

April 6, 2000

Mr. Gary J. Taylor
Vice President, Nuclear Operations
South Carolina Electric & Gas Company
Virgil C. Summer Nuclear Station
Post Office Box 88
Jenkinsville, South Carolina 29065

SUBJECT: SAFETY EVALUATION OF RELIEF REQUESTS RR-CISI-1 THROUGH
RR-CISI-7 FOR THE CONTAINMENT INSERVICE INSPECTION PROGRAM,
VIRGIL C. SUMMER NUCLEAR STATION (TAC NO. MA6756)

Dear Mr. Taylor:

By letter dated September 15, 1999, South Carolina Electric and Gas Company, the licensee, submitted seven relief requests (RRs) to use alternatives to the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, Subsection IWE and Subsection IWL, regarding seals and gaskets, bolted connections, successive inspections, concrete surface visual examinations, containment coating inspections (2), and nondestructive examination personnel qualification and certification. The NRC staff has reviewed the proposed alternative examinations.

The results of this review are provided in the enclosed Safety Evaluation. The alternatives to the Code requirements, as proposed in RR-CISI-2, RR-CISI-5, and RR-CISI-6, will provide an acceptable level of quality and safety and are authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the first 10-year interval of the Containment Inspection Program. For RR-CISI-1, RR-CISI-3, RR-CISI-4, and RR-CISI-7, compliance with the Code would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. For this reason, the proposed alternatives are authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the first 10-year interval of the Containment Inspection Program.

If you have any questions, please contact Karen Cotton at 301-415-1438.

Sincerely,

/RA/

Richard L. Emch, Jr., Chief, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-395

Enclosure: As stated

cc w/encl: See next page

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The results of this review are provided in the enclosed Safety Evaluation. The alternatives to the Code requirements, as proposed in RR-CISI-2, RR-CISI-5, and RR-CISI-6, will provide an acceptable level of quality and safety and are authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the first 10-year interval of the Containment Inspection Program. For RR-CISI-1, RR-CISI-3, RR-CISI-4, and RR-CISI-7, compliance with the Code would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. For this reason, the proposed alternatives are authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the first 10-year interval of the Containment Inspection Program.

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO CONTAINMENT INSERVICE INSPECTION PROGRAM

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

VIRGIL C. SUMMER NUCLEAR STATION

DOCKET NO. 50-395

1.0 INTRODUCTION

In the *Federal Register* dated August 8, 1996, the Commission amended Section 50.55a of Title 10 of the *Code of Federal Regulations* (10 CFR 50.55a) to incorporate by reference Subsections IWE and IWL of Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, 1992 Edition through 1992 Addenda. Subsection IWE provides the requirements for inservice inspection (ISI) of Class MC (metallic containment) components and the metallic liner of Class CC (concrete containment) components. Subsection IWL provides the requirements for ISI of Class CC components.

The regulations require that ISI of certain Class MC and CC components be performed in accordance with Section XI of the ASME Code and applicable addenda, except where alternatives have been authorized or relief has been requested by the licensee and granted by the Commission pursuant to paragraphs (a)(3)(i), (a)(3)(ii), or (g)(6)(i) of 10 CFR 50.55a. In proposing alternatives or requesting relief, the licensee must demonstrate that (1) the proposed alternatives provide an acceptable level of quality and safety, (2) compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety, or (3) conformance is impractical for its facility.

In its letter dated September 15, 1999, South Carolina Electric and Gas Company (SCE&G, the licensee) proposes alternatives to the requirements of IWE and IWL for the Virgil C. Summer Nuclear Station (VCSNS). The NRC's findings with respect to authorizing the alternatives are given below.

2.0 RELIEF REQUESTS

2.1 Relief Request RR-CISI-1

The licensee requests relief from the requirements of IWE-2500, Table IWE-2500-1, Category E-D, items E5.10 and E5.20. The Code requires seals and gaskets to be visually examined once each interval. The licensee proposes to assure their leaktightness by the performance of Appendix J testing.

2.1.1 Licensee's Basis for Requesting Relief

The licensee states:

The leak tightness of the seals and gaskets for containment penetrations are verified in accordance with Option B of 10 CFR 50, Appendix J, Type B tests as required by VCSNS Technical Specifications. SCE&G has determined that VCSNS has the following types of containment penetrations with seals and gaskets which are subject to the Section XI requirements for Examination Category E-D, Items E5.10 and E5.20. A description of these penetrations and their seals and gaskets is provided below.

1. Electrical Penetrations

There are 47 electrical penetrations of the header plate type. The header plate is bolted to the nozzle. Double O-ring gaskets form the seal between the header plate and nozzle. This type of seal is subjected to Type B leakage tests.

2. Piping Penetrations

There are 3 spare piping penetrations that penetrate the containment boundary which are fitted with bolted removable blank flanges and Flexitallic™ type gaskets. These penetrations are for temporary services into the Reactor Building during plant shut down. These penetrations are subjected to Type B leakage tests.

3. Equipment Hatch and Personnel Air Locks

There are two (2) personnel airlocks and one (1) equipment hatch that penetrate the containment boundary. In the case of these penetrations, the barrel is solidly welded to the Reactor Building liner. The cover door on the equipment hatch is sealed to the barrel assembly with a double O-ring seal. Both the inside and outside doors of personnel airlocks are sealed with double O-ring seals. The personnel airlocks also have operating shafts that penetrate the inner and outer barriers of these penetrations. These barrier penetrations are also sealed with double O-ring seals. All of these penetrations are subjected to Type B leakage testing.

If the Section XI examination of seals and gaskets in electrical penetrations were to be performed, the following activities would be required:

- a pre-maintenance Appendix J test,
- de-termination of cables (if adequate cable slack is not available),
- disassembly and re-assembly of the penetration for examination of the seals and gaskets,
- re-termination of the cables (if necessary),

- post-maintenance testing of the cables, and
- a post maintenance Appendix J test of the penetration.

The activities required to accomplish the Section XI examinations of seals and gaskets in the spare piping penetrations, the containment hatch, and airlocks would be similar except for the de-termination, re-termination, and testing of cables.

The performance of these activities introduces the risk that the component housing the seals and gaskets could be damaged and, in most cases, will require the needless installation of new seals or gaskets due to their design or due to good maintenance practices. Also, the Appendix J test is ultimately the proof test for service. Therefore, an Appendix J test [supersedes] the need to perform the Section XI testing.

Section XI recognizes that disassembly of joints to perform these examinations is not warranted. Note 1 in Examination Category E-D was modified in the 1993 Addenda of Section XI to state that "Sealed or gasket connections need not be disassembled solely for the performance of examinations." However, without disassembly, most, if not all, of the surface of the seals and gaskets would be obstructed from examination.

For those penetrations that are routinely breached, a Type B test is required upon final assembly. Airlocks and hatches are tested in accordance with 10 CFR 50, Appendix J, after being opened. Any degradation of the seals and gaskets would be revealed by an increase in the leakage rate. Corrective measures would be applied and the component retested. Since the Type B test will assure the leak tight integrity of primary containment, the performance of the visual examination would not increase the level of safety or quality.

Overall containment leakage is verified by 10 CFR 50, Appendix J, Type A tests. Although the Type A test does not verify individual penetration leakage, it does provide additional assurance that there is no significant leakage through the containment pressure boundary, which includes all sealed penetrations. As noted in 10 CFR 50, Appendix J, the purpose is to measure leakage of containment or penetrations whose design incorporates resilient seals, gaskets, sealant compounds, and electrical penetrations fitted with flexible metal seal assemblies.

Seals and gaskets are not considered a part of the containment pressure boundary under current Code design rules, see ASME Code, Section III, NE-2121(b). Also, repair or replacement of seals and gaskets is not subject to Section XI rules in accordance with Paragraph IWA-4111(b)(5).

Relief is requested in accordance with 10 CFR 50.55a(a)(3)(i), on the basis that the proposed alternative examination would provide an acceptable level of quality and safety. Testing the seals and gaskets in accordance with 10 CFR 50, Appendix J will provide adequate assurance of the leak-tight integrity of the seals and gaskets.

Implementation Schedule:

This relief will be implemented during the inspection intervals for containment inspections at VCSNS as required by ASME Code, Section XI, 1992 Edition, 1992 Addenda, Subsection IWE.

2.1.2 Alternative Examination

The licensee proposes:

No alternative requirements are necessary due to the requirements of 10 CFR 50, Appendix J which govern the VCSNS Containment Leakage Rate Testing Program (CLRTP).

2.1.3 Evaluation

The components for which relief is requested are the seals and gaskets of Class MC pressure-retaining components. IWE-2500, Table IWE-2500-1, Examination Category E-D, Items E5.10 and E5.20 of the Code, require seals and gaskets on airlocks, hatches, and other devices to be visually examined (VT-3) once each inspection interval to assure containment leaktightness. Instead of performing a visual examination as required by the Code, the licensee proposes to confirm leaktightness by testing in accordance with 10 CFR Part 50, Appendix J.

Performance of VT-3 examinations on seals and gaskets requires that the components be disassembled. This involves determining cables at electrical penetrations, disassembling the joint, removing and examining the gaskets and seals, reassembling the joint, reterminating the cables, performing a post-maintenance test of the cables, and performing a post-maintenance Appendix J test. The 1993 Addenda to Section XI of the ASME Code recognizes that disassembly of joints for the sole purpose of performing a visual examination is unwarranted. Examination Category E-D was therefore modified to remove this requirement.

Disassembling components for the sole purpose of inspecting seals and gaskets is an undue hardship on the licensee and does not offer a compensating increase in the level of quality and safety. Reasonable assurance of the functionality and integrity of the containment penetration seals and gaskets will be provided by the licensee's alternative to perform testing in accordance with 10 CFR Part 50, Appendix J.

2.1.4 Conclusion

The proposed alternative to the requirements of IWE-2500, Table IWE-2500-1, Examination Category E-D, Items E5.10 and E5.20, is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the first 10-year interval of the Containment Inspection Program. Compliance with the specified requirements of this section would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

2.2 Relief Request RR-CISI-2

The licensee requests relief for all pressure-retaining bolts from the requirements of IWE-2500, Table IWE-2500-1, Category E-G, Item E8.20. The Code requires a bolt torque or tension test for bolted connections that have not been disassembled and reassembled during the inspection interval. The licensee proposes to use the 10 CFR Part 50, Appendix J, Type B test as an alternative to the Code requirement.

2.2.1 Licensee's Basis for Requesting Relief

The licensee states:

The following examinations and tests required by Subsection IWE ensure the structural integrity and leak-tightness of pressure retaining bolting associated with IWE:

- (1) Exposed surfaces of bolted connections shall be visually examined in accordance with requirements of Table IWE-2500-1, Examination Category E-G, Pressure Retaining Bolting, Item No. E8.10, and
- (2) Bolted connection seals and gaskets shall meet the pressure test requirements of Table IWE-2500-1, Examination Category E-P, All Pressure Retaining Components, Item E9.40, and
- (3) A general visual examination of the entire containment once each inspection period shall be conducted in accordance with 10 CFR 50.55a(b)(2)(x)(E).

Subsection IWE requires that a bolt torque or tension test be performed on bolted connections that have not been disassembled and reassembled during the inspection interval. The performance of a Type B test demonstrates that the bolt torque or tension remains adequate to provide structural integrity and that a leak rate, if any, is within acceptable limits. The torque or tension value of bolting only becomes an issue if the leak rate is excessive. Determination of the torque or tension value would require that the bolting be untorqued and then re-torqued or retensioned. Once a bolt is torqued or tensioned on a containment component, it is not expected to be subject to dynamic loading that could cause it to experience significant change. Appendix J testing and visual inspection is adequate to demonstrate that design function is met. Also, torque or tension testing is not required for any other ASME Section XI, Class 1, 2, or 3 bolted connection or their supports as part of the inservice inspection program.

In accordance with 10 CFR 50.55a(a)(3)(ii), relief is requested for VCSNS 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.

Implementation Schedule:

This relief will be implemented during the inspection intervals for containment inspections at VCSNS as required by ASME Code, Section XI, 1992 Edition, 1992 Addenda, Subsection IWE.

2.2.2 Alternative Examination

The licensee proposes:

Omit the inspection requirement of Item E8.20 from the Section XI Containment Inspection Program based on the redundancy of other regulatory requirements that provide indication of the integrity of the bolting.

2.2.3 Evaluation

IWE-2500, Table IWE-2500-1, Category E-G, Item E8.20 of the Code requires that pressure-retaining bolting that has not been disassembled and reassembled during the inspection interval be torque or tension tested. This examination is used to help determine that a seal is leaktight and that the structural integrity of the bolted connection is maintained. The licensee proposes to use the 10 CFR Part 50, Appendix J, Type B test as an alternative to the Code requirement.

In the 1997 Addenda of ASME Code Section XI, the requirement to test bolt torque or tension has been removed. The licensee's proposed alternative to use Appendix J, Type B testing to verify the containment pressure seal, together with visual examinations to verify penetration integrity, will provide reasonable assurance of containment pressure integrity.

2.2.4 Conclusion

The licensee's proposed alternative to the requirements of IWE-2500, Table IWE-2500-1, Category E-G, Item E8.20, is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the first 10-year interval of the Containment Inspection Program. This alternative examination provides an acceptable level of quality and safety.

2.3 Relief Request RR-CISI-3

The licensee requests relief from IWE-2420(b) and IWE-2420(c), which require the licensee to perform successive examination of flaws, areas of degradation, and repairs. Relief from the Code is requested only for the successive examination of repairs.

2.3.1 Licensee's Basis for Requesting Relief

The licensee states:

The purpose of a repair is to restore the component to an acceptable condition for continued service in accordance with the acceptance standards of Article IWE-3000. Paragraph IWA-4150 requires the owner to conduct an evaluation of the suitability of the repair including consideration of the cause of failure.

Repairs are required to restore the component to an acceptable condition for continued service, therefore, successive examinations are not warranted. No requirements exist in Paragraphs IWB-2420(b), IWC-2420(b), nor Paragraph IWD-2420(b) that require repairs to be subject to successive examination requirements. Furthermore, if the repair is made in an area likely to experience accelerated degradation or aging, it would require an augmented examination in accordance with Table IWE-2500-1, Examination Category E-C. The purpose of IWE-2420(b) is to increase attention for those indications that, when left as-is, have been found to be acceptable for continued service (i.e. no repair or replacement required at the time). If a component has been repaired or replaced, then the more frequent examination would not be needed.

The successive examination of repairs in accordance with Paragraphs IWE-2420(b) and IWE-2420(c), therefore constitutes a burden without a compensating increase in quality or safety.

In accordance with 10CFR50.55a(a)(3)(ii), relief is requested for VCSNS 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.

Implementation Schedule:

This relief will be implemented during the inspection intervals for containment inspections at VCSNS as required by ASME Code, Section XI, 1992 Edition, 1992 Addenda, Subsection IWE.

2.3.2 Alternative Examination

The licensee proposes:

Limit the successive inspections required by Paragraphs IWE-2420(b) and IWE-2420(c) to flaws and areas of degradations that are accepted for continued service by evaluation and are not repaired. Areas that are repaired in accordance with Article IWA-4000 are not subject to the requirements of IWE-2420(b) and IWE-2420(c).

2.3.3 Evaluation

The licensee requests relief from IWE-2420(b) and IWE-2420(c), which require the licensee to perform successive examination of flaws, areas of degradation, and repairs. Relief from the Code is requested only for the successive examination of repairs.

Subsections IWB-2420(b), IWC-2420(b), and IWD-2420(b) of Section XI do not require successive inspection of repairs for ASME Code Class 1, 2, and 3 components as required by IWE-2420(b) for ASME Code Class MC components. Since the failure mechanism which necessitated the repair is identified and corrected in accordance with the Code, and since the repair gets preservice examinations, performance of successive examinations is a hardship on the licensee without a compensating increase in safety.

2.3.4 Conclusion

The licensee's proposed alternative to the requirements of IWE-2420(b) and IWE-2420(c) for repaired components is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the first 10-year interval of the Containment Inspection Program. Compliance with the Code requirements would result in a hardship without a compensating increase in the level of quality and safety.

2.4 Relief Request RR-CISI-4

For containment inspections required by IWL-2310, the licensee proposes an alternative to the minimum-illumination and maximum-direct-examination-distance requirements specified in IWA-2210 and Table IWA-2210-1. This alternative requires that the conditions or indications for which the visual examinations are performed be detectable at the chosen distance and illumination.

2.4.1 Licensee's Basis for Requesting Relief

The licensee states:

Current Code Requirements:

Section XI, Paragraph IWA-2210, Visual Examinations, prescribes specific minimum illumination and maximum direct VT-1, VT-2, and VT-3 examination distance for surfaces. IWA-2210 allows remote visual examination in lieu of direct visual examination, but requires that the remote examination procedure be demonstrated to resolve the selected test characters. IWA-2210 also requires that illumination levels be measured on each examination surface, unless the same portable light source or similar installed lighting equipment is demonstrated to provide the specified illumination at the maximum examination distance. Illumination levels from battery powered portable lights shall be checked before and after each examination or series of examinations, not to exceed 4 hours between checks. Section XI, Paragraphs IWL-2310(a) and (b) specifies that for VT-1C and VT-3C visual examinations, the minimum illumination, maximum direct examination distance, and maximum procedure demonstration lower case character height shall be as specified in IWA-2210 for VT-1 and VT-3 visual examinations.

The specified requirements from which an alternative is requested are:

1. The requirement of IWA-2210 to demonstrate by procedure that direct visual examinations can resolve the specified lower case characters at minimum illumination levels specified in Table IWA-2210-1.
2. The requirement of IWA-2210 to measure illumination levels on examination surfaces.
3. The requirement of IWA-2210 to measure illumination levels from battery powered portable lights at an interval not exceeding 4 hours.

4. The requirement of IWA-2210 to check the illumination levels of battery powered portable lights before and after each examination or series of examinations.
5. The requirement of IWL-2310(a) and (b) that for VT-1C and VT-3C visual examinations, the minimum illumination, maximum direct examination distance, and maximum procedure demonstration lower case character height shall be as specified in IWA-2210 for VT-1 and VT-3 visual examinations.

The purpose of IWA-2210 and IWL-2310(a) and (b) is to ensure that visual examinations are performed in a consistent manner that is capable of detecting the conditions for which the examinations are performed. The proposed alternative has been determined to satisfy this purpose, but eliminates requirements that are either inappropriate or unnecessary for visual examination of Class MC and Class CC components. This alternative requires that visual examinations be demonstrated to be capable of detecting conditions for which the examinations are conducted. Resolution of a 1/64 inch or 1/32 inch black line on an 18% neutral gray card as specified in this alternative provides an acceptable method for demonstrating direct and remote visual examinations, without requiring measurement of lighting illumination levels.

10 CFR 50.55a(b)(2)(x)(B) allows an alternative to the minimum illumination and maximum examination distance requirements of Table IWA-2210-1 for remote visual examinations performed in accordance with IWE (metal containments) only. Since 10 CFR 50.55a(b)(2)(x)(B) did not give an exception for remote visual examinations of concrete containments under IWL, those examinations must continue to meet the requirements of IWA-2210. Compliance with the requirement to resolve the specified test chart characters at typical examination distances needed for concrete surface examinations would prove to be too stringent for the conditions for which these examinations are being performed. The proposed alternative provides an equivalent method of demonstrating that the VT-1C and VT-3C visual examinations are capable of detecting conditions for which these examinations are performed.

For direct visual examination of Class MC and Class CC components, the requirements of IWA-2210 and IWL-2310(a) and (b) are unnecessary, provided the direct visual examination can also be demonstrated to be capable of detecting conditions for which these examinations are performed.

For Class MC applications, it is anticipated that most surfaces will require remote visual examination because of structural geometries which make access difficult. Because 10 CFR 50.55a(b)(2)(x)(B) allows the maximum remote examination distance to be extended and the minimum illumination decreased, compliance with lighting and examination distance requirements of Table IWA-2210-1 need not be met for remote VT-3 visual examinations conducted at distances exceeding 4 feet. It is unnecessary to require that a direct visual examination performed on the surface at a distance less than 4 feet comply with the requirements of Table IWA-2210-1 when a remote visual examination of that same surface is permitted to be performed using lower illumination levels at distances exceeding 4 feet, provided the illumination is sufficient and the resolution is adequate to detect conditions for which the examination is performed.

The requirement of IWA-2210 to check illumination levels from battery powered portable lights at intervals not exceeding 4 hours is excessive and unnecessary. Because of the length of time it typically requires to access certain containment surfaces and perform examinations, it is a hardship to require that illumination levels be checked at this frequency. The imposition of an arbitrary 4 hour limit is inappropriate when it can be otherwise demonstrated that sufficient illumination is provided during the examination or series of examinations. Compliance with the 4 hour limitation will increase the amount of time required to perform examinations and will result in additional personnel radiological exposure, without any increase in the level of quality of the examinations. Also, if a portable lighting source becomes contaminated during the course of an examination, it may be difficult to transport the lighting source to a location where the illumination level on this equipment can be checked within the 4 hour limit.

The requirement of IWA-2210 to check illumination levels of battery powered light sources before and after each examination or series of examinations is unnecessary, provided the visual examinations can be demonstrated to be capable of detecting conditions for which these examinations are performed.

Relief is requested in accordance with 10 CFR 50.55a(a)(3)(ii). The proposed alternatives provide an acceptable level of quality and safety.

2.4.2 Alternative Examination

The licensee proposes:

In lieu of the requirements of IWA-2210 and IWL-2310, the following alternative is proposed:

IWA-2210 VISUAL EXAMINATIONS

IWA-2210 VT-1 and VT-1C Examinations

- (a) VT-1 examinations are conducted to detect discontinuities and imperfections on the surfaces of components, including such conditions as cracks, wear, corrosion, erosion, physical damage or degradation, and conditions identified in IWE-3500. VT-1C examinations are conducted in accordance with IWL-2310(a).
- (b) Direct VT-1 and VT-1C examinations may be conducted when access is sufficient to place the eye within 24 inches of the surface to be examined and at an angle not less than 30° to the surface. Mirrors may be used to improve the angle of vision. The examination, using natural or artificial lighting, shall be sufficient to resolve a 1/64 inch black line on an 18% neutral gray card.
- (c) Remote VT-1 and VT-1C examinations may be substituted for direct examination. Remote examination may use aids, such as telescopes, binoculars, borescopes, fiber optics, cameras, or other suitable instruments, provided such systems have a resolution capability at least equivalent to that attainable by direct visual examination.

IWA-2212 VT-2 Examination

- (a) VT-2 examinations are conducted to detect evidence of leakage from pressure retaining components, with or without leakage collection systems, as required during the conduct of system pressure tests.
- (b) VT-2 examinations shall be conducted in accordance with IWA-5000. The examination, using natural or artificial lighting, shall be sufficient to resolve a 1/32 inch black line on an 18% neutral gray card.

IWA-2213 VT-3 and VT-3C Examinations

- (1) 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; and to detect discontinuities and imperfections, such as loss of integrity at bolted or welded connections, loose or missing parts, debris, corrosion, erosion, or other degradation, and conditions identified in IWE-3500. VT-3C examinations are conducted in accordance with IWL-2310(b).
- (2) VT-3 includes examinations for conditions that could affect operability or functional adequacy of snubbers and constant load and spring type supports.
- (3) VT-3 and VT-3C examinations may be performed directly or remotely, and may use aids, such as telescopes, binoculars, borescopes, fiber optics, cameras, or other suitable instruments. The examination, using natural or artificial lighting, shall be sufficient to resolve a 1/32 inch black line on an 18% neutral gray card.

IWA-2215 Replication

Surface replication methods may be used for VT-1, VT-1C, VT-3, and VT-3C examinations when the surface resolution is at least equivalent to that of direct visual observation.

IWL-2310 Visual Examination and Personnel Qualification

- (a) VT-1C visual examinations are conducted to determine concrete deterioration and distress for suspect areas detected by VT-3C, and conditions (e.g., cracks, wear, or corrosion) of tendon anchorage and wires or strands.
- (b) VT-3C visual examinations are conducted to determine the general structural condition of concrete surfaces by identifying areas of concrete deterioration and distress, such as defined in ACI 201.1R.
- (c) The Owner's written practice shall define qualification requirements for concrete examination personnel in accordance with IWA-2300. Limited certification in accordance with IWA-2350 may be used for examiners limited to concrete.

2.4.3 Evaluation

For the containment inspections required by IWL-2310, the licensee proposes an alternative to the minimum illumination and maximum direct examination distance requirements specified in IWA-2210 and Table IWA-2210-1. This alternative requires that the conditions or indications for which the visual examinations are performed be detectable at the chosen distance and illumination.

Visual examinations of the concrete containment are performed to determine if damage or degradation, including cracks, wear, corrosion, erosion, or other physical damage, warrants additional evaluation or repair of the structure. Because of the nature of concrete, a concrete containment will have numerous small surface cracks and imperfections. These are due to shrinkage and are not detrimental to the structural integrity of the containment. Application of IWA-2210 and Table IWA-2210-1 requirements to identify these insignificant shrinkage-type cracks and imperfections due to shrinkage is an unnecessary burden and could require a large number of person-hours to erect scaffolding, use lifts, and evaluate insignificant indications.

As the licensee notes, the staff has changed the requirements for visual examinations performed in accordance with Subsection IWE. For these remote visual examinations, 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.

The licensee's proposed alternative requires resolution of a 1/64-inch (VT-1 and VT-1C) or 1/32-inch (VT-2, VT-3, and VT-3C) black line on an 18% neutral gray card as a method for doing direct and remote visual examinations without measuring lighting illumination levels. Although the alternative does not measure illumination, it adequately ensures that indications that might impair containment integrity are detectable.

2.4.4 Conclusion

The proposed alternative to the requirements specified in IWA-2210 and Table IWA-2210-1 for performance of containment inspections required by IWL-2310 is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the first 10-year interval of the Containment Inspection Program. Compliance with the specified requirements would result in hardship without a compensating increase in the level of quality and safety.

2.5 Relief Request RR-CISI-5

The licensee requests relief from IWE-2500(b), which requires that paint or coatings be visually examined in accordance with Table IWE-2500-1 before removal. The licensee does not propose an alternative examination because inspections of coatings at VCSNS are governed by the requirements of industry standards.

2.5.1 Licensee's Basis for Requesting Relief

The licensee states:

IWE-2500(b) requires that when paint or coatings are to be removed, a visual examination of the paint or coatings shall be performed in accordance with Table IWE-2500-1. Neither the paint nor coatings contribute to the structural integrity or leak tightness of the containment. The interiors of containment are painted or coated to prevent rust and to aid in radiological control. Furthermore, the paint or coatings on the containment pressure boundary were not subject to Code rules when they were originally applied and are not subject to Section XI rules for repair or replacement in accordance with IWA-4111(b)(5).

The containment liner coatings will be examined during the IWE examinations. Industry Standards will be used to characterize any coating degradation. 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 Section XI, repairs to the primary containment boundary, if required, would be conducted in accordance with Section XI Code rules.

The application of Section XI rules for removal of paint or coatings when unrelated to a Section XI repair or replacement activity, is an unnecessary burden without a compensating increase in quality and safety. SCE&G is therefore requesting relief in accordance with 10CFR50.55a(a)(3)(ii).

Implementation Schedule:

This relief will be implemented during the inspection intervals for containment inspections at VCSNS as required by ASME Code, Section XI, 1992 Edition, 1992 Addenda, Subsection IWE.

2.5.2 Alternative Examination

The licensee proposes:

No alternative requirements are necessary due to the requirements of the Industry Standards which govern the inspections of coatings at VCSNS.

2.5.3 Evaluation

The licensee requests relief from IWE-2500(b), which requires that paint or coatings be visually examined in accordance with Table IWE-2500-1 before removal. The licensee does not propose an alternative examination because inspections of coatings at VCSNS are governed by industry standards.

As indicated in Section 2.6.3, the staff finds that VCSNS's coating program is adequate to monitor the proper removal of the old paint and application of the new coatings. The licensee's program is subject to the quality assurance requirements of 10 CFR Part 50, Appendix B. Performing an additional examination before removal of the old paint and documenting its condition would not provide additional assurance of the containment structural integrity.

2.5.4 Conclusion

The licensee's proposed alternative to the requirements of IWE-2500(b) is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the first 10-year interval of the Containment Inspection Program. The alternative examination provides an acceptable level of quality and safety.

2.6 Relief Request RR-CISI-6

Paragraph IWE-2200(g) of the Code requires that when paint or coatings are reapplied, the condition of the new paint or coating shall be documented in the preservice examination records. Relief is requested from the requirement to perform a preservice inspection of new paint or coatings.

2.6.1 Licensee's Basis for Requesting Relief

The licensee states:

Paint and coatings are not part of the containment pressure boundary under current Code rules as they are not associated with the pressure retaining function of the component (Paragraph NE-2110 (b)(5) of ASME Section III). Furthermore, the paint and coatings on the containment pressure boundary were not subject to Code rules when they were originally applied and are not subject to Section XI rules for repair or replacement in accordance with IWA-4111(b)(5).

Recording the condition of reapplied coating in the preservice record does not substantiate the containment structural integrity. Any defect present in the reapplied coating would be addressed by coatings procedures and inspection and is clearly not an indication of the condition of the pressure boundary. Any future indications discovered in the area will require evaluation regardless of the preservice record. Recording the condition of new paint or coating in the preservice records does not increase the level of quality and safety of the containment.

In SECY 96-080, "Issuance of Final Amendment to 10 CFR Section 50.55a to Incorporate by Reference the ASME Boiler and Pressure Vessel Code (ASME Code), Section XI, Division 1, Subsection IWE and Subsection IWL," dated April 17, 1996, response to Comment 3.2 about IWE-2200(g) states, "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 periodic inspections performed in accordance with Industry Standards and IWE will assure that the "soundness and condition of the topcoat" is satisfactory.

Also, the requirement to perform a preservice examination when paint or coatings are reapplied has been removed in the rewrite of Subsection IWE of ASME Code Section XI included in the 1998 Edition.

The application of Section XI rules for performing preservice inspection after applications of paint or coatings is an unnecessary burden without a compensating increase in quality and safety. SCE&G is therefore requesting relief in accordance with 10 CFR 50.55a(a)(3)(ii).

Implementation Schedule:

This relief will be implemented during the inspection intervals for containment inspections at VCSNS as required by ASME Code, Section XI, 1992 Edition, 1992 Addenda, Subsection IWE.

2.6.2 Alternative Examination

The licensee proposes:

No alternative requirements are necessary due to the requirements of the Industry Standards which govern the inspections of coatings at VCSNS.

2.6.3 Evaluation

Paragraph IWE-2200(g) of the Code requires that when paint or coatings are reapplied, the condition of the new paint or coating be documented in the preservice examination records. Relief is requested from the requirement to perform a preservice inspection of new paint or coatings.

The licensee states that the adequacy of applied coatings is verified through conformance to the industry standards which govern the inspections of coatings at VCSNS. These controls are described in the licensee's November 11, 1998, response to Generic Letter 98-04:

- (a) Service Level 1 coatings used for new applications and repair and replacement activities are procured from a vendor with a quality assurance program meeting the applicable requirements of 10 CFR Part 50, Appendix B. The applicable technical and quality requirements that the vendor is required to meet are specified by SCE&G in procurement documents. Acceptance activities are conducted in accordance with procedures that are consistent with American National Standards Institute N 45.2 requirements (e.g., receipt inspection, source surveillance, etc.). The technical and quality requirements, combined with appropriate acceptance activities, provide adequate assurance that the coatings received meet the requirements of the procurement documents.
- (b) The qualification testing of Service Level 1 coatings used for new applications and repair and replacement activities inside containment meets the applicable requirements in the standards and regulatory commitments referenced above. These coatings, including maintenance and repair coatings, have been evaluated as meeting the applicable standards and regulatory requirements previously referenced.

- (c) The surface preparation, application, and surveillance during installation of Service Level 1 coatings used for new applications and repair and replacement activities inside containment meet the applicable portions of the standards and regulatory commitments referenced above. Documentation of completion of these activities is consistent with the applicable requirements.

The licensee's alternative program for the application of paint or coating, its inspection, and its quality assurance provisions provide an adequate method for protecting the inside surfaces of the containment.

2.6.4 Conclusion

The licensee's proposed alternative to the requirements of IWE-2200(g) is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the first 10-year interval of the Containment Inspection Program. This alternative examination provides an acceptable level of quality and safety.

2.7 Relief Request RR-CISI-7

IWA-2300, "Qualification of Nondestructive Examination Personnel," requires qualification of nondestructive examination personnel to CP-189, as amended by Section XI. The licensee proposes to conduct examinations required by Subsections IWE and IWL with personnel qualified and certified to a written practice based on SNT-TC-1A per the 1989 Edition of Section XI.

2.7.1 Licensee's Basis for Requesting Relief

Section XI requires qualification of nondestructive examination (NDE) personnel to CP-189, as amended by Subarticle IWA-2300.

A written practice based on these requirements duplicates efforts already in place for the other subsections used for the remainder of the 1989 Section XI programs (IWB, IWC, IWD, and IWF). The VCSNS Second Ten Year Inservice Inspection Program for non-containment inservice inspection is written to meet the 1989 Edition of Section XI which requires a written practice based on SNT-TC-1A, "Personnel Qualification and Certification in Nondestructive Testing," as amended by the requirements of Subarticle IWA-2300. Further, Subarticle IWA-2300 of the 1992 Edition, 1992 Addenda, states, "Certifications based on SNT-TC-1A are valid until re-certification is required."

Visual examination is the primary nondestructive examination method required by Subsections IWE and IWL. Neither CP-189 nor SNT-TC-1A specifically includes visual examination. Therefore, the Code requires qualification and certification to comparable levels as defined in CP-189 or SNT-TC-1A, as applicable, and the employer's written practice. Ultrasonic thickness

examinations may also be required by Table IWE-2500-1. These examinations are relatively simple and do not require an extensive training and qualification program. Therefore, use of CP-189 in place of SNT-TC-1A will not improve the capability of examination personnel to perform the visual and ultrasonic thickness examinations required by Subsection IWE.

Development and administration of a second program would not enhance safety or quality and would serve as a burden, particularly in developing a second written practice, tracking of certifications, and duplication of paperwork. This duplication would also apply to Nondestructive Examination (NDE) vendor programs. Updating to the 1992 Edition, 1992 Addenda, for Subsections IWB, IWC, etc., would require a similar request for relief.

Relief is requested in accordance with 10 CFR 50.55a(a)(3)(i) on the basis that the proposed alternative examination would provide an acceptable level of quality and safety. Qualification of NDE personnel to the requirements of CP-189 will not provide assurance of the meaningfulness and integrity of inspections performed.

Implementation Schedule:

This relief will be implemented during the inspection intervals for containment inspections at VCSNS as required by ASME Code, Section XI, 1992 Edition, 1992 Addenda, Subsection IWE and IWL.

2.7.2 Alternative Examination

The licensee proposes:

Examinations required by Subsections IWE and IWL shall be conducted by personnel qualified and certified to a written practice based on SNT-TC-1A per the 1989 Edition (No Addenda) of Section XI. Visual examination personnel will receive specific training in conducting concrete examinations to update their qualifications for VT-1C and VT-3C inspections.

2.7.3 Evaluation

Subsection IWA-2300, "Qualification of Nondestructive Examination Personnel," requires qualification of nondestructive examination personnel to CP-189, as amended by Section XI. The licensee proposes to conduct examinations required by Subsections IWE and IWL with personnel qualified and certified to a written practice based on SNT-TC-1A per the 1989 Edition of Section XI.

The licensee's current program for qualifying and certifying NDE personnel is based on the 1989 Edition of the ASME Code Section XI requirements for Class 1, 2, and 3 components. The 1989 Edition of the Code requires the use of SNT-TC-1A for the qualification and certification of NDE personnel. Therefore, the licensee would have to develop a second

program for qualifying and certifying its NDE personnel for containment inspection in accordance with IWA-2300 of the 1992 Edition of the Code. This is a hardship without a compensating increase in the level of quality and safety.

As the licensee notes, visual examination is the primary nondestructive examination method required by IWE. The requirements established in SNT-TC-1A for personnel certifications are similar to the requirements described in CP-189. Therefore, use of CP-189 in place of SNT-TC-1A would not improve the capability of examination personnel to perform the visual and ultrasonic thickness examinations required by IWE.

2.7.4 Conclusion

The licensee's proposed alternative to the requirements of IWA-2300 (1992 Edition of the Code) for containment ISI is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the first 10-year interval of the Containment Inspection Program. Compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality or safety.

3.0 CONCLUSION

The alternatives to the Code requirements, as proposed in RR-CISI-2, RR-CISI-5, and RR-CISI-6, will provide an acceptable level of quality and safety and are authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the first 10-year interval of the Containment Inspection Program.

For relief requests RR-CISI-1, RR-CISI-3, RR-CISI-4, and RR-CISI-7, compliance with the Code would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. For this reason, the proposed alternatives are authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the first 10-year interval of the Containment Inspection Program.

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