will be tracked and resolved as part of the licensing process for VEGP.

6. Section 5.0, Audits

Section 5.0 describes a review of past audit findings (including NRC inspection findings) that was conducted as part of the Module 4 Readiness Review. GPC performed the review to assess the adequacy of the emphasis they had placed on resolution of audit findings related to the scope of Module 4.

This area was not inspected in detail by the NRC inspectors because it assessed data that was more indirectly obtained than that described in other important report sections (e.g. Module 4 report Sections 3.0 and 6.0) and because the NRC was already familiar with much of the data (e.g., from the findings of NRC inspections, review of the INPO self assessment, and review of items reported in accordance with 10 CFR 50.55e).

The NRC inspectors examined the data and rationale presented to determine if it supported the section's conclusion, which was in essence, that proper emphasis had been placed on resolution of audit findings. The inspectors also examined the material presented relative to NRC findings to determine if it was an accurate presentation, basing their evaluation on their own past knowledge of NRC findings (as from inspections the Region had conducted - see paragraph 5 of this report for examples) and from summary information they obtained by review of NRC reports assessing GPC's performance (NRC Reports 424/84-01, 83-06 and 82-14).

The inspectors found that the presentation of NRC findings was accurate and that the data and rationale presented supported the section's conclusions.

7. Section 6.0, Program Verification

- a. Section 6.0 describes GPC's verification to assure that the VEGP design and construction programs adequately implement commitments. It contains summary data supporting the review assessment, including Readiness Review findings (violations of licensing commitments, project procedures or engineering requirement identified by the reviewers) and their resolution. The Readiness Review findings were classified into levels of importance to plant safety. The following levels were used:

- I - Violation of licensing commitments, project procedures, or engineering requirements with indication of safety concerns.
- II - Violation of licensing commitments or engineering requirements with no safety concerns.
- III - Violation of project procedures with no safety concerns.

Section 6.0 is divided into two subsections, Subsection 6.1, which describes design program verifications and Subsection 6.2, which describes construction program verification. The verifications in the two subsections were performed completely independent of one another and, as a consequence, GPC did not check any piping or mechanical equipment items through the entire process of design and construction.

NRC inspectors who evaluated this section examined both design and construction aspects of some items (e.g., an RHR encapsulation vessel

and associated piping) to aid in ensuring that significant aspects of work processes were not overlooked in the assessment. The NRC examination of the Readiness Review described in the respective design and construction subsections is provided below.

b. Subsection 6.1, Design Program Verification

- (1) As described in the Module 4 report, Readiness Review verification of the design program was performed by a design RRT consisting of six personnel experienced in power plant design engineering. The verification was intended to ensure, through sampling, that the design processes for mechanical equipment and piping had been adequately controlled and had resulted in proper implementation of licensing commitments in design documents. The module report describes the design program verification as having been performed in two phases.

Phase I

Phase I was the verification of implementation of commitments documented in the Module 4 report Subsection 3.5 implementation matrix. Inspection of this phase is discussed in paragraph 4 of this report.

Phase II

Phase II was the verification that (1) the design program commitments and requirements were satisfactorily carried through and implemented in second-order design documents and that (2) the design activities were conducted in accordance with project procedures and QA requirements.

The design RRT conducted Phase II by reviewing samples of commitments, requirements, and the documents that represented program design activity accomplishment (e.g., drawings, procurement specification, and calculations). Samples were reportedly selected by the RRT based on their applicability to systems and equipment that were considered representative - the RHR, NSCW and AFW systems and the CCW heat exchangers and boric acid storage tank.

- (2) NRC Inspection of Readiness Review Verification of Commitment and Requirement Implementation in Second-Order Design Documents

The design commitments and requirements which were verified to have been implemented in second-order design documents by the RRT during the Phase II verifications are identified in Module 4 report Tables 3.5 and 6.1.2. The RRT definition of second-order design documents was, apparently, that they were any documents other than design criteria documents. According to the Module 4

report, the commitments verified in such second-order design documents were approximately 20% of the Module 4 design commitments.

The inspectors performed their examination of the Readiness Review verifications as follows:

(a) Sample Size Verification

The inspectors examined the commitments in the Module 4 Tables 3.5 and 6.1.2 to determine if the number verified as implemented in second-order design documents (in accordance with the apparent Readiness Review definition of second-order design documents) was as stated. The inspectors determined that the approximately 20% stated in the module report was accurate. However, the inspectors determined that the Readiness Review verifications were often only partial verifications, in that:

- 1 Where implementation was required to be carried out in many documents, only a sample may have been checked and the size of the population of implementing documents was not reported (e.g., commitments 4929 and 4927 in the commitments verification matrix).
- 2 Where the implementation was accomplished through offsite actions, details of offsite implementation were sometimes not considered. Instead, letters stating that the actions had been performed were considered adequate verification (e.g., commitment 4673 in the implementation matrix, commitment 4931 and requirements from FSAR Sections 6.3.2.2.4 and 6.3.2.1 in the commitments verification matrix).
- 3 The review of design calculations as secondary commitment implementation documents did not verify the technical adequacy of commitment implementations.
- 4 The implementation verifications stopped at design documents, the accurate transformation of design commitments and requirements into hardware features was not directly assessed.

(b) Determination of the Adequacy of Readiness Review Verification

The inspectors reviewed the design commitment and requirement implementation verifications listed in the Readiness Review commitments verification matrix (Module 4, Table 6.1-2) by

re-verifying implementation of a selected sample. The inspectors' sample included 11 of the 40 commitments and requirements listed in the matrix plus one related commitment. The inspectors sample and the results of their re-verifications are given in Table 2 of this report. The inspectors found, as indicated in Table 2, that the implementation was correct as stated in the Readiness Review report.

(3) Inspection of Readiness Review Verification That Design Documents are Developed and Utilized in Accordance With Project Procedures and Design QA Requirements

The RRT reviewed selected samples of design documents to verify their proper preparation and use. The verifications were performed using checklists where considered appropriate.

The NRC inspectors selected and reviewed samples of the documents reviewed by the RRT and examples of the RRT findings. The inspectors also examined and evaluated additional samples of documents, not reviewed by the RRT, to provide a broader coverage for some equipment items and to avoid checking only documents that had already been checked by the RRT. For most of their inspection the inspectors examined the documents utilizing the same criteria and checklists as the RRT. The results of the inspectors' examinations and evaluations were then compared with the results obtained by the RRT on the same items. A summary of the types and number of design documents reviewed by the RRT and the NRC inspectors is given in Table 3. The inspectors' evaluation and resultant findings are described below under headings for the type of design documents reviewed and a heading for the Readiness Review Findings.

(a) Design Criteria

The module report indicates that the RRT reviewed Design Criteria documents (DCs) to ascertain whether they implemented the Module 4 commitments. This was done in the development of their implementation matrix. The NRC inspectors did not extensively review the DCs but instead examined them to verify RRT implementation checks and as necessary to perform evaluations of other items (e.g., system drawings) to determine if the items complied with the DCs. These DCs are identified in Tables 1 and 5 of this report.

Reviews performed by the inspectors revealed discrepancies in three DCs that were not identified by the RRT in their review of the same documents:

- 1 A failure to incorporate revised intermediate pipe break criteria and controls in DC-1018 (partially identified by the RRT in Readiness Review Finding 4-75, see the discussion of commitments 951, 954, 956, and 1543, in Subsection 4.d.(4) of this report).
- 2 A failure to incorporate all criteria for postulation of through-wall leakage cracks in moderate energy Class 1 piping in DC-1018 (see discussion of commitment 959 in Subsection 4.d.(5) of this report).
- 3 A failure to revise DC-2702 to reflect changed criteria for the location of RHR and CS system containment sump post-accident sampling system lines (discovered by NRC inspectors in their evaluation of the RRT review of drawings and drawing change notices, which is described later in subsection 7.b.(3).(c)).
- 4 A failure to revise DC-1204 to reduce the requirement for containment isolation valves in the lines from the RHR sumps from two to one (discovered by NRC inspectors in their evaluation of the RRT review of drawings and drawing change notices, which is described later in this subsection 7.b.(3).(c)).

As noted for the first of the DC errors and omissions listed above, it was partially identified by the RRT in their Finding 4-75. The RRT also identified two other Findings 4-66 and 4-67, involving errors and omissions in DCs. This indicates the possibility of a generic problem in the preparation and review of DCs and their revisions. This is identified for subsequent NRC review as Unresolved Item 424/85-35-06, Adequacy of Preparation and Revision of DCs.

(b) Calculations

The RRT performed programmatic (not technical) reviews of 36 of the 313 calculations considered to be within the scope of Module 4. The RRT utilized a checklist in reviewing the calculations. This checklist is given in Figure 6.1-1 of the Module 4 report. The NRC inspectors rechecked 22 of the 36 calculations. The calculations rechecked by the inspectors, the criteria used and the inspectors' findings are identified in Table 4 of this report. The inspectors determined that the RRT review of calculations was generally satisfactory.

The RRT identified a relatively large number of findings in their review of calculations, nine of the 16 findings that were identified during Module 4 design verifications. In addition, the NRC inspectors identified several discrepancies that appeared to be of minor safety significance. These are indicated in Table 4. They involve calculations X6CXA-35, which had been reviewed by the RRT, and calculations 1K3-1202-111-02 and 110-02, which had not been reviewed by the RRT. Because of the large number of RRT findings relative to design calculations and because of the inspectors' discovery of additional (although minor) calculation discrepancies, the inspectors determined that the calculations should be examined further by GPC and the NRC to assure that the safety concerns have received adequate corrective action. Followup on the corrective action for the calculations is identified as Inspector Followup Item 424/85-35-07, Calculation Corrective Actions.

(c) Drawings and Drawing Change Notices

The module report states that the Readiness Review of this area concentrated on changes to drawings and their impact on other drawings. The RRT used Module 4 report checklists (Figures 6.1-2 and 6.1-3) in performing their reviews. The drawings and changes reviewed by the RRT included system Piping and Instrumentation Diagrams (P&IDs) and associated Drawing Change Notices (DCNs), one Area Drawing, and the related Isometric Drawings (ISOs).

For their review, the NRC inspectors selected examples of P&IDs, ISOs, DCNs and some of the associated RRT completed checklists. The sample selected by the inspectors included three P&IDs (two revisions of one, making a total of four), seven ISOs, 68 DCNs and five RRT completed checklists (one for a P&ID, one for an ISO and three for DCNs). The examples selected and reviewed by the inspectors, the inspectors' review criteria, and the inspectors' findings are given in Table 5 of this report. For their review of P&IDs, ISOs, and DCNs, the inspectors generally used the same review criteria (RRT checklists) as the RRT. The inspectors accomplished their reviews of RRT completed checklists by reviewing the checklist entries and associated drawings or DCNs with the RRT member who had performed the checklist. The inspectors' reviews were conducted to determine if the RRT reviews provided a satisfactory assessment of the adequacy of GPC's preparation of drawings and DCNs.

The inspectors' review of the checklists and checklist performance identified several items of concern, whereas the other examinations they performed identified one. The latter concern was with regard to a discrepancy between the maximum

design pressure indicated on ISO 1K3-1205-019-02 and that given in the Line Designation List. This discrepancy was not identified by the RRT although they reviewed the same ISO. The inspectors determined that it should be examined further by GPC and the NRC to assure that its significance is minor and that it receives any necessary corrective action. This further examination is identified as Inspector Followup Item (IFI) 424/85-35-08, Maximum Design Pressure Discrepancy.

The items of concern established during the inspectors' review of RRT completed checklists were as follows:

- 1 The inspectors' review of RRT Figure 6.1-2 checklists completed on ISO 1K3-1205-003-01 and P&ID 1X4DB122 revealed that the RRT performance of the checklists did not provide a significant assessment of the drawings. The inspectors' review of the completed checklist found that seven of eight checklist items on each had been marked not applicable (NA). The only checks made were in response to the checklist item 2 question - "Has drawing received all required signatures?" The RRT considered this to be a check to ascertain that the standard signature blocks on the drawings had been initialed. It was not even a check to see if the initials in the blocks were by the personnel authorized to sign-off the drawings.
- 2 In performing the Figure 6.1-2 checklist review of P&ID 1X4DB122 and ISO 1K3-1205-003-01 (referred to above) the RRT reviewer marked checklist item 4 not applicable. This item asks "Have design criteria been maintained or incorporated?" The NRC inspectors saw no reason that Item 4 could not or should not be checked, and they performed the check by examining the ISO and P&ID to determine if they were in accordance with criteria given in the applicable DC (DC-1204). The NRC inspectors found that the DC-1204 specified two containment isolation valves in the RHR line from the containment sump, but the P&ID and ISO showed only one, indicating that either the P&ID and ISO or the DC were incorrect.

The Figure 6.1-3 checklist utilized by the RRT in performing reviews of DCNs appeared to be a satisfactory checklist. The inspectors' examination of completed Figure 6.1-3 checklists indicated satisfactory completion of most checklist items. However, the inspectors found an incorrect RRT verification of a significant checklist item for one of the four completed DCN checklists that they reviewed. The first item on checklist Figure 6.1-3 is to determine whether the change is in

accordance with current DC requirements. ISO 1K3-1205-003-01, DCN-11 relocated a post-accident sampling system line on the RHR system suction piping from the containment sump. DC-2702, Post Accident Sampling System (PASS), indicates a direct connection of the PASS line to the sump and that there is no interface between the RHR system and PASS. The DCN change, then, was not in accordance with DC-2702.

The inspectors consider the inadequacies in the drawing checklist (Module 4 Figure 6.1-2) and the incorrect and omitted RRT verifications described above to be identified as Unresolved Item 424/85-35-09, Adequacy of Drawing and DCN Reviews. Readiness Review management indicated the drawing and DCN noncompliance with DC requirements (DC-1204 and 2702) described above were the result of failure to properly revise the DCs to incorporate accepted design changes. The apparent uncorrected changes in DC-1204 and -2702 were identified for further review as Unresolved Item 424/85-35-06, Adequacy of Preparation and Revision of DCs. (See paragraph 7.b.(3).(a))

(d) Construction Specifications

The construction specifications are design documents which provide the requirements for development of the (field) construction procedures that control field work. The GPC module report indicated that the design RRT limited their review relative to construction specifications to 12 construction specification change notices (CSCNs). According to the module report, the construction RRT reviewed the field procedures and the associated construction specification sections to verify implementation of the FSAR commitments. With regard to the statement in the Module 4 report that indicated the construction RRT had reviewed specification sections, the inspectors found no documented evidence of the review in the implementation matrix or elsewhere. Readiness Review management informed the inspectors that the construction RRT had concentrated on review of the construction procedures to assure they implemented the commitments. The inspectors found that the implementation matrix did indicate RRT review of most construction procedures. However, the inspectors noted that GPC construction procedures for receipt, storage, and maintenance of mechanical equipment and the nondestructive examination (NDE) procedures associated with welding were not included.

The inspectors were informed that the procedures for receipt, storage, and maintenance would be addressed in a separate Readiness Review appendix (Appendix E) covering material control.

The inspectors found no evidence that the RRT intended to assess the (construction) welding NDE procedures. The inspectors do not consider the assessment necessary because the NDE procedures have received extensive review in NRC inspections and based on the inspectors' experience, NDE procedures are not revised to make them less conservative.

The NRC inspectors only briefly reviewed construction procedures in their evaluation of the Readiness Review, as they were already familiar with them from past inspections that had detected no procedural discrepancies that are not being satisfactorily addressed. Examples of construction procedures reviewed by the NRC in recent inspections are listed in Table 6.

The inspectors consider that the apparent failure of the RRT to perform a significant review of the construction specifications and the construction procedures for receipt, storage and maintenance may represent a minor deficiency in the performance of the Readiness Review. The inspectors have determined that the significance of this deficiency should be examined further by GPC and the NRC and this is identified Inspector Followup Item 424/85-35-10, Review of Construction Specifications and Procedures.

(e) Field Change Requests (FCRs)

From the Module 4 report it is unclear how many FCRs were written that apply to Module 4. The RRT selected and reviewed a sample of 71 utilizing a checklist. The RRT had one finding, Finding 4-80. The finding was that one of the 71 FCRs failed to include a rationale for the disposition provided. For reasons described in the module report, the RRT determined that the finding was a violation of a project procedure for which there was no safety concern.

For their evaluation of the RRT review the NRC inspectors selected and examined a sample consisting of 17 FCRs that had not been reviewed by the RRT and one that had been. The NRC sample and the findings are given in Table 7. All FCRs examined were considered satisfactory.

(f) Deviation Reports (DRs)

The RRT performed a detailed review of 100 DRs (includes Nonconformance Reports, the former title for DRs) which the module report states were selected based on the following:

- 1 Interfacing disciplines and organizations were involved
- 2 Design documents were affected

The review had only one Finding (Module 4 report Finding 4-97) of a deficiency in a DR. The conclusion of the RRT was that the Finding was a procedural violation with no safety concern.

The NRC inspectors evaluated the RRT review through examination of 28 DRs, 27 of which were DRs that had been reviewed by the RRT. The DRs reviewed by the inspectors are listed in Table 8. The inspectors found no procedural discrepancies in the DRs and identified no deficiencies in the RRT review of this area.

(g) Procurement Specifications

The module report indicates that the RRT performed a detailed review of six procurement specifications utilizing Module 4 checklist Figure 6.1-7. The review identified two findings, both considered violations of project procedures with no safety concern. Both involved inconsistencies with design criteria. The NRC inspectors evaluated the RRT review of procurement specifications by examining one of the six specifications that the RRT had reviewed and assessing the adequacy of the review. The specification examined by the inspectors (X4AH04 Shop Fabricated Atmospheric Tanks....), the criteria used in performing the assessment and the inspectors' findings are described in Table 9. The inspectors performed the assessment by (1) independently reviewing the specification utilizing selected items from the checklist that had been used by the RRT in their review, and (2) reviewing the specification and checklist completed by the RRT with the RRT member who performed the review. The NRC inspectors found the following apparent deficient conditions for the RRT review performed using the 15 item RRT checklist:

- 1 The RRT reviewer considered checklist Item 2 to be the same as Item 1 and as a result made no check for that item.
- 2 Item 4 was a check to determine if the specification included the requirements of ANSI N45.2.11-74 and NRC Regulatory Guide 1.64, Rev. 2. The -74 revision of ANSI N45.2.11 is not applicable to the Vogtle equipment design. The applicable revision of ANSI N45.2.11 is Draft 2, Rev. 2. Regulatory Guide 1.64 is not applicable at all. The specification example reviewed did not include any reference to ANSI N45.2.11. RRT management stated that compliance with the essential requirements of ANSI N45.2.11 had been obtained in the specification through its reference to ANSI N45.2-71. Additional NRC review will be required to verify the RRT rationale that ANSI N45.2-71 may be substituted for ANSI N45.2.11. The

inspectors are concerned that reference to RG 1.64 and the newer revisions of ANSI N45.2.11 in the RRT checklist indicate some lack of attention to detail in the Readiness Review process.

- 3 Checklist items 7 and 8, which were for checks of calculations, were marked "not applicable" because they were not reviewed, not because they could not have been reviewed. The inspectors understood that they were not reviewed because they were not readily available on site.
- 4 Checklist items 11 and 12 were; (11) "were SDDRs incorporated into this specification" and (12) "were MSCNs incorporated into this specification." Supplier Deviation Disposition Requests (SDDRs) are documents used by suppliers to request deviations from purchase orders (or specification requirements). Material Specification Change Notices (MSCNs) are documents used to provide a means of making and documenting changes to a bill of material specification (not changes to equipment specifications) without the necessity of revising the specifications. The inspectors noted that for the equipment specification review the RRT reviewer had marked checklist Item 11 "yes" and Item 12 "no." The RRT reviewer stated these entries were based on examination of the revision blocks on the specifications to determine if the blocks indicated that SDDRs and MSCNs had been incorporated during the revisions. There was no recognition that MSCNs did not apply to equipment specifications (Item 12 should have been marked not applicable) and there was no verification that all SDDRs applicable to the specification were included in the revision blocks or if any of them were fully incorporated.
- 5 Checklist Item 13 was to verify that the specification complied with the requirements of the DC and the FSAR commitments. The RRT reviewer marked the item "yes". The inspectors found that the specification did not incorporate the requirements of Regulatory Guide 1.44 from DC-1204. Also, the inspectors noted that radiation levels specified for CCW surge tanks, ACCW tanks and isolation valve encapsulation vessels did not include units (e.g., RADS). There was no apparent identification of detail FSAR commitments or DC requirements which the RRT reviewer was to verify as incorporated for verification of this checklist item.

- 6 There was no checklist item requiring assessment of the adequacy of the procurement specification revision process.

The conditions described above and measures to assure that applicable design bases and other requirements are included or referenced in procurement documents are identified as Unresolved Item 424/85-35-11, Inadequate Review of Procurement Specifications.

(h) Vendor Documentation

According to the Module 4 report, the Readiness Review of vendor documentation included examples of vendor drawings, SDDRs, equipment qualification documentation, field equipment change orders (FECOs) and supplier quality verification documentation lists (SQVDLs). The RRT identified no findings relative to vendor documentation. The NRC inspectors performed a limited evaluation of the Readiness Review in this area through examination of RRT performance relative to one of six vendor drawings they reviewed. The drawing example selected by the inspectors was the RHR Isolation Valve Encapsulation Vessel drawing. The selection was made to continue continuity of review relative to the RHR system valve encapsulation vessel and associated piping. The RRT review was conducted using the Module 4 Figure 6.1-8 checklist. The inspectors evaluated the adequacy of the RRT checklist and the RRT performance of checklist items by reviewing the vendor drawing and the associated RRT completed checklist with the RRT reviewer to determine if the checklist and its performance resulted in a satisfactory review. The vendor drawing reviewed, the review criteria used by the NRC inspectors and their findings are summarized in Table 9. The inspectors found that the RRT review of the drawing appeared to be incomplete, in that,

- 1 The drawing was partially illegible, a discrepancy that the RRT failed to identify in their review of the same drawing.
- 2 The checklist (Module 4 report, Figure 6.1-8) completed by the RRT in reviewing the drawing resulted in a cursory review. Seven of the ten items on the checklist were either marked "not applicable" or were simply not performed by the RRT. In addition, one item on the checklist that was marked as having been performed was not applicable (Item 1). The inspectors found that only three of the ten checklist items appeared to contain significant review criteria for the vendor drawing (Items 4a, 4b, and 5b.c) and none of the three were performed by the RRT. The inspectors determined that

each of the three could have been performed. The three items were as follows:

- . Item 4a - "Are selected data and materials on the vendor document in compliance with the procurement specification?" (The RRT member who performed the checklist simply failed to complete this item. It was not marked "not applicable.")
- . Item 4b - "Are selected materials on the vendor document in compliance with the code if code item?" (The RRT member who performed the checklist marked this checklist item not applicable. He informed the inspectors that he did not recall why.)
- . Item 5.bc - "Does the supplier's design conform to the licensing commitments/design criteria?" (This item was marked "not applicable" by the RRT member who performed the checklist. He stated that he did so because he did not accomplish review of the item.)

The inadequacies in the RRT checklist and the RRT performance of the checklist and the failure of the RRT to note the drawing illegibility, described above, are identified as Unresolved Item 424/85-35-12, Inadequate Review of Vendor Drawings.

(i) Readiness Review Design Verification Findings

During the performance of verification activities the design RRT raised a number of questions which required clarification or resolution, or which were findings of deviations from commitments or procedures that required project evaluation, disposition, and corrective actions. RRT questions or issues were documented and processed. The design RRT identified 16 Findings, some of which have already been mentioned above. Of the 16 Findings, the RRT determined that three represented safety concerns while the other 13 did not. In their assessment of responses received from the project for the Findings, the RRT reported that they concluded that the Findings do not affect the design adequacy of existing piping and equipment.

The inspectors evaluated the RRT resolution of their Findings by first reviewing their descriptions of the Findings and responses to determine if the information satisfactorily supported their conclusion regarding the Findings. The inspectors determined, based on the information presented in the module report, that the RRT conclusion was adequately supported.

Subsequently, the inspectors examined examples of Readiness Review information requests and Findings to determine if they had received satisfactory responses, and if the Findings and responses were accurately depicted in the Module 4 report. Two Information Requests and two Findings were selected and examined.

The two Information Requests reviewed by the inspectors, the criteria used by the inspectors in assessing the responses to the requests and the inspectors' findings as to the adequacy of the responses are given in Table 10. The inspectors found that the information requests received satisfactory responses.

The Readiness Review Findings reviewed by the inspectors, the inspectors' review criteria and their findings are summarized in Table 11 and described in greater detail below:

- 1 Finding 4-75 - This Finding was that a calculation failed to postulate intermediate pipe breaks in accordance with DC-1018. The response received by the RRT from project management for this Finding was that elimination of the breaks in the calculations was in accordance with an NRC approved change. The response also stated that DC-1018 had originally not reflected the change because the change notice had been misplaced. The response stated that the DC had now been revised to incorporate the change and that review and identification actions had been implemented to prevent recurrence of unincorporated DC changes. The RRT determined that the response was acceptable. As described in the discussion of commitments 951, 954, 956, and 1543 in 4.d.(4) above; the inspectors found that there were conditions included in the NRC approval of the change in requirements for postulation of intermediate pipe breaks. Project and RRT personnel failed to recognize and verify implementation of the conditions and, based on the absence of that verification, the inspectors identified (in Subsection 4.d.(4) above) Unresolved Item 424/85-35-03. In view of the failure of project and RRT personnel to recognize and assure implementation of the subject conditions (which are not recognized in DC-1018), the inspectors consider the RRT's resolution of their Finding 4-75 to have been inadequate.
- 2 Finding 4-85 - This Finding was that Project Classes stated on the specification and the technical provisions for the RHR isolation valve encapsulation vessel were incorrect. Project Classes indicate the level of quality requirements applicable to the item, e.g., ASME Code Class. The project response to this Finding was

that while the incorrect Project Class had been identified on the documents, the specific requirements given in the text of the documents assured that the proper requirements were met. To assure that proper Project Classes were indicated on other documents, the response stated that eight specifications were checked and no other discrepancies were found.

The inspectors had reviewed the specification and technical provisions for the RHR isolation valve encapsulation vessel and agreed with the response that the requirements given in the text assured adherence to the intent of the correct Project Class. The inspectors did find, however, other examples of apparent improper Project Classes on the following documents:

- a. Field Change Request M-FCRB-6398
- b. Calculation X6CXA-35 (Project Class 212 versus 111 specified for it in the Line Designation List)
- c. Proposal for Shop Fabricated Atmospheric Tanks Built to Section III of the ASME Boiler and Pressure Vessel Code (proposal for specification X4AH04)

Based on the inspectors' identification of the additional documents with incorrectly specified Project Classes, described above, Readiness Review Finding 4-85 does not appear to have been satisfactorily resolved by the Project or the RRT. The inspectors found that it did not appear that either the RRT identified examples of improperly specified Project Classes for Finding 4-85 or those identified by the inspectors would have resulted in significant discrepancies in hardware or documentation. However, the inspectors' findings indicate that misclassification may be more extensive than originally suggested by Finding 4-85. The resolution of both design verification Findings examined by the inspectors and is identified as Unresolved Item 424/85-35-13, Inadequate Resolution of Readiness Review Design Verification Findings.

c. Subsection 6.2, Construction Program Verification

- (1) As described in the Module 4 report, the Readiness Review verification of construction was performed by a Construction RRT consisting of six personnel experienced in nuclear construction. It was intended to ensure, through sampling, that the construction processes for mechanical equipment and piping had been adequately controlled and had resulted in proper implementation of licensing

commitments. The module report describes the construction verification as having been performed in two phases. Phase I was an appraisal of completed piping hardware and associated quality documentation. Phase II was an evaluation of in-process and related activities for piping and equipment installation.

Summary details of the RRT Phase I and Phase II reviews, the NRC evaluation of each phase and an NRC evaluation of the findings of the RRT reviews are described below:

(a) Phase I

The RRT conducted the Phase I review by selecting a sample, performing a physical inspection of the sample selected, and reviewing completed documentation associated with the sample. The RRT Phase I sample included only items that had been installed and completed through hydrostatic testing. No emergency core cooling systems (ECCSs) were inspected. The RRT sample included piping (and valves) on the following isometric drawings:

1K3-1217-182-01, Auxiliary Component Cooling Water

1K3-1202-111-02, Nuclear Service Cooling Water

1K5-2403-051-01, Diesel Generator

1K3-1217-176-01, Auxiliary Component Cooling Water

1K4-1202-001-04, Nuclear Service Cooling Water

1K3-1202-405-03, Nuclear Service Cooling Water

1K3-2303-019-01, Fire Protection (Seismic I)

These isometrics represent four large bore installations, three small bore installations and a portion of six tests out of 27 Code hydrostatic tests performed as of February 1, 1985.

The hardware assessed reportedly included 133 field welds and 14 valves. The physical inspections were conducted using a checklist developed from the construction procedures, which basically implement ASME Section III criteria. The checklist is provided in the Module 4 report as Figure 6.2-1. For welds the checklist provided for checks of such attributes as contour, size, transitions, undercut, cracks, etc. Valves were checked for identification, orientation, flow direction, handle/operator orientation and damage. For the piping itself, the checks included location/orientation, dimensions/slope, size and type material, surface damage, and material/welder number identification and marking.

According to the module report, the Phase I RRT review of documentation included a review of each of the above listed isometric documentation packages for inclusion of all required documents, legibility of the documents, and administrative completeness of the documents. In addition, a sample of the records was reportedly examined in detail. The sample examined in detail included 39 field welds, seven valves, one hydrotest package, 16 pieces of field added pipe/fittings and six large pipe spools. The detailed review was conducted using checklists described in Module 4 Figures 6.2-2 through -4. The RRT identified six Findings in their review of documentation involving: (1) discrepancies between material markings and information recorded; (2) weld process sheets that referenced improper procedure revisions; (3) an incorrect material description on a material requisition; (4) inadequate control of a fabrication sketch; (5) a missing QC verification of valve line up for a hydrotest; and (6) a missing material requisition.

(b) Phase II

The RRT Phase II construction program review addressed examples of installed mechanical equipment, a variety of ongoing construction activities, and document/records control. The review reportedly conducted relative to each is summarized as follows:

1 Mechanical Equipment

Field inspections and reviews of available documentation were conducted using checklists (Module 4 report Figures 6.2-5 and 6.2-6). The walkdowns were to assess freedom from damage, maintenance and storage, configuration and location, and visual weld quality. Documentation reviews checked procurement, installation and maintenance records to verify compliance with construction procedure and vendor requirements. Equipment considered in the review included:

- . Auxiliary feedwater pump turbine driver
1-1302-P4-001-K01
- . Chemical and volume control positive displacement
pump 1-1208-P6-001
- . Seal water heat exchanger 1-1208-E6-004
- . Component cooling water pump 1-1203-P4-001
- . Safety injection pump 1-1202-P6-001
- . Boric acid storage tank 1-1208-T4-003

Note: The review of mechanical equipment was the only Phase II review conducted by the RRT using formal checklists.

2 Material Storage

Examples of piping storage areas were inspected and storage reports were reviewed to determine compliance with procedural requirements for piping storage.

3 Welding-Related Activities and Leak Testing

The review of welding-related activities included observation of work and records for weld rod control, piping fit-up and cleanliness and in-process welding. The sample size for the fit-up and cleanliness and in-process welding was very small, involving three welds for the former and one for the latter. The review for leak testing included, for one test - the review of the test package prior to test, witnessing the test and review of the completed test package. The reviews of welding-related activities and hydrotesting assessed compliance with ASME code and construction procedure requirements.

4 Deviation Reports

A sample of 100 closed DRs pertaining to piping and equipment was reviewed for conformance with the applicable construction procedure (PPP Procedure XV-2).

5 NDE/Radiography

The assessment of nondestructive examination and radiography was performed to ascertain compliance with project procedures and ASME Section III requirements. The assessment was performed in two parts. The first was a review of 153 radiographs and associated inspection reports and the second was a review of liquid penetrant examination results for six welds, with performance witnessed for two of the six.

6 Document/Records Control

The assessment of document/records control was performed by the RRT to ascertain that drawings, including Design Change Notices (DCNs), located in the field document control stations were current and that process sheets were controlled in accordance with PPP procedure VI-5. In selecting examples for assessment, past GPC audit findings (Audit GD07-85/22) that identified incidents of

incorrect drawing revisions at field document control stations were reportedly considered. Fifteen DCNs and associated drawings and 20 process sheets were selected and checked.

The RRT Phase II review resulted in ten findings involving an improper anchor bolt spacing, a misplaced QC inspector eye examination report, improper storage conditions and inspections, failure to document hydrotest vent points, unclear DR justifications, a failure to provide impact tests, bypassed ASME inspector review and concurrence, document control station possession of an incorrect drawing revision, omission of required entries on radiography reports and the need for a revised response to NRC on a 50.55(e) item for ER-309L weld wire. The RRT determined that nine of the findings involved no safety concerns.

(2) NRC Evaluation of RRT Phase I and II Review

The NRC inspectors evaluated the RRT Phase I and II reviews by examining and assessing selected examples of constructed hardware (equipment and piping) and associated records. The inspectors' sample included some of the hardware inspected by the RRT in their review. The remainder consisted of equipment and piping that was selected for assessment totally independent of the RRT sample; and some that was included to provide a continuity of review of selected equipment through both design and construction. The RHR isolation valve encapsulation vessel and associated piping provide an example of the latter. The items examined by the inspectors, the criteria used in assessing the items, and the inspectors' comments/findings for the items are provided in Table 12. Table 12 also indicates whether the RRT reviewed the hardware and records for the items. The inspectors' examination of the RRT Phase I review, their examination of the RRT Phase II review and their findings are described below:

(a) NRC Examination of RRT Phase I Review

Relative to the RRT Phase I review, the NRC inspectors' examinations (as depicted in Table 12) represent two of the seven isometrics that were assessed by RRT plus five that were not included in the RRT review. The inspectors utilized the RRT checklists in many of their examinations to assess their adequacy.

(b) NRC Examination of RRT Phase II Review

With regard to the RRT Phase II review, a comparison/discussion of the RRT and NRC verifications is as follows:

1 Mechanical Equipment

The NRC examinations included two of the seven mechanical equipment items addressed by the RRT. The RRT checklist was used in performing the examinations such that its adequacy could be assessed. The inspectors also examined hardware and records for four other equipment items utilizing RRT checklist criteria and other criteria as described in Table 12.

2 Material Storage

The inspectors did not assess this area except to examine the RRT description of their performance and findings in this area. From past inspections the inspectors were aware of piping storage discrepancies at Vogtle. However, such discrepancies as have been experienced are very unlikely to result in serious damage and the inspectors elected not to address this area.

3 Welding Related Activities and Leak Testing

The RRT performed a very limited review in this area checking only one leak test, three welds for fit-up and cleanliness and one in-process weld plus checks of welding material controls at the issue stations. The NRC inspectors did not perform an evaluation relative to any of the above except welding material control. Controls were checked at an issue station.

4 Deviation Reports

The inspectors did not specifically review DRs relative to construction as part of their evaluation. However, they have reviewed and were familiar with the DRs from past inspections (e.g., NRC Inspection 424/84-36).

5 NDE/Radiography

The inspectors did not evaluate the RRT review in this area. The related GPC procedures and performance of the procedures have been accessed in past NRC inspections (e.g., 424/84-36, 84-13, 83-13, 84-26, 84-03, and 82-20).

6 Document/Records Control

The RRT only reviewed a small number of documents in this area, 15 DCNs and their associated drawings and 20 process sheets. It was noted, however, that the

Readiness Review is preparing an appendix (Appendix D) to cover document control to be issued for NRC evaluation. On this basis, the NRC inspectors determined not to specifically evaluate any related material during their inspection.

(c) NRC Findings

With regard to the construction RRT performance of their Phase I and II reviews. The inspectors determined that some of the Readiness Review checklists did not appear to be well organized to provide efficient review, but found that an experienced individual could use them satisfactorily. The inspectors did not identify any deficiencies in the review performed by the construction RRT. In the course of examining hardware, records and activities not assessed by the RRT, the inspectors did identify a number of items of concern. None of these items by itself appeared to represent a major problem. However, the items require additional inspection and resolution to determine their collective impact on the NRC evaluation of the Readiness Review of VEGP Unit 1 mechanical equipment and piping.

- 1 In examining the RHR isolation valve encapsulation vessel identified V-1-1205-V4-01, the inspectors noted apparent undersize welds/excessive grinding for bellows to flange (weld 49) and pipe to flange (weld 50) welds as depicted on drawing 1X4AH04-23-13. Pending GPC evaluation of the condition and further NRC review to determine its significance, this is identified as Unresolved Item 424/85-35-14, Undersize/Overground Welds.
- 2 While examining the piping and valve inside the RHR isolation valve encapsulation vessel the inspectors discovered structural members supporting the piping that were not depicted on the drawing. The basis for and controls on the installation of these supports could not readily be determined. Pending GPC investigation/evaluation of the condition and NRC inspection of their findings this is identified as Unresolved Item 424/85-35-15, Undocumented Piping Supports.
- 3 During the review of records for the RHR isolation valve encapsulation vessel the inspectors found that all of the associated RHR system pipe was a low carbon grade of stainless steel, while the isolation valve was not. The inspectors requested that GPC explain the apparent inconsistency and identified it as Inspector Followup Item 424/85-35-16, Inconsistency in the Use of Low Carbon Stainless Steel.

- 4 In examining the control of welding materials from an issue station the NRC inspectors identified apparent discrepancies in conformance to PPP procedures VIII-3 and GWS III/I. The discrepancy related to procedure VIII-3 was failure to conform to requirements for daily verification and recording of electrode holding oven temperatures. The discrepancy related to procedure GWS III/I was failure to issue proper revisions of welding technique forms to welders on issue of the electrodes revolved. These items were identified as unresolved but became Violation 424/85-40-03, Failure to Follow Procedures for Control of Welding, in a subsequent inspection.
- 5 In examining the installation of mechanical equipment the NRC inspectors identified apparent discrepancies in completion of required preventive maintenance on NSCW pump motors. The discrepancies involved were failure to provide required energization of pump motor heaters. This item was identified as unresolved but became Violation 424/85-40-04, Failure to Protect Permanent Plant Equipment, in a subsequent inspection.

(d) NRC Evaluation of RRT Findings and Their Resolution

The construction RRT identified 18 Findings in their Phase I and II construction reviews. The RRT also identified two additional Findings (for a total of 20), one in review of audits and one in review of commitment implementation. For convenience these latter two Findings were discussed in Subsection 6.2 of the Readiness Review Module 4 report.

The inspectors evaluated the construction RRT resolution of their 20 Findings, first reviewing their description of the Findings and responses in the Module 4 report to determine if the information supported their conclusions. The inspectors determined, based on the information presented in the module report, that the RRT conclusions were adequately supported.

Subsequently, the inspectors examined examples of Readiness Review findings in detail to determine if they had received satisfactory responses, and if they were accurately depicted in the Module 4 report. Four findings were selected and examined.

The Readiness Review Findings examined by the inspectors, the inspectors' review criteria and their findings are summarized in Table 13 and described in greater detail below.

1 Finding 4-45

This Finding was that arc strikes and/or areas of weld spatter were found during RRT examination of Code piping. The project response to this Finding was that PPP had removed the arc strikes/weld spatter in accordance with procedure IX-52. All removal areas were evaluated by GPC and found not to affect the hardware.

The inspectors examined several of the areas involved (ISO 1K4-1202-001-04) and verified that removal had been accomplished with no adverse affect to the piping involved.

2 Finding 4-46

This Finding was that a review of 133 weld process sheets revealed three instances where the material marking was not in accordance with the associated process sheet. The project response to this Finding was to correct the discrepancies based on other supporting documentation for the welds involved. The inspectors examined the hardware and supporting documentation for two of the discrepancies involved (welds 111-W-165 and 111-W-139 on ISO 1K3-1202-111-02) and verified that corrective action was properly accomplished.

3 Finding 4-56

This Finding was that as-built piping, in one instance (ISO 1K3-1217-182-01), violated hot-pipe-to-raceway separation requirements of electrical construction specification X3AR01, Section E8. The project response was to correct piping construction specification X4AZ01 and related PPP Procedure IX-3 to include minimum separation requirements of 1" from installed piping to any other obstruction, issue DR ED-8341 to allow "use-as-is" of the condition for ISO-1K3-1217-182-01 and initiate a 100% reinspection program for piping systems already hydrotested. The inspectors reviewed the proposed corrections to the procedures involved and verified adequate use-as-is engineering disposition for DR ED-8341. Inspectors were informed that 100% reinspection and necessary changes to the procedures were not yet complete, even though the July 16, 1985, commitment date reported in Section 6.0 of the Module 4 was past. (The completion date is also reported as June 1, 1985, in Section 8.0 of the Module 4 report). The inspectors also noted the potential for separation problems in other areas of piping installations.

Additional separation problems (lack of 1" minimum separation between containment pipe rack R0001 and piping on ISO 1K4-1201-036-01) were identified during a subsequent NRC inspection and continued NRC concern was identified as Inspector Followup Item 424/85-40-01, Assurance of Necessary Minimum Clearances for Installed Piping.

4 Finding 4-83

This Finding concerned a potential construction deficiency that had been reported to the NRC in accordance with 10 CFR 50.55(e) (NRC item 424/CDR 83-42). The potential deficiency was identified as hot cracks which had occurred during welder qualification testing for dissimilar metal joints (carbon steel to stainless steel) to be welded with the gas tungsten arc welding (GTAW) process and type ER309L weld wire. The final GPC report to the NRC on CDR 83-42 was dated December 18, 1983, and concluded that a substantial safety hazard/deficiency did not exist. This conclusion was supported by a BPC metallurgical report showing the significant causes of the hot cracking to be associated with the qualification testing due to high weld metal dilution and welder technique during qualification testing, which provided high heat input). The type ER309L weld wire was within specification but near allowable limits on phosphorous and sulfur levels.

Reported corrective actions included BPC review of PPP carbon steel to stainless steel GTAW welding procedures to ensure that the potential for high heat input and excessive weld metal dilution was minimized and review of radiographic film of carbon steel to stainless steel production welds (primarily containment liner penetrations) to assure that none of the production welds contained defects due to hot cracking. The review of radiographic film identified defects in containment liner penetration welds not associated with hot cracking and these defects were reported to the NRC in accordance with 10 CFR 50.55(e) (NRC item 424/CDR 84-56).

Finding 4-83, as stated in the Module 4 report, was that NRC was not informed of revised corrective action regarding CDR 83-42 in that applicable welding procedures were not revised since the weld wire was removed from the site. The project response stated in the Module 4 report was that a revised response to the NRC would be submitted by May 30, 1985.

The inspectors were aware of details concerning CDR 83-42 and related CDR 84-56 from previous NRC inspections (see NRC Inspection Reports 50-424/84-18, 84-30, and 85-14) and knew of no need for revision to the final GPC report on CDR 83-42 transmitted on December 18, 1983. In discussions with the inspectors, project personnel denied any project commitment to RRT for a revised 50.55(e) response. They stated that the details previously provided to the NRC had been correct. The significance of the matter in which Finding 4-63 was resolved will be examined further by GPC and the NRC. It is identified for tracking purposes as Unresolved Item 424/85-35-17, Inadequate Resolution of Readiness Review Findings.

8. Section 8.0 Program Assessments/Conclusions

Section 8.0 provides a summary of corrective actions that remain open with regard to Readiness Review Findings, resumes indicating the backgrounds and qualification of design and construction team personnel, and the assessments of various groups who participated in the development of the module. The inspectors examined the materials in and related to this section to evaluate the personnel background and qualification information and to assure an understanding of the assessment statements.

TABLE 1
COMMITMENTS REVIEWED
(SHEET 1 OF 11)
(SEE NOTE 1)

<u>RRT NUMBER</u>	<u>SOURCE</u>	<u>SECTION</u>	<u>COMMITMENT SUBJECT</u>	<u>DOCUMENT FEATURE</u>	<u>NRC REVIEWED (SEE NOTE 2)</u>	<u>FINDINGS/COMMENTS</u>
145	FSAR	1.9.38	QA REQUIREMENTS, SHIPPING, RECEIVING, STORAGE AND HANDLING	RG 1.38, MAY 1977	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY (INCORPORATED IN COMMITMENT NO. 1578 TO RG 1.116)
154	FSAR	1.9.61	DAMPING VALUES FOR SEISMIC DESIGN OF NUCLEAR POWER PLANTS	RG 1.61, OCTOBER 1973	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
217	FSAR	5.2.3	WELDER QUAL. FOR LIMITED ACCESSIBILITY	RG 1.71, DEC. 1973	IDENTIFICATION	ACCEPTED EXPLANATION THAT COMMITMENT BELONGS IN MODULE 8 AND VERIFIED ASSIGN- MENT
256	FSAR	5.2.3.4.6	CONTROL OF DELTA FERRITE IN SS	RG 1.31, APR. 1978	IDENTIFICATION AND IMPLEMENTATION (INCLUDED REVIEW OF ADDITIONAL DCs 1201 AND 1204)	SATISFACTORY
259	FSAR	5.2.3.4	SENSITIZED SS	RG 1.44, MAY 1973	IDENTIFICATION AND IMPLEMENTATION (INCLUDED REVIEW OF ADDITIONAL DCs 1201 AND 1204)	SATISFACTORY (WAS NOT INCLUDED IN COMMITMENT IDENTIFI- CATION MATRIX (SECTION 3.4). LISTED AS COMMITMENT NO. 218 IN MASTER COMPUTER LIST)
322	FSAR	6.1.1.1	MATERIALS SELECTION AND FABRICATION	ASME III, NC-2160 AND NC-3120	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
332	FSAR	6.1.1.2	ESF CONSTRUCTION MATERIALS	PROHIBITION OF COLD- WORKED AUSTENITIC SS WITH YIELD STRENGTHS GREATER THAN 90 KSI	IDENTIFICATION AND IMPLEMENTATION	IMPROPERLY EXCLUDED FROM MODULE 4. (PROPERLY IDENTIFIED AND ASSIGNED TO MODS 16, 20, 18A)
384	FSAR	9.2.1-3 (TABLE)	NSCW SYSTEM EQUIPMENT DESIGN	EQUIPMENT CODES AND STANDARDS	IDENTIFICATION AND IMPLEMENTATION	INADEQUATE GPC VERIFICATION OF IMPLEMENTATION, RRT VERIFICATION IS BASED ON REFERENCE TO ASME III IN SECTION 2.0 OF DC 1202. THE RELEVANT ASME CLASS IS NOT IDENTIFIED IN SECTION 2.0.

TABLE 1
COMMITMENTS REVIEWED
(SHEET 2 OF 11)
(SEE NOTE 1)

RRT NUMBER	SOURCE	SECTION	COMMITMENT SUBJECT	DOCUMENT FEATURE	NRC REVIEWED (SEE NOTE 2)	FINDINGS/COMMENTS
682	FSAR	1.9.26	QUAL. GROUP CLASS AND STANDARDS FOR WATER, STEAM AND RADWASTE CONTAINING COMPONENTS OF NPP	RG 1.26, REV. 3, FEB. 1976	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY, BUT UNNECESSARY DUPLICATION OF COMM. 1753
703	FSAR	1.9.58	QUALIFICATION OF INSPECTION PERSONNEL	RG 1.58, SEP. 1980	IDENTIFICATION	ACCEPTED EXPLANATION THAT COMMITMENT BELONGS IN APPENDIX AND VERIFIED ASSIGNMENT
711	FSAR	1.9.82	SUMPS FOR EMERGENCY CORE COOLING AND CONTAINMENT SPRAY SYSTEMS	RG 1.82, JUNE 1974	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY, BUT UNNECESSARY DUPLICATION OF COMM. 2515
880	FSAR	3.2.2-1	PRINCIPAL CODES AND STANDARDS FOR T.3.2.2-1	ASME III, CLASS 1, 2, 3 OR MC, NF, OR CS	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
885	FSAR	3.2.2-1	CONST. CODES/STDS. Q.G.-B FOR PRESSURE VESSELS, PIPING, PUMPS, VALVES, ATM. STORAGE TANKS, 0-15 psig STORAGE TANKS, SUPPORTS, METAL CONT. COMP, CORE SUPPORT STRS.	ASME III, D.1, SUB. NC, CLASS 2	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
889	FSAR	3.2.2-2	CONST. CODES/STDS. Q.G.-C FOR PRESSURE VESSELS, PIPING, VALVES, ATM. STORAGE TANKS, 0-15 psig STORAGE TANKS, SUPPORTS	ASME III, D.1, SUB. ND, CLASS 3	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
924	FSAR	3.5	MISSILE PROTECTION	10 CFR 50, APP. A, GDC 4	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
932	FSAR	3.5.1.3.2	PROTECTION AGAINST LOW TRAJECTORY TURBINE MISSILES	RG 1.115, JULY 1977	IDENTIFICATION	ACCEPTED EXPLANATION THAT COMMITMENT WAS INCLUDED IN MODULE 1
947	FSAR	3.6.1.2	SUB-COMPARTMENT PRESSURE ANALYSIS	BN-TOP-4, REV. 1 (OCTOBER 1977)	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
948	FSAR	3.6.1.2	HIGH ENERGY LINE LOCATIONS	THERE ARE NO HIGH-ENERGY LINES IN THE PROXIMITY OF THE CONTROL ROOM	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY

TABLE 1
COMMITMENTS REVIEWED
(SHEET 3 OF 11)
(SEE NOTE 1)

RRT NUMBER	SOURCE	SECTION	COMMITMENT SUBJECT	DOCUMENT FEATURE	NRC REVIEWED (SEE NOTE 2)	FINDINGS/COMMENTS
950	FSAR	3.6.2.1	HIGH ENERGY BREAK LOCATIONS (CLASS 1)	ASME III, Div. 1, CLASS 1	IDENTIFICATION AND IMPLEMENTATION	INADEQUATE GPC IDENTIFICATION OF COMMITMENT. GPC IDENTIFICATION BASED ON REFERENCE TO ASME CLASS 1 PIPING. REQUIREMENTS FOR BREAKS AT TERMINAL ENDS OF CLASS 1 HIGH ENERGY PIPING OUTSIDE THE PRIMARY RCL WERE NOT IDENTIFIED AS PART OF THE COMMIT- MENT. REQUIREMENTS FOR INTERMEDIATE BREAK LOCATIONS ARE INCLUDED IN COMMIT- MENT 954.
951	FSAR	3.6.2.1	HIGH ENERGY PIPE BREAKS (EXCLUDING REACTOR COOLANT LOOP)	BTP MEB 3-1	IDENTIFICATION AND IMPLEMENTATION, INCLUDED REVIEW OF ADDITIONAL REGULATORY BASES (APRIL 26, 1984, LETTER FROM GPC TO NRC AND RESPONSES) TO ALLOW OMISSION OF INTERMEDIATE PIPE BREAK LOCATIONS	INADEQUATE GPC VERIFICATION OF IMPLEMENTATION, RRT VERIFICATION BASED ON REFERENCE TO MEB 3-1 IN SECTION 1.0 OF DC 1018. RRT DID NOT IDENTIFY OR FOLLOWUP ON ADDI- TIONAL REQUIREMENTS REGARDING MINIMUM DISTANCE FROM WELDED ATTACHMENTS. (UNR 85-35-03)
952	FSAR	3.6.2.1	HIGH ENERGY PIPE IN CONTAINMENT PENETRATION AREAS	ASME III, NC-3652	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
954	FSAR	3.6.2.1	HIGH ENERGY BREAK INTERMEDIATE LOCATIONS (CLASS 1)	ASME III, NB-3653	IDENTIFICATION AND IMPLEMENTATION (SEE COMMENTS ON COMM. 951)	INADEQUATE GPC VERIFICATION OF IMPLEMENTATION, RRT VERIFICATION BASED ON REFERENCE TO NB-3653 IN SECTION 3.3.B.2 OF DC 1018 (SEE COM- MENTS ON COMM. 951) (UNR 85-35-03)

TABLE 1
COMMITMENTS REVIEWED
(SHEET 4 OF 11)
(SEE NOTE 1)

RRT NUMBER	SOURCE	SECTION	COMMITMENT SUBJECT	DOCUMENT FEATURE	NRC REVIEWED (SEE NOTE 2)	FINDINGS/COMMENTS
955	FSAR	3.6.2.1	NON-NUCLEAR (NOT ASME) PIPING BREAK LOCATIONS	ASME III FOR CLASS 2 AND 3 PIPING	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
956	FSAR	3.6.2.1	HIGH ENERGY INTER- MEDIATE BREAK LOCATIONS (CLASS 2 AND 3)	ASME III, NC-3600, NC-3652	IDENTIFICATION AND IMPLEMENTATION (SEE COMMENTS ON COMM. 951)	INADEQUATE GPC VERIFICATION OF IMPLEMENTATION, RRT VERIFICATION BASED ON REFERENCE TO NC 3652 IN SECTION 3.3B.3 of DC 1018 (SEE COMMENTS ON COMM. 951) (UNR 85-35-03)
957	FSAR	3.6.2.1	ASME SEC. III AND NON-NUCLEAR PIPING MODERATE ENERGY	FLOODING EFFECTS FROM PIPE BREAKS DETERMINED ON BASIS OF 30 MIN. OPERATOR TIME REQUIRED TO EFFECT CORRECTIVE ACTION	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
958	FSAR	3.6.2.1	THROUGH-WALL LEAKAGE CRACKS	ASME III, NE-1120	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
959	FSAR	3.6.2.1	THROUGH-WALL LEAKAGE CRACKS ON CLASS 1 MODERATE ENERGY	STRESS GREATER THAN 1.2 SM	IDENTIFICATION AND IMPLEMENTATION	INADEQUATE GPC VERIFICATION OF IMPLEMENTATION (MATRIX INDICATES VERIFICATION OF INCLUSION IN DC-1018, TABLE 1. NRC INSPECTORS FOUND THAT COMM. WAS NOT IMPLMENTED BY DC-1018). (UNR 85-35-04)
960	FSAR	3.6.2.1	THROUGH WALL LEAKAGE CRACKS ON CLASS 2 AND 3 MODERATE ENERGY PIPING	STRESS GREATER THAN 0.4 (1.2 SH + SA)	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
961	FSAR	3.6.2.3	LONGITUDINAL BREAK POSTULATION AT INT. POINTS OF ASME III, CLASS 1, 2, AND 3 HIGH ENERGY PIPING	OMISSION ALLOWED WHERE: CLASS 1 - STRESS DOES NOT EXCEED 2.5 SM (NB-3653) AND/OR USAGE DOES NOT EXCEED 0.1 CLASS 2 AND 3 - STRESS DOES NOT EXCEED .8 (1.2 SH + SA) (NC-3652)	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY (LIMIT INCORRECTLY REPORTED AS 0.85 (1.2 SH + SA) ON BOTH IDENTIFICATION MATRIX (SECTION 3.4) AND IMPLEMENTATION MATRIX (SECTION 3.5))

TABLE 1
COMMITMENTS REVIEWED
(SHEET 5 OF 11)
(SEE NOTE 1)

RRT NUMBER	SOURCE	SECTION	COMMITMENT SUBJECT	DOCUMENT FEATURE	NRC REVIEWED (SEE NOTE 2)	FINDINGS/COMMENTS
1509	FSAR	1.9.1.1	ECCS CONTAINMENT HEAT REMOVAL SYSTEMS DESIGN	RG 1.1, REV. 0, NOV. 1970	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
1532	FSAR	1.9.29	SEISMIC DESIGN CLASSIFICATION	RG 1.29, SEPT. 1978	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY, BUT UNNECESSARY DUPLI- CATION OF COMMITMENT NO. 1754
1537	FSAR	1.9.37	QA REQUIREMENTS FOR CLEANING	RG 1.37, MAR. 1973	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY, BUT UNNECESSARY DUPLICA- TION OF COMMITMENT 1578
1543	FSAR	1.9.46	PROTECTION AGAINST PIPE BREAK INSIDE CONTAINMENT	CONFORMANCE TO BTP MEB 3-1 AND BTP ASB 3-1 IN LIEU OF RG 1.46	IDENTIFICATION AND IMPLEMENTATION (SEE COMMENTS ON COMM. 951)	INADEQUATE GPC VERIFICATION OF IMPLEMENTATION, RR VERIFICATION BASED ON REFERENCES TO MEB 3-1 AND ASB 3-1 IN SECTION 1.0 OF DC-1018 (SEE COMMENTS ON COMM. 951) (UNR 85-35-03)
1569	FSAR	1.9.85	MATERIAL CODE CASE ACCEPT. ASME III, DIV. I	RG 1.85, REV. 20 (NOV. 1980)	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
1571	FSAR	1.9.85	MATERIAL CODE CASE ACCEPT. ASME III, DIV. I	ASME III, DIV. I	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
1578	FSAR	1.9.116	QA REQUIREMENTS FOR INSTALLATION, INSPECTION AND TESTING OF MECHANICAL EQUIPMENT AND SYSTEMS	RG 1.116, REV. 0-R (JUNE 1976)	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
1579	FSAR	1.9.116	QA REQUIREMENTS FOR INSTALLATION, INSPECTION AND TESTING OF MECHANICAL EQUIPMENT AND SYSTEMS	ANSI N45.2.8-1975	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY, BUT UNNECESSARY DUPLI- CATION OF COMM. 1578
1599	FSAR	1.9.148	FUNCTIONAL SPEC. FOR ACTIVE VALVE ASSEMBLIES IN SYSTEMS IMPORTANT TO SAFETY	RG 1.148, REV. 0 (MARCH 1981)	IDENTIFICATION AND IMPLEMENTATION	INADEQUATE GPC VERIFICATION OF IMPLEMENTATION, RRT BASED VERIFICATION ON CONFORMANCE TO ASME CODE (AS REFERENCED IN DC-1010-T1) RG. 1.148 SPECIFIES REQUIRE- MENTS ADDITIONAL TO ASME

TABLE 1
COMMITMENTS REVIEWED
(SHEET 6 OF 11)
(SEE NOTE 1)

<u>RRT NUMBER</u>	<u>SOURCE</u>	<u>SECTION</u>	<u>COMMITMENT SUBJECT</u>	<u>DOCUMENT FEATURE</u>	<u>NRC REVIEWED (SEE NOTE 2)</u>	<u>FINDINGS/COMMENTS</u>
1611	FSAR	1.9.139	GUIDANCE FOR RHR	RG 1.139, REV. 0 (MAY 1978)	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
1688	FSAR	3.9.B.3.3	CRITERIA FOR PRESSURE RELIEVING DEVICES, MAXIMUM ALLOWABLE INTERNAL PRESSURE MAIN STEAM PIPE OR HEADER	110% OF STEAM GENERATOR DESIGN PRESSURE PER ASME CODE	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY (HOWEVER RRT FAILED TO IDENTIFY OTHER COMMITMENTS IN FSAR SECTION 3.9.B.3.3 - SEE NOTE 3) (UNR 85-35-01)
1743	FSAR	3.1.5	PIPING SYSTEM PENE- TRATION CONTAINMENT	10CFR50, APP. J	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
1744	FSAR	3.1.5	RCPB PENETRATING CONTAINMENT	ASME III, CL. 2	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
1753	FSAR	3.2.2	VEGP CLASSIFICATION SYSTEM	RG 1.26, FEB. 1976	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
1754	FSAR	3.2.2	VEGP CLASSIFICATION SYSTEM	RG 1.29, SEP. 1978	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
1764	FSAR	3.5.1.2	2 INCH AND LARGER VALVE DESIGN CRITERIA TO PRECLUDE VALVE STEM EJECTION	ASME III	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
1765	FSAR	3.5.1.2	2 INCH AND LARGER VALVE DESIGN CRITERIA TO PRECLUDE VALVE STEM EJECTION	CONTROL OF LOAD DURING BOLT TIGHTENING	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
1778	FSAR	3.8.2.1	PIPE ATTACHED TO CONTAINMENT WALL	ASME III, CLASS 2	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
1779	FSAR	3.8.2.1	ISOLATION VALVE ENCAPSULATION VESSEL ASSEMBLIES	ASME III, CLASS MC	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
1781	FSAR	3.8.2.4	DESIGN OF FLUED HEAD OF PROCESS PIPING PENETRATION ASSEMBLIES	ASME III, ARTICLE NC-3000 1977 THRU SUMMER 1978 ADDENDA	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
1786	FSAR	3.8.2.1	PROCESS PIPE PENE- TRATION ASSEMBLIES (HIGH TEMP. PIPING)	MAXIMUM OPERATING TEMPERATURE RANGE 445 DEGREES F - 557 DEGREES F	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
1787	FSAR	3.8.2.1	PROCESS PIPE PENE- TRATION ASSEMBLIES (HIGH TEMP. PIPING)	DESIGNED TO LIMIT CONCRETE MAXIMUM TEMPERATURE TO 200 DEGREES F	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY

TABLE 1
COMMITMENTS REVIEWED
(SHEET 7 OF 11)
(SEE NOTE 1)

<u>RRT NUMBER</u>	<u>SOURCE</u>	<u>SECTION</u>	<u>COMMITMENT SUBJECT</u>	<u>DOCUMENT FEATURE</u>	<u>NRC REVIEWED (SEE NOTE 2)</u>	<u>FINDINGS/COMMENTS</u>
1788	FSAR	3.8.2.5	STRUCTURAL ACCEPTANCE CRITERIA	ASME III, D.1. SUB. NC (CLASS 2 PIPING)	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
1789	FSAR	3.8.2.6	MATERIALS, QC AND SPECIAL CONSTRUCTION TECHNIQUES	ASME III, SUB. NC, ART. NC-2000 (CLASS 2 PIPING)	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
1832	IEB-80-08	C-80/02/26	WELDING OF PENETRATION SLEEVE TO FLUED HEAD (OR INTERMEDIATE SLEEVE FOR FLUED HEADS EQUIPPED WITH INTER- MEDIATE SLEEVE)	SLEEVE TO FLUED HEAD WELDS ARE PERFORMED AT VENDORS SHOPS AND ARE SUBJECT TO 100% RADIO- GRAPHY PER ASME III, NC-5200	IDENTIFICATION	SATISFACTORY
1841	FSAR	3.6.2.3	BREAK PROPAGATION, LARGE RCS PIPING	PROPAGATION OF BREAK TO UNAFFECTED LOOPS PREVENTED	IDENTIFICATION AND IMPLEMENTATION	INADEQUATE. GPC DID NOT IDENTIFY OR VERIFY NECESSARY PREREQUISITE CONDI- TIONS AS PART OF THE COMMITMENT
1842	FSAR	3.6.2.3	BREAK PROPAGATION, LARGE RCS PIPING	PROPAGATION OF BREAK IN AFFECTED LOOP DOES NOT EXCEED 20% OF FLOW AREA OF RUPTURED LINE	IDENTIFICATION AND IMPLEMENTATION	INADEQUATE (SAME COMMENT AS COMM. NO. 1841)
1855	FSAR	1.9.31	CONTROL OF FERRITE CONTENT IN STAINLESS STEEL WELD METAL	RG 1.31, REV. 3, APRIL 1978	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY, BUT UNNECESSARY DUPLI- CATION OF COMM NO. 256
1989	FSAR	3.8.2.4	STEEL CONTAINMENT, ISOLATION VALVE ENCAPSULATION VESSEL ASSEMBLIES, DESIGN	ASME III, ART NE-3000 1974 THRU SUMMER 1976 ADDENDA	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
2170	FSAR	6.1.1.1	ESF CONST MATERIALS WELD MATERIALS (S.S.)	ASME IX	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
2346	FSAR	5.4.7.2	APPLICABLE CODES AND CLASSIFICATION	THE ENTIRE RHRS IS DESIGNED AS NUCLEAR SAFETY CLASS 2 WITH THE EXCEPTION OF THE SUCTION ISOLATION VALVES, WHICH ARE SAFETY CLASS 1	IDENTIFICATION AND IMPLEMENTATION	INADEQUATE GPC VERIFICATION OF IMPLEMENTATION. RRT VERIFICATION BASED ON REFERENCE TO ASME CLASS 2 IN SECTION 1.0 OF DC-1205. THE EXCEPTION THAT RHR SUCTION ISOLATION VALVES ARE ASME CLASS 1 IS NOT INCLUDED IN DC-1205.

TABLE 1
COMMITMENTS REVIEWED
(SHEET 8 OF 11)
(SEE NOTE 1)

<u>RRT NUMBER</u>	<u>SOURCE</u>	<u>SECTION</u>	<u>COMMITMENT SUBJECT</u>	<u>DOCUMENT FEATURE</u>	<u>NRC REVIEWED (SEE NOTE 2)</u>	<u>FINDINGS/COMMENTS</u>
2486	FSAR	6.2.2.2	MATERIAL THAT CAN COME IN CONTACT WITH RECIRCULATION FLUID - CSS	AUSTENITIS S.S.	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
2515	FSAR	6.2.2.2	DESIGN OF THE CONTAIN- MENT EMERGENCY CORE COOLING SYSTEM SUMPS	RG 1.82, JUNE 1974	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
2809	FSAR	6.2.7.2.E	FRACTURE TOUGHNESS TEST FOR PRESSURE BOUNDARY PIPING	ASME III, DIV. 1, SUBSECTION NE, 1974 THRU SUMMER 1975 ADDENDA	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
2816	FSAR	6.3.2.2.9	REFUELING WATER STORAGE TANK	DESIGNED TO SEISMIC CATEGORY 1 REQUIRE- MENTS, HEATER PROVIDED TO MAINTAIN MIN. WATER TEMP. OF 50 DEGREES F.	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
4673	IEB-79-28	C-80/08/05	POSSIBLE MALFUNCTION OF NAMCO MODEL EA180 LIMIT SWITCHES @ ELEVATED TEMPERATURES (SAFETY-RELATED EQUIP- MENT)	REPAIR VALVES WITH NAMCO EA180 POSITION SWITCHES WITH SWITCH HOUSING NOS. BETWEEN 01-79 AND 08-79, PLACING VALVES ON HOLD UNTIL REPAIR IS COMPLETE	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY IDENTIFICATION BUT IMPLEMENTATION VERIFICATION WAS SUPERFICIAL. IT WAS BASED ON LETTERS FROM BPC TO GPC STATING WHAT HAD BEEN DONE
4674	IEB-80-05	C-80/08/05	VACUUM CONDITION RESULTING IN DAMAGE TO CVCS HOLDUP TANKS	LOW PRESSURE OR HOLDUP TANKS THAT CAN CONTAIN PRIMARY SYSTEM WATER ARE DESIGNED INTO SYSTEM TO PRECLUDE VACUUM CONDITIONS	IDENTIFICATION	SATISFACTORY
4675	IEB-83-06	C-83/11/23	NONCONFORMING MATERIALS SUPPLIED BY TUBE-LINE CORPORATION, (LONG ISLAND CITY, NY HOUSTON, TX, CAROL STREAM, IL)	INVOKE ASME III, SUB. NX-2600, 1977. (TO VERIFY THAT CHEM- COMPOSITION OF TUBE-LINE LINE FITTINGS IS ACCEPT- ABLE, I.E., IN CONFORMANCE FOR ASME SECT. III, APPLICATIONS)	IDENTIFICATION AND IMPLEMENTATION	INADEQUATE. THE ACTUAL COMMITMENTS WERE NOT RECOGNIZED AND, THEREFORE, THEIR IMPLEMENTATION WAS NOT VERIFIED.

TABLE 1
COMMITMENTS REVIEWED
(SHEET 9 OF 11)
(SEE NOTE 1)

<u>RRT NUMBER</u>	<u>SOURCE</u>	<u>SECTION</u>	<u>COMMITMENT SUBJECT</u>	<u>DOCUMENT FEATURE</u>	<u>NRC REVIEWED (SEE NOTE 2)</u>	<u>FINDINGS/COMMENTS</u>
4679	IEB-79-24	C-79/11/01	FROZEN LINES	ALL SAFETY-RELATED PROCESS INSTR. AND SAMPLING LINES THAT ARE PHYSICALLY ROUTED IN AN AREA EXPOSED TO EXTREMELY COLD WEATHER SHALL BE PROVIDED WITH ADEQUATE HEAT TRACING	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
4890	IEB-79-03	C-79/05/09	JACKETED PIPE SPOOLS IN CONTAINMENT SPRAY SYSTEM AND RHR SYSTEM: 4 SPOOLS	ASME III, 1974 ED., CLASS 2, (NCL. ADDENDA THRU SUMMER 1975)	IDENTIFICATION AND IMPLEMENTATION	INADEQUATE. GPC RR PERSONNEL IDENTIFIED COMMITMENTS WHERE THERE WERE NONE. FURTHER THEY DID NOT VERIFY IMPLEMENTATION OF THE SIGNIFICANT ASPECTS OF THE COMMITMENTS THAT WERE IDENTIFIED
4891	IEB-79-03	C-79/05/09	JACKETED PIPE SPOOLS IN CONTAINMENT SPRAY SYSTEM AND RHR SYSTEM: 4 SPOOLS	ASME III, CODE CASE N-32	IDENTIFICATION AND IMPLEMENTATION	INADEQUATE. SAME COMMENT AS FOR COMMITMENT 4890.
4892	IEB-79-03	C-79/05/09	JACKETED PIPE SPOOLS IN CONTAINMENT SPRAY SYSTEM AND RHR SYSTEM: 4 SPOOLS	100% RADIOGRAPHIC INSPECTION	IDENTIFICATION AND IMPLEMENTATION	INADEQUATE. COMMIT- MENT WAS INSUFFICI- ENTLY IDENTIFIED AND WAS NOT UNDERSTOOD NOR PROPERLY VERIFIED
4913	FSAR	9.2.1-1	NSCW SYSTEM DESIGN	MAX. HEAT LOAD DURING ACCIDENT CONDITIONS IS 349.8 MILLION BTU/HR	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY (MIS-IDENTIFIED AS COMMITMENT NO. 4923 IN REPORT TABLE 6.1-2 "COMMITMENTS VERIFICATION MATRIX")
4914	FSAR	9.2.1-1	NSCW SYSTEM DESIGN	MIN. FLOW PER TRAIN UNDER ACCIDENT CONDITIONS IS 15,733 GPM	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
4916	FSAR	3.2.2-1	NSCW SYSTEM DESIGN	NSCW VALVES AND PIPING OUTSIDE CONTAINMENT ARE ASME CLASS 3	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
4917	FSAR	3.2.2-1	NSCW SYSTEM DESIGN	NSCW VALVES AND PIPING INSIDE CONTAINMENT ARE ASME CLASS 2	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY

TABLE 1
COMMITMENTS REVIEWED
(SHEET 10 OF 11)
(SEE NOTE 1)

<u>RRT NUMBER</u>	<u>SOURCE</u>	<u>SECTION</u>	<u>COMMITMENT SUBJECT</u>	<u>DOCUMENT FEATURE</u>	<u>NRC REVIEWED (SEE NOTE 2)</u>	<u>FINDINGS/COMMENTS</u>
4928	FSAR	6.3.2.5	RHR SYSTEM	PIPING IS AUSTENITIC STAINLESS STEEL	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
4929	FSAR	6.3.2.5	RHR SYSTEM	PIPING IS ANSI CLASS 2 AND ASME CLASS 2	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
4932	FSAR	3.2.2-1	BORIC ACID STORAGE TANK (BAST)	BORIC ACID STORAGE TANK IS ASME CLASS 3	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
4933	FSAR	3.2.2-1	BORIC ACID STORAGE TANK (BAST)	BORIC ACID STORAGE TANK IS SEISMIC CATE- GORY 1	IDENTIFICATION AND IMPLEMENTATION	SATISFACTORY
---	IEB-77-04	C-78/01/03	CONTAINMENT SUMP PH	CALCULATIONS MUST BE BASED ON MAXIMUM BORON CONCENTRATIONS AND WATER VOLUMES PERMITTED	IDENTIFICATION	ACCEPTED EXPLANATION THAT THIS COMMITMENT BELONGED IN MODULE 21W AND VERIFIED ASSIGNMENT
---	IEB-78-04	C-78/04/21	ENVIRONMENTAL QUALIFI- CATION OR MODIFICATION OF DESIGN	STEM MOUNTED LIMIT SWITCHES ON VALVES INSIDE THE CONTAINMENT	IDENTIFICATION	ACCEPTED EXPLANATION THAT THIS COMMITMENT BELONGED IN MODULE 20 AND VERIFIED ASSIGN- MENT
---	IEB-79-03A	C-81/04-02	ASME SA-312 TYPE 304 PIPE WITH LONGITUDINAL WELDS	DESIGN STRESSES VERIFIED LESS THAN 85% OF CODE ALLOWABLE	IDENTIFICATION	ACCEPTED EXPLANATION THAT THIS COMMITMENT BELONGED MODULE 11 AND THAT IT HAD BEEN SO ASSIGNED
---	IEB-81-02	C-81/11/20	FAILURE OF GATE VALVES TO CLOSE AGAINST DIFFERENTIAL PRESSURE	VALVES TO BE MODIFIED TO MEET REQUIREMENTS	IDENTIFICATION	ACCEPTED EXPLANATION THAT COMMITMENT BELONGED IN MODULE 16 AND VERIFIED IT HAD BEEN SO ASSIGNED
---	FSAR	17.1.2 17A.3	QA REQUIREMENTS FOR DESIGN OF NUCLEAR POWER PLANTS	ANSI N45.2.11, DRAFT 2, REV. 2	IDENTIFICATION	INADEQUATE. GPC DID NOT IDENTIFY (UNR 424/85-35-03)

TABLE 1

COMMITMENTS REVIEWED
(SHEET 11 OF 11)
(SEE NOTE 1)

NOTES:

- (1) The entries in the first five columns of this table were taken from the GPC Module 4 report, Section 3.4 table, without substantive modification. Exceptions to this are the last five commitments, for which all entries were developed by NRC inspectors; and No. 1832, which had entries in the fourth and fifth columns modified by NRC inspectors for clarification. An explanation of the column headings is as follows: RRT Number - A reference number assigned to the commitment by GPC. Source - The document containing the commitment (FSAR or IEB) identifies the FSAR section or GPC IEB response correspondence date. Commitment Subject - The subject of the FSAR section or IEB. Document/Feature - The document or plant feature discussed in the FSAR section or the IEB. NRC Reviewed - What the NRC review was to verify. Typically this was to verify identification of the commitment by the Readiness Review and in many instances to verify that GPC had properly determined implementation of the commitment as indicated in their Module 4 report Section 3.5. Findings/Comments - The NRC's findings as to whether GPC actions reviewed were satisfactory or inadequate, often accompanied by comments regarding the basis for the finding.
- (2) Identification - indicates review to verify that the GPC Readiness Review properly identified the commitment. Implementation - indicates document review to verify that the GPC Readiness Review satisfactorily identified document source(s) that implemented the commitment. If the NRC review checked document in addition to those identified by GPC, the additional sources are given in parenthesis.
- (3) Other applicable commitments associated with criteria for pressure relieving devices (FSAR Section 3.9.B.3.3) and not identified by RRT during identification of commitments 1688 and 1689 (The Requirement to use a 2.0 dynamic load factor which was assigned to module 11) are as follows:
- Relief valve connections will be spaced on the header so that there is no local interaction (Implemented by DC-1017 - 3.2.A.3)
 - Reaction force and moment affects on the steam header, supports, and connecting nozzles for each valve blowing for combinations of valves blowing shall be considered. The steady blowdown load is not transmitted to the header but is carried by the structure, using a piston-type design (Implemented by DC-1017 - 3.2.1)
 - The reaction force of the flowing valve shall be obtained from the valve manufacturer; however, the manufacturer's reaction force is verified by the total hydraulic reaction force analysis (Implemented by DC-1017 - 3.2.1)
 - Stress analysis of the safety and relief valve system is conducted including evaluation of the header local stresses due to reaction moment when applicable (Implemented by DC-1017 - 3.2.1)
 - Material thicknesses are selected to accommodate expected loads and maintain stresses within allowable limits (Implemented by DC-1017 - 3.2.1)

The inspectors questioned whether the above commitments would be assigned to other modules. GPC's response did not indicate module assignments. Need for further review on this item is included in Unresolved Item Item 424/85-35-01, Assurance of Adequate Readiness Review Coverage of Module 4.

TABLE 2
COMMITMENTS AND REQUIREMENTS VERIFICATION REVIEW
(SHEET 1 OF 2)
(See Note 1)

Requirement/Commitment Description	FSAR Section or IEB	Classification		Verification Documents	RRT Review	Findings/Comments
		Commitment	Requirement			
<u>NSCW System</u>						
Cold weather protection for small diameter lines	IEB 79-24	4679		P&ID 1X4DB133-1	No (See com- ment)	heat tracing in proper location but no note on DWG. (See Note 2)
NSCW valves and piping outside containment are ASME Class 3	Table 3.2.2-1	4916		P&ID 1X4DB133-2 Proc. Specs X4AR01, X4AR21 and X5AC03	Yes for all Docs.	Satisfactory - all docs.
NSCW valves and piping inside Containment are ASME Class 2	Table 3.2.2-1	4917		P&ID 1X4DB135-1 Proc. Spec. X4AR01	Yes for both Docs.	Satisfactory - for both Docs
NSCW pumps (2 per train) and standby pump are rated at 8600 GPM at 230 ft. head	9.2.1.2.2		X	Proc. Spec. X4AF02 Vendor Doc., Bechtel log 1X4AF02-142-1 Bingham-Willamette Co. pump test curve	Yes for all Docs.	Satisfactory - all docs.
<u>SI System</u>						
Cold weather protection for small diameter lines	IEB- 79-24	4679		P&ID 1X4DB121, Rev. 14	No	Satisfactory
<u>RHR System</u>						
Piping is austenitic stainless steel.	6.3.2.5.2B	4928		Line List 1X4DR004, Rev. 4 FAB. ISO. 1K3-1205-003-01 1K3-1205-004-01 1K3-1205-006-02 1K3-1205-019-02 Material Class AX4DR001 P&ID 1X4DB112 Rev. 13	Yes for all Docs.	All documents checked were satisfactory

Table 2
COMMITMENTS AND REQUIREMENTS VERIFICATION REVIEW
(SHEET 2 OF 2)

Requirement/Commitment Description	FSAR Section or IEB	Classification		Verification Documents	RRT Review	Findings/Comments
		Commitment	Requirement			
ANSI safety class 2, seismic Category 1, ASME class 2 pipe	6.3.1 6.3.2.5.2B	4929		P&ID 1X4DB122, Rev. 13 FAB. ISO. 1K3-1250-004-01 1K3-1205-006-02 1K3-1205-019-02 Line List 1X4DR004, Rev. 4	Yes for all Docs.	All documents checked were satisfactory
<u>Boric Acid Storage Tank</u>						
Usable BAST capacity is 46,000 gal.	Table 9.3.4-2		X	Proc. Spec. X4AH03 Table 1	Yes	Satisfactory
Design temperature: 200°F	Table 9.3.4-2		X	Proc. Spec. X4AH03- SK-4-76 Rev. G	Yes	Satisfactory
Design pressure: Atmospheric	Table 9.3.4-2		X	Proc. Spec. X4AH03- SK-4-76 Rev. G	Yes	Satisfactory
Material: Austenitic SS	Table 9.3.4-2		X	Proc. Spec. X4AH03 Section 4	Yes	Satisfactory
BAST is ASME Class 3	Table 3.2.2-1	4932		Proc. Spec. X4AH03 Section 3.3.2	Yes	Satisfactory
BAST is seismic Category 1	Table	4933		Proc. Spec. X4AH03 Section 3.3.2	Yes	Satisfactory

NOTES:

1. The table headings are similar to those utilized in RR Module 4 report, Table 6.1-2. For RRT review a "yes" entry indicates that verification in the stated documents was examined by both the NRC and the RRT. "No" indicates the verification was performed by the NRC but not the RRT.
2. The commitment had been to include a note on all drawings requiring heat tracing for small diameter piping susceptible to freezing temperatures. This was not done. However examination of examples of drawings and design criteria documents by NRC indicated that other steps had been implemented that met the intent of the commitment.

TABLE 3
SUMMARY OF DESIGN DOCUMENTS
REVIEWED BY RRT AND NRC

<u>Review Area</u>	<u>Total Number</u>	<u>RRT Reviewed</u>	<u>NRC Reviewed</u>
Commitments Implementation	--	260	77
Design Criteria	23	23	12
Calculations	313	35	21
Drawings			
Mechanical (P&IDs)	45	11	3
Drawing Change Notices	~4,000	349	68
Procurement Specifications	31	6	1
Construction Specification Change Notices	368	12	0
Field Change Requests	Unknown	71	17
Deviation Reports	~4,000	100	28
Supplier Deviation Disposition Requests	146	24	0
Equipment Qualification Documentation	Unknown	2	0
Field Engineering Change Orders	~20	5	0
Supplier Quality Verification Documentation List Specs.	Unknown	4	0
Vendor Drawings	Unknown	6	1

TABLE 4
CALCULATIONS REVIEWED
(SHEET 1 OF 3)

<u>Number</u>	<u>Title Description</u>	<u>NRC Reviewed For (SEE NOTE 1)</u>	<u>RRT Review</u>	<u>Findings/Comments</u>
X6CXA-17	Whip/Jet AFW Pumphouse	RRT checklist items	Yes	Satisfactory
X6CXB-074	Jet Load	RRT checklist items	Yes	Satisfactory
X6CXB-079	Jet Load	RRT checklist items	Yes	Satisfactory
X6CXB-099	Jet Impingement	RRT checklist items	Yes	Satisfactory
X6CXB-128	Jet Impingement	RRT checklist items	Yes	Satisfactory
X6CXB-130	Jet Impingement	RRT checklist items	Yes	Satisfactory
X6CXD-08	Aux. Bldg. Missles	RRT checklist items	Yes	Satisfactory
X6CXD-01	Unit 1 Containment Missile Analysis	RRT checklist items	Yes	Satisfactory
X6CHG-20.1	AFW Pumphouse P/T Analysis	RRT checklist items	Yes	Satisfactory
X4C1202V04	NSCW Pump Verification	RRT checklist items	Yes	Satisfactory
X4C1302V03	AFW Pump - Overspeed Trip Verification	RRT checklist items	Yes	Satisfactory
X6CXA-14	Whip/Jet Control Bldg.	RRT checklist items	Yes	Satisfactory
X6CXA-25	Whip/Jet AFW Pumphouse	RRT checklist items	Yes	Satisfactory, Concur with GPC-RR Findings 4-71, 4-72.
X6CXA-34	Containment Jet Impingement	RRT checklist items	Yes	Satisfactory, Concur with GPC-RR Findings 4-89, 4-72.
X6CXC-025	Flooding	RRT checklist items	Yes	Satisfactory, Concur with GPC-RR Finding 4-68.
X4C1301V03	AFW Pump Steam Supply and Exhaust Pressure Drops	RRT checklist items	Yes	Satisfactory, Concur with GPC-RR Finding 4-70.
X6CXA-35	SIS Jet Thrust	RRT checklist items	Yes	Quality Class Listed as 212, LDL lists Class as 111. Otherwise, satis- factorily
X4PCESS16	Pipe Wall Thickness	RRT checklist items	Yes	Satisfactory, Concur with GPC-RR Finding 4-79.

TABLE 4
CALCULATIONS REVIEWED
(SHEET 2 OF 3)

<u>Number</u>	<u>Title Description</u>	<u>NRC Reviewed For (SEE NOTE 1)</u>	<u>RRT Review</u>	<u>Findings/Comments</u>
X4PCESS17	Pipe Wall Thickness	RRT checklist items	Yes	Satisfactory, Concur with GPC-RR Finding 4-79.
X4PCESS20	Pipe Wall Thickness	RRT checklist items	Yes	Satisfactory, Concur with GPC-RR Finding 4-79.
X4PCESS22	Pipe Wall Thickness	RRT checklist items	Yes	Satisfactory, Concur with GPC-RR Finding 4-79.
1K3-1205-006-02	Stress Calculation X4CP-7008	Design Conditions (Piping basic design data). Incorporation of design changes.	No	Satisfactory
1K3-1205-019-02	Stress Calculation X4CP-7011	Design Conditions (Piping basic design data). Incorporation of design changes.	No	Satisfactory
1K3-1202-111-02	Stress Calculation X4CP-7169	Design Conditions (Piping basic design data). Incorporation of design changes.	No	Piping analysis indicates for lines 1202-111-2" & 1202-376-2" pressure is 150 psig. LDL indicates that the pressure is 200 psig. Support at Node PT 50 deleted, no supporting documentation. Otherwise, satisfactory.
1K3-1202-110-02	Stress Calculation X4CP-7004	Design Conditions (Piping basic design data). Incorporation of design changes.	No	Piping analysis indicates pressure is 150 psig. LDL indicates pressure to be 200 psig. Otherwise, satisfactory.

TABLE 12-1

INSPECTION AND RECORD REVIEW DETAILS FOR VALVE
ENCAPSULATION VESSEL V1-1205-V4-001
(SHEET 1 OF 3)

A. Inspection Details

Inspection for Compliance with Code
and Drawing 1X4AH04-23-13

Findings/Comments

- Configuration	Support/bracing in vessel that was not depicted on the drawing or described in the vessel specification. The apparent lack of requirements/controls for these supports/brackets will be identified as Unresolved Item 424/85-35-15.
- Material thickness and weld size for anchor bolt chairs	Satisfactory
- Welds 7-12, 17, 18, 46, 47, 49, and 50	Welds 49 and 50 are partly undersize and show evidence of possible overgrinding. This is identified as Unresolved Item 424/85-35-14. The condition is possibly related to repairs described on DR MD 2264.
- Vessel nameplate	Satisfactory
- Valve nameplate	Satisfactory
- General surface condition (all visible features)	Satisfactory

TABLE 12-1

INSPECTION AND RECORD REVIEW DETAILS FOR VALVE
ENCAPSULATION VESSEL V1-1205-V4-001
(SHEET 2 OF 3)

B. Records Review Details

Receipt Records Review for Compliance With
Code, Drawing, and Procurement Specification

Findings/Comments

- Hydrotest Report	Satisfactory
- Air Test Report	Satisfactory
- Certification of Painting	Satisfactory
- Code Data Report for Vessel	Satisfactory
- Code NPV Report for Valve	GPC requested to explain inconsistency-all piping is "L" grade but valve is not. Inspector Followup Item (84-35-16)
- Pipe NPP-1 Code Data Report	Satisfactory
- Material Certifications for vessel flanges, 4" pipe and 14" pipe	Satisfactory
- Material Certifications for E308-16, E309-16, ER308 and ER308L welding materials	Satisfactory
- Penetrant Examination Reports for welds 17 and 18	Satisfactory
- Radiographic Examination Reports for welds 1, 3, and 46	Satisfactory
- Welding Material Certifications and welder qualifications for welds 16, 17, and 46	Satisfactory

TABLE 12-1

INSPECTION AND RECORD REVIEW DETAILS FOR VALVE
ENCAPSULATION VESSEL V1-1205-V4-001
(SHEET 3 OF 3)

C. <u>Installation Records Reviewed for Compliance With Code and PPP Procedure Requirements</u>	<u>Findings/Comments</u>
- Field Process Sheet for Tag No. V-1-1205-V4-001 (dated 6/5/81) - for setting, bolting, and grouting	Satisfactory
- Material Requisition for Encapsulation Vessel 1-1205-V4-001, SN 2431.10	Project class improperly identi- fied as 212. No apparent safety significance.
- Field Process Sheet for removing of expansion joint shipping clip - Mark No. V-1-1205-V4-001 (dated 9/16/83) (included penetrant examination report, dated 5/31/85 for removal area.)	Satisfactory
- Field Process Sheet for removing valve motor - Mark No. 1-1205-V4-001 (dated 9/20/82)	Satisfactory
- NCR MD-1888 (8/21/81) dispositioning damage to vessel head	Satisfactory
- Field Process Sheet for rewelding anchor bolts - Mark No. 1-1205-V4-001 (dated 10/12/81)	Satisfactory
- NCR MD-1217 (8/28/81) dispositioning improperly installed anchor bolts	Satisfactory
- Periodic preventive maintenance/storage check record for vessel	Satisfactory
- Periodic preventive maintenance/storage check record maintained for valve up to turnover to operations	Satisfactory

TABLE 12-2

INSPECTION AND RECORDS REVIEW DETAILS FOR SPOOL PIECES

A. Inspection DetailsSpool Piece IdentificationHardware InspectionFindings

Isometric 1K3-1205-003-01

Spool Piece 003-S-08
(14" pipe)

Visual examination for configuration per drawing; proper Code required nameplate; 163' 2 3/16" elevation, 5' 6 15/16" length between elbows and 4" length between nipple and valve per drawing and final weld requirements per Code and drawing.

Satisfactory

Spool Piece 028-S-01
(14" pipe)

Visual examination for configuration per drawing, proper Code required nameplate, orientation and identification of valve 122, 6" length per drawing and final weld requirements per Code and drawing.

Satisfactory

Spool Piece 061-S-01

Visual examination for configuration per drawing and final weld requirements per Code and drawing

Satisfactory

B. Records Review DetailsRecords ReviewFindingsSpool Piece IdentificationIsometric 1K3-1205-003-01
Spool Piece 028-S-01

The following records were reviewed for compliance with the Code and drawing -

- NPP-1 Data Report for spool piece (ASME Class 2)
- NPV Reports for valve SNs E 9001-120-1 and BT291 (Class 2)
- Pipe and fittings "L" grade austenitic stainless steel
- Valve SNs match those noted in a walkdown
- Radiography reports for pipe welds
- Radiography reports for repairs to valve SN E9001-120-1
- Valve materials for valve SNs E9001-120-1 and BT291

Satisfactory

TABLE 13

READNESS REVIEW MECHANICAL CONSTRUCTION TEAM
FINDINGS REVIEWED

<u>Finding Number</u>	<u>RR Finding</u>	<u>Level/ Category</u>	<u>Resolution/ Project Response</u>	<u>NRC Reviewed For</u>	<u>Findings/Comment</u>
4-45	Arc strikes/weld spatter on Code piping.	II	Removed in accordance with PPP procedure IX-52.	Hardware surveyed for complete removal	Satisfactory
4-56	Minimum clearances on installed code piping (inadequate hot pipe to raceway separation).	I	Dispositioned use as is and minimum separation requirement added to specifications.	Unit 1 containment surveyed for additional separation problem specification revisions reviewed. (See text)	Additional separation problems identified, (IFI 85-40-01). (See text)
4-46	Weld stencils not in agreement with associated process sheets.	III	Process sheets corrected based on hardware verification and other associated supporting data.	Hardware surveyed/records reviewed to substantiate proper & complete corrective action.	Satisfactory
4-83	Failure to notify NRC on revised corrective action for 50.55(e) item on ER-309L weld wire Lot No. 05766 (424/CDR 83-42)	III	Revision of related welding procedures not done since wire was removed from site. Revised response to be submitted to NRC (See Note)	Agreement with details regarding CDR 83-42 and related CDR 84-56 in NRC inspection report Nos. 84-18, 84-30 and 84-14.	Unsatisfactory GPC project personnel denied need for a revised response to a CDR 83-42. (See Note)

NOTE: Resolution of CDR 83-42 by removal of the ER-309L weld wire from the site would not have satisfied related CDR 84-56 due to use of the wire on containment liner penetration welds. Details regarding NRC review of these CDRs are included in the inspection reports listed. This item is identified as Inspector Followup Item 424/85-35-17. Inadequate Resolution of Readiness Review Findings.