



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
OF THE SECOND TEN-YEAR INTERVAL INSERVICE INSPECTION PROGRAM PLAN

REQUEST FOR RELIEF NOS. RR-07 AND IWI-5242(a)

FOR

SOUTH CAROLINA ELECTRIC AND GAS COMPANY

VIRGIL C. SUMMER NUCLEAR STATION

DOCKET NUMBER 50-395

1.0 INTRODUCTION

The Technical Specifications for Virgil C. Summer Nuclear Station state that the inservice inspection of the American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components shall 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 (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 difficulties 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 preservice 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 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 applicable edition of Section XI of the ASME Code for the Virgil C. Summer Nuclear Station second 10-year inservice inspection (ISI) interval is the 1989 Edition. The components (including supports) may meet the requirements set forth in subsequent editions and addenda of the ASME Code incorporated by reference in 10 CFR 50.55a(b) subject to the limitations and modifications listed therein and subject to Commission approval.

ENCLOSURE 1

Pursuant to 10 CFR 50.55a(g)(5), if the licensee determines that conformance with an examination requirement of Section XI of the ASME Code is not practical for its facility, information shall be submitted to the Commission in support of that determination and a request made for relief from the ASME Code requirement. After evaluation of the determination, pursuant to 10 CFR 50.55a(g)(6)(i), the Commission may grant relief and may impose alternative requirements that are determined to be authorized by law, will not endanger life, property, or the common defense and security, and are otherwise in the public interest, giving due consideration to the burden upon the licensee that could result if the requirements were imposed. In two letters dated December 20, 1995, and supplemented by a letter dated March 27, 1996, South Carolina Electric and Gas Company, submitted to the NRC Requests for Relief Nos. RR-07 and IWA-5242(a) for the Virgil C. Summer Nuclear Station. The licensee submitted an additional list of components to Request for Relief No. IWA-5242(a) by its letter dated March 27, 1996.

2.0 EVALUATION AND CONCLUSIONS

The staff, with technical assistance from its contractor, INEL, has evaluated the information provided by the licensee, in support of its Second Ten-Year Interval Inspection Program Plan, Requests for Relief Nos. RR-07 and IWA-5242(a) for the Virgil C. Summer Nuclear Station. Subsequent, to INEL's Technical Letter Report (TLR) to the staff, the licensee submitted an additional list of components to Request for Relief No. IWA-5242(a) by its letter dated March 27, 1996. The March 27, 1995 letter requests relief from additional applicable Class 1 and 2 pressure retaining bolted connections that are insulated in systems borated for the purpose of reactivity control from the requirements of ASME Section XI IWA-5242(a). The staff reviewed the licensee's letter dated March 27, 1996, independently of INEL's report and concluded that the additional components did not change the evaluation and conclusion documented in the attached INEL TLR for Request for Relief No. IWA-5242(a).

Based on the information submitted, the staff adopts the contractor's conclusions and recommendations presented in the TLR attached. The staff has concluded that the proposed alternatives contained in Request for Relief RR-07, and IWA-5242(a), including the list of additional components contained in the licensee's letter dated March 27, 1996, for the Virgil C. Summer Nuclear Station provides an acceptable level of quality and safety. Therefore, the Request for Relief Nos. RR-07 and IWA-5242(a) for the Virgil C. Summer Nuclear Station are authorized pursuant to 10 CFR 50.55a(a)(3)(i).

Principal Contributor: T. McLellan

Dated: April 11, 1996

IDAHO NATIONAL ENGINEERING LABORATORY
TECHNICAL LETTER REPORT
ON THE SECOND 10-YEAR INSERVICE INSPECTION INTERVAL
REQUEST FOR RELIEF NOS. RR-07 AND IWI-5242(a)
FOR
VIRGIL C. SUMMER NUCLEAR STATION
SOUTH CAROLINA ELECTRIC & GAS COMPANY
DOCKET NUMBER 50-395

1.0 INTRODUCTION

By two letters dated December 20, 1995, the licensee, South Carolina Electric & Gas Company, submitted Requests for Relief RR-07 and IWA-5242(a) to the *Virgil C. Summer Nuclear Station, ASME Section XI Inservice Examination Manual for 2ND Inspection Interval*. The Idaho National Engineering Laboratory (INEL) staff has evaluated the subject requests for relief in the following section.

2.0 EVALUATION

The information provided by the licensee in support of the requests for relief for the second inspection interval has been evaluated below. The second 10-year inservice inspection (ISI) interval will end January 2004. The Code of record for the second 10-year ISI interval at V. C. Summer is the *American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, 1989 Edition*.

- A. Request for Relief RR-07, Examination Categories B-D and B-F, Items B3.90, B3.100, and B5.10, Reactor Vessel Nozzle-to-Vessel Welds, Nozzle Inside Radius Sections, and Nozzle-to-Safe End Welds

Code Requirement: Examination Category B-D, Items B3.90 and B3.100 require 100% volumetric examination per IWB-2500-7 of at least 25% but not more than 50% of reactor vessel nozzle-to-vessel welds and nozzle inside radius sections by the end of the first period.

Examination Category B-F, Item B5.10 requires 100% surface and volumetric examination per Figure IWB-2500-8 of dissimilar metal nozzle-to-safe end welds that may be examined coincident with the vessel nozzle examinations.

Licensee's Code Relief Request: The licensee requested relief from performing the Code-required volumetric examinations of at least 25% but not more than 50% of Item B3.90, B3.100 and B5.10 welds by the end of the first period.

ENCLOSURE 2

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

"An inspection was performed on the outlet nozzles during the third period of the first interval (RF-7), and represents an additional set of data above that required by the Code.

"Performing 100% of the nozzle inspections during the same outage allows all data to be extracted using one ultrasonic testing acquisition system. This provides a data base which will increase the reliability of the data analysis as it relates to the condition of both the inlet and outlet nozzles.

"By performing these inspections in the third period, they can be scheduled to coincide with the reactor vessel inspection and thereby be performed with the lower internals removed. This prevents the possibility of the remote examination equipment causing damage to the lower internals.

"Since RF-7, the ASME has approved Code Case N-521 which states that these inspections may be deferred to the third period provided the following conditions are met:

"No inservice repairs or replacements by welding have ever been performed on any of the Nozzle-to-Vessel Welds, Inside Radius Sections, or Nozzle-to-Safe End Welds.

"None of the Nozzle-to-Vessel Welds, Inside Radius Sections, or Nozzle-to-Safe End Welds contains identified flaws or relevant conditions that currently require successive inspections in accordance with IWB-2420(b).

"The unit is not in the first inspection interval.

"Performing the alternate test avoids the following hardships.

"A predicted dose for performance of examinations in both the first and third period of the second and subsequent intervals of 2.5 REM per interval.

"The additional manpower, cost, and critical path outage time associated with the performance of remote examinations in the first period of the second and subsequent intervals with the lower intervals [internals] installed.

"In summary, the alternate test provides for an additional inspection of the outlet nozzles and increases the relevance of future data acquisition. The criteria for applying the alternative rules in lieu of Table IWB-2500-1 are met as delineated in Code Case N-521. The alternate test eliminates the hardship of performing two remote examinations in the reactor vessel without adversely affecting the level of quality and safety in the plant."

Licensee's Proposed Alternative Examination (as stated):

"Perform 100% of Reactor Vessel Nozzle related inspections during the third period of the second and subsequent inspection intervals."

Evaluation: The Code requires volumetric and surface examination of the subject nozzle-to-vessel welds, inside radius sections, and nozzle-to-pipe welds during each 10-year ISI interval. At least 25%, but not more than 50% (credited), of the nozzle-to-vessel welds and inside radius sections must be examined by the end of the first inspection period, and the balance completed by the end of the 10-year interval. The sequence of examinations established for the subject welds during the first inspection interval shall be repeated during each successive interval.

The licensee examined the outlet nozzle-to-vessel welds, inside radius sections, and outlet nozzle-to-pipe welds during the first period of the second 10-year interval to meet the Code requirements. In addition, the licensee repeated the examination of these welds during the third period of the second interval. The subject welds will be reexamined during the third period of the third interval.

Paragraph IWB-2420(a), "Successive Inspections," states that the sequence of component examinations established in the first inspection interval shall be repeated during successive inspection intervals, to the extent practical. Thus, examinations are performed at intervals of not more than 10 years. The licensee reexamined the subject welds during the third period of the second interval. This reexamination of the outlet nozzle welds during the first interval established a new sequence of examinations for the Reactor Pressure Vessel. Since the subject welds were examined in the third period of the second interval, 10 years will not be exceeded if the examinations are deferred to the third period of the third interval. Therefore, this schedule will provide an acceptable level of quality.

The licensee's proposed alternative will provide an acceptable level of quality and safety since there will be no more than 10 years between inspections, except where the length of a 10-year interval is adjusted in accordance with IWA-2430. Therefore, it is recommended that the proposed alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(i).

B. Request for Relief IWA-5242(a), System Pressure Tests for Insulated Bolted Connections

Code Requirement: IWA-5242(a) states that for systems borated for the purpose of controlling reactivity, insulation shall be removed from pressure-retaining bolted connections for a direct VT-2 visual examination.

Licensee's Code Relief Request: The licensee requested relief from the Code-required removal of insulation for VT-2 visual examinations of bolted connections in Class 1 and 2 borated systems inside containment,

which are normally tested in a high temperature and elevated radiation environment.

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

"Inside containment, the referenced systems are tested in an environment that is hazardous to personnel. Ambient temperature is between 100 and 120 degrees Fahrenheit. Personnel must manipulate undesirable work platforms such as ladders against components that would be in excess of 500 degrees Fahrenheit. Removing and reinstalling insulation under these conditions is difficult to perform and is not consistent with the ALARA concept when compared to the alternate approach.

"This position is supported by the following facts:

- "1. The ASME issued Code Case N-533 to provide an alternative to the removal of insulation at bolted connections for Class 1 systems.
- "2. Surry Power Station was granted relief from the referenced code section in NRC letter #95-404 dated 07/19/95.
- "3. Pre-existing boric acid leaks will be detected at atmospheric or static pressures due to residue deposits.
- "4. A four hour hold time will ensure that boric acid leaks that develop during the outage will be identified during the VT-2 examination that will be performed prior to startup.
- "5. The alternate test will not be applied to post repair/replacement activities on bolted connections."

Licensee's Proposed Alternative Examination (as stated):

"It is proposed that insulated bolted connections inside containment on Class 1 systems that are borated for the purpose of controlling reactivity be examined each refueling outage at atmospheric or static pressure. The examination will be performed with insulation removed. Similarly, insulated bolted connection on Class 2 systems inside containment that are borated for the purpose of controlling reactivity will be examined once each examination period. In addition to the above, all of the piping and components associated with these Class 1 and 2 systems inside containment will be examined at their required frequencies and under the conditions specified in IWA-5000, IWB-5000 and IRC-5000, with the exception of the removal of insulation from bolted connections. These examinations will be performed utilizing a four hour hold time."

Evaluation: Paragraph IWA-5242(a) requires the removal of all insulation from pressure-retaining bolted connections in systems borated for the purpose of controlling reactivity when performing VT-2 visual

examinations during system pressure tests. The licensee has proposed to examine Class 1 bolted connections each refueling outage at atmospheric or static pressure with insulation removed. Similarly, insulated bolted connections on Class 2 systems inside containment that are bolted for the purpose of controlling reactivity will be examined once each examination period. The licensee has also committed to perform the Code-required pressure test without removing the insulation but requiring a four-hour hold time.

By performing system pressure tests as required by ASME Section XI with the insulation in place and a four-hour hold time will most likely result in the detection of any significant leakage. Removal of the insulation, as proposed by the licensee, at atmospheric or static pressure during outages will allow for examination for evidence of bolted water leakage.

Based on the review of the licensee's basis for relief and proposed alternative, it has been determined that the licensee's alternative to the Code-required insulation removal provides an acceptable level of quality and safety. Therefore, it is recommended that the licensee's proposed alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(i).

3.0 CONCLUSION

The INEL staff has reviewed the licensee's submittal and concludes that, for the Request for Relief IWA-5242(a), it has been determined that the licensee's approach to the Code-required insulation removal provides an acceptable level of quality and safety. For Request for Relief RR-07, the INEL staff concludes that the licensee's proposed alternative will provide an acceptable level of quality and safety since there will be no more than 10 years between inspections, except where the length of a 10-year interval is adjusted in accordance with IWA-2430. Therefore, it is recommended that the licensee's proposed alternatives be authorized pursuant to 10 CFR 50.55a(a)(3)(i).

Mr. Gary J. Taylor
South Carolina Electric & Gas Company

VIRGIL C. SUMMER NUCLEAR STATION

cc:

Mr. R. J. White
Nuclear Coordinator
S.C. Public Service Authority
c/o Virgil C. Summer Nuclear Station
Post Office Box 88, Mail Code 802
Jenkinsville, South Carolina 29065

J. B. Knotts, Jr., Esquire
Winston & Strawn Law Firm
1400 L Street, N.W.
Washington, D.C. 20005-3502

Resident Inspector/Summer NPS
c/o U.S. Nuclear Regulatory Commission
Route 1, Box 64
Jenkinsville, South Carolina 29065

Regional Administrator, Region II
U.S. Nuclear Regulatory Commission
101 Marietta St., NW., Ste. 2900
Atlanta, Georgia 30323

Chairman, Fairfield County Council
Drawer 60
Winnsboro, South Carolina 29180

Mr. Virgil R. Autry
Director of Radioactive Waste Management
Bureau of Solid & Hazardous Waste Management
Department of Health & Environmental Control
2600 Bull Street
Columbia, South Carolina 29201

Mr. Robert M. Fowlkes, Acting Manager
Operations
South Carolina Electric & Gas Company
Virgil C. Summer Nuclear Station, Mail Code 303
Post Office Box 88
Jenkinsville, South Carolina 29065

Mr. George A. Lippard, Acting Manager
Nuclear Licensing & Operating Experience
South Carolina Electric & Gas Company
Virgil C. Summer Nuclear Station, Mail Code 830
Post Office Box 88
Jenkinsville, South Carolina 29065