

June 20, 2001

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

SUBJECT: SECOND 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM PLAN
REQUESTS FOR RELIEF 13, 14, 15, 21, AND 33 FOR VOGTLE ELECTRIC
GENERATING PLANT, UNITS 1 AND 2 (TAC NO. MB0603 AND MB0604)

Dear Mr. Beasley:

The staff has reviewed and evaluated the information you provided in your letter dated October 18, 2000, proposing Requests for Relief 13, 14, 15, 21, and 33 for the second 10-year interval for Vogtle Electric Generating Plant, Units 1 and 2. In a conference call on March 23, 2001, you provided clarifying information regarding surface exams that were 100% completed where relief was not requested. The staff found your requests for relief acceptable. The staff's evaluation and conclusions are provided in the enclosure.

Sincerely,

/RA/

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

cc w/encl: See next page

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Vogtle Electric Generating Plant

cc:

Mr. J. A. Bailey
Manager, Licensing
Southern Nuclear Operating
Company, Inc.
P. O. Box 1295
Birmingham, Alabama 35201-1295

Mr. J. Gasser
General Manager, Vogtle Electric
Generating Plant
Southern Nuclear Operating
Company, Inc.
P. O. Box 1600
Waynesboro, Georgia 30830

Office of Planning and Budget
Room 615B
270 Washington Street, SW.
Atlanta, Georgia 30334

Mr. J. D. Woodard
Executive Vice President
Southern Nuclear Operating
Company, Inc.
P. O. Box 1295
Birmingham, Alabama 35201-1295

Steven M. Jackson
Senior Engineer - Power Supply
Municipal Electric Authority
of Georgia
1470 Riveredge Parkway, NW.
Atlanta, Georgia 30328-4684

Harold Reheis, Director
Department of Natural Resources
205 Butler Street, SE. Suite 1252
Atlanta, Georgia 30334

Attorney General
Law Department
132 Judicial Building
Atlanta, Georgia 30334

Mr. J. D. Sharpe
Resident Manager
Oglethorpe Power Corporation
Alvin W. Vogtle Nuclear Plant
P. O. Box 1600
Waynesboro, Georgia 30830

Charles A. Patrizia, Esquire
Paul, Hastings, Janofsky & Walker
10th Floor
1299 Pennsylvania Avenue
Washington, DC 20004-9500

Arthur H. Dombey, Esquire
Troutman Sanders
NationsBank Plaza
600 Peachtree Street, NE.
Suite 5200
Atlanta, Georgia 30308-2216

Resident Inspector
Vogtle Plant
8805 River Road
Waynesboro, Georgia 30830

Office of the County Commissioner
Burke County Commission
Waynesboro, Georgia 30830

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SECOND 10-YEAR INTERVAL INSERVICE INSPECTION

REQUESTS FOR RELIEF 13, 14, 15, 21, AND 33

VOGTLE ELECTRIC GENERATING PLANT, UNITS 1 AND 2

SOUTHERN NUCLEAR OPERATING COMPANY, INC.

DOCKET NUMBERS 50-424 AND 50-425

1.0 INTRODUCTION

By letter dated October 18, 2000, Southern Nuclear Operating Company, Inc. (SNC, the licensee) submitted requests for relief from certain requirements of the American Society of Mechanical Engineers (ASME) Code, Section XI for Vogtle Electric Generating Plant (VEGP), Units 1 and 2. The information provided by the licensee in support of the requests for relief from Code requirements has been evaluated by the staff and the basis for disposition is documented below.

Inservice Inspection (ISI) of the ASME Code Class 1, 2, and 3 components is to be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel 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 10 CFR 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 the licensee demonstrates that: (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 (ISI) 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 ten-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) twelve months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The Code of record for VEGP, Units 1 and 2, second 10-year ISI interval is the 1989 Edition of the ASME Boiler and Pressure Vessel Code.

Enclosure

2.0 EVALUATION

The staff has reviewed the information concerning ISI program Requests for Relief 13, 14, 15, 21, and 33 for the second 10-year interval for VEGP, Units 1 and 2, provided in the letter dated October 18, 2000. In a conference call on March 23, 2001, the licensee provided clarifying information regarding surface exams that were 100% completed where relief was not requested.

The information provided by the licensee in support of its requests for relief from Code requirements has been evaluated and the basis for disposition is documented below.

2.1 Request for Relief 13 Examination Category B-J , Item B9.11 Pressure Retaining Welds In Piping

Code Requirement: 1989 ASME Code Edition, Section XI Examination Category B-J, Table IWB-2500-1 requires surface and volumetric examination of pressure-retaining welds in Class 1 piping. Applicable examination volumes are shown in ASME Section XI Figure IWB- 2500-8 and includes essentially 100% of the weld length. In addition, ASME Section XI Appendix III, Supplement 4, requires that the angle beam examination for reflectors transverse to the weld be performed on the weld crown and ½ inch of the base material on each side of the weld for austenitic materials.

System/Components(s) for Which Relief is Requested: Volumetric examination of pressure-retaining piping welds in Class 1 systems as identified in the table below:

Table 1

ASME Section XI Category/Item	Identification No.	Description	Limitation	Approximate Percentage	1 st Int RR No.
B-J/B9.11	11201-058-7	VEGP-1 6" Elbow to Flange	One side examination due to flange configuration	87%	N/A
B-J/B9.11	11204-023-16	VEGP-1 6" Valve to Pipe	One side examination due to valve configuration	75%	N/A
B-J/B9.11	11204-042-1	VEGP-1 6" Valve to Pipe	One side examination due to valve configuration	65%	N/A
B-J/B9.11	11204-043-1	VEGP-1 6" Valve to Pipe	One side examination due to valve configuration	65%	N/A
B-J/B9.11	11204-044-2	VEGP-1 6" Valve to Pipe	One side examination due to valve configuration	62%	N/A

ASME Section XI Category/Item	Identification No.	Description	Limitation	Approximate Percentage	1 st Int RR No.
B-J/B9.11	21201-029-30	VEGP-2 4" Valve to Pipe	One side examination due to valve configuration	80%	N/A
B-J/B9.11	21201-036-6	VEGP-2 12" Pipe to Pipe	One side examination due to valve configuration	87%	N/A
B-J/B9.11	21201-036-7	VEGP-2 12" Valve to Pipe	One side examination due to valve configuration	87%	N/A
B-J/B9.11	21204-023-16	VEGP-2 6" Valve to Pipe	One side examination due to valve configuration	87%	N/A
B-J/B9.11	21204-042-1	VEGP-2 6" Valve to Pipe	One side examination due to valve configuration	87%	N/A
B-J/B9.11	21204-042-15	VEGP-2 6" Pipe to Tee	One side examination due to Tee Configuration	86%	N/A
B-J/B9.11	21204-043-1	VEGP-2 6" Valve to Pipe	One side examination due to valve Configuration	87%	N/A

Licensee's Code Relief Request: The licensee requested relief from performing a full Code coverage volumetric examination of the Class 1 piping welds identified in the above table.

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

Physical limitations due to geometric configuration of the welded areas restrict coverage of examination volume as required by Figure IWB-2500-8 and ASME Section XI Appendix III, Supplement 4. To obtain 100% coverage, the ultrasonic beam must pass through the entire examination volume in 4 directions, axial (up & down) and circumferential (clockwise & counter-clockwise). Full axial coverage from one side may be accomplished by utilizing a 3T calibration (1 ½ node). However, weld configurations (crown, counterbore) and/or material properties may not allow examination coverage to extend beyond 1T (½ node). For the First Ten-Year Interval, the circumferential (transverse) scans were only required on the weld crown per Appendix III of the 1983 Edition of ASME Section XI with Addenda through Summer 1983. That requirement could usually be met

for most configurations. Refer to Attachment 2^[1] of this document for a typical representation of a single side access examination, along with limitations.

The volumetric examinations of the Class 1 piping welds are being conducted to the fullest extent practical. As noted herein, physical access is restricted, thereby preventing full Code examination coverage.

In order to examine 100% of the weld volume, systems would require extensive modifications. The resulting increase in plant safety would not compensate for the burden that would result from imposition of the requirement. While Code coverage during the second ten-year interval may vary due to the imposition of the new Code requirement, the level of quality will not change from that obtained during the first ten-year interval.

As a result, SNC requests that relief be authorized pursuant to 10 CFR 50.55a(g)(6)(i) since complete examination coverage is impractical.

Licensee's Proposed Alternative Examination (as stated):

No alternate examination is proposed. However, refracted longitudinal (RL) waves, which have been shown to provide a more reliable detection of circumferential flaws when passing through the weld material, are used on all single side access austenitic welds.

Evaluation: The ASME Code 1989 Edition, Section XI Examination Category B-J, Table IWB-2500-1 requires surface and volumetric examination of pressure-retaining welds in Class 1 piping. The licensee requested relief from performing a full Code coverage volumetric examination of the Class 1 piping welds identified in Table 1 above.

The licensee noted that to obtain 100% coverage, the ultrasonic beam must pass through the entire examination volume in 4 directions, axial (up & down) and circumferential (clockwise & counter-clockwise). Full axial coverage from one side may be accomplished by utilizing a 3T calibration (1 ½ node). However, weld configurations (crown, counterbore) and/or material properties may not allow examination coverage to extend beyond 1T (1/2 node). The licensee further noted that for the first 10-year interval, the circumferential (transverse) scans were only required on the weld crown per Appendix III of the 1983 Edition of ASME Section XI with Addenda through Summer 1983 and that requirement could usually be met for most configurations.

The staff determined that, because of the physical limitations due to geometric configuration of the subject welded areas, the Code requirements are impractical. In order to examine 100% of the weld volume, the subject systems would have to be redesigned and that would result in burden to the licensee. The resulting increase in plant safety would not compensate for the burden that would result from imposition of the requirement.

¹Attachment is not included in this safety evaluation.

The licensee obtained 75% to 86% volumetric coverage; 100% surface examination, which was also required, was obtained as well. The licensee used refracted longitudinal (RL) waves, which have been shown to provide a more reliable detection of circumferential flaws when passing through the weld material, on all single side examinations of austenitic welds. The volumetric and surface coverages obtained should detect any significant patterns of degradation. The licensee's proposed volumetric coverage and the use of RL waves to examine the subject components provides reasonable assurance of structural integrity of the subject components. Therefore, the licensee's relief is granted pursuant to 10 CFR 50.55a(g)(6)(i).

2.2 Request for Relief 14 Examination Category C-A , Item C1.20 Pressure Vessels, Category C-B, Item Nos. C2.21 and C2.22 Pressure Vessels and Nozzles, Category C-C, Item No. C3.10 Integrally Welded Attachments of Pressure Vessels

Code Requirement:

(a) ASME Section XI, Category C-A, Item No. C1.20, Table IWC-2500- 1, requires volumetric examination of pressure-retaining welds of Class 2 pressure vessels. Applicable examination volumes are shown in Figures IWC-2500-1 and 2.

(b) ASME Section XI, Category C-B, Item Nos. C2.21 and C2.22, Table IWC-2500-1, requires volumetric examinations of pressure-retaining welds of Class 2 pressure vessels and nozzle inner radii and surface examinations of nozzle reinforcement plate welds. The applicable examination volume is shown in Figure IWC-2500-4.

(c) ASME Section XI, Category C-C, Item No. C3.10, Table IWC-2500- 1, requires surface examination of integrally welded attachments of Class 2 pressure vessels. Applicable examination areas are shown in Figure IWC-2500-5.

System/Component(s) for Which Relief is Requested: Volumetric examination of pressure-retaining welds and nozzle inner radius sections of vessels and surface examinations of nozzle reinforcement plates (Class 2) as identified in Table 2 below:

Table 2

ASME Section XI Category/Item No.	Identification No.	Description	Limitation	Approximate Percentage	1 st Int. RR No.
C-A/C1.20	11204-V6-001-W02	VEGP-1 BIT Head to Shell Weld	Vessel supports and weld configuration (OD taper)	57%	RR-30
C-A/C1.20	11204-V6-001-W03	VEGP-1 BIT Head to Shell Weld	Vessel weld configuration (OD taper)	62%	RR-30
C-B/C2.21	11201-B6-001-W18	VEGP-1 Main Steam Outlet Nozzle to Head Weld	Nozzle configuration (100% shell/0% nozzle)	50%	RR-29

ASME Section XI Category/Item No.	Identification No.	Description	Limitation	Approximate Percentage	1 st Int. RR No.
C-B/C2.21	11201-B6-002-W19	VEGP-1 SG Feedwater nozzle to shell weld	Nozzle configuration (100% shell/0% nozzle)	50%	RR-29
C-B/C2.21	11201-B6-004-W26	VEGP-1 SG Auxiliary Feedwater nozzle to shell weld	Nozzle configuration (100% shell/0% nozzle)	50%	RR-29
C-B/C2.21	11204-V6-001-W01	VEGP-1 BIT Nozzle to Head Weld	Nozzle configuration (100% shell/0% nozzle)	50%	RR-30
C-B/C2.21	11204-V6-001-W04	VEGP-1 BIT Nozzle to Head Weld	Nozzle configuration (100% shell/0% nozzle)	50%	RR-30
C-B/C2.21	21201-B6-001-W18	VEGP-2 SG Main Steam outlet nozzle to head weld	Nozzle configuration (100% shell/0% nozzle)	50%	Unit 2 RR-29
C-B/C2.21	21201-B6-002-W19	VEGP-2 SG Feedwater nozzle to shell weld	Nozzle configuration (100% shell/0% nozzle)	50%	Unit 2 RR-29
C-B/C2.21	21201-B6-002-W26	VEGP-2 Auxiliary Feedwater nozzle to shell	Nozzle configuration (100% shell/0% nozzle)	50%	Unit 2 RR-29
C-B/C2.22	11201-B6-001-IR03	VEGP-1 SG Main Steam outlet nozzle inner radii	Nozzle configuration (no inner radius)	0%	RR-28
C-B/C2.22	11205-E6-001-IR01 & IR02	VEGP-1 RHR HX Inner radii	Nozzle configuration (0% shell/0% Nozzle)	0%	RR-32
C-B/C2.22	11205-E6-002-IR01 & IR02	VEGP-1 RHR HX Inner radii	Nozzle configuration (0% shell/0% nozzle)	0%	RR-32
C-B/C2.22	21201-B6-001-IR03	VEGP-2 SG Main Steam outlet nozzle inner radii	Nozzle configuration (no inner radius)	0%	Unit 2 RR-28
C-B/C2.22	21205-E6-001-IR-01 & IR-02	VEGP-2 RHR HX Inner radii	Nozzle configuration (0% shell/0% nozzle)	0%	Unit 2 RR-32
C-B/C2.22	21205-E6-002-IR-01 & IR-02	VEGP-2 RHR HX Inner radii	Nozzle configuration (0% shell/0% nozzle)	0%	Unit 2 RR-32
C-B/C2.31	11205-E6-001-W09- through W12	VEGP-1 RHR HX reinforcement plate	Nozzle configuration (Inaccessible)	0%	RR-32

ASME Section XI Category/Item No.	Identification No.	Description	Limitation	Approximate Percentage	1 st Int. RR No.
C-B/C2.31	11205-E6-002-W09- through W12	VEGP-1 RHR HX reinforcement plate	Nozzle configuration (Inaccessible)	0%	RR-32
C-B/C2.31	21205-E6-001-W09- through W12	VEGP-2 RHR HX reinforcement plate	Nozzle configuration (Inaccessible)	0%	Unit 2 RR-32
C-B/C2.31	21205-E6-002-W09- through W12	VEGP-2 RHR HX reinforcement plate	Nozzle configuration (Inaccessible)	0%	Unit 2 RR-32
C-B/C3.30	11204-V6-001-W05	VEGP-1 Boron Injection Tank Support Attachment	Support configuration	64%	Unit 1 RR-30
C-B/C3.30	11208-P6-002-W03	VEGP-1 CVCS CCP Support Attachment	Support configuration	70%	Unit 1 RR-30
C-B/C3.30	21208-P6-002-W03	VEGP-2 CVCS CCP Support Attachment	Support configuration	70%	Unit 2 RR-30

Licensee's Code Relief Request: Pursuant to 10 CFR 50.55a(g)(6)(i) the licensee requested relief from performing the Code-required volumetric examinations of the components identified in Table 2 above.

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

(a) For the VEGP-1 Boron Injection Tank (BIT), the outside diameter (OD) configuration, combined with the interfering support legs and cast stainless steel material, presents physical limitations that prevent complete coverage during ultrasonic examinations.

(b) Geometric configuration of the SG main steam, auxiliary feedwater, main feedwater nozzles, and Boron Injection Tank nozzles presents physical limitations that prevent complete coverage during ultrasonic examination. As a result, scanning from the nozzle side is not feasible.

The configuration of the steam generator (SG) steam outlet nozzle is such that no inner radius exists. The nozzle is manufactured from a forging that is a solid block of steel. Seven (7) holes, each 8 1/2-inch diameter, have been drilled through this forging to provide an outlet for the steam. Thus, this nozzle does not have a conventional inner radius.

The configuration of the VEGP Residual Heat Removal (RHR) heat exchanger (Hx) nozzles differs from that shown in ASME Section XI Figure IWC-2500-4(c). Although the reinforcing plate welded to the vessel has a rounded configuration in the flow, it is not a true nozzle inner radius when compared with the

configuration in Figure IWC- 2500-4(c). Please refer to Attachment 2^[2] for a figure depicting the VEGP configuration. It is not possible to perform an inner radius ultrasonic examination since the interface between the reinforcing plate and the RHR heat exchanger vessel wall prohibits volumetric examination. Although the reinforcement plate is welded to the inside diameter of the heat exchanger wall, the reinforcing plate-to-vessel welds are inaccessible. Therefore, it is impractical to perform a surface examination on the reinforcing plate-to-vessel welds.

(c) The Boron Injection Tank (BIT) and Centrifugal Charging Pump (CCP) integrally welded support attachments are configured such that portions of the weld are inaccessible for surface examination. Please refer to Attachment 3^[3] for pictures depicting the VEGP configuration of the BIT and CCP integrally welded support attachments.

The examinations are being conducted to the fullest extent practical.

Relief was initially granted by the NRC during the First Ten-Year Interval for those welds/components in Attachment 1 having requests for relief submitted for them. These included First Ten-Year Interval Requests for Relief RR-28, RR-29, RR-30, and RR-32. NRC approval was documented in correspondence dated November 26, 1991, and December 17, 1991, for VEGP 1 and 2, respectively. It was determined during the first ten-year interval review process that geometric configurations and interferences make the volumetric examinations of these welds impractical to perform to the extent required by the Code. The subject components would require extensive modifications in order to obtain complete compliance with the specific requirements of ASME Section XI. The increase in plant safety would not compensate for the burden placed on the licensee that would result from imposition of the requirement.

Although there are physical obstructions which limit the amount of examination coverage for those components identified in Attachment 1^[4], reasonable assurance still exists that an acceptable level of quality and safety will be maintained since there have been no catastrophic failures of Class 2 pressure vessels. SNC requests that relief be authorized pursuant to 10 CFR 50.55a(g)(6)(i) since imposing the Code requirements is impractical.”

Licensee's Proposed Alternative Examination (as stated):

No alternate examination is proposed. The affected Class 2 vessel welds are being examined to the fullest extent practical.

²Attachment 2 is not included in this safety evaluation.

³Attachment 3 is not included in this safety evaluation.

⁴Attachment 1 is not included in this safety evaluation.

Evaluation: The Code requires 100% volumetric or surface examination of the subject examination areas. However, access to these areas is limited by component configuration or design such that examinations cannot be performed. Therefore, the Code-required volumetric examinations are impractical for these areas. Design modifications would be required to allow access for examination. Imposition of the Code requirements would result in a burden on the licensee.

For the VEGP-1 boron injection tank (BIT), the outside diameter (OD) configuration, combined with the interfering support legs and cast stainless steel material, presents physical limitations that prevent complete coverage during ultrasonic examinations. The licensee can examine at least 50% of each weld. These examinations should detect any significant patterns of degradation. Therefore, reasonable assurance of the structural integrity will be provided by the partial examinations.

The configuration of the steam generator (SG) steam outlet nozzle is such that no inner radius exists. The nozzle is manufactured from a forging that is a solid block of steel. Seven (7) holes, each 8 ½-inch diameter, have been drilled through this forging to provide an outlet for the steam. Thus, this nozzle does not have a conventional inner radius and the Code examinations are impractical to perform.

The configuration of the residual heat removal (RHR) heat exchanger nozzles differs from that shown in ASME Section XI Figure IWC-2500-4(c) and the reinforcing plate welded to the vessel has a rounded configuration in the flow which is not a true nozzle inner radius when compared with the configuration in Figure IWC- 2500-4(c). The licensee stated that it is not possible to perform an inner-radius ultrasonic examination since the interface between the reinforcing plate and the RHR heat exchanger vessel wall prohibits volumetric examination. Furthermore, the reinforcement plate is welded to the inside diameter of the heat exchanger wall and the reinforcing plate-to-vessel welds are inaccessible. Therefore, it is impractical to perform a surface examination on the reinforcing plate-to-vessel welds.

The BIT and centrifugal charging pump (CCP) integrally welded support attachments are configured such that portions of the weld are inaccessible for surface examination. The licensee can examine at least 64% of each weld. These examinations should detect any significant patterns of degradation. Therefore, reasonable assurance of the structural integrity will be provided by the partial examinations.

Based on the evaluation above, it is concluded that the Code volumetric or surface examinations are impractical for the subjected examination areas. Therefore, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i).

2.3 Request for Relief 15 Examination Category C-F-1 , Items C5.11 Circumferential Piping Welds

Code Requirement: 1989 Edition ASME Code, Section XI, Examination Category C-F1, Table IWC-2500-1 requires surface and volumetric examination of pressure-retaining welds in Class 2 piping. Applicable examination volumes are shown in ASME Section XI Figure IWC-2500-7 and includes essentially 100% of the weld length. In addition, ASME Section XI Appendix III, Supplement 4, requires that the angle beam examination

for reflectors transverse to the weld be performed on the weld crown and ½ inch of the base material on each side of the weld for austenitic materials.

System/Component(s) for Which Relief is Requested: Volumetric examination of pressure-retaining piping welds in Class 2 systems as identified in Table 3 below:

Table 3

ASME Section XI Category/Item No.	Identification No.	Description	Limitation	Approximate Percentage	1 st Int RR No.
C-F-1/C5.11	11204-012-1	VEGP-1 8" Valve to Pipe	One sided examination due to valve configuration	86%	N/A
C-F-1/C5.11	11204-012-2	VEGP-1 8" Pipe to Valve	One sided examination due to valve configuration	86%	RR-36
C-F-1/C5.11	11204-012-3	VEGP-1 8" Valve to Pipe	One sided examination due to valve configuration	86%	N/A
C-F-1/C5.11	11204-039-1	VEGP-1 8" Valve to Pipe	One sided examination due to valve configuration	88%	N/A
C-F-1/C5.11	11204-039-34	VEGP-1 6" Pipe to Valve	One sided examination due to valve configuration	62%	N/A
C-F-1/C5.11	11205-005-32	VEGP-1 14" Pipe to Nozzle	One sided examination due to nozzle configuration	87%	RR-36
C-F-1/C5.11	11205-006-19	VEGP-1 8" Pipe to Valve	One sided examination due to valve configuration	85%	N/A
C-F-1/C5.11	11205-007-6	VEGP-1 8" Pipe to Flange	One sided examination due to flange configuration	87%	N/A
C-F-1/C5.11	11205-007-7	VEGP-1 8" Flange to Pipe	One sided examination due to flange configuration	75%	N/A
C-F-1/C5.11	11206-004-4	VEGP-1 10" Pipe to Valve	One sided examination due to valve configuration	86%	RR-36

ASME Section XI Category/Item No.	Identification No.	Description	Limitation	Approximate Percentage	1 st Int RR No.
C-F-1/C5.11	11206-004-17	VEGP-1 12" Flange to Pipe	One sided examination due to flange configuration	88%	RR-36
C-F-1/C5.21	11208-145-16	VEGP-1 4" Pipe to Valve	One sided examination due to valve configuration	86%	N/A
C-F-1/C5.11	11208-411-27	VEGP-1 8" Valve to Pipe	One sided examination due to valve configuration	86%	N/A
C-F-1/C5.11	11205-008-80	VEGP-2 8" Pipe to Valve	One sided examination due to valve configuration	64%	N/A

Licensee's Code Relief Request: Pursuant to 10 CFR 50.55a(g)(6)(i) the licensee requested relief from performing a full Code Coverage volumetric examination of the Class 2 piping welds identified in Table 3 above.

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

Physical limitations due to geometric configuration of the welded areas restrict coverage of the examination volume required by Figure IWC-2500-7 and ASME Section XI Appendix III, Supplement 4. To obtain 100% coverage, the ultrasonic beam must pass through the entire examination volume in 4 directions, axial (up & down) and circumferential (clockwise & counter-clockwise). Full axial coverage from one side may be accomplished by utilizing a 3T calibration (1 ½. node). However, weld configurations (crown, counterbore) and/or material properties may not allow examination coverage to extend beyond 1T (½ node). For the First Ten-Year Interval, the circumferential (transverse) scans were only required on the weld crown per Appendix III of the 1983 Edition of ASME Section XI with Addenda through Summer 1983. That requirement could usually be met for most configurations. Refer to Attachment 2^[5] of this document for a typical representation of a single side access examination, along with limitations.

The volumetric examinations of the Class 2 piping welds are being conducted to the fullest extent practical. As noted herein, physical access is restricted, thereby preventing full Code examination coverage.

Relief was granted by the NRC for a portion of the Class 2 piping welds listed in Attachment 1^[6] during the First Ten-Year Interval. These included First

⁵Attachment 2 is not included in this safety evaluation.

⁶Attachment 1 is not included in this safety evaluation.

Ten-Year Interval Requests for Relief RR-34, RR-35, RR-36 and RR-37 for VEGP-1 and 2. NRC approval was documented in correspondence dated November 26, 1991, and December 17, 1991, for VEGP-1 and 2, respectively.

In order to examine 100% of the weld volume, systems would require extensive modifications. The resulting increase in plant safety would not compensate for the burden that would result from imposition of the requirement. While Code coverage during the second ten-year interval may vary due to the imposition of the new Code requirement, the level of quality will not change from that obtained during the first ten-year interval.

As a result, SNC requests that relief be authorized pursuant to 10 CFR 50.55a(g)(6)(i) since complete examination coverage is impractical.

Licensee's Proposed Alternative Examination (as stated):

No alternate examination is proposed. However, refracted longitudinal (RL) waves, which have been shown to provide a more reliable detection of circumferential flaws when passing through the weld material, are used on all single side access austenitic welds.

Evaluation: The ASME Code, Section XI, Examination Category C-F-1, Table IWC-2500-1 requires 100% surface and volumetric examination of pressure-retaining welds in Class 2 piping. The licensee requested relief from performing a full Code coverage volumetric examination of the Class 2 piping welds identified in Table 3 above.

The licensee noted that physical limitations due to geometric configuration of the welded areas restrict coverage of the examination volume required by the Code. To obtain 100% coverage, the ultrasonic beam must pass through the entire examination volume in four directions, axial (up & down) and circumferential (clockwise & counter-clockwise). Full axial coverage from one side may be accomplished by utilizing a 3T calibration (1 ½ node). However, weld configurations (crown, counterbore) and/or material properties may not allow examination coverage to extend beyond 1T (½ node). The licensee further noted that for the first 10-year interval, the circumferential (transverse) scans were only required on the weld crown per Appendix III of the 1983 Edition of ASME Section XI with Addenda through Summer 1983 and that requirement could usually be met for most configurations.

The staff concludes that to examine 100% of the weld volume of the subject systems would require extensive modifications and imposition of the requirements would be a burden on the licensee. Therefore, the Code requirements are impractical.

The licensee obtained 64% to 87% volumetric coverage and 100% surface examination was required. The licensee used RL waves, which have been shown to provide a more reliable detection of circumferential flaws when passing through the weld material, on all single side access austenitic welds. These examinations should detect any significant patterns of degradation. The volumetric and surface coverages obtained and the licensee's use of RL waves to examine the subject components provides reasonable

assurance of structural integrity of the subject components. Therefore, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i).

2.4 Request for Relief 21 Examination Category C-A , Item C1.21 and C-B, Item C2.11 Letdown Heat Exchanger Vessels and their Connections in Piping

Code Requirement: 1989 Edition ASME Code, Section XI, Table IWC-2500-1, Examination Category C-A (Item C1.20) requires a volumetric examination, and Examination Category C-B (Item C2.11) requires a surface examination.

System/Components(s) for Which Relief is Requested: Relief is requested from the surface and volumetric examination requirements of vessels and their connections in piping 4" nominal pipe size (NPS) and smaller in:

1. Residual Heat Removal (RHR), Emergency Core Cooling (ECC), and Containment Heat Removal (CHR) systems or portions thereof, except high pressure safety injection systems.
2. Systems other than RHR, ECC, and CHR systems or portions thereof.

Specifically, the following components are involved:

<u>Component</u>	<u>VEGP-1 Tag No.</u>	<u>VEGP-2 Tag No.</u>
Excess Letdown Heat Exchanger	1-1208-E6-002	2-1208-E6-002
Letdown Heat Exchanger	1-1208-E6-003	2-1208-E6-003
Letdown Reheat Heat Exchanger	1-1208-E6-007	2-1208-E6-007

Licensee's Code Relief Request: The licensee requested relief to exclude the components cited above from the required surface and volumetric examinations as allowed in IWC-1220, "Components Exempt From Examination," in the 1989 Addenda (including subsequent editions and addenda) of ASME Section XI and ASME Code Case N-408-2 which has been endorsed for general use in Revision 9 of Regulatory Guide 1.147.

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

Subarticle IWC-1220 of the 1989 Addenda of ASME Section XI allowed the exemption of selected components from the surface and volumetric examination requirements of IWC-1220. The 1996 Addenda of ASME Section XI also includes these exemptions in IWC-1220. The NRC granted these exemptions to VEGP in the first interval through correspondence dated March 8, 1996, and August 13, 1996, for VEGP-1 and 2, respectively. (Reference First Ten-Year Interval Request for Relief RR-62 for VEGP-1 and 2.)

These exemptions will be allowed when the newer Addenda and Editions of the Code are authorized in 10 CFR 50.55a. SNC sees no benefit in performing examinations on components which the Code has determined can be exempted. The other requirements in the Code are therefore acceptable to assure an

acceptable level of safety or quality. It is impractical to perform examinations which do not provide a compensating increase in the level of safety or quality.

Licensee's Proposed Alternative Examination (as stated):

These exemptions exclude the applicable vessels from the surface and volumetric examinations required by IWC-2500. The remainder of the Code-required examinations (i.e., pressure tests) would be performed to assure that an acceptable level of safety and quality is maintained for the applicable components.

Evaluation: The licensee editorially revised this relief to delete the reference to the Chemical Volume and Control System (CVCS) Regenerative Heat Exchangers for VEGP, Units 1 and 2 (11208-E-6-001 and 21208-E6-001, respectively). The welds and components supports for these heat exchangers are now addressed in the licensee's Request for Relief RR-33. In addition, references to the Suction Dampeners for VEGP, Units 1 & 2 (1-1208-V4-002 and 2-1208-V4-002, respectively) and to the Discharge Dampeners for VEGP, Units 1 & 2 (1-1208-V4-002 and 2-1208-V4-002, respectively) have been deleted since these components are no longer part of plant design. The licensee has made no other changes to its request for relief. The NRC authorized the licensee's alternative in its Safety Evaluation dated December 31, 1998, pursuant to 10 CFR 50.55a(a)(3)(i); however, since that time the 1989 Addenda of the ASME Code has been approved for use in 10 CFR 50.55a. Therefore, the licensee's use of the 1989 Addenda is authorized pursuant to 10 CFR 50.55a(g)(4)(iv) for the second 10-year interval.

- 2.5 Request for Relief 33 Examination Category C-A , Items C1.10 Shell Circumferential Welds, Item C1.20 Head-to-Shell Welds, Item No. C1.30 Tubesheet-to-Shell Welds, Examination Category C-B, Item No. C2.11 Nozzle-to-Shell Welds, Examination Category C-C, Item No. C3.10 Integrally Welded Attachments on Pressure Vessels. Table IWF-2500-1, Category F-A, requires visual, VT-3 examination of component supports. SNC uses Code Case N-491 for supports.

Code Requirement: The 1989 Edition of the Section XI Code, Table IWC-2500-1, Examination Category C-A, Item No. C1.10 requires a volumetric examination of shell circumferential welds, Item No. C1.20 requires a volumetric examination of head-to-shell welds, Item No. C1.30 requires a volumetric examination of tubesheet-to-shell welds, and Examination Category C-B, Item No. C2.11 requires a surface examination of nozzle-to-shell welds where vessel nominal thickness $\leq \frac{1}{2}$ inch, and Examination Category C-C, Item No. C3.10 requires a surface examination of integrally welded attachments on pressure vessels. Table IWF-2500-1, Category F-A, requires visual, VT-3 examination of component supports. SNC uses Code Case N-491 for supports.

Licensee's Code Relief Request: The licensee requested relief from performing the examination of the Regenerative Heat Exchanger welds and component supports.

System/Component(s) for Which Relief is Requested: Regenerative Heat Exchanger (VEGP-1 tag no. 1-1208-E6-001, VEGP-2 tag no. 2-1208-E6-001) welds and component supports.

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

The Regenerative Heat Exchanger is a Class 2 heat exchanger that is designed to reduce unnecessary heat losses by heating the Reactor Coolant System (RCS) charging flow with the letdown flow. The 3" charging inlet/outlet lines are connected to the heat exchanger on the tube side, and the 3" letdown inlet/outlet lines are connected on the shell side. All of the 3" lines are exempt from non-destructive examinations per IWC-1221(c); however, the heat exchanger requires examination. The examination of the Regenerative Heat Exchanger is considered to constitute an unnecessary hardship without an associated increase in the level of quality and safety. This conclusion is based on the following:

A conservative whole body dose in the range of one to two Rem is a reasonable estimate for examining the Regenerative Heat Exchanger. Dose rate surveys taken during the ninth Unit 1 refueling outage in Mode 6 with water in the heat exchanger indicate a contact dose rate of one-and-one-half to three (1.5 to 3) Rem/hour, a dose rate at one foot away from the heat exchanger of 800 to 1000 MRem/hour, and a general area dose rate of 300 to 600 MRem/hour. Unit 2 dose rates are comparable with those of Unit 1. The estimated stay time to perform the Code-required examinations on the Regenerative Heat Exchanger is one hour. SNC considers this cumulative dose to constitute a hardship with no increase in the level of quality and safety for this system.

The subject welds and piping supports are located on a component where all of the numerous welds and supports on the connecting lines are exempt from non-destructive examination. Not performing the examination of these heat exchanger welds and supports in a system where almost all of the welds and supports do not require examination should have no effect on the level of quality and safety for this system.

The Code requirements, if imposed, present a significant hardship to SNC and would result in radiation exposure that is contrary to the principles of ALARA (As Low As Reasonably Achievable). Further, the inlet and outlet piping are exempt from volumetric and surface examination requirements. SNC concludes that a compensating increase in the level of quality and safety will not be provided by non-destructively examining the Regenerative Heat Exchanger welds and their component supports, since the connecting piping is exempt from nondestructive examinations. The VT-2, visual examination performed during the pressure tests will provide adequate assurance of the operational readiness of the Regenerative Heat Exchanger; therefore, approval is requested per the requirements of 10 CFR 50.55a(a)(3)(ii).

Licensee's Proposed Alternative Examination (as stated):

No alternative examinations will be performed.

Evaluation: The Code requires 100 percent volumetric and/or surface examination of the subject Class 2 Regenerative Heat Exchanger welds. The examination of these

items is restricted due to extreme radiological conditions. The licensee proposed to eliminate the examinations on the Regenerative Heat Exchanger.

The Regenerative Heat Exchanger is a Class 2 heat exchanger that is designed to reduce unnecessary heat losses by heating the RCS charging flow with the letdown flow. The 3" charging inlet/outlet lines are connected to the heat exchanger on the tube side and the 3" letdown inlet/outlet lines are connected on the shell side. All of the 3" lines are exempt from non-destructive examinations per IWC-1221(c); however, the heat exchanger requires examination.

The licensee stated that the whole body dose is in the range of one to two Rem for examining the Regenerative Heat Exchanger. The dose rate surveys taken by the licensee during the ninth Unit 1 refueling outage in Mode 6 with water in the heat exchanger indicate a contact dose rate of one-and-one-half to three (1.5 to 3) Rem/hour, a dose rate at one foot away from the heat exchanger of 800 to 1000 mRem/hour, and a general area dose rate of 300 to 600 mRem/hour (milliRem/hour). The licensee noted that the Unit 2 dose rates are comparable with those of Unit 1. The estimated stay time to perform the Code-required examinations on the Regenerative Heat Exchanger is one hour.

The inlet and outlet piping are exempt from volumetric and surface examination requirements. The staff concludes that a compensating increase in the level of quality and safety will not be provided by non-destructively examining the Regenerative Heat Exchanger welds and their component supports. The Code required VT-2, visual examination performed by the licensee during the pressure tests, provides reasonable assurance of the structural integrity of the Regenerative Heat Exchanger. Therefore, the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the second 10-year interval.

3.0 CONCLUSION

The staff evaluated the licensee's submittal and concludes that certain inservice examinations cannot be performed to the extent required by the Code at the VEGP, Units 1 and 2. A summary of Requests for Relief 13, 14, 15, 21, and 33 determinations are provided in the Attachment.

For Requests for Relief RR-13, RR-14, and RR-15 discussed above, the staff concludes that the Code requirements are impractical for the subject welds and the examinations performed provide reasonable assurance of structural integrity of the subject welds. Therefore, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i) for the second 10-year interval. The staff has determined that granting relief pursuant to 10 CFR 50.55a(g)(6)(i) is authorized by law and will not endanger life or property, or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

For Request for Relief RR-21 the staff concludes that the licensee editorially revised this relief by deleting the reference of the CVCS Regenerative Heat Exchangers, Suction Dampeners, and Discharge Dampeners for VEGP, Units 1 & 2. The licensee has made no other changes to its request for relief. The NRC authorized the licensee's alternative in its Safety Evaluation

dated December 31, 1998, pursuant 10 CFR 50.55a(a)(3)(i); however, since that time the 1989 Addenda of the ASME Code has been approved for use in 10 CFR 50.55a. Therefore, the licensee's use of the 1989 Addenda is authorized pursuant to 10 CFR 50.55a(g)(4)(iv) for the second 10-year interval.

For Request for Relief RR-33 the staff concludes that the Code requirements would be a hardship on the licensee without a compensating increase in the level of quality and safety. The Code-required VT-2, visual examination performed by the licensee during the pressure tests provides reasonable assurance of the structural integrity of the Regenerative Heat Exchanger. Therefore, the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the second 10-year interval.

Attachment: Summary of Relief Request

Principal Contributor: T. McLellan, EMC/DE

Date: June 20, 2001

SUMMARY OF RELIEF REQUESTS

Relief Request Number	System or Component	Exam Category	Item No.	Volume or Area to be Examined	Required Method	Licensee Proposed Alternative	Relief Request Status
RR-13	Piping Welds	B-J	B9.11	Elbow to Pipe and Valve to Pipe	Volumetric and Surface	None -Coverage Obtained	Granted 10 CFR 50.55a(g)(6)(i)
RR-14	Boron Injection Tank, SG, MS, & RHR HX	C-A, C-B, & C-C	C1.20, C2.21, C2.22, & C3.10	Head-to-Shell weld and Nozzle-to-Head Weld	Volumetric or Surface	None-Coverage Obtained	Granted 10 CFR 50.55a(g)(6)(i)
RR-15	Piping Welds	C-F-1	C5.11	Valve to Pipe, Pipe to Valve, Pipe to Nozzle, Pipe to Flange, and Flange to Pipe	Volumetric	None - Coverage Obtained	Granted 10 CFR 50.55a(g)(6)(i)
RR-21	RHR Heat Exchanger	C-A & C-B	C1.20 & C2.11	Vessels and piping connections 4" NPS and smaller	Volumetric or Surface	None	Authorized 10 CFR 50.55a(g)(4)(iv)
RR-33	Regenerative Heat Exchanger	C-A, C-B, C-C, and F-A	C1.10, C1.20, C1.30, C2.11, and C3.11	Shell Circumferential Welds, Tubesheet-to-Shell Welds, Head-to-Shell Welds, Nozzle-to-Shell Welds, Integrally Welded Attachments, and Component Supports	Volumetric or Surface	None	Authorized 10 CFR 50.55a(a)(3)(ii)