

SOUTH CAROLINA ELECTRIC & GAS COMPANY

POST OFFICE 764

COLUMBIA, SOUTH CAROLINA 29218

September 27, 1984

O. W. DIXON, JR.
VICE PRESIDENT
NUCLEAR OPERATIONS

Mr. Harold R. Denton
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

SUBJECT: Virgil C. Summer Nuclear Station
Docket No. 50/395
Operating License No. NPF-12
1st Interval
Inservice Inspection Program

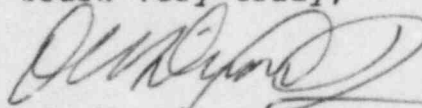
Dear Mr. Denton:

South Carolina Electric & Gas Company (SCE&G), acting for itself and as agent for South Carolina Public Service Authority, hereby submits ten (10) copies of additional information regarding the first Interval Inservice Inspection (ISI) Program as requested by the Nuclear Regulatory Commission Staff in a letter dated July 23, 1984. In addition to the response to each question, (see Attachment I) the following are included:

- 1) Question 121.27 - Attachment II.
- 2) Question 121.12 - Attachment III.
- 3) GTP-303, Inservice Inspection (replaces GTP-003) - Attachment IV.
- 4) A list of piping welds and their scan limitations - Attachment V.
- 5) Copies of the piping isometrics which identify the welds - Attachment VI.
- 6) A copy of revised relief requests - Attachment VII.

If you require additional information, please advise.

Yours very truly,



O. W. Dixon, Jr.

A047
1/10

MDQ:OWD/cc
Attachments:

cc: V. C. Summer
T. C. Nichols, Jr./O. W. Dixon, Jr.
E. H. Crews, Jr.
E. C. Roberts
W. A. Williams, Jr.
D. A. Nauman
J. P. O'Reilly (w/attach.)
Group Managers
O. S. Bradham

C. A. Price (w/attach.)
C. L. Ligon (NSRC)
K. E. Nodland
R. A. Stough
G. Percival
C. W. Hehl
J. B. Knotts, Jr. (w/attach.)
NPCF
File (2)

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PDR ADDOCK 05000395
Q PDR

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ATTACHMENT I
RESPONSE TO "REQUEST FOR ADDITIONAL INFORMATION"

QUESTION 2A.

Presently, the Virgil C. Summer ISI Program is based on the 1977 Edition of the Code, Summer 1978 Addenda. 10 CFR 50.55a (46 FR 20153, effective 5/4/81) specifies the primary code applicable to the program as the 1977 Edition, Summer 1979 Addenda, based on the date of the full power operating license (11/12/82, License Amendment 5, NUREG 0871).

Please submit the necessary revisions to reflect any Summer 1979 Addenda requirements so that we can continue our review.

RESPONSE TO QUESTION 2A

In 1980, during review of the Virgil C. Summer Nuclear Station Final Safety Analysis Report (FSAR), the Nuclear Regulatory Commission had two (2) questions concerning Inservice Inspection (ISI). These two (2) questions, 121.12 and 121.27, (Attachments II and III) address ISI at the Virgil C. Summer Nuclear Station for the initial ten years of operation.

Question 121.27 specifically directs SCE&G to utilize ASME Code Section XI 1977 Edition through Summer 1978 Addenda, unless the Operating License is issued before November 1, 1980. Since our Operating License was not issued before November 1, 1980, but was issued after November 1, 1980, SCE&G committed to utilization of the 1977 Edition through Summer 1978 Addenda.

Question 121.12, in part, directed SCE&G to submit an Inservice Inspection Plan within six months of the anticipated date for commercial operation. This statement also directed SCE&G to "utilize that edition of Section XI of the ASME Code referenced in your FSAR or later editions of Section XI referenced in the Federal Register that you may elect to apply".

These two questions and responses were incorporated in the Virgil C. Summer Nuclear Station FSAR and, accordingly, our ISI Program was developed and submitted in accordance with these commitments.

Considering the background, it is felt that the 1977 edition of the Code including the Summer 1978 Addenda should be the code of record for the first interval of inspections.

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QUESTION 2B

Our review of the Inservice Inspection Program documents did not find that the 1974 Edition, Summer 1975 Addenda, is being used for selecting Class 2 welds in systems providing the functions of Residual Heat Removal, Emergency Core Cooling and Containment Heat Removal. This is a requirement of 10 CFR 50.55a(b)(2)(iv)(a). What provisions have you made to comply with this requirement?

RESPONSE TO QUESTION 2B

GTP-303, Inservice Inspection Non-Destructive Examination, Section 4.5 and Attachment 7.3 (enclosed as Attachment IV) details the requirements for compliance to 10 CFR 50.55a(b)(2)(iv)(a). The systems are listed along with the requirements specified by ASME Code Section XI 1974 Edition, through and including Summer 1975 Addenda.

QUESTION 3

Paragraph IWB-1220 and IWC-1220 of Section XI permit certain Class 1 and Class 2 components to be exempted from volumetric and surface examination. The Summer PSI Program listed a number of allowed exemptions from Code NDE. A similar list does not appear in the current ISI Program. Please submit a list of allowed exemptions.

RESPONSE TO QUESTION 3

Exemptions from Code Class 1 surface and volumetric examinations are as follows:

- a) Reactor Coolant System component connections, piping and associated valves of 1" nominal pipe size (NPS) and smaller.
- b) Reactor Vessel Head connections and associated piping 2" NPS and smaller made inaccessible by control rod drive penetrations.

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RESPONSE TO QUESTION 3 (continued)

- c) Reactor Vessel Head Vents - these are less than 2" NPS.
- d) Reactor Vessel Level Instrumentation - these are less than 2" NPS.
- e) Steam Generator Tubes - examined in accordance with Technical Specifications.

Exemptions from Code Class 2 surface and volumetric examinations are as follows:

- a) All Chemical and Volume Control System (CVCS) piping equal to or less than 4" NPS is exempted by IWC-1220(c).
- b) All Boron Injection System piping equal to or less than 4" NPS is exempted by IWC-1220(c).
- c) All high head Safety Injection System piping equal to or less than 4" NPS is exempted by IWC-1220(c).
- d) The Seal Water Injection Filter is manufactured from piping of 4" nominal pipe size and, thereby, exempted by IWC-1220(c).
- e) The Refueling Water Storage Tank (RWST) and associated piping are not required to operate during normal plant operations nor perform a system function, but remain flooded under static conditions at a pressure greater than 80% of the pressure that they will be subjected to when required to operate. Therefore, the RWST and associated piping are exempted by IWC-1220(a).
- f) The Letdown Heat Exchanger Nozzles are 3" NPS and are therefore excluded by IWC-1220(c). There are no integrally welded supports on the Class 2 portion of the vessel. The tubesheet flange bolting is 1" diameter and is not included in IWC-2500-1 Category C-D.

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RESPONSE TO QUESTION 3 (continued)

- g) The Excess Letdown Heat Exchanger Nozzles are 2" diameter and thereby exempted by IWC-1220(c).
- h) The Regenerative Heat Exchanger Nozzles are 3" diameter and thereby exempted by IWC-1220(c). There are no integrally welded supports or pressure retaining bolting.
- i) The Seal Water Heat Exchanger Nozzles are 4" NPS and thereby exempted by IWC-1220(c). Two other nozzles and two integrally welded supports are attached to the Class 3 portion of the vessel and, therefore, exempted. The tube flange bolting is 3/4" and thereby exempted by IWC-2500 C-D.
- j) The Letdown Reheat Heat Exchanger Nozzles are 4" NPS and exempted by IWC-1220(c). There are no integrally welded supports on the Class 2 portion of the vessel and tubesheet.
- k) The Seal Water Return Filter and Reactor Coolant Filter Nozzles are 2" NPS and thereby exempted by IWC-1220(c). The bolting is 5/8" diameter and therefore IWC-2500 Category C-D does not apply.
- l) The Volume Control Tank Nozzles are 4, 3 and 2 inch diameter and thereby exempted.
- m) The Steam Generators do not have any integrally welded supports attached to the Class 2 portion.
- n) There are no Class 2 valves with pressure retaining welds or integrally welded supports.

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QUESTION 4

The program tables do not show pressurizer head welds (Category B-B, Item B2.20) and partial penetration welds in Class 1 vessels, such as CRD and Instrument nozzles and pressurizer heater nozzles (Category B-E, Items B4.10 and B4.20), to be included in the NDF Program. Please explain these omissions.

RESPONSE TO QUESTION 4

There are no pressurizer head welds on the Virgil C. Summer pressurizer. However, there are pressurizer head-to-shell welds (Category B-B, Items B2.11 and B2.12) which are identified in procedure GTP-303, Page 126 of Attachment 7.2.

Partial penetration welds in Class 1 vessels (Category B-E, Items B4.10 and B4.20) are leak tested per the requirements of GTP-304 and the appropriate Surveillance Test Procedure.

QUESTION 5

The Category B-O examination item in your program tables (Peripheral CRD housing welds) contains a remark that accessible surfaces will be examined. Similarly, the Category B-B examinations on Steam Generator Tube-Sheet-To-Head welds are to be done "as accessibility permits". Please indicate how these examinations will meet Code requirements.

RESPONSE TO QUESTION 5

The statement "as accessibility permits" was inserted in the program relative to "ALARA" considerations. However, this statement has been removed from the program (GTP-303). Should "ALARA" considerations preclude examination of these welds, relief requests will be submitted. Otherwise, the examinations will be performed in accordance with code requirements.

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QUESTION 6

For Category B-J and C-F piping weld examinations, we cannot determine from the program and program tables that the examination sample meets Code requirements. Please provide the following information:

- A. Current piping isometric drawings referenced in the program tables.
- B. A description of the process used in selecting welds for examination.
- C. Specific reference to the Code weld selection requirements that will or will not be met.
- D. Confirmation that the selection process will minimize the number of welds needing relief.

RESPONSE TO QUESTION 6

- A. Isometric drawings referenced in the program tables are contained in Attachment VI.
- B. The selection process used is the same as described in GTP-303 and ASME Section XI Code.
 - 1) 1977 Edition, Summer 1978 Addenda Notes 1 and 2 Table IWB-2500-1 Category B-J selection process.
 - 2) 1977 Edition, Summer 1978 Addenda Notes 1(a), 1(b), 1(c), 1(d), 1(e), 1(f) C-F Table IWC-2500-1 selection process.
 - 3) 1974 Edition, Summer 1975 Addenda Subarticle IWC-2411 for Emergency Core Cooling (ECC), Residual Heat Removal (RHR) and Containment Heat Removal (CHR) Systems.

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RESPONSE TO QUESTION 6 (continued)

- C. The 1977 Edition, Summer 1978 Addenda weld selection requirements will be met for all Category B-J and C-F piping welds except for RHR, CHR and ECC Systems.

The 1974 Edition, Summer 1975 Addenda weld selection requirements will be met for RHR, ECC and CHR Systems.

- D. Since the Code requires that welds selected for examination be structural discontinuity welds, practically all welds potentially require relief from examination requirements due to UT beam reflection/refraction characteristics.

QUESTION 7

The Category C-F section in the program tables identifies 12 containment penetrations (pp 39 and 40) that have four inaccessible welds each. For those welds required by Category C-F to be examined, please indicate how Code requirements are to be met.

RESPONSE TO QUESTION 7

These welds are containment penetration sleeve-to-piping welds and, therefore, are not categorized by the C-F section. In addition, these welds do not form, nor are they part of, the pressure retaining boundary.

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QUESTION 8

This question pertains to the following Relief Requests:

- 1-RPV-1: Category B-F requirements on reactor vessel nozzle-to-safe end welds.
- 1-PRESS-1: Category B-F requirements on pressurizer nozzle-to-safe end welds.
- 1-S/G-1: Category B-F requirements on Steam Generator nozzle-to-safe end welds.
- 1-PIPE-1: Category B-J requirements on piping system branch connections.
- 1-PIPE-2: Category B-J requirements on all other piping system welds.
- 2-PIPE-1: Category C-F requirements on Class 2 piping system welds.

The weld list issued in your letter 8/25/81 was based on examination limitations noted during PSI. In order to complete our review of these ISI Relief Requests, please supply an updated version of the above list for welds actually selected for examination in Categories B-F, B-J and C-F. The list should contain the following information as a minimum:

- A. Based on the use of a later Code for ISI than for PSI, the scan limitations should be reviewed and updated as necessary.
- B. Some welds identified in some of these Relief Requests were not shown on the 8/25/81 list. These and any other identified welds with scan limitations should be included in the updated list.

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QUESTION 8 (continued)

- C. Those welds that are known to require relief should be identified. The Code category and item number should also be shown. In addition, for these welds a short generic explanation of each one or two word description of the scan limitation in the limitation column of the 8/25/81 list should be included.
- D. Part of your proposed alternative examination for these requests is to perform surface examination on "essentially 100% of the required areas". Any limitations to the Code required surface examinations should be identified. Alternatively, an explanation of what is meant by "essentially 100% of the required areas" and how the examination will comply with the Code should be given.

RESPONSE TO QUESTION 8

An updated version of the scan limitations for categories B-F, B-J and C-F is contained in Attachment V.

- A. The UT scan limitations have been reviewed and updated to Summer 1978 Addenda.
- B. The updated list identifies the welds, and their limitations, which were examined subsequent to 8/25/81.
- C. Those welds known to require relief (Attachment VII) are identified in the updated list. The Code Category, item number and the scan limitation are also shown in the list. In addition, a short generic explanation is included to describe applicable limitations.
- D. In some cases, welded supports or attachments or rerouted piping may interfere with the performance of surface examinations specified as an alternative examination.

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QUESTION 8 (continued)

In these cases, the examination surface area will be limited to that area accessible to the NDE Operator. Since some of the limitations (permanent structure restrictions) were installed subsequent to the PSI Examination, the specific limitation will be noted on the NDE Data Sheet at the time of the ISI examination.

It should be noted that the later edition of the Code generally requires a larger number of examinations than the 1974 Edition, Summer 1975 Addenda. Consequently, at this time, the updated version of Scan Limitations will not show or indicate the total number of welds nor their limitations. By the end of the 1st inspection interval, the welds and associated scan limitations relevant to 1977 Edition through Summer 1978 Addenda should be identified and the list should be complete.

QUESTION 9

Specific NDE Relief Requests:

This question pertains to the following Relief Requests:

- 1-PRESS-2: Category B-D requirements on pressurizer nozzle-to-vessel welds and inside radii.
- 2-H/X-1: Category C-A requirements on Class 2 heat exchanger head-to-shell and flange-to-shell welds.
- 2-H/X-2: Category C-B requirements on Class 2 heat exchanger nozzle-to-vessel welds.
- 2-S/G-1: Category C-B requirements on Class 2 Steam Generator nozzle-to-vessel welds.

Based on UT Examination requirements for ISI (updated from those used in the PSI Program), please describe the geometric limitations that presently preclude full Code examinations.

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RESPONSE TO QUESTION 9

Relief Requests 1-PRESS-2, 2-H/X-1, 2-H/X-2 and 2-S/G-1 have been revised to reflect specific geometric limitations (See Attachment VII). In addition, Code Item Numbers have been identified to the Code Category to further clarify and identify the specific items.

QUESTION 10

Paragraph IWA-2231 allows the use of radiography for volumetric examination. For those areas where UT cannot be performed, please describe under "justification for relief" the extent to which you have considered radiography or commit to its use as appropriate under "alternative examination".

RESPONSE TO QUESTION 10

Generally, the Code requires that the welds selected for examination be at structural discontinuities. Since these welds would be located at elbows, T-fittings, flanges, pumps, valves, etc., there would be a change in metal direction and thickness of the base metal and weld metal.

In more severe metal thickness and direction changes, the majority of the sound could be attenuated or redirected away from the ultra-sonic receiver due to the reflection characteristics of ultra-sound. Under these circumstances, the operator would not be able to credit the weld with 100% UT examination. Since this would involve most of the welds selected for examination, to consider RT of these welds would be impractical.

Also, RT would have no use in detecting laminations and very limited use in detecting fine tight cracks, the typical flaws expected while performing volumetric examination.

In some cases, around systems containing radio-isotopes, the film may be prematurely exposed during the setup or examination time. Such results would not be reliable, thus such data must be considered invalid.

In lieu of submitting the captioned explanation for each relief request, the explanation is presented as part of this response.

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QUESTION 11

All pressure test relief requests state that, for various lines penetrating the containment pressure boundary, containment leak testing per 10 CFR 50, Appendix J will be used to take the place of the Code required hydrostatic pressure testing. For each relief request, please provide the technical details that will show why relief is needed, such as extent of pipe involved, inability to isolate, etc.

RESPONSE TO QUESTION 11

Since pressure tests are exempted by ASME Section XI, IWC-1220, for the following systems, the associated relief requests are being withdrawn.

<u>SYSTEM</u>	<u>RELIEF REQUEST No.</u>	<u>REASON</u>
(BA)	2-BA-1	2" < 6" - exempted
(DN)	2-DN-1	1" < 6" - exempted
(FS)	2-FS-1	4" < 6" - exempted
(HR)	2-HR-1	3/8" < 6" - exempted
(IA)	2-IA-1	6" < 200°F & < 275 PSI - exempted
(LR)	2-LR-1	2" < 4" - exempted
		3/4" < 6" - exempted
		8" < 200°F & < 275 PSI - exempted
(ND)	2-ND-1	3" < 4" - exempted
(AC)	2-AC-1	6" < 200°F & 275 PSI - exempted
(NG)	2-NG-1	1" < 6" - exempted
(SS)	2-SS-1	3/8" < 6" - exempted
(SA)	2-SA-1	2" < 6" - exempted
Containment	2-RH-1	Part of Containment
Containment	2-SP-1	Part of Containment

In addition, Relief Request 2-AH-1 is also being withdrawn. A relief request will be submitted at a later time, along with appropriate technical justification, if required.

ATTACHMENT II

121.27

Section 5.7.6.6 of the applicant's FSAR states the repair procedures in IWC-4000 and IWD-4000 of 1974 Edition of Section XI are in the course of preparation. Therefore, the applicant proposes to use provisions of the ASME Code, Section III edition applicable to construction of the component.

The Regulation requires that the initial 10 year ISI program be based on the 1977 Edition including all Addenda through Summer 1978 with certain exceptions defined in 10CFR50.55a, unless the V.C. Summer operating license is issued before November 1, 1980.

The 1977 Edition of Section XI requires that Class 2 and Class 3 components be repaired to rules of IWB-4000. We will require a specific relief request governing repair procedures in the inservice inspection program if the requirements defined in 10CFR50.55a can not be met.

In order to evaluate the degree of compliance with the augmented inspection requirements in SRP 3.6.1, we will require the following information:

1. Describe the Section XI preservice examinations performed on these welds.
2. Provide a list of the high energy piping welds that are not being completely examined and a technical justification.

RESPONSE:

The repair program for the Virgil C. Summer Nuclear Station will comply with the ASME Code Section XI 1977 Edition Summer 1978 Addenda. In the meantime, a repair program has been established using an "NA" ASME

ATTACHMENT II (con't)

Certificate Holder and their ASME Accepted Quality Assurance Program. The repairs are being completed in compliance with the ASME Section XI 1974 Edition Summer 1975 Addenda. The Section XI 1974 Edition Summer 1975 Addenda permits using the applicable Component Construction Code if no rules exist within Section XI for completing the repair.

ATTACHMENT III

121.12 The inspection program requirements, as detailed in Q121.6, have recently been revised to reflect information gained from recent inspection program reviews. Therefore, Q121.6 is now superseded by the information required by this question, including staff guidance for preparing relief requests.

We require that your inspection program for Class 1, 2 and 3 components be in accordance with the revised rules in 10 CFR Part 50, Section 50.55a, paragraph (g). Accordingly, submit the following information:

1. A preservice inspection plan which is consistent with the required edition of the ASME Code. This inspection plan should include any exceptions you propose to the Code requirements.

2. An inservice inspection plan submitted within six months of the anticipated date for commercial operation.

This preservice inspection plan will be required to support the safety evaluation report finding regarding your compliance with preservice and inservice inspection requirements. Our determination of your compliance will be based on:

1. That edition of Section XI of the ASME Code referenced in your FSAR or later editions of Section XI referenced in the FEDERAL REGISTER that you may elect to apply.

2. All augmented examinations established by the Commission when added assurance of structural reliability was deemed necessary. Examples of augmented examination requirements can be found in the NRC positions on: (1) high energy fluid systems in Section 3.6 of the Standard Review Plan (SRP), NUREG-75/087; (2) turbine disk integrity in Section 10.2.3 of the SRP.

ATTACHMENT III (CON'T)

Your response to this item should define the applicable edition(s) and subsections of Section XI of the ASME Code. If any of the examination requirements of the particular edition of Section XI you referenced in the FSAR cannot be met, a request for relief must be submitted, including complete technical justification to support your request.

Detail guidelines for the preparation and content of the inspection programs to be submitted for staff review and for relief requests are attached as Appendix A to Section 121.0 of our review questions.

RESPONSE

Preservice Inspection Plan - The requirements of 10CFR50.5a(g)2 will be met by the Virgil C. Summer Nuclear Station Preservice Inspection Program. The preservice inspection program is being developed and conducted in accordance with ASME Boiler and Pressure Vessel Code Section XI, 1974 Edition, Summer 1975 Addenda. The results of the baseline tests and examinations for the preservice inspection program will be evaluated. Requests for relief will be determined from this baseline data. Upon completion and prior to ninety days of fuel loading, the Virgil C. Summer Nuclear Station Preservice Inspection Program including requests for relief will be submitted to the NRC staff. Requests for relief will include technical justifications to support conclusions.

Inservice Inspection Plan - The requirements of 10CFR50.55a(g)4 will be met by the Virgil C. Summer Nuclear Station Inservice Inspection Program. The Inservice Inspection Program is being developed with ASME Boiler and Pressure Vessel Code Section XI, 1977 Edition, Summer 1978 Addenda. The completed inservice inspection program plan including requests for relief to code requirements will be submitted within 6 months of commercial operation. Requests for relief will include technical justifications to support conclusions.