

June 5, 2000

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

SUBJECT: VOGTLE ELECTRIC GENERATING PLANT, UNIT 2, FIRST 10-YEAR
INTERVAL INSERVICE INSPECTION PROGRAM REQUEST FOR RELIEF
(TAC NO. MA4356)

Dear Mr. Beasley:

By letters dated November 30, 1998 (Letters LCV-1279 and LCV-1280), Southern Nuclear Operating Company, submitted a proposed alternative to the Augmented Reactor Pressure Vessel Examination required by Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(g)(6)(ii)(A) and requests for relief from requirements of the American Society of Mechanical Engineers (ASME) Code, Section XI, for the Vogtle Electric Generating Plant, Unit 2. Additional information was provided in a letter dated December 29, 1999, in response to a Nuclear Regulatory Commission (NRC) request for additional information (RAI). The proposed alternative and requests for relief are for the first 10-year inservice inspection (ISI) interval.

The staff with technical assistance from its contractor, the Idaho National Engineering and Environmental Laboratory (INEEL), has reviewed and evaluated the information provided by letters dated November 30, 1998, and December 29, 1999. Based on its review, the NRC staff finds the licensee's requests for relief is acceptable.

For the Vogtle Electric Generating Plant, Unit 2, 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 a hardship or unusual difficulty without a compensating increase in quality or safety. The granting of relief or authorization of an alternative is based upon the fulfillment of any commitments made by the licensee in its basis for each relief request and the alternatives proposed.

J. B. Beasley, Jr.

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The staff's evaluation and conclusions are contained in Enclosure 1. Enclosure 2 lists each request for relief and the status of approval. Enclosure 3 is the INEEL Technical Letter Report.

Sincerely,

/RA L. Olshan for:/

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

Docket Nos. 50-424 and 50-425

Enclosures: As stated

cc w/encls: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

FOR

FIRST 10-YEAR INTERVAL INSERVICE INSPECTION

REQUESTS FOR RELIEF

FOR

VOGTLE ELECTRIC GENERATING, UNIT 2

SOUTHERN NUCLEAR OPERATING COMPANY

DOCKET NO. 50-425

1.0 INTRODUCTION

Inservice inspection (ISI) of the American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components is performed in accordance with Section XI of the ASME Boiler and Pressure Vessel (B&PV) Code and applicable addenda as required by 10 CFR 50.55a(g), except where specific written relief has been granted by the Commission pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(g)(6)(i). 10 CFR 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)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the pre-service examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The Code of record for the Vogtle Electric Generating Plant, Unit 2, first 10-year ISI interval is the 1989 Edition of the ASME Boiler and Pressure Vessel Code.

Enclosure 1

2.0 EVALUATION

The NRC staff, with technical assistance from Idaho National Engineering and Environmental Laboratory (INEEL), has reviewed the information concerning ISI program requests for relief submitted for the first 10-year intervals for Vogtle Electric Generating Plant, Unit 2, in a Southern Nuclear Operating Company (the licensee) letter dated November 30, 1998. Additional information was provided by the licensee in its letter dated December 29, 1999.

The staff adopts the evaluations and recommendations for granting relief or authorizing alternatives contained in the Technical Letter Report (TLR), Enclosure 3 prepared by INEEL. Enclosure 2 lists each relief request and the status of approval.

For the Vogtle Electric Generating Plant, Unit 2, 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 a hardship or unusual difficulty without a compensating increase in quality or safety.

The requests for relief are granted or authorized and closeout the first 10-year interval ISI program plan. Additionally, the granting of relief or authorization of an alternative is based upon the fulfillment of any commitments made by the licensee in its basis for each relief request and the alternatives proposed.

3.0 CONCLUSION

The Vogtle Electric Generating, Unit 2, ISI program requests for relief from the Code requirements have been reviewed by the staff with the assistance of its contractor, INEEL. The TLR provides INEEL's evaluation of these requests for relief. The staff has reviewed the TLR and concurs with the evaluations and recommendations for granting relief or authorizing alternatives. A summary of the requests for relief determinations is presented in Enclosure 2. The staff concludes that the requests for relief as evaluated by this Safety Evaluation will provide reasonable assurance of structural integrity of the subject components in the licensee's requests for relief. The staff has determined that granting relief pursuant to 10 CFR 50.55a(g)(6)(i) and authorizing alternatives pursuant to 10 CFR 50.55a(a)(3)(i) or (a)(3)(ii) is authorized by law and will not endanger life or property, or the common defense and security and is otherwise in the public interest.

Principal Contributor: T. McLellan

Date: June 5, 2000

TABLE 1
SUMMARY OF RELIEF REQUESTS

Relief Request Number	INEEL TLR Sec.	System or Component	Exam Category	Item No.	Volume or Area to be Examined	Required Method	Licensee Proposed Alternative	Relief Request Disposition
Augmented RPV Examinations	2.1	Reactor Pressure Vessel	B-A	B1.11	Circumferential Shell Welds	Volumetric	Utilize volumetric coverage obtained	Authorized 10 CFR50.55a(a)(3)(ii)
RR-2	2.2	Reactor Pressure Vessel	B-A	B1.11	Circumferential Shell Welds	Volumetric	Utilize volumetric coverage obtained	Granted 10 CFR50.55a(g)(6)(i)
RR-5	2.3	Reactor Pressure Vessel	B-A	B1.21	Circumferential Head Welds	Volumetric	Utilize volumetric coverage obtained	Authorized 10 CFR50.55a(a)(3)(ii)
RR-20 (Revision 1)	2.4	Class 1 Piping	B-J	B9.11	Circumferential Piping Welds	Volumetric/Surface	Utilize volumetric/Surface coverage obtained	Granted 10 CFR50.55a(g)(6)(i)
RR-30 (Part C-B)	2.5	Class 2 Pressure Vessels	C-B	C2.21	Nozzle-to-Shell Welds	Volumetric/Surface	Utilize volumetric coverage obtained	Granted 10 CFR50.55a(g)(6)(i)
RR-34 (Part C-F-1)	2.6	Class 2 Piping	C-F-1	C5.11	Circumferential Welds in SS Piping	Volumetric/Surface	Utilize volumetric coverage obtained	Granted 10 CFR50.55a(g)(6)(i)
RR-36 (Revision 1)	2.7	Class 2 Piping	Augmented Exams		Circumferential Welds	Volumetric	Utilize volumetric coverage obtained and perform a supplemental surface examination	Remain Granted 10 CFR 50.55a(g)(6)(i)
RR-63	2.8	Reactor Pressure Vessel	B-D	B3.90	RPV Nozzle-to-Vessel Welds	Volumetric	Utilize volumetric coverage obtained	Granted 10 CFR50.55a(g)(6)(i)
RR-64	2.9	Class 1, 2, 3	IWA-4000		Piping, Valves, and Fittings ≤NPS 1"	Repair Requirements	Eliminate backfit of record keeping requirements	Authorized 10 CFR50.55a(a)(3)(ii)

**TECHNICAL LETTER REPORT
ON THE FIRST 10-YEAR INTERVAL INSERVICE INSPECTION
REQUESTS FOR RELIEF
FOR
SOUTHERN NUCLEAR OPERATING COMPANY
VOGTLE ELECTRIC GENERATING PLANT, UNIT 2
DOCKET NUMBER: 50-425**

1. INTRODUCTION

By letters dated November 30, 1998 (Letters LCV-1279, and LCV-1280), the licensee, Southern Nuclear Operating Company, submitted a proposed alternative to the Augmented Reactor Pressure Vessel Examination required by 10 CFR 50.55a(g)(6)(ii)(A) and requests for relief from requirements of the ASME Code, Section XI, for the Vogtle Electric Generating Plant, Unit 2. Additional information was provided in a letter dated December 29, 1999, in response to a Nuclear Regulatory Commission (NRC) request for additional information (RAI). The proposed alternative and requests for relief are for the first 10-year inservice inspection (ISI) interval. The Idaho National Engineering and Environmental Laboratory (INEEL) staff's evaluation of the subject proposed alternative and requests for relief is in the following section.

2. EVALUATION

The information provided by Southern Nuclear Operating Company in support of the proposed alternative and requests for relief from Code requirements has been evaluated and the bases for disposition are documented below. The Code of record for the Vogtle Electric Generating Plant, Unit 2, first 10-year ISI interval, which ended May 30, 1997, is the 1989¹ Edition of Section XI of the ASME Boiler and Pressure Vessel Code.

2.1 Proposed Alternative to 10 CFR 50.55a(g)(6)(ii)(A), Augmented Reactor Pressure Vessel Examination

Regulatory Requirement: In accordance with 10 CFR 50.55a(g)(6)(ii)(A), all licensees must implement once, as part of the inservice inspection interval in effect on September 8, 1992, an augmented examination of the reactor pressure vessel (RPV) welds specified in Item B1.10 of Examination Category B-A of the 1989 Edition of the ASME Code, Section XI. Examination Category B-A, Items B1.11 and B1.12, require volumetric examination of essentially 100% of the RPV circumferential and longitudinal shell welds, as defined by Figures IWB-2500-1 and -2, respectively. Essentially 100%, as defined by 10 CFR 50.55a(g)(6)(ii)(A)(2), is greater than 90% of the examination volume of each weld.

Licensee's Proposed Alternative: In accordance with 10 CFR 50.55a(a)(3)(ii), the licensee proposed that the coverage obtained be found acceptable for the following weld.

Comp. ID	Component Description	ASME Category	Item Number	Aggregate Coverage	Limitation
W06	Lower Shell-to-Head Weld	B-A	B1.11	61%	Core support lugs

¹The first ten-year interval program was originally written to meet the requirements of the 1983 through Summer 1983 Addenda of ASME XI. The licensee received authorization to update to the 1989 edition in November of 1996.

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

"Six (6) core support lugs are located on the lower shell of the RPV adjacent to lower shell-to-bottom head weld 21201-V6-001-W06. These core support lugs obstruct movement of the mechanized examination equipment sled/transducer along the lower shell side (upper scan region) of circumferential weld W06. As a result, examination coverage of this non-beltline weld from the inside diameter (ID) of the RPV was limited to approximately sixty-one (61%) of the weld length. This result is comparable to the sixty-six percent (66%) coverage reported during preservice examinations (PSI). A full-Code examination of this weld in service is not possible based on the following:

"General dose rates at the bottom of the vessel (as measured for VEGP-2 during its sixth maintenance/refueling outage (2R6)) are estimated to be approximately 200 millirem/hour (mr/hr) with contact dose rates at the insulation surface approximately 1 Rem/hour (R/hr).

"Nondestructive examination (NDE) personnel would need to perform thirteen UT scans for each area receiving the supplemental examination. It is calculated that the dose to the NDE personnel in performing these examinations would be approximately 3.25R

"Prior to performing examinations, personnel would need to erect any necessary scaffolding, remove insulation, and perform any required weld preparation in the high radiation field.

"This effort is further exacerbated by the fact that much of the RPV insulation used at VEGP was designed using rivets and screws and does not lend itself to easy removal and replacement. After examinations were completed, any scaffolding would need to be removed and insulation would need to be replaced. The actual number of person-hours spent in the vicinity of the RPV would not be known until such an effort was completed; however, the dose is estimated to be approximately 4.50 R.

"NDE personnel would need to locate and mark the areas where the supplemental examinations need to be performed. When performing ID examinations, limitations are located in respect to the core support lugs and the RPV flange, using indexing provided by the automated inspection tool. Translating these locations to the OD with a high degree of confidence would be extremely difficult task while working in high radiation field.

"The area not receiving ID examination is not located in the beltline region; therefore, concern with radiation embrittlement is not a factor. The lower shell-to-bottom head weld had a complete ultrasonic examination performed from the OD in

the fabrication shop, as a conservative measure, to ensure there were no unacceptable flaws that would need to be evaluated during preservice examinations. A review of fabrication shop ID and OD data indicates that no indications were observed in the areas not receiving ID inservice coverage; therefore, there is little likelihood of a crack propagating from a fabrication defect in the area.

"The examination of RPV shell welds provides an acceptable level of quality and safety even though all could not be fully examined. The average examination coverage of all Category B-A, Item No. B1.10 welds was greater than ninety-five percent (95%) and each weld (or portions of welds) located in the beltline region,

i.e., welds W05, W15, W16, and W17, received one-hundred percent (100%) coverage.

“These completed examinations provide reasonable assurance that unacceptable service induced flaws have not developed in these welds and that RPV shell weld integrity is maintained. The examinations were performed to the extent practical using state-of-the-art equipment and techniques available at the time of the examination in Spring 1998 within the limitations of design and access of the RPV. The evaluations and examinations performed meet the objectives of the augmented examinations defined in 10 CFR 50.55a(g)(6)(ii)(A); therefore, the NRC is requested to authorize the proposed alternative. Based on the results of the examinations discussed above, SNC concludes that the public health and safety will not be endangered.”

Evaluation: To comply with the augmented reactor vessel examination requirements of 10 CFR 50.55a(g)(6)(ii)(A), licensees must volumetrically examine essentially 100% of each of the Item B1.10 shell welds. As an alternative to the requirement of the regulations, the licensee proposed that the examination coverage obtained be considered to provide an acceptable level of quality and safety for the subject RPV weld.

At Vogtle Electric Generating Plant, Unit 2, the augmented coverage requirements could not be met for one shell weld, Weld W06, due to six core support lugs. For Weld W06 the physical obstructions limited coverage to 61% of the required volume; to achieve complete coverage, design modifications would be required to increase access from the inside surface (ID).

As a result of the augmented volumetric examination rule, licensees must make a reasonable effort to maximize examination coverage of their reactor vessel welds. In cases where examination coverage from the ID is inadequate, examination from the outside surface (OD) using manual inspection techniques may be an option. However, extensive surface preparation (removal of insulation, weld preparation and scaffolding erection) would be required for the licensee to perform supplemental examinations from the outside diameter. The effort expended to obtain access to the examination surface for the OD examination would result in considerable radiological exposure that is not warranted for the additional volumetric coverage achieved. Therefore, imposition of this requirement would result in a significant hardship without a compensating increase in the level of quality and safety.

The licensee has examined a significant portion of the subject welds. In addition, the licensee has met the coverage requirements for the remaining thirteen B1.10 RPV shell welds. No recordable indications exceeding the acceptance standards of the Code were noted. Based on the volumetric examination coverage attained, and the examinations conducted on the other B1.10 RPV welds, the INEEL staff concludes that any significant patterns of degradation, if present, would have been detected and that the examinations performed provide reasonable assurance of the continued structural integrity of the subject welds. Therefore, it is recommended that the licensee's proposed alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(ii).

2.2 Request for Relief No. RR-2, Examination Category B-A, Item B1.11, Reactor Pressure Vessel (RPV) Lower Shell-to-Bottom Head Weld 21201-V6-001-W06

Code Requirement: Examination Category B-A, Item B1.11 requires 100% volumetric examination, as defined by Figure IWB-2500-1, for RPV circumferential shell welds.

Licensee's Code Relief Request: Pursuant to 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from examining RPV circumferential shell weld 21201-V6-001-W06 to the extent required by the Code.

Licensee's Basis for Requesting Relief (as stated):

"Six RPV core support lugs are located on the lower shell of the RPV adjacent to RPV lower shell-to-bottom head weld 21201-V6-001-W06. These core support lugs (See Attachment 1 to this relief request) obstructed movement of the mechanized examination equipment sled/transducer along the lower shell side (upper scan region) of this weld. As a result, examination coverage of this non-beltline weld from the inside diameter (ID) of the RPV was limited to approximately sixty-one percent (61%) of the weld length. Complete coverage from the inside diameter (ID) of the RPV would necessitate redesign and modification of The RPV which is not practical.

"Performance of supplemental examinations from the RPV outside diameter (OD) was evaluated as a possible means of increasing coverage. These evaluations concluded that supplemental OD examinations could increase the total coverage to that required by ASME Section XI; however, such coverage was considered impractical due to the large radiation exposure (estimated as approximately 7.75 Rem (R)). This conclusion was based on the following:

- "(1) General area dose rates at the bottom of the vessel (as measured for VEGP-2 during Maintenance/Refueling Outage 2R6) are estimated to be approximately 200mr/hr with contact dose rates at the insulation surface approximately 1 R/hr.
- "(2) Non-Destructive Examination (NDE) personnel would need to perform thirteen UT scans for each area receiving the supplemental examinations. It is calculated that the dose to the NDE personnel in performing these examinations would be approximately 3.25R.
- "(3) Prior to performing examinations, personnel would need to erect any necessary scaffolding, remove insulation, and perform any required weld preparation in the high radiation field. This effort is further exacerbated by the fact that much of the RPV insulation used a VEGP was designed using rivets and screws and does not lend itself to easy removal and replacement. After examinations were completed, any scaffolding would need to be removed and insulation would need to be replaced. The actual number of person-hours spent in the vicinity of the RPV would not be known until such an effort was completed; however, the dose is estimated to be approximately 4.5R.
- "(4) NDE personnel would need to locate and mark the areas where the supplemental examinations need to be performed. When performing ID examinations, limitations are located in respect to the core support lugs and the RPV flange, using indexing providing by the automated inspection tool. Translating these locations to the OD with a high degree of confidence would be an extremely difficult task while working in high radiation field.

"This weld is a non-beltline area weld; therefore, radiation embrittlement is not a factor. This weld had a complete ultrasonic examination performed from the OD in the fabrication shop, as a conservative measure, to ensure that no unacceptable flaws were present that would require evaluation during preservice examinations.

A review of data indicates that no indications were observed in the areas not receiving ID inservice coverage.

“Compliance with Code coverage requirements would necessitate refabrication of the RPV to perform complete Code examinations from the ID or it would necessitate performance of supplemental examinations from the OD. Refabrication of the RPV to perform the Code required examinations from the ID is not practical and supplemental OD examinations have been evaluated by VEGP as impractical due to radiation exposure consideration. Fabrication shop examinations indicate that no indications were observed in the areas not receiving ID inservice coverage; therefore, there is little likelihood of a crack propagating from a fabrication defect.

“Examinations performed from the ID, combined with good fabrication shop examination results and lower embrittlement rates (of a non-beltline area) should provide reasonable assurance of the operational readiness of this weld and the RPV. Denial of this relief request would cause an excessive burden to VEGP.”

Licensee’s Proposed Alternative Examination (as stated):

“No supplemental examination is proposed. However, it should be noted that an overall, general visual examination (VT-3) of the RPV was performed in accordance with the requirements of ASME Section XI, Category B-N-1, Item No. B13.10, during the maintenance/refueling outage in which weld 21201-V6-001-W06 was examined volumetrically, i.e., during VEGP-2 Maintenance/Refueling Outage 2R6.”

Evaluation: The Code requires 100% volumetric examination of RPV lower shell-to-bottom head Weld 21201-V6-001-W06. However, access to this weld is obstructed by six core support lugs adjacent to the weld. These support lugs limit the volumetric examination and make the Code coverage requirements impractical for the subject weld. To meet the Code requirements, the RPV would require design modifications to allow access for complete examination. Imposition of this requirement would create a considerable burden on the licensee.

The licensee examined 61% of the Code-required volume for the subject weld, along with complete volumetric examination of the remaining RPV shell welds. In addition, a VT-3 visual examination was performed on the RPV in accordance with Category V-N-1, Item No. B13.10. The combination of these examinations would have detected any existing patterns of degradation and provides reasonable assurance of the continued structural integrity for the RPV. Based on the impracticality of meeting the Code requirements, and the reasonable assurance of the structural integrity provided by the examinations that were performed, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i) for the first 10-year interval.

2.3 Request for Relief No. RR-5, Examination Category B-A, Item B1.21, Circumferential Head Welds in Reactor Pressure Vessels

Code Requirement: Examination Category B-A, Item B1.21, requires 100% volumetric examination of the accessible portion of all circumferential head welds, as defined by Figure IWB-2500-3.

Licensee’s Proposed Alternative: In accordance with 10 CFR 50.55a(a)(3)(ii), the licensee proposed that the coverages obtained be found acceptable for the following weld.

Comp. ID	Component Description	ASME Category	Item Number	Aggregate Coverage	Limitation
W07	Bottom Head Circumferential Weld	B-A	B1.21	75%	In-core instrumentation tubes

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

"This 'dollar plate' weld was examined from inside the RPV in 1998 at the end of the first 10-year interval using remote 'contact' techniques and the Westinghouse inside diameter (ID) inspection tool. There were no recordable indications. The composite examination volume coverage using this technique was limited to approximately seventy-five (75%) of the examination volume. As seen in Attachments 1 and 2 to this relief request, approximately thirty (30) peripheral in-core flux instrumentation tubes are located within about 18 inches of the centerline of the subject weld.

"The Westinghouse ID inspection tool used for the examination utilized a transducer sled in contact with the surface of the head. This sled was manipulated around the instrument tubes to achieve maximum practical coverage for this tool. However, this tool had limited degree of motion, which, when combined with the curved geometry of the bottom head and the limitations posed by the instrument tubes, had limited ability to perform complete Code examinations. The most recent Westinghouse inspection tool designs (which have more advanced robotics with multiple degrees of motion) were used to perform the 1998 VEGP-2 examinations.

"The ID coverage of weld 21201-V6-001-W07 during the 10-year inservice examinations was limited during the first 10-year interval examinations, but was done to the extent practical, as allowed by the existing equipment. An option to increase this coverage was evaluated by SNC, but was determined to represent an extreme hardship. This option was:

"Supplemental OD Examinations - If outside diameter (OD) examinations were to be performed, they would have to be performed on the entire accessible length of the weld, because correlation of the numerous ID limitations to a corresponding location on the OD would be impractical. To perform the examination from the OD, personnel would need to erect scaffolding; remove the insulation; perform any required weld preparation; ultrasonically examined the weld; re-install the insulation; and remove the scaffolding. General area dose rates at the bottom of the RPV (as measured for Unit 2 during this sixth maintenance/refueling outage) are approximately 220mr/hr, with a contact dose rate at the insulation surface of approximately 1 R/hr. It was conservatively calculated that the dose to perform the weld examinations from the OD of the vessel would be in excess of 11.5R. A radiation dose of this magnitude, to perform examination of one weld, is contrary to the principles of as low as reasonable achievable (ALARA) and is considered by SNC to be an extreme hardship. Even if it was practical to perform such an examination, Code coverage would be improved, but it is unlikely that Code coverage of greater than ninety percent (90%) could be obtained due to the proximity of the instrument tubes.

"Weld 21201-V6-001-W07 was ultrasonically examined (manually) during the shop fabrication of the RPV at Combustion Engineering, using 0, 45, and 60-degree transducers. These examinations were performed from both the inside and the

outside of the vessel to assure that no unacceptable flaws were present. A review of the data for this weld indicates that no recordable indications were found in the weld or in the adjacent base material.

“SNC has demonstrated there is a adequate assurance that the structural integrity of weld 21201-V6-001-W07 is being maintained and that compliance with the Code requirements would result in a hardship without a compensating increase in the level of quality and safety.”

Evaluation: Examination Category B-A, Item B1.21 requires 100% volumetric examination of the accessible portion of all circumferential head welds. As an alternative, the licensee proposed that the examination coverage obtained be considered to provide an acceptable level of quality and safety for the subject RPV circumferential head weld.

At Vogtle Electric Generating Plant, Unit 2, the Code coverage requirements could not be met for one circumferential head weld due to 30 peripheral in-core flux instrumentation tubes. For Weld W07 the physical obstructions limited coverage to 75% of the required volume. To achieve complete coverage for the subject welds, design modifications of the RPV would be required to increase access from the inside surface (ID).

In order to meet requirements specified in the code, licensees must make a reasonable effort to maximize examination coverage. In cases where examination coverage from the ID is inadequate, examination from the outside surface (OD) using manual inspection techniques may be an option. However, extensive surface preparation (removal of insulation, weld preparation and scaffolding erection) would be required for the licensee to perform supplemental examinations from the outside diameter. The effort expended to obtain access to the examination surface for the OD examination would result in considerable radiological exposure (approximated to be greater than 11R) that is not warranted for the additional volumetric coverage that might be achieved.

The licensee has examined a significant portion (75%) of the subject weld. In addition, multiple Category B-A, Pressure Retaining Welds have been examined. Based on the volumetric examination coverages attained, and the examinations conducted on other Category B-A RPV welds, the INEEL staff concludes that significant patterns of degradation, if present, would have been detected, and the examinations completed provide reasonable assurance of the continued structural integrity of the subject welds. Imposition of the Code requirement would result in a significant hardship without a compensating increase in the level of quality and safety. It is therefore recommended that the licensee's proposed alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(ii).

2.4 Request for Relief No. RR-20 (Revision 1), Examination Category B-J, Item No. B9.11, Pressure Retaining Welds in Piping

Note: Request for Relief RR-20 was previously evaluated and granted for four Class 1 B-J welds in an NRC SER dated November 26, 1991. However, in Revision 8 of the ISI program, the licensee added seven additional B-J welds to the request for relief. Additionally, the licensee revised the examination coverage (increase in coverage) obtained for one weld evaluated in the original Request for Relief. Since the addition of welds to the Request for Relief is considered a revision, the Request for Relief will be evaluated as Request for Relief RR-20, Revision 1.

Code Requirement: Examination Category B-J, Item No. B9.11 requires surface and volumetric examination as defined by Figure IWC-2500-8 for circumferential welds in

piping NPS 4 or larger.

Licensee's Code Relief Request: In accordance with 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from the full Code-required volumetric examination for the welds listed below.

WELD	CAT. ITEM	DESCRIPTION	COVERAGE	LIMITATION
21201-036-21*	B-J B9.11	6" Pipe to Valve	83% - UT 100% - PT	Geometry of Valve
21201-059-12*	B-J B9.11	6" Tee to Pipe	100% - UT 95% - PT	Geometry of Valve
21201-060-1*	B-J B9.11	6" Tee to Pipe	100% - UT 95% - PT	Geometry of Valve
21204-024-15*	B-J B9.11	6" Pipe to Valve	87.5% - UT 100% - PT	Geometry of Valve
21204-024-16	B-J B9.11	6" Valve to Pipe	87.5% - UT 100% - PT	Geometry of Valve
21204-025-21	B-J B9.11	6" Pipe to Valve	75% - UT 100% - PT	Geometry of Valve
21204-025-22	B-J B9.11	6" Valve to Pipe	87.5% - UT 100% - PT	Geometry of Valve
21204-044-1	B-J B9.11	6" Valve to Pipe	87.5% - UT 100% - PT	Geometry of Valve
21204-044-13	B-J B9.11	6" Pipe to Tee	87.5% - UT 100% - PT	Geometry of Tee
21204-045-1	B-J B9.11	6" Valve to Pipe	81.5% - UT 100% - PT	Geometry of Valve
21204-045-28	B-J B9.11	6" Pipe to Tee	87.5% - UT 100% - PT	Geometry of Tee
*Weld evaluated in original Request for Relief.				

Licensee's Basis for Requesting Relief (as stated):

"Physical limitations due to geometric configuration of the welded areas, support obstructions, etc., do not permit complete coverage of the welds as required by ASME Section XI. The Code required surface examination will be performed.

In Response to Request for Additional Information the Licensee stated:

"The welds in Attachment 1 to Request for Relief RR-20 were added after the 2R6 outage, which was the first outage after updating to the 1989 Edition of the ASME Section XI Code from the 1983 Edition of the ASME Section XI Code. These welds

are limited due to the additional requirement of Supplement 4 of Appendix III, referenced below.

“Article III, Paragraph III-4430, of the 1989 Edition of ASME Section XI states, ‘The angle beam examination for reflectors transverse to the weld shall be performed on the weld crown on a single scan path to examine the weld root by one-half V path in two directions along the weld.’ This requirement is the same for the 1983 Edition of the ASME Section XI Code.

“In addition to the above requirement, Supplement 4 (Austenitic and Dissimilar Metal Welds) of Appendix III was added to the 1989 Edition of ASME Section XI Code, which requires ‘The angle beam examination for reflectors transverse to the weld shall be performed in two directions covering the minimum area from ½ in. from one side of the weld crown to ½ in. from one side of the weld crown to ½ in. from the other side of weld crown including the crown.’

“The Code coverages in question are Pipe to Valve and Pipe to Tee welds (see Attachment 1 to Request for Relief RR-20, Revision 8). These welds have configurations such that only scanning from the pipe side can be performed (up or down scans). For reflectors oriented parallel to the weld, 100% coverage can be obtained with this scan from the pipe side. No scans or coverages can be obtained from the Valve or Tee side. For reflectors oriented transverse to the weld (clockwise and counter-clockwise, i.e., cw and ccw, respectively), scanning can only be performed on the pipe side and the weld obtaining approximately 75% coverage. Please refer to Figure 1 that provides both a photograph and a diagram of the area of interest.

“Typical Code coverage for scanning for transverse reflectors is normally around 75%; however, depending on the precise contour of the surface, more or less coverage may be obtained.”

Licensee’s Proposed Alternative Examination (as stated):

“None”

Evaluation: The Code requires 100% volumetric and surface examination of the subject welds. Review of the sketches provided by the licensee revealed that complete volumetric examination is impractical due to component configurations such as valve bodies, and tee radii. To meet the Code requirements for volumetric examination, the subject welds and/or adjoining components would require significant engineering re-design and modifications. Therefore, the Code’s volumetric examination requirement is impractical for the subject welds. Imposition of this requirement would create a considerable burden on the licensee.

The licensee has volumetrically examined 75-100% of the Code-required volume and greater than 90% of the Code-required surface examinations of the subject welds. Based upon the volumes of the subject welds that were examined, and the Code-required surface examinations completed, it is concluded that patterns of degradation, if present, would have been detected. Therefore, reasonable assurance of the continued structural integrity of the subject welds has been provided, and it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

2.5 Request for Relief No. RR-30 (Part C-B), Examination Category C-B, Item No. C2.21, Nozzle to Shell Welds

Note: Request for Relief RR-30 was previously evaluated and granted for Class 2 vessel welds, pump casing welds, and integrally welded attachments on pumps in NRC SER's dated November 26, 1991, and August 13, 1996. However, in Revision 8 of the ISI program, the licensee added two nozzle-to-shell welds to the request for relief. Since these welds are a different examination category, they will be evaluated as Request for Relief RR-30, (Part C-B).

Code Requirement: Examination Category C-B, Item C2.21 requires 100% volumetric and surface examination as defined by Figures IWB-2500-4(a) or (b).

Licensee's Code Relief Request: In accordance with 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from the Code-required 100% volumetric examination of the following welds.

WELD	CAT. ITEM	DESCRIPTION	COVERAGE	LIMITATION
21205-E6-002-W04	C-B C2.21	RHR Heat Exchanger, Nozzle to Shell Welds	100% - PT 50% - UT	Component Configuration
21205-E6-002-W05	C-B C2.21	RHR Heat Exchanger, Nozzle to Shell Welds	100% - PT 50% - UT	Component Configuration

Licensee's Basis for Requesting Relief (as stated):

"Access limitations are due to geometric configuration of the welded areas. Flanges and supports restrict coverage of required examination volume areas. The actual restriction for each weld is shown in Attachment 1.

"The maximum percentage possible of the required ultrasonic examination will be performed."

In Response to the Request for Additional Information the Licensee stated:

"Article I, Paragraph I-2200 of the 1989 Edition of ASME Section XI requires Vessel Welds less than or equal to 2 inches in thickness to be examined in accordance with Appendix III. Appendix III, Article III, Paragraph III-4430 states, 'The angle beam examination for reflectors transverse to the weld shall be performed on the weld crown on a single scan path to examined the weld root by one-half V path in two directions along the weld.' In addition to this requirement, Supplement 4 of Appendix III (Austenitic and Dissimilar Metal Welds) states, 'The angle beam examination for reflectors transverse to the weld shall be performed in two directions covering the minimum area from ½ in. from one side of the weld crown to ½ in. from the other side of the weld crown including the crown.'

"The Code examination coverage in question is the Inlet Nozzle to Tube Side Shell Welds (please refer to Table 1). Because of the configuration of these welds, the only scan that can be performed for reflectors parallel to these welds is up or down. For reflectors oriented parallel to the weld, 100% coverage can be obtained with this scan. For reflectors oriented transverse to the weld (clockwise and counter-clockwise, i.e., cw and ccw, respectively), no coverage can be obtained resulting in a total Code coverage of 50%. Please refer to Figure 2 that provides both a photograph and a diagram of the area of interest."

Licensee's Proposed Alternative Examination (as stated):

"None"

Evaluation: The Code requires 100% surface and volumetric examination of Class 2 pressure vessel nozzle-to-shell welds. However, sketches provided by the licensee show that complete volumetric examination of Welds 21205-06-002-W04 and 21205-E6-002-W05 is limited due to the nozzle design configuration (extreme interface between RHR Shell and RHR Nozzle). Therefore, the Code-coverage requirements are impractical for these welds. To meet the Code requirements, the subject components would require engineering redesign and modification to allow access to the subject welds. Imposition of the Code requirements would result in a considerable burden on the licensee.

The licensee examined the subject welds to the extent practical, obtaining a cumulative total of 50% of the required volume for the subject welds. Additionally, the Code-required 100% surface examination was performed on each nozzle weld. Based on the volume examined and the Code-required surface examinations performed, it is concluded that any significant patterns of degradation, if present, would have been detected and reasonable assurance of the structural integrity of the pressure-retaining nozzle welds has been provided.

Due to the impracticality of meeting the Code examination requirements for the subject welds, and the reasonable assurance provided by the examinations that were completed, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

2.6 Request for Relief No. RR-34 (Part C-F-1), Examination Category C-F-1, Item C5.11 Pressure-Retaining Welds in Austenitic Stainless Steel or High Alloy Piping

Code Requirement: Examination Category C-F-1, Item C5.11 requires 100% volumetric and surface examination of circumferential welds in piping $\geq 3/8$ " nominal wall thickness for piping $>NPS 4$ as defined by Figure IWB-2500-7.

Licensee's Code Relief Request: In accordance with 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from the Code-required 100% volumetric examination of the following welds.

WELD	CAT. ITEM	DESCRIPTION	COVERAGE	LIMITATION
21204-006-2	C-F-1 C5.11	24" Valve to Elbow	78.5%	Geometry of Valve
21204-122-6	C-F-1 C5.11	10" Pipe to Valve	35%	Geometry of Valve
21208-137-13	C-F-1 C5.11	8" Valve to Pipe	87.5%	Geometry of Valve
21208-139-13	C-F-1 C5.11	6" Valve to Pipe	87.5%	Geometry of Valve
21208-411-24	C-F-1 C5.11	6" Pipe to Valve	87.5%	Geometry of Valve

Licensee's Basis for Requesting Relief (as stated):

"Physical limitations due to geometric configuration of the welded areas. Support

obstructions, inaccessibility etc. restrict coverage of examination volume as required by fig. IWC-2500-7.

“The Code Required ultrasonic examination will be performed to the extent possible. The Code required surface examination will be performed.”

In Response to the Request for Additional Information the licensee stated:

“The welds in Attachment 1 to Request for Relief RR-34, Revision 8, were added after the 2R6 outage, which was the first outage after updating to the 1989 Edition of ASME Section XI Code from the 1983 Edition of the ASME Section XI Code. These welds are limited due to the additional requirement of Supplement 4 of Appendix III, as referenced below.

“Article III, Paragraph III-4430, of the 1989 Edition of ASME Section XI states, ‘the angle beam examination for reflectors transverse to the weld shall be performed on the weld crown on a single scan path to examine the weld root by one-half V path in two directions along the weld.’ This requirement is the same for the 1983 of the ASME Section XI Code.

“In addition to the above requirement, Supplement 4 (Austenitic and Dissimilar Metal Welds) of Appendix III was added to the 1989 Edition of ASME Section XI Code, which requires ‘The angle beam examination for reflectors transverse to the weld shall be performed in two directions covering the minimum area from the other side of the weld crown including the crown.’

“The Code coverages in question are Pipe to Valve and Valve to Elbow welds (see Attachment 1 to Request for Relief RR-34, Revision 8). These welds have configurations such that only scanning from the pipe or elbow side can be performed (up or down scans). For reflectors oriented parallel to the weld, normally 100% coverage can be obtained, depending upon material type, with this scan from the pipe or elbow side. No scans or coverages can be obtained from the Valve side. For reflectors oriented transverse to the weld (clockwise and counter-clockwise scans, i.e., cw and ccw, respectively), scanning can only be performed on the pipe side and the weld obtaining approximately 75% coverage. Please refer to Figure 3 that provides both a photograph and a diagram of the area of interest. Typical Code coverage for scanning for transverse reflectors is normally around 75%; however, depending on the precise contour of the surface, more or less coverage may be obtained.

“Additional Limitation: Weld 21204-122-6 (as identified in Attachment 1 to Request for Relief RR-34) is fabricated from SA-376 Grade Material. As a result of a severely banded microstructure, this material exhibits severe angular variations and significant attenuation problems during a typical shear-wave ultrasonic examination. A refracted longitudinal (RL) wave, which is a ½ node examination technique, was found to be the best technique for examining this type of material. The Refracted Longitudinal technique being used will also produce a limitation if the examination can only be performed for the pipe side due to ½ node calibration. In addition to this limitation, this weld has a welded restraint that is 6 inches long and 3.3 inches for the weld centerline at top dead center and bottom dead center. Please refer to Figure 4 that provides photographs of the area of interest.”

Licensee’s Proposed Alternative Examination (as stated):

“None”

Evaluation: The Code requires 100% volumetric and surface examination of the subject Class 2 circumferential piping welds. Review of the sketches provided by the licensee revealed that complete volumetric examination is impractical due to component configurations resulting from the valve body to piping outside surface geometries. To meet the Code requirements for volumetric examination, the subject welds and/or adjoining components would require significant engineering re-design and modifications. Therefore, the Code volumetric examination requirement is impractical for the subject welds. Imposition of this requirement would create a considerable burden on the licensee.

The licensee has completed 35-87.5% of the Code-required volumetric examinations, and 100% of the Code-required surface examinations. Based on the volume examined and the Code-required surface examinations performed, it is concluded that any significant patterns of degradation, if present, would have been detected and reasonable assurance of the structural integrity of the pressure-retaining welds has been provided. Therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

2.7 Request for Relief No. RR-36 (Revision 1), Augmented Volumetric Examination of Class 2 Piping Welds in the Engineered Safety Systems

Note: Request for Relief RR-36 was previously evaluated and granted for seventy (70) augmented welds in an NRC SER dated November 26, 1991. However, in Revision 8 of the ISI program, the licensee added three additional augmented welds to the request for relief. Since the addition of welds to the Request for Relief is considered a revision, it will be evaluated as Request for Relief RR-36 (Revision 1).

Augmented Requirement: As a condition of licensing, Southern Nuclear Company (Georgia Power Company) agreed to volumetrically examine a minimum of 7.5% of the Class 2 welds in the engineered-safety systems (Containment Heat Removal, Emergency Core Cooling, and Residual Heat Removal Systems). These examinations shall be performed in accordance with the following Code requirements:

- 1) Section XI, Paragraph III-4420 requires that volumetric examination be performed using a sufficiently long beam path to provide coverage of the required examination volume in two beam-path directions. The examinations shall be performed from two sides of the weld, where practicable, or from one side of the weld as a minimum.
- 2) Paragraph III-4430 requires that the angle beam examination for reflectors transverse to the weld be performed on the weld crown on a single scan path to examine the weld root by ½ V-path in two directions along the weld.
- 3) Paragraph III-2430 requires that scanning be done at two times (+6 dB) the primary reference level.

Licensee's Relief Request: Relief is requested from the 100% volumetric examination coverage of the following augmented welds.

WELD	CAT. ITEM	DESCRIPTION	COVERAGE	LIMITATION
221202-216-59	Augmented	6" Pipe to Flange	50%	No exam from flange side
221202-225-1	Augmented	6" Pipe to Flange	50%	No exam from flange side
221202-229-2	Augmented	6" Pipe to Flange	50%	No exam from flange side

Licensee's Basis for Requesting Relief (as stated):

"Physical limitations due to geometric configuration of the welded areas; flanges, fittings, support obstructions, and etc. prevent complete coverage."

Licensee's Proposed Alternative Examination (as stated):

"SNC will perform a supplemental surface exam on the subject welds during the Fall 1999 maintenance/refueling."

Evaluation: An earlier revision of this request for relief from augmented volumetric examination requirements was granted in an NRC SER dated November 26, 1991. The current revision adds three welds to the original request for relief of seventy welds. The licensee's original basis for relief in 1991 was due to physical limitations due to geometric configurations of the welded areas and piping support obstructions. The limitations associated with the additional welds are similar to those specified for the original seventy welds. The addition of three welds to the request for relief does not change the original evaluation's technical justification for granting of relief. Therefore, based upon the original Safety Evaluation, it is recommended that relief remain granted for the revised version of Request for Relief 36, per 10 CFR 50.55a(g)(6)(i).

2.8 Request for Relief No. RR-63, Examination Category B-D, Item B3.90, Reactor Pressure Vessel Nozzle-to-Vessel Welds

Code Requirement: Examination Category B-D, Item B3.90 requires a 100% volumetric examination of reactor pressure vessel (RPV) nozzle-to-vessel welds as defined by Figure IWB-2500-7(a) through (d). The examination volume includes 100% of the weld length.

Licensee's Code Relief Request: In accordance with 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from the Code examination requirements for the reactor pressure vessel nozzle-to-vessel welds listed below.

WELD	CAT. ITEM	DESCRIPTION	COVERAGE	LIMITATION
212-1-V6-001-W25	B-D B3.90	RPV Outlet Nozzle-to-Shell Weld	72%	Protuding Inner Radius (Boss)
212-1-V6-001-W28	B-D B3.90	RPV Outlet Nozzle-to-Shell Weld	72%	Protuding Inner Radius (Boss)
212-1-V6-001-W29	B-D B3.90	RPV Outlet Nozzle-to-Shell Weld	72%	Protuding Inner Radius (Boss)
212-1-V6-001-W32	B-D B3.90	RPV Outlet Nozzle-to-Shell Weld	72%	Protuding Inner Radius (Boss)

Licensee's Basis for Requesting Relief (as stated):

"The required examination volume and associated weld configuration (barrel type nozzle with a protruding inner radius) for the outlet nozzles is shown in ASME Section XI IWB-2500-7(a). Coverage and limitations for this configuration (see Attachment 1) are listed below:

- (1) *Reflectors Parallel to the Outlet Nozzle-To-Vessel Weld* - Ultrasonic examinations will be performed from the nozzle bore using scans as allowed by T-441.3.2.2. Coverage from this direction is 100%.

“(2) *Reflectors Transverse to the Outlet Nozzle-To-Vessel Weld* - Ultrasonic examinations will be performed on the ID of the vessel wall and accessible portions of the adjoining nozzle using scans, directed clockwise and counterclockwise. The protruding inner radius (nozzle boss) limits scanning on the nozzle due to scanner interference’s. Coverage from this direction is estimated at approximately forty percent (43%).

“*Composite Coverage* - Composite coverage is calculated as seventy-two (72%) based on the average of the parallel and transverse scans listed above.

“Various techniques have been evaluated including the use of additional angles and outside diameter (OD) examinations; however, it was concluded that the techniques described above permit the maximum practical coverage to be obtained. Compliance with Code coverage requirements would necessitate refabrication of the RPV nozzles, which is impractical. The 100% coverage from the nozzle bore will assure that circumferential cracking existing in the weld would have been detected. Coverage limitations existed only for the detection of axially oriented cracking, which has less safety significance. Therefore, the examinations performed will provide reasonable assurance of the operational readiness of the welds and the RPV. Denial of this relief request would cause an excessive burden to VEGP...”

Licensee’s Proposed Alternative Examination (as stated):

“Ultrasonic examination of these welds will be performed to the maximum extent practical from the nozzle bore and from the RPV ID surface. No other examination will be conducted.”

Evaluation: The Code requires 100% volumetric examination of the subject RPV outlet nozzle-to-vessel welds. However, complete examination is restricted by geometric configuration (protruding nozzle boss) that makes the 100% volumetric examination impractical to perform for these areas. To gain access for examination, the RPV nozzles would require design modifications. Imposition of this requirement would create an undue burden on the licensee.

The licensee has examined these welds to the extent practical, obtaining significant coverage (72%) for each nozzle. In addition, other Class 1 nozzles are being examined as required by the Code. Therefore, any existing patterns of degradation would have been detected by the examinations that were completed and reasonable assurance of the structural integrity has been provided.

Based on the impracticality of meeting the Code coverage requirements for the subject nozzle-to-vessel welds, and the reasonable assurance provided by the examinations that were completed on these and other Class 1 nozzles, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

2.9 Request for Relief No. RR-64, IWA-4000, Repair Procedures, Class 1, 2, and 3 Piping, Valves, and Fittings ≤NPS 1"

Code Requirement: IWA-4000 provides rules and requirements for repairs to pressure-retaining components and their supports, including appurtenances and subassemblies, or parts of a component and core support structures. The rules include repair program requirements, inspection, welding and welder qualification, pressure testing, examination, and documentation.

Licensee's Proposed Alternative: In accordance with 10 CFR 50.55a(a)(3)(ii), the licensee proposed to eliminate the administrative requirement to document past repairs (backfit) to components 1-inch nominal pipe size (NPS) and smaller.

The licensee stated:

"IWA-4130 of the 1995 Addenda to ASME Section XI allows the application of alternative requirements of replacement to *all repair and replacement* activities. Although after the fact, it is believed that these have been met for VEGP-2 except possibly for piping and components 1-inch NPS and smaller, ASME Code Class 1, 2, and 3 heat exchangers, and steam generators, e.g., steam generator level taps. Because of the numerous MWOs that would have to be reviewed for possible applicability, GPC and its successor, SNC, do not wish to backfit the record keeping requirements of the 1983 Edition of ASME Section XI with Addenda through Summer 1983 for any past instances involving repairs to piping and components 1-inch NPS and smaller, particularly in light of the equalization of repair and replacement requirements as found in the 1995 Addenda to the Code."

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

"Around October 1996, an Authorized Nuclear Inspector (ANII) at VEGP identified a possible non-compliance with the requirements associated with record keeping for repairs of piping and components 1-inch NPS and smaller. Review of the VEGP Repair/Replacement Program during VEGP-2 Maintenance/Refueling Outage 2R5 in Fall 1996 confirmed the ANII's concern and revealed that repairs to piping and components 1-inch NPS and smaller were being treated similar to replacement of piping and components of that size, i.e., it was believed that repairs of piping and components 1-inch NPS and smaller were exempt, including the requirements associated with record keeping. As a result of this misunderstanding of the Code requirements for repairs, both VEGP units appear to have been in non-compliance with the repair requirements, including those associated with record keeping, e.g., use of ASME Form NIS-2 (Owner's Report for Repairs and Replacements), since the beginning of commercial operation through October 1996 (time of discovery) for repairs of piping and components 1-inch NPS and smaller. The NRC was advised of this potential non-compliance with the requirements of the ASME Section XI Code in Georgia Power Company, (GPC) letter LCV-0932 dated January 8, 1997. Complicating the issue was direction reportedly given by an ANII who preceded the ANII who identified the potential non-compliance. Reportedly, the previous ANII indicated to plant personnel responsible for repair activities that he did not wish to witness and presumably otherwise verify repairs to piping and components 1-inch NPS and smaller. To the best of the knowledge and belief of GPC, the former licensee and operator of VEGP, and its sister company, Southern Nuclear Operating Company (SNC), the current licensee and operator of VEGP, any such repairs performed to piping and components 1-inch NPS and smaller were technically sound and were performed in accordance with approved procedures.

"Because a significant effort would be required to review approximately thirty-one thousand (31,000) Maintenance Work Orders (MWOs) generated for VEGP-2 for the period from May 20, 1989 (date of commercial operation) through October 1996 (time of discovery) for possible non-compliance with a record keeping requirement, it is our position that complying with the record keeping requirements, including use of ASME Form NIS-2 for any such repairs of piping and components 1-inch NPS and smaller, would not provide a commensurate increase in the level of safety if the Code requirements were imposed for record keeping. As a result, relief is requested from the record keeping requirements for repairs to piping and components 1-inch NPS and smaller. Similar relief was requested for VEGP-1 and

was submitted to the NRC for review and approval as part of Revision 8 to VEGP-1 ISI Program document ISI-P-006. Since the identification of this potential non-compliance, plant personnel responsible for repair activities have been instructed that repairs, irrespective of the size of piping and component involved, are to be properly documented. In addition, the ASME Section XI Repair/Replacement Program was revised to require that repairs, irrespective of the size of the component involved, were to be properly documented. Further, in March 1997, a training course on ASME Section XI (with emphasis on repair and replacement requirements) was held and included personnel directly involved with repair and replacement activities at VEGP. To the best of our knowledge and belief, VEGP-2 has been in Code compliance with the repair requirements for piping and components 1-inch NPS and smaller since October 1996.

"IWA-4130 in the 1995 Addenda to ASME Section XI allows application of alternative requirements for replacement to *all repair and replacement* activities. The alternative requirements are specifically addressed in paragraphs IWA-4131 and IWA-4132 of IWA-4130 and exclude Class 1, 2, and 3 heat exchanger tubes, sleeves, and welded plugs for heat exchanger tubes. It is the position of SNC that steam generators would be similarly excluded since they are considered at VEGP to be heat exchangers. Had the requirements of this later addenda of the ASME Section XI Code been in effect for the period in question, the record keeping requirements for piping and components 1-inch NPS and smaller would not have been required except for tubes, sleeves, and welded plugs for Class 1, 2, and 3 heat exchangers and steam generators.

"As a result, it is our position that compliance with the repair requirements of the 1983 Edition of ASME Section XI with Addenda through Summer 1983 for piping and components 1-inch NPS and smaller does not provide a commensurate increase in the level of safety if these repair requirement were imposed.

"The 1983 Edition of ASME Section XI Code with Addenda through Summer 1983 provides an exemption for replacement items 1-inch NPS and smaller from the requirements of IWA-7000, but repairs to such are not similarly exempted. Therefore, a repair to an item is subject to more restrictive requirements than replacing them.

"IWA-4130 in the 1995 Addenda to ASME Section XI allows application of alternative requirements for replacement to *all repair and replacement* activities. The alternative requirements are specifically addressed in paragraphs IWA-4131 and IWA-4132 of IWA-4130. Heat exchanger tubing, sleeves, and welded plugs used for plugging heat exchanger tubes for Class 1, 2, and 3 systems are excluded from the alternative requirements of IWA-4130.

"Imposing the requirements of the 1983 Edition of ASME Section XI with Summer 1983 Addenda retroactively to any repairs conducted to piping and components 1-inch NPS and smaller for the period from May 20, 1989 until October 1996 when the subject non-compliance was confirmed and remedied would present an undue hardship in light of changes in the Code. Without reviewing each of the approximately thirty-one thousand (31,000) maintenance work order packages, the exact number of potential non-compliance cannot be quantified. All repair and replacement requirements are believed to have been met except possible the record keeping requirements, i.e., completion of an ASME Form NIS-2, 'Owner's Report for Repairs and Replacements', for piping and components 1-inch NPS and smaller. It is our belief that the number of any such occurrences of repairs to items

1" NPS and smaller are relatively few and are of minor safety significance. There are no other areas of non-compliance associated with this particular issue to the best of our knowledge and belief. We acknowledge that cost is not considered a burden in complying with the Code requirements. However, we do not believe that record keeping requirements should be retroactively imposed in this instance since no similar record keeping requirement exists for replacements 1-inch NPS and smaller. No commensurate increase in the level of quality and safety would be achieved if we were to administratively backfit any repairs to items 1-inch NPS and smaller that are within the scope of the VEGP-2 ISI Program. Nor would there be a decrease in the margin of public health and safety if this administrative function, i.e., completion of an ASME Form NIS-2, 'Owner's Report for Repairs and Replacements', was not performed. ASME has concluded that the repair requirements for items 1-inch NPS and smaller should be similar to those for replacements which do not require similar actions for small items 1-inch NPS and smaller. This is documented in ASME Section XI Code Case N-544 whose provisions were incorporated into the 1995 Addenda to ASME Section XI. Any repairs would have been performed using various existing approved procedures and/or programs as required by 10 CFR 50, Appendix B, which established control on the planning, work control, quality assurance/quality control, and implementation of work packages. As a result, it is requested that the proposed alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(ii) on the basis that an undue hardship would be imposed if the Code requirements were retroactively imposed for the period in question."

In Response to the Request for Additional Information the licensee stated:

"Relief is being requested from fulfilling the administrative requirement to document any past repairs to components 1-inch nominal pipe size (NPS) and smaller, e.g., piping, valves, fittings, etc., should they have occurred and that may have inadvertently exempted from the code requirements. Specifically, this would include the record keeping requirements of IWA-4700, IWA-6220, and IWA-6340 in the 1983 Edition of the ASME Section XI Code with Summer 1983 Addenda.

"Please note that VEGP-2 Request for Relief RR-64 is virtually identical in content to the similarly numbered request for relief submitted for VEGP-1 by our letter LCV-1124 dated December 1, 1997, and later supplemented by our letter LCV-1124-A dated May 26, 1998. VEGP-1 Request for Relief RR-64 was subsequently approved by the NRC as documented in its letter dated January 29, 1999."

Evaluation: The Code requires that repairs and replacements be performed in accordance with IWA-4000 and IWA-7000, respectively. Pursuant to IWA-7400, piping, valves, and fittings NPS 1-inch and smaller are exempt from the requirements of Article IWA-7000. However, Article IWA-4000 has no exemption criteria for components NPS 1-inch and smaller. Therefore, some licensees may choose to replace rather than repair items to avoid the repair requirements of IWA-4000. As an alternative, the licensee proposed to use the requirements of IWA-4130 of the 1995 Addenda to exempt items 1-inch NPS and smaller from the repair and replacement requirements of the Code. This is equivalent to the alternative contained in Code Case N-544, *Repair and Replacement of Small Items*, which has not yet been approved for general use by the NRC in Regulatory Guide 1.147.

In accordance with the 1995 Addenda and Code Case N-544, piping, valves, and fittings NPS 1-inch and smaller, except for heat exchanger tubing and sleeves, and welded plugs used for heat exchanger tubing, are exempt from both repair and replacement

requirements of the Code. The exemption criteria used for the repair of items NPS 1-inch and smaller is comparable to existing Code requirements for the replacement of similar items. Therefore, the INEEL staff believes that IWA-4130 of the 1995 Addenda provides reasonable assurance of pressure boundary integrity with one exception: ASME Section XI differentiates between steam generators and heat exchangers by providing separate item numbers. As currently written, the 1995 Addenda, IWA-4130 does not address steam generator tubing, only "heat exchanger" tubing. To address this uncertainty, the licensee has stated that steam generators are considered heat exchangers and, therefore, would be required to meet all IWA-4000 requirements with the remainder of heat exchanger tubing, sleeves, and welded plugs.

As stated by the licensee, imposition of the Code requirements would necessitate a significant effort to review approximately 31,000 work orders to complete paperwork that is not required by later Code Addenda. This effort could potentially divert plant personnel from other activities that could affect plant safety. It is concluded that imposition of these record keeping activities, to document repairs that are not required to be documented by later Code Editions, would result in an undue hardship without a compensating increase in the level of quality and safety. Therefore, it is recommended that the licensee's proposed alternative relative to first interval repairs be authorized pursuant to 10 CFR 50.55a(a)(3)(ii).

3. CONCLUSION

The INEEL staff has reviewed the licensee's submittals and concludes that the Code requirements are impractical to meet for the issues contained in Requests for Relief RR-2, RR-20 (Revision 1), RR-30 (Part C-B), RR-34 (Part C-F-1), and RR-63. Therefore, relief should be granted pursuant to 10 CFR 50.55a(g)(6)(i). In addition, the technical content of Request for Relief RR-36 (Revision 1) has not changed. Therefore, relief should remain granted.

For Request for Relief RR-36, it is concluded that the addition of three welds to the request for relief does not change the original evaluation's technical justification for granting of relief. Therefore, based upon the original Safety Evaluation, it is recommended that relief remain granted for the revised version of Request for Relief 36, per 10 CFR 50.55a(g)(6)(i).

For Requests for Relief RR-5 and RR-64, it is concluded that the Code requirements would result in hardship without a compensating increase in the level of quality and safety. Therefore, it is recommended that these proposed alternatives be authorized pursuant to 10 CFR 50.55a(a)(3)(ii).

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