

June 16, 2000

Mr. J. B. Beasley, Jr.
Vice President
Southern Nuclear Operating
Company, Inc.
Post Office Box 1295
Birmingham, Alabama 35201-1295

SUBJECT: SAFETY EVALUATION OF THE CONTAINMENT INSERVICE INSPECTION PROGRAM FIRST 10-YEAR INTERVAL REQUESTS FOR RELIEF FOR SOUTHERN NUCLEAR OPERATING COMPANY, VOGTLE ELECTRIC GENERATING PLANT, UNITS 1 AND 2 (TAC NOS. MA5314 AND MA5315)

Dear Mr. Beasley:

By letter dated April 5, 1999, Southern Nuclear Generating Company (licensee) submitted relief requests from ASME Code, Section XI and regulatory requirements contained in Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a for the first 10-year containment inservice inspection (ISI) program for Vogtle Units 1 and 2. By letter dated October 20, 1999, the licensee provided additional information in response to NRC staff's questions. The staff has reviewed your containment relief requests against the requirements of the 1992 Edition, 1992 Addenda of the ASME Code, Section XI for Class MC and CC components.

Relief is granted from or alternatives are authorized to the inspection requirements which have been determined to be impractical to perform, where an alternative provides an acceptable level of quality and safety, or where compliance would result in hardship or unusual difficulty without a compensating increase in quality and safety.

The alternatives proposed in relief requests (RR) RR-E-1, RR-E-3, RR-E-4, RR-E-5, RR-L-1, RR-L-2, and the relief request from the regulatory reporting requirements of 10 CFR 50.55a(b)(2)(ix)(A) and (D) are authorized pursuant to 10 CFR 50.55a(a)(3)(i) on the basis that they provide an acceptable level of quality and safety. The alternative proposed in RR-E-2 is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) on the basis that compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Relief is granted for RR-L-3 pursuant to 10 CFR 50.55a(g)(6)(i) for the first ten-year interval. In making this determination, the staff considered the impracticality of performing the required inspections and the burden on the licensee if the Code requirements were imposed.

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The ISI program relief requests which are authorized herein are acceptable for implementation for the first ten-year containment inspection interval. The granting of relief is based upon the fulfillment of any commitments made by the licensee in the basis for each relief request and the alternatives proposed. The staff's safety evaluation is enclosed.

Sincerely,

/RA/

L. Raghavan, Acting Chief, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-424 and 50-425

Enclosure: Safety Evaluation

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
OF THE
FIRST 10-YEAR INTERVAL INSERVICE INSPECTION
REQUESTS FOR RELIEF
FOR
SOUTHERN NUCLEAR OPERATING COMPANY
VOGTLE ELECTRIC GENERATING PLANT, UNIT 1 AND 2
DOCKET NOS. 50-424 AND 50-425

1.0 INTRODUCTION

Inservice inspection of the American Society of Mechanical Engineers (ASME) Code Class MC and CC components will be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel (B&PV) Code and applicable addenda as required by Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). Section 50.55a(a)(3) states that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if (i) the proposed alternatives would provide an acceptable level of quality and safety, or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(5), if the licensee determines that conformance with an examination requirement of Section XI of the ASME Code is not practical for its facility, information will be submitted to the Commission in support of that determination and a request made for relief from the ASME Code requirement. After evaluation of the determination, pursuant to 10 CFR 50.55a(g)(6)(i), Commission may grant relief and may impose requirements that are determined to be authorized by law, will not endanger life, property, or the common defense and security, and are otherwise in the public interest, giving due consideration to the burden upon the licensee that could result if the requirements were imposed. The containment inservice inspection program for Vogtle Electric Generating Plant (VEGP), Units 1 and 2 was prepared to meet the requirements of Subsection IWE and IWL of the 1992 Edition, 1992 Addenda, of the ASME Code, Section XI.

Pursuant to 10 CFR 50.55a(g)(6)(ii)(B), for ASME Code Class MC and CC components (including integral attachments of MC and metallic liners of CC components), licensees will

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expedite the inservice inspection requirements of Subsection IWE and Subsection IWL of the

1992 Edition with the 1992 Addenda and complete the first inspection by September 9, 2001.

Section 50.55a(g)(6)(ii)(B)(1) states that the inservice examinations specified for the first period of the first inspection interval in Subsection IWE of the 1992 Edition and addenda as modified in 10 CFR 50.55a(b)(2)(ix) will serve the same purpose for operating plants as the preservice examination. 10 CFR 50.55a(g)(6)(ii)(B)(2) allows licensees to implement the inservice examinations which correspond to the number of years of operation which are specified in Subsection IWL of the 1992 Edition and addenda as modified in 10 CFR 50.55a(b)(2)(ix) and will serve the same purpose for operating plants as the preservice examination specified for plants not yet in operation.

By letter dated April 5, 1999, the licensee submitted to the NRC its alternatives to the Section XI requirements for IWE/IWL pursuant to 10 CFR 50.55a(a)(3). The NRC staff's evaluation of the licensee's proposed relief requests follows.

2.0 EVALUATION OF RELIEF REQUESTS

- A. Relief Request RR-E-1 for IWE Requirements for Class MC Components IWE-2500, Table IWE-2500-1, Examination Category E-D, Item Nos. E5.10, Seals and E5.20, Gaskets

Code Requirement: IWE-2500, Table IWE-2500-1 requires seals and gaskets on airlocks, hatches, and other devices to be visually examined, VT-3, once each interval to assure containment leak-tight integrity.

Licensee's Proposed Alternative: The licensee proposed to use 10 CFR Part 50, Appendix J testing in lieu of the ASME Section XI requirements to ensure the leak tightness of seals and gaskets.

The licensee stated:

The leak tightness of seals and gaskets identified in section I will be tested in accordance with 10 CFR 50, Appendix J. If a seal or gasket becomes visually accessible, it will be visually inspected by maintenance personnel before reassembly or closure and 10 CFR 50, Appendix J leakage testing.

Licensee's Basis for Proposed Alternative (as stated):

Practical VT-3 visual examination considerations of these seals and gaskets would require the joints to be disassembled since many of the surfaces of the seals and gaskets are normally inaccessible. The ASME Code Committee recognized that disassembly of the joints to perform visual examinations was not warranted, and the 1998 Edition of ASME Section XI removed the examination requirement.

The proposed alternate examination (Appendix J, Option B) provides a periodic, non-intrusive test method which will ensure that the integrity of the seals and gaskets is being maintained. As noted in 10 CFR 50, Appendix J, the purpose of the testing is to ensure that leakage of containment penetrations whose design incorporates resilient seals, gaskets, sealant compounds, electrical penetrations fitted with seal assemblies remains below established limits. Damage to seals or gaskets, which could affect containment integrity is best detected with this type of test and will be performed as follows:

Electrical Penetrations and Containment Penetrations Whose Design Incorporates Resilient Seals, Gaskets, Or Sealant Compounds

Those penetrations that are not disassembled during the 10-year interval will receive an Appendix J Option B test at least once in the 10-year interval. For those penetrations that are disassembled or opened, an Appendix J test is required upon final assembly (prior to start up). Additionally, if a seal (including O-rings) or a gasket is replaced, it will be visually inspected by maintenance personnel before re-assembly or closure. These tests and inspections will assure the leak tightness of primary containment and provide an acceptable level of quality and safety.

Airlocks and the Containment Equipment Hatch

The Personnel Airlocks are opened as needed during maintenance outages and refueling outages. Prior to final closure, the accessible portions of gaskets and the door sealing faces are inspected for damage that could affect the leak tightness of the seal. If gasket replacement is necessary, the new gasket will be visually inspected by maintenance personnel before re-assembly or closure. Door seals will be Appendix J tested in accordance with the Technical Specification requirements within seven days of opening and once every 30 days during periods of frequent opening.

The Containment Equipment Hatch is normally removed during refueling outages. If gasket replacement is necessary, the new gasket will be visually inspected by maintenance personnel before re-assembly or closure. Prior to establishing containment integrity following the refueling outage, the Containment Equipment Hatch is leak rate tested in accordance with Appendix J.

These tests and inspections will assure the leak tightness of primary containment and provide an acceptable level of quality and safety.

Staff Evaluation: The Code requires that seals and gaskets on airlocks, hatches, and other devices be VT-3 visually examined once each interval to assure containment leak-tight integrity. The licensee proposes to use Appendix J, Option B, Type B testing as a verification of containment integrity rather than disassembly and reassembly of the subject components for the sole purpose of examination. The 1993 Addenda to Section XI has recognized that disassembly of the subject components to visually examine the seals and gaskets is unwarranted. The staff agrees that the functionality of the containment penetration seals and gaskets would be verified during the Type B testing as required by 10 CFR Part 50, Appendix J.

Consequently, the licensee's proposed alternative to verify containment penetration seals and gaskets will provide an acceptable level of quality and safety. Therefore, the licensee's proposed alternative contained in Relief Request RR-E-1 is authorized pursuant to 10 CFR 50.55a(a)(3)(i).

B. Relief Request RR-E-2, IWE-2420(b), Successive Examinations After Repair

Code Requirement: Paragraph IWE-2420(b), requires that when component examination results require evaluation of flaws, evaluation of areas of degradation, or repairs in accordance with IWE-3000, and the component is found to be acceptable for continued service, the areas containing such flaws, degradation, or repairs will be reexamined during the next inspection period. The reexaminations will be performed in accordance with Examination Category E-C and at the schedule specified in the inspection requirements of IWE-2411 or IWE-2412.

Licensee's Proposed Alternative: In accordance with 10 CFR 50.55a(a)(3)(ii), the licensee proposed to restore the component to an acceptable condition for continued service and remove the requirement for successive examination.

The licensee stated:

Repairs will be performed in accordance with IWA-4000, to restore the component to an acceptable condition. Successive examinations as required by IWE-2420(b) will not be performed; however, successive examinations will continue to be done on those flaws or areas of degradation which have been accepted for continued service by evaluation.

Licensee's Basis for Proposed Alternative (as stated):

10 CFR Part 50.55a was amended in the Federal Register (61 FR 41303) to require the use of the ASME Section XI, 1992 Edition, 1992 Addenda, when performing containment examinations. The purpose of the repair is to restore the component to an acceptable condition for continued service in accordance with the acceptance standards of IWE-3000. When making repairs, IWA-4150 requires the owner to conduct an evaluation of the suitability of the repair including consideration of the cause of failure.

Repairs are performed in accordance with IWA-4000, the intent of which is to use the construction code to restore the component to its original condition where practical. If a repair has restored the component to an acceptable condition, successive examinations are not warranted. If the repair was not suitable, then the repair does not meet code requirements and the component is not acceptable for continued service; further repair work would be necessary. No similar requirement is found for Class 1, 2, and 3 ASME Section XI repairs. Conducting successive examinations on components that have been repaired would result in hardship without a compensating level of quality and safety. In addition, if the repair area is subject to accelerated degradation, the repair would still require augmented examination in accordance with Table IWE-2500-1, Examination Category E-C.

Staff Evaluation: Paragraph IWE-2420(b) requires that when examination results in evaluation of flaws or areas of degradation (per IWE-3000), and the component is acceptable for continued service, or when examinations result in performance of a repair/replacement activity, the items containing such flaws, areas of degradation, or areas subjected to a repair/replacement, will be re-examined during the next inspection period. The licensee is proposing not to perform any reexaminations on repaired components during the next or successive inspection periods. However, the licensee will perform successive examinations on those flaws or areas of degradation which have been accepted for continued service by evaluation (IWE-2420(c)).

The staff finds that when repairs are complete, IWA-4150 requires licensees to evaluate the suitability of the repair. When a repair is required because of failure of an item, the evaluation will consider the cause of failure to ensure that the repair is suitable. Considering that the failure mechanism is identified and corrected as required and the repair receives pre-service examinations as required, the proposed alternative will provide reasonable assurance of structural integrity. In doing this, the requirements of successive examinations are deemed to be unnecessary. Furthermore, IWB-2420(b), IWC-2420(b), and IWD-2420(b) do not require the successive inspection of repairs for ASME Code Class 1, 2, and 3 components as required in IWE-2420(b) for ASME Code Class MC components. On this basis, the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) that compliance with the specific code requirements would result in hardship without a compensating increase in the level of quality and safety.

- C. Relief Request RR-E-3 for IWE-2500, Table IWE-2500-1, Examination Category E-G, Pressure-retaining Bolting, Item E8.20

Code Requirement: ASME Section XI, 1992 Edition, 1992 Addenda, Table IWE-2500-1, Examination Category E-G, pressure-retaining bolting, Item E8.20, requires bolt torque or tension testing on bolted connections that have not been disassembled and reassembled during the inspection interval.

Licensee's Proposed Alternative: In accordance with 10 CFR 50.55a(a)(3)(i), the licensee proposed to visually examine accessible bolted connections in accordance with the requirements of Table IWE-2500-1 and to assure that the bolted connections meet the pressure test requirements of Table IWE-2500-1.

The licensee stated:

The following examinations and tests required by Subsection IWE ensure the structural integrity and the leak-tightness of Class MC (Metallic Containment) pressure-retaining bolting, and, therefore, no additional alternative examinations are proposed:

1. When accessible, exposed surfaces of bolted connections shall be visually examined in accordance with the requirements of Table IWE-2500-1, Examination Category E-G, Pressure-retaining Bolting, Item No. E8.10, and

2. Bolted connections shall meet the pressure test requirements of Table IWE-2500-1, Examination Category E-P, All Pressure-retaining Components (10 CFR 50, Appendix J leak-rate test).

Licensee's Basis for Proposed Alternative (as stated):

10 CFR Part 50.55a was amended in the Federal Register (61 FR 41303) to require the use of the ASME Section XI, 1992 Edition, 1992 Addenda, when performing containment examinations. Bolt torque or tension testing is required on IWE bolted connections that have not been disassembled and reassembled during the inspection interval, but is not required on any other ASME Section XI Class 1, 2, or 3 bolted connections. This type of testing was removed from the 1998 ASME Section XI Code.

Bolted flanges on containment airlocks and bolted flanges on small piping penetrations each receive a 10 CFR Part 50, Appendix J, leak-rate test. The performance of the 10 CFR Part 50, Appendix J test itself proves that the bolt torque or tension remains adequate to provide a leak rate that is within acceptable limits. The torque or tension value of bolts only becomes an issue if the leak-rate is excessive. Once a bolt is torqued or tensioned, it is not subject to dynamic loading that could cause it to experience significant change. Appendix J testing and visual inspection is adequate to demonstrate that the design function is met.

Staff Evaluation: The Code requires that the pressure-retaining bolting that has not been disassembled and reassembled during the inspection interval be torque or tension tested. This examination is used to aid in the determination that a leak-tight seal exists and that the structural integrity of the subject bolted connection is maintained. The licensee proposed to use VT-1 visual examination once each inspection interval as required by Examination Category E-G, Item E810 and the 10 CFR Part 50, Appendix J leak rate testing as an alternative to the Code requirement to verify the integrity of the penetrations with bolted connections. The performance of Appendix J, Type B test will prove that the bolt torque or tension remains adequate to provide a leak rate that is within acceptable limits. Appendix J testing and the VT-1 visual examination are adequate to demonstrate that design function is met. In addition, the overall containment leakage test in accordance with 10 CFR Part 50, Appendix J (Type A tests) will provide additional assurance that there is no significant leakage through the containment pressure boundary.

If the adequacies of bolted connections are verified during Appendix J testing, the staff finds that the additional torque testing as per Table IWE-2500(E8.20) is unwarranted. Moreover, the licensee's proposed alternative will provide an acceptable level of quality and safety. Therefore, the staff authorizes the licensee's proposed alternative in RR-E-3 pursuant to 10 CFR 50.55a(a)(3)(i) on the basis that it provides an acceptable level of quality and safety.

D. Relief Request RR-E-4 for All Class MC, Subarticle IWE-2200(g), Pre-service Examination Requirements of Reapplied Painted or Coated Containments

Code Requirement: ASME Section XI, 1992 Edition, 1992 Addenda, Subsection IWE-2200(g) requires that when paint or coatings are reapplied, the condition of the new paint or coating shall be documented in the preservice examination records.

Licensee's Proposed Alternative: In accordance with 10 CFR 50.55a(a)(3)(i), the licensee has proposed to use its qualified coatings program to examine reapplied paint and coatings.

The licensee stated:

The reapplied paint and coatings on the containment vessel will be examined in accordance with the VEGP "Qualified (N) Coatings" program. If degradation of the coating is identified, additional measures will be applied to determine if the containment pressure boundary is affected. Although repairs to paint and coatings are not subject to the repair/replacement rules of ASME Section XI based on the Code's response to Inquiry 97-22, repairs to the primary containment boundary, if required, would be conducted in accordance with ASME Section XI Code rules.

Licensee's Basis for Proposed Alternative (as stated):

The paint and coatings on the containment pressure boundary were not subject to Code rules when originally applied and are not subject to ASME Section XI rules for repair or replacement in accordance with IWA-4111(b)(5). The VEGP coating program, which is applied and inspected in accordance with a quality assurance program which meets the requirements of 10 CFR 50, Appendix B, verifies the adequacy of applied coatings. *Recording* the condition of reapplied coating in the preservice record does not substantiate the containment structural integrity. However, SNC acknowledges that the quality and integrity of coatings applied is relevant to the containment's functional integrity. This assurance is best accomplished by visually inspecting the coating, which is accomplished through the VEGP "Qualified (N) Coatings" program. Should deterioration of the coating in the reapplied area occur, the area would require additional evaluation regardless of the preservice record. Recording the condition of the new paint or coating in the preservice records does not increase the level of quality and safety of the containment.

In NRC SECY 96-080 dated April 17, 1996, the Commission responded to Comment 3.2, which involves IWE-2200(g), by stating "In the NRC's opinion, this does not mean that a visual examination must be performed with every application of paint or coating. A visual examination of the topcoat to determine the soundness and the condition of the topcoat should be sufficient." The visual examination is currently accomplished through the VEGP "Qualified (N) Coatings" program.

Staff Evaluation: The licensee has proposed to perform paint and coating examinations in accordance with existing plant requirements rather than documenting the condition of the new paint or coating on the preservice examination report as required by IWE-2200(g).

The licensee states that its coating program, which is applied and inspected in accordance with a quality assurance program that meets the requirements of 10 CFR Part 50, Appendix B, verifies the adequacy of applied coatings. Further, degraded coatings in the reapplied area would require additional evaluation regardless of the preservice record, and its subsequent documentation in the preservice record does not increase the level of quality and safety of the containment.

The licensee's nuclear coatings program, which meets the requirements of 10 CFR Part 50, Appendix B, provides a conservative approach to the inspection and documentation of new coatings. The staff finds the proposed alternative adequate for protecting the inside steel surfaces of the containment. Therefore, the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(i) on the basis that it provides an acceptable level of quality and safety.

E. Relief Request RR-E-5 for IWE-2500, Examination and Pressure Test Requirements, IWE-2500(b) Visual Examination of Paint and Coatings Prior to Removal

Code Requirement: ASME Code, 1992 Edition, 1992 Addenda, Subarticle IWE-2500(b), requires that when paint or coatings are to be removed, the paint or coatings shall be visually examined in accordance with Table IWE-2500-1 prior to removal.

Licensee's Proposed Alternative: In accordance with 10 CFR 50.55a(a)(3)(i) the licensee proposed to use its existing coatings program for examination of paint and coatings.

The licensee stated:

The paint and coatings on the containment vessel will be examined in accordance with the VEGP "Qualified (N) Coatings" program. If degradation of the coating is identified, additional measures will be applied to determine if the containment pressure boundary is affected. Although repairs to paint or coatings are not subject to the repair/ replacement rules of ASME Section XI based on the Code's response to Inquiry 97-22, repairs to the primary containment boundary, if required, would be conducted in accordance with ASME Section XI Code rules.

Licensee's Basis for Proposed Alternative (as stated):

10 CFR 50.55a was amended, as cited in the Federal Register (61 FR 41303) to require the use of the 1992 Edition, 1992 Addenda, of ASME Section XI when performing containment examinations. Paint and coatings are not part of the containment pressure boundary under current Code rules because they are not associated with the pressure-retaining function of the component. The interiors of containments are painted to prevent corrosion and to aid in contamination removal efforts. Paint and coatings on the containment pressure boundary were not subject to Code rules when they were originally applied and are not subject to ASME Section XI rules for repair or replacement in accordance with IWA-4111(b)(5). Deterioration of the paint or coating materials, e.g., flaking, scaling, etc., on containment would be an indicator of potential degradation of the containment pressure boundary. Additional measures would be employed to determine the nature and extent of any degradation, if present. The application

of ASME Section XI rules for removal of paint or coatings when unrelated to an ASME Section XI repair or replacement activity, does not provide a compensating increase in the level of quality and safety.

Staff Evaluation: The licensee proposes to examine existing painted or coated components prior to removal under its "Qualified (N) Coatings" program. In addition, the licensee indicated that paint and coatings were not part of the Code rules when they were originally applied and are not subject to ASME Section XI rules for repair or replacement in accordance with IWA-4111(b)(5). However, if degradation of the coating is identified, the licensee has committed to implementing additional measures to determine if the degradation will have an effect on the containment pressure boundary.

Based upon the licensee's "Qualified (N) Coatings" program and the implementation of additional measures to determine if degraded paint or coatings will affect the containment pressure boundary, the staff concludes that the proposed alternative, as stated by licensee, is adequate for protecting the containment pressure boundary and will provide an acceptable level of quality and safety. Therefore, the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(i) on the basis that it provides an acceptable level of quality and safety.

F. Request for Relief RR-L-1, Visual Examination Requirements for Minimum Illumination and Maximum Direct Distance of Class CC Components under IWL-2310

Code Requirement: ASME Code, Section XI, Subarticle IWL-2310, Visual Examination and Personnel Qualification, requires VT-1C visual examination to be conducted to determine concrete deterioration and distress for suspect areas detected by VT-3C examinations and requires the use of IWA-2210 for VT-1 visual examination, which establishes the minimum illumination, maximum direct distance, and maximum procedure demonstration lowercase character height for conduct of the visual exam.

Licensee's Proposed Alternative: In accordance with 10 CFR 50.55a(a)(3)(i), the licensee will perform the VT-3C examination with the exception of the requirements found in IWA-2210, Table IWA-2210-1 for visual examination.

The licensee stated:

VT-3C examinations will be performed as required by IWL-2310 except that instead of using the minimum illumination, maximum direct examination distance, and maximum procedure demonstration lower case character height requirements specified in IWA-2210 and Table IWA-2210-1 for VT-3 examinations, the recommendations of the [Registered Professional Engineer] RPE for illumination and distance will be implemented.

Licensee's Basis for Proposed Alternative (as stated):

The VT-3 requirements specified in IWA-2210 and Table IWA-2210-1 were developed for the examination of components such as Class 1 pump and valve bodies, the Class 1 reactor pressure vessel interior, Class 3 welded attachments, and Class 1, 2, and 3 supports. VT-3 examinations are conducted to determine the general mechanical and structural condition of components and their

supports by verifying parameters such as clearances, settings, and physical displacements. Additionally, VT-3 examinations are conducted to detect discontinuities and imperfections, such as loss of integrity at bolted or welded connections, loose or missing parts, debris, corrosion, wear or erosion. For these Class 1, 2, and 3 components, small amounts of corrosion/erosion or small crack-like surface flaws may be detrimental to the structural integrity of the component; therefore, the stringent requirements of IWA-2210 and Table IWA-2210-1 are generally appropriate.

However, it was recognized by the industry and the NRC during the development of the implementing 10 CFR 50.55a rules that IWA-2210 and Table IWA-2210-1 requirements were excessively stringent for the IWE-required examination of the metal portion of the containment. Therefore, the NRC changed the requirements to allow that "When performing remotely the visual examinations required by Subsection IWE, the maximum direct distance specified in Table IWA-2210-1 may be extended and the minimum illumination requirements specified in Table IWA-2210-1 may be decreased provided that the conditions or indications for which the visual examination is performed can be detected at the chosen distance and illumination".

SNC has concluded that, similar to the consideration used for the IWE examinations, the use of the VT-3 requirements found in IWA-2210 and Table IWA-2210-1 when performing VT-3C examinations of the concrete surfaces is also excessively stringent and should not be applied. This is based on the recognition that due to the nature of concrete, a concrete containment will have numerous, small "shrinkage-type" surface cracks or other imperfections that are not detrimental to the structural integrity of the containment. The application of IWA-2210 and Table IWA-2210-1 "minimum illumination requirements," "maximum direct visual examination distance requirements," and "maximum procedure demonstration lower case character height requirements," to attempt to identify these small "shrinkage-type cracks" or other imperfections is considered to be unnecessary and could result in a large number of man-hours erecting scaffolding, using lifts, or evaluating insignificant indications, etc.

Per the requirements of IWL-2310, the Registered Professional Engineer (RPE) is experienced in evaluating the inservice condition of structural concrete and is knowledgeable of the design and Construction Codes and other criteria used in design and construction of concrete containments. The RPE will use experience and training to determine the necessary requirements to detect indications that are detrimental to the containment integrity.

Staff Evaluation: To comply with the expedited examination of containment required by 10 CFR 50.55a(g)(6)(ii)(B), licensees must perform visual examinations on Class MC and metallic liners of Class CC concrete components per the requirements of IWE and visual examinations on Class CC concrete components per the requirements of IWL of ASME Section XI.

The licensee proposed an alternative to the requirements of IWL-2310, which invokes IWA-2210, Table IWA-2210-1, which specifies minimum illumination and maximum direct

distances for visual examination. The licensee indicated that the RPE would recommend the minimum illumination and maximum distance to complete the required containment visual examination. The staff, having reviewed the licensee's submittal, found that the proposed alternative examination did not specify how the minimum illumination and maximum distances would be determined and controlled by the RPE. Following a telephone conference with the staff, the licensee in a letter dated October 20, 1999, provided supplemental information clarifying how the RPE would conduct the proposed alternative visual examination. In the supplemental information provided to the staff, the licensee stated that indications of interest would be detectable at the chosen distances and illumination as specified by the RPE. Further, the procedures used would be demonstrated to the authorized nuclear inservice inspector (ANII) for the concrete examination, and the RPE will use the appropriate American Concrete Institute (ACI) documents as guidance for determining the limiting flaw size.

While the use of the licensee's proposed alternative does not result in a quantitative evaluation of the illumination, it provides a method to verify that the indications of interest are visually detectable. The staff finds that by having the licensee demonstrate the procedures to the satisfaction of the ANII, the illumination and distances chosen by the licensee will be adequate to detect indications of interest. Having demonstrated that the indications of interest are detectable at varying distances and illumination, the proposed alternative will provide an acceptable level of quality and safety. Therefore, the staff authorizes the licensee's proposed alternative pursuant to 10 CFR 50.55a(a)(3)(i) for the first ten-year containment ISI interval.

G. Relief Request RR-L-2 for IWL-2410, Concrete and IWL-2420 Unbonded Post-Tensioning Systems

Code Requirement: ASME Code, Section XI, 1992 Edition, 1992 Addenda, Subarticle IWL-2410, Concrete, requires all concrete to be examined in accordance with IWL-2510 at 1, 3, and 5 years following the completion of the containment Structural Integrity Test CC-6000 and every 5 years thereafter. Subarticle IWL-2420, Unbonded Post-Tensioning Systems, requires unbonded post-tensioning systems to be examined in accordance with IWL-2520 at 1, 3, and 5 following the completion of the containment structural integrity test and every 5 years thereafter.

Licensee's Proposed Alternative: In accordance with 10 CFR 50.55a(a)(3)(i), the licensee will conduct IWL examinations concurrently on Units 1 and 2 taking exception to IWL-2421 for sites with two plants.

The licensee stated:

The next tendon and concrete examinations will be performed on VEGP-1 and 2 by August 1, 2000 \pm 1 year and every 5 years \pm 1 year thereafter.

Licensee's Basis for Proposed Alternative (as stated):

Due to the expense of repairing, inspecting, and testing the tendon surveillance platforms, Georgia Power Company, the former operator and licensee of VEGP and sister company to SNC, the current operator and licensee, requested a change to the Technical Specifications for VEGP -1 and 2 to allow testing of both units during the same time period. The requested change was authorized by the NRC in their letter dated September 12, 1989, to Georgia Power Company, and

resulted in Amendments 23 and 4 to the Technical Specifications for VEGP-1 and 2, respectively. The use of the above approved Technical Specification change will continue to provide assurance of containment structural integrity.

Staff Evaluation: The Code in Section XI, subparagraph IWL-2410, requires concrete examinations commence not more than 6 months prior to the specified dates (from the structural integrity test) and shall be completed not more than 6 months after such dates. The 10-year and subsequent examinations shall commence not more than 1 year prior to the specified dates and shall be completed not more than 1 year after such dates.

The licensee in its relief request proposed to perform the required examination on Units 1 and 2 respectively, by August 1, 2000, \pm 1 year and every 5 years \pm 1 year thereafter. The staff, having reviewed the licensee's submittal, found that the proposed alternative examination may extend beyond the time to complete the examination as required by the Code. Following a telephone conference with the staff, the licensee in a letter dated October 20, 1999, provided supplemental information which clarified its intent to complete the Code-required examination within the time allowed by the Code.

The staff having approved the testing of both units in our safety evaluation of VEGP's TS Amendments 23 and 4 for Units 1 and 2, respectively, finds that the proposed alternative will provide an acceptable level of quality and safety. Therefore, the staff authorizes the proposed alternative pursuant to 10 CFR 50.55a(a)(3)(i) on the basis that the examinations will be completed within the limits of the Code and that it provides an acceptable level of quality and safety.

H. Relief Request RR-L-3 for IWL-2500, Examination Requirements, Subarticle IWL-2523, Tendon Wire and Strand Sample Examination and Testing

Code Requirement: ASME Code, Section XI, 1992 Edition, 1992 Addenda, Subarticle IWL-2523, IWL-2523.1 and IWL-2523.2 requires the detensioning and sample removal from each type of tendon to be followed by sample examination and testing for corrosion, mechanical damage, yield strength, ultimate tensile strength, and elongation.

Licensee's Proposed Alternative: In accordance with 10 CFR 50.55a(a)(3)(i), the licensee proposed to conduct lift-off testing on Unit 2; however, the licensee proposes to take credit for strand testing on Unit 1 for Unit 2.

The licensee stated:

Amendments 23 and 4 to the Plant Technical Specifications for VEGP-1 and 2, respectively, were authorized by the NRC in their letter dated September 12, 1989, to Georgia Power Company, the former licensee and operator of VEGP and sister company to SNC, the current licensee and operator. Based on these particular amendments being issued for the VEGP Technical Specifications, the following testing is proposed as an alternative to the ASME Section XI Code requirements:

During lift-off testing of Unit 2, one tendon on Unit 1 will be strand tested in accordance with IWL-2523 as credit for Unit 2. The type tendon strand tested will be alternated between hoop and inverted-U tendons.

Licensee's Basis for Proposed Alternative (as stated):

The VEGP post-tensioning systems are designed so that no tendons on Unit 2 and only a sample on Unit 1 can be detensioned without creating voids in the sheathing filler material. VEGP was originally licensed with the NRC so that tendon lift-off and strand testing would be performed on Unit 1 and that no lift-off and strand testing would be performed or required on the post-tensioning system of Unit 2. Presently, even though not originally required, VEGP is performing lift-off testing on the Unit 2 tendons but cannot perform strand testing in conjunction with lift-off testing due to the Unit 2 tendon design.

Staff Evaluation: The Code requires one sample tendon of each type to be completely detensioned and examined for corrosion and mechanical damage. In addition, the detensioned tendon will be tested to determine its yield strength, ultimate tensile strength, and elongation. The licensee proposed to conduct lift-off testing on Unit 2 coincident with detensioning a sample tendon on Unit 1, taking credit for the detensioned tendon on Unit 1 for Unit 2.

The licensee's Amendments 23 and 4 for Units 1 and 2, respectively, was approved by the NRC on September 12, 1989. The amendments addressed the unique design consideration of the VEGP containments as stated in the basis for relief. The NRC staff, in its safety evaluation (SE) of September 12, 1989, noted that lift-off testing could be performed on Unit 2, while detensioning and retensioning would be very difficult for the licensee to perform. Based upon the prior approval by the NRC staff of TS Amendments 23 and 4, the completion of lift-off testing on Unit 2, and the tendon detensioning and material testing on Unit 1, the staff finds that reasonable assurance of continued structural integrity will be provided.

The staff concludes that compliance with the Code requirements for VEGP, Unit 2, are impractical to perform to the extent required giving consideration to the unique design and construction of Unit 2. Furthermore, the staff has determined that the licensee's proposed alternative is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest. Therefore, the staff grants relief for RR-L-3 pursuant to 10 CFR 50.55a(g)(6)(i).

I. Relief Request for 10 CFR 50.55a(b)(2)(ix)(A) and (D) for the Reporting of the Grease Leakage and Composition of Grease and Water within Tendon Sheaths

Regulatory Requirement: 10 CFR 50.55a(b)(2)(ix)(A) Examination of Concrete Containments, requires grease caps that are accessible to be visually examined to detect grease leakage or grease cap deformations. Grease caps must be removed for this examination when there is evidence of grease cap deformation that indicates deterioration of anchorage hardware. 10 CFR 50.55a(b)(2)(ix)(D) requires licensees to report the following conditions, if they occur, in the ISI summary report required by IWA-6000:

1. The sampled sheathing filler grease contains chemically combined water exceeding 10 percent by weight or the presence of free water.

2. The absolute difference between the amount removed and the amount replaced exceeds 10 percent of the tendon net duct volume.
3. Grease leakage is detected during general visual examination of the containment surface.

Licensee's Proposed Alternative (as stated):

In lieu of submitting information to the NRC in the ISI Summary Report concerning tendon grease leakage, SNC will report only those occurrences where leakage exceeds 7 gallons. Such occurrences of grease leakage exceeding seven gallons will be reported to the NRC pursuant to existing VEGP Technical Specification 5.6.9, i.e., within 30 days of identifying any abnormal degradation of the containment structure. The Technical Specification-required report will constitute the report required by 10 CFR 50.55a(b)(2)(ix)(A) (as interpreted by SNC) and (D). The 30-day report required by Technical Specifications will be referenced in the ISI Summary Report by SNC letter number and date; however, a separate report will not be submitted to the NRC for fulfilling the requirement(s) of 10 CFR 50.55a(b)(2)(ix)(A) (as interpreted by SNC) and (D) since to do so would be redundant.

Licensee's Basis for Proposed Alternative (as stated):

10 CFR 50.55a(b)(2)(ix)(A) requires:

"Grease caps that are accessible must be visually examined to detect grease leakage or grease cap deformation. Grease caps must be removed for their examination when there is evidence of grease cap deformation that indicates deterioration of anchorage hardware."

10 CFR 50.55a(b)(2)(ix)(D) requires:

"The licensee shall report the following conditions, if they occur, in the ISI Summary Report required by IWA-6000:

- (1) The sampled sheathing filler grease contains chemically combined water exceeding 10 percent by weight or the presence of free water;
- (2) The absolute difference between the amount removed and the amount replaced exceeds 10 percent of the tendon net duct volume;
- (3) Grease leakage is detected during general visual examination of the containment surface."

10 CFR 50.55a(b)(2)(ix)(A) does not explicitly state that grease caps that are accessible, visually examined, and are observed to have grease leakage must be addressed in the ISI Summary Report required by IWA-6000. However, SNC believes that it is the intent of the NRC that licensees address any such tendon

grease leakage identified in the ISI Summary Report. Conversely, 10 CFR 50.55a(b)(2)(ix)(D) explicitly states that certain conditions, including grease leakage detected during general visual examinations of containment, must be addressed in the ISI Summary Report. The Rule does not limit ISI reporting of grease to only that leakage that is determined to be excessive.

VEGP Technical Specifications 5.6.9 requires that “any abnormal (emphasis added) degradation of the containment structure detected during the tests required by the Prestressed Concrete Containment Tendon Surveillance Program shall be reported to the NRC within 30 days.” Further, that Technical Specification requires that “the report shall include the condition of the concrete (especially at tendon anchorages), the inspection procedure, the tolerances in cracking, and the corrective action taken.” Excessive grease leakage could be viewed as abnormal degradation. However, small amounts of grease leakage are not considered by SNC to be abnormal and are believed to be common to unbounded post-tensioned concrete structures such as the containments at VEGP.

The Concrete Containment Tendon Surveillance Program used at VEGP is performed to the requirements of NRC Regulatory Guide (RG) 1.35, Revision 2, with the VEGP position on the regulatory guide noted in VEGP Updated Final Safety Analysis Report sections 1.9.35.2 and 3.8.1.7.2. This program and the reporting requirements therefore have been previously approved by the NRC for use at VEGP. As a result, their continued use should be acceptable. Visual examinations of containment concrete to fulfill the requirements of ASME Section XI, Subsection IWL, are to be performed concurrently with the containment tendon testing.

The tendon testing program used at VEGP is implemented in accordance with VEGP Maintenance Department Manual GEN-100, “Tendon Surveillance Program Manual,” which provides the tendon surveillance program requirements as referenced in the Bases for VEGP Technical Specification Surveillance Requirement (SR) 3.6.1.2. SR 3.6.1.2 states:

“For ungrouted, post-tensioned tendons, this SR ensures that the structural integrity of the containment will be maintained in accordance with the provisions of the Containment Tendon Surveillance Program. Testing and Frequency are consistent with the recommendations of Regulatory Guide 1.35 (Ref. 4) and approved exceptions.”

Reference 4 as cited in SR 3.6.1.2 is NRC Regulatory Guide 1.35, Revision 2. Associated plant procedures for conducting the containment tendon surveillance program included 25044-1 (for VEGP-1), “Containment Tendon Grease Leakage Tracking,” 25044-2 (for VEGP-2) which is similarly titled to 25044-1, and 28235-C, “Containment Tendon Structural Integrity Test.” The 25044-designated procedures are unit-specific and log locations in the respective unit to have grease leakage in excess of 7 gallons. Seven gallons equates to approximately three percent (3%) of the tendon net duct volume. Procedure 28235-C provides administrative controls to meet the intent of the Technical Specifications

surveillance requirements, including reporting degraded conditions, and to ensure that the structural integrity of the containment is maintained. Excessive grease leakage, as addressed in GEN-100, is considered to be an indication of potential abnormal containment degradation and is required to be reported to the NRC in a 30-day report pursuant to VEGP Technical Specification 5.6.9.

Staff Evaluation: 10 CFR 50.55a(b)(2)(ix)(A) requires licensees to visually examine accessible grease caps to detect grease leakage or grease cap deformation, and 10 CFR 50.55a(b)(2)(ix)(D)(3) requires licensees to report grease leakage detected during general visual examination of the containment surface in the ISI summary report required by IWA-6000.

The licensee interpreted the requirement to visually examine accessible grease caps for grease leakage and deformation as an additional reporting requirement of grease leakage in the ISI report. Title 10 of the *Code of Federal Regulations* Section (10 CFR) 50.55a(b)(2)(ix)(D)(2) indicates what quantity of grease must be documented in the summary report; however, (D)(3) does not define the limits or quantities for reporting grease leakage in the summary report.

During a telephone conference with the licensee, the staff indicated that reporting grease leakage from visually examined caps is not the intent of 10 CFR 50.55a(b)(2)(ix)(A). Visual examination simply aids in discovering more significant problems related to tendon caps and tendon degradation as observed in Information Notice (IN) 99-10, Degradation of Prestressing Tendon Systems in Prestressed Concrete Containments, and IN 85-10, Post Tensioned Containment Tendon Anchor Head Failure. Therefore, cap grease leakage and deformation lead to potentially more damaging consequences of tendon system, and grease leakage may be an indicator.

In addition to reporting the requirements of 10 CFR 50.55a(b)(2)(ix)(D)(1), (2), and (3) the licensee will document the location of grease leakage from the containment surface and to the extent practicable quantify the surface leakage. Grease leakage through the containment surface exceeding the identified leakage shall be reported in the ISI report in accordance with 10 CFR 50.55a(b)(2)(ix)(D)(3). Having reviewed the licensee's proposed alternative for reporting abnormal leakage by TS procedures and the reporting of leakage in excess of that identified through containment visual inspection, the proposed alternative will provide an acceptable level of quality and safety. Therefore, the licensee's proposed alternative in conjunction with reporting grease leakage during the general visual examination exceeding what the licensee normally experiences is authorized pursuant to 10 CFR 50.55a(3)(i) on the basis that it provides an acceptable level of quality and safety.

3.0 CONCLUSION

The staff has evaluated the licensee's submittal for VEGP, Units 1 and 2. The authorizing of alternatives or granting of relief is based upon fulfillment of any commitments made by the licensee in its basis for each relief request and the alternatives proposed. The implementation of the ISI program and relief requests is subject to inspection by the NRC.

Relief is granted for RR-L-3 pursuant to 10 CFR 50.55a(g)(6)(i) for the remainder of the current 10-year interval. In making this determination, the staff considered the impracticality of performing the required inspections and the burden on the licensee if the Code requirements were imposed. The alternatives proposed in relief requests RR-E-1, RR-E-3, RR-E-4, RR-E-5,

RR-L-1, and RR-L-2 are authorized pursuant to 10 CFR 50.55a(a)(3)(i) on the basis that they provide an acceptable level of quality and safety. The alternative proposed in the relief request from the regulatory reporting requirement of 10 CFR 50.55a(b)(2)(ix)(A) and 10 CFR 50.55a(b)(2)(ix)(D) is authorized pursuant to 10 CFR 50.55a(a)(3)(i) on the basis that it provides an acceptable level of quality and safety. The alternative proposed in relief request RR-E-2 is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) on the basis that compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality or safety.

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Date: June 16, 2000

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