



November 6, 2000  
RC-00-0346

Document Control Desk  
U. S. Nuclear Regulatory Commission  
Washington, DC 20555

Gentlemen:

Subject: VIRGIL C. SUMMER NUCLEAR STATION  
DOCKET NO. 50/395  
OPERATING LICENSE NO. NPF-12  
REQUEST FOR RELIEF TO USE THE QUALIFICATION  
METHODS OF ASME CODE SECTION XI APPENDIX III  
IN LIEU OF SECTION XI APPENDIX VIII FOR  
ULTRASONIC EXAMINATION OF CLASS I PIPING REPAIR  
NRR 00-0253

Stephen A. Byrne  
Vice President  
Nuclear Operations  
803.345.4622

South Carolina Electric & Gas Company (SCE&G) submits the attached request for an alternative to the requirements of the ASME Code regarding specific non-destructive examinations to be performed at VCSNS on the reactor coolant system (RCS).

Preparation activities are currently underway at VCSNS to address the replacement of the "A" loop hot leg nozzle weld. This request provides an alternative to ultrasonic examination qualifications made in accordance with the ASME Code Section XI, Appendix VIII, 1995 Edition, 1996 Addenda, when performed from the inside surface of circumferential welds in the course of post replacement pre-service examination of welds in the "A" loop hot leg at VCSNS. The proposed alternative will use the ultrasonic methodology described in the ASME Code Section XI Appendix III 1989 Edition, which is the code of record for the second Inspection Interval at VCSNS. SCE&G has determined that the alternative provides an acceptable level of quality and safety.

The description of this alternative, including justification, is included as an attachment to this letter. SCE&G requests timely NRC staff review and approval of this request so that VCSNS can complete the weld repair of the "A" hot leg crack and return the RCS to operable status. VCSNS is currently shut down for its 12<sup>th</sup> refueling outage and will not restart the plant until the RCS code compliance is restored.

**NUCLEAR EXCELLENCE - A SUMMER TRADITION!**

A047

South Carolina Electric & Gas Co.  
Virgil C. Summer Nuclear Station  
P. O. Box 88  
Jenkinsville, South Carolina  
29065

803.345.5209  
803.635.1461

Document Control Desk  
NRR 00-0253  
RC-00-0346  
Page 2 of 2

SCE&G is submitting the attached relief requests in accordance with 10CFR50.55a(a)(3)(i).

Should you have any questions, please call Mr. Barry Mather at (803) 345-4601 or Mr. Phil Rose at (803) 345-4052.

Very truly yours,



Stephen A. Byrne

PAR/SAB/dr  
Attachment

c: N. O. Lorick  
N. S. Carns  
T. G. Eppink (w/o Attachment)  
R. J. White  
L. A. Reyes  
K. R. Cotton  
NRC Resident Inspector  
J. B. Knotts, Jr.  
B. E. Mather  
RTS (NRR 00-0253)  
File (810.19-2, 810.58)  
DMS (RC-00-0346)

**South Carolina Electric & Gas Co. (SCE&G)  
Virgil C. Summer Nuclear Station (VCSNS)  
Relief Request**

**Subject:**

Corrective action for the "A" loop hot leg nozzle to safe-end weld involves removal of the subject weld (along with a small portion of pipe) and replacement with a spool piece and its associated welds. This request provides for the alternative use of the ASME Section XI Appendix III examination requirements, in lieu of Section XI Appendix VIII, for ultrasonic examinations performed from the inside surface on Class I butt-welded joints.

**Components for Which Relief is Requested:**

Class 1 Category B-J pressure retaining welds in piping, Item Number B9.10.

**Current Code Requirement:**

10 CFR 50.55a(g)(6)(ii)(C) requires that Supplements 2 and 3 to Appendix VIII of Section XI, Division 1, 1995 Edition, 1996 Addenda of the ASME Boiler and Pressure Vessel Code be implemented by May 22, 2000. In accordance with ASME Code Appendix I 1995 Edition 1996 Addenda, examination of austenitic and ferritic piping welds to detect and size flaws must use procedures, equipment and personnel qualified by performance demonstration to the requirements of Appendix VIII, Supplements 2 and 3.

**Alternative Requirement:**

The proposed alternative will use the ultrasonic methodology described in the ASME Code Section XI Appendix III 1989 Edition, which is the code of record for the second Inspection Interval at VCSNS. The alternative will permit performance of the post-weld, pre-service examination (inside surface) of the ASME Code required inspection at VCSNS utilizing the methodology, equipment, and personnel currently available.

### **Basis for Request:**

#### Reduced Radiation Exposure to Personnel

Nondestructive examination (NDE) performed from the outside surface of the pipe requires personnel to handle the ultrasonic equipment both for delivery to the pipe area and also for its attachment to the pipe. In contrast, the same ultrasonic examination performed on the inside surface is accomplished remotely thereby limiting the exposure of personnel to dangerous radiation fields that exceed 0.5 R/hr on contact at the pipe surface. For this reason, the inside examination is preferable since its use results in significantly less dosage to personnel when compared to examinations from the outside.

#### Improved Volumetric Coverage from the Inside

Volumetric coverage of the subject welds utilizing ultrasonic methods is estimated to be less than 90% when examined from the outside surface. Improved volumetric coverage can be accomplished from the inside surface using an automated process with coverage expected at near 100%. For this reason, the inside examination is preferable since it provides for improved volumetric coverage when compared to examinations from the outside.

#### Demonstration of Ultrasonic Method

The use of a tri-metallic weld represents a more difficult ultrasonic examination problem than a similar metal austenitic pipe weld. In this regard, SCE&G will demonstrate the effectiveness of the Appendix III ultrasonic procedure using a mockup by the Electric Power Research Institute NDE Center of SA-508 ferritic steel, Inconel 182 butter, and an Inconel 182 weld joining an austenitic safe-end of SA-182 F-316 stainless steel. The mockup contains at least seven flaws distributed on the inner and outer diameter, in the weld metal and butter.

#### Industry Progress in Meeting Appendix VIII

The concept of personnel performance demonstration for ultrasonic examination qualification was introduced in the Section XI 1989 Edition and Addenda. In 1991, an industry focus group was formed to implement the requirements of Appendix VIII, and in 1994, qualifications for piping examinations from the outside surface were initiated. The Industry is now capable of providing services to satisfy the Appendix VIII Supplements 2 and 3 requirements for outside surface examinations involving pipe-to-pipe welds.

Current industry efforts are now focused on completing the demonstrations for similar and dissimilar metal weld examinations from the pipe inside surface. An Appendix VIII, Supplement 10, dissimilar weld program is under development, and modifications to Supplement 12 are currently in progress to address piping examination from the inside surface. These efforts match the intention of industry focus groups to complete qualification of pipe weld examination methods performed from the inside surface in conjunction with the nozzle to shell and dissimilar metal weld examinations. Qualified examinations are anticipated to begin by the effective rulemaking date of November 22, 2002, allowing for adequate time to acquire and "finger print" specimens, ensure specimens contain the required flaw orientations and distributions, address geometric and limited scanning surface conditions, prepare protocols, procedures and train personnel.

In accordance with 10 CFR 50.55a(a)(3)(i), NRC staff approval is requested based on the proposed alternative examination providing an acceptable level of quality and safety.

**Implementation Schedule:**

This relief will be implemented during the second inspection interval, specifically during the post weld examinations scheduled to occur prior to startup from the current refueling outage. The expected date for completion of the weld repair is December 15, 2000.