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SUBJECT: Forwards RAI re requests for relief to Code Cases N-521,
 N-491, N-509 & N-524.

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November 7, 1996

AEP:NRC:0969AA

Docket Nos.: 50-315
50-316

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

Gentlemen:

Donald C. Cook Nuclear Plant Units 1 and 2
THIRD 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM AND
ASSOCIATED REQUESTS FOR RELIEF (TAC NOS. M94871 AND M94872)
REQUEST FOR ADDITIONAL INFORMATION

References

1. Letter AEP:NRC:0969AW, E. E. Fitzpatrick to U. S. NRC, "Donald C. Cook Nuclear Plant Units 1 and 2, THIRD 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM AND ASSOCIATED REQUESTS FOR RELIEF (TAC NOS. M94871 AND M94872), REQUEST FOR ADDITIONAL INFORMATION" dated, September 10, 1996.
2. Letter, C. A. Carpenter to E. E. Fitzpatrick, "D.C. COOK, UNITS 1 AND 2, REQUESTING APPROVAL OF CODE CASE N-498-1 AS AN ALTERNATIVE TO THE REQUIRED HYDROSTATIC PRESSURE TEST (TAC NOS. M91783 AND M91784)", dated July 5, 1995.

The third 10-year inservice inspection plan for Cook Nuclear Plant utilizes code cases that have not been incorporated into Regulatory Guide 1.147. Because of this, NRC approval of the use of these code cases as alternatives to the ASME Section XI requirements is required. The particular code cases for which approval is required were identified in our September 10, 1996, letter (reference 1).

The attachments to this letter provide relief requests that would allow Cook Nuclear Plant to use Code Cases N-521, N-491-1, N-509, and N-524 as alternatives to the requirements of the 1989 edition of ASME Code Section XI.

Please note that although Code Case N-498-1 was identified in reference 1, this letter does not contain a relief request for use of this code case because we previously obtained approval for its use (reference 2). Approval of these requests is required by July 1, 1997.

Sincerely,

A handwritten signature in dark ink, appearing to read 'E. E. Fitzpatrick', is written over the word 'Sincerely,'.

E. E. Fitzpatrick
Vice President

Attachments

jmb

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U. S. Nuclear Regulatory Commission
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AEP:NRC:0969AA

cc: A. A. Blind
A. B. Beach
MDEQ - DW & RPD
NRC Resident Inspector
J. R. Padgett

Attachment 1 to AEP:NRC:0969AA

BACKGROUND INFORMATION AND JUSTIFICATION

TO USE CODE CASE N-521 AS AN ALTERNATIVE FOR

THE EXAMINATION OF NOZZLE TO VESSEL

AND SAFE END WELDS AND INSIDE RADIUS SECTIONS

FOR THE COOK NUCLEAR PLANT UNITS 1 and 2

THIRD 10-YEAR INTERVAL

*

I. System/Component for which relief is requested

Nozzle to vessel welds, nozzle inside radius sections, and nozzle to safe end welds for Cook Nuclear Plant, units 1 and 2.

II. Code Requirements

Examination categories B-D and B-F, items B3.90 and B3.100 of ASME Section XI code, 1989 edition with no addenda, require 100% volumetric examination per IWA-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 5.10 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.

III. Basis for code relief

The ASME Section XI code requirements for the examination of reactor pressure vessel nozzle to vessel welds, the nozzle inside radius sections, and nozzle to safe end welds stipulate a distribution of these examinations in at least two of the three periods. The same sequence established in the first 10-year interval must be used for successive 10-year intervals. The implementation of these code requirements would result in an additional set-up of the automated ultrasonic (UT) equipment used to examine the nozzle to vessel welds, inside radius sections, and nozzle to safe end welds. Additionally, personnel radiation exposure would increase due to the additional set-up of automated UT equipment and support hours needed to perform this examination.

This position is further supported by the following.

Code Case N-521 issued by the ASME Section XI organization provides an acceptable alternative to the code method for the examination of the nozzle to vessel and safe end welds, and inside radius sections.

This code relief was approved for use for the V.C. Summer Nuclear Plant, for the second 10-year interval (reference 1).

IV. Alternative Method

As an alternative to the requirements of the 1989 edition of the ASME Section XI code, it is proposed to perform all the nozzle to vessel, nozzle to safe end welds, and inside radius section examinations in the third period of the third interval.

V. Justification for granting code relief

Code Case N-521 imposes the following conditions that must be met prior to its use:

no inservice repairs or replacements by welding have been performed on the nozzle to vessel and safe end welds, or inside radius section;

the nozzle to vessel and safe end welds and the inside radius section examination volume shall not contain flaws that require successive examinations in accordance with IWA-2420(b); and

the unit is not in the first 10-year interval.

Cook Nuclear Plant has not performed inservice repairs or replacements on the nozzle to vessel and safe end welds, and inside radius sections. Flaws have not been identified in the examination volume that require successive examinations and both units 1 and 2 are in the third 10-year interval; therefore, applicability of this code case has been met.

The deferral of all examinations to the third period of the third 10-year interval will result in reduced set-up hours and personnel radiation exposure hours due to consolidation of manpower efforts (set-up and support) to the third period of the third 10-year interval.

The examination of nozzle to vessel welds from the shell side was performed for units 1 and 2 in the third period of the second 10-year interval during the 1995 and 1996 refueling outages. Examination of nozzle to vessel welds from the bore inside diameter (four for unit 1 and two for unit 2) were performed in the first period to meet code requirements. The second 10-year interval examination of the inside radius sections and nozzle to safe end welds was performed in accordance with table IWA-2500-1 of the code (at least 25% but not more than 50% in the first period and the balance of 100% in the third period). Four of the eight inside radius sections and nozzle to safe end welds were performed in the third period (1995) of the second 10-year interval for unit 1. Six of eight inside radius sections and nozzle to safe end welds for unit 2 were examined in 1996.

Because we performed a majority of the examinations in the third period of the second 10-year interval, and there were no flaws detected in any of the examinations conducted in the first or second intervals, it is reasonable to conclude that the deferment of all the examinations to the third period of the third 10-year interval will not compromise the safety of plant personnel or equipment.

The alternate test using Code Case N-521 eliminates the hardship of performing two automated examinations per inspection interval while providing an acceptable level of quality and safety for Cook Nuclear Plant.

VI. Reference

1. Letter, F. J. Hebdon to G. J. Taylor, "Evaluation of Relief Requests for RR-07 and IWA-5242(a), Virgil C. Summer Nuclear Station (TAC Nos. M94363 and M94364)," dated April 11, 1996.

Attachment 2 to AEP:NRC:0969AA

BACKGROUND INFORMATION AND JUSTIFICATION

TO USE CODE CASE N-491-1 AS AN ALTERNATIVE FOR
THE INSPECTION OF CLASS 1, 2, 3, AND MC COMPONENT SUPPORTS
FOR COOK NUCLEAR PLANT UNITS 1 and 2
THIRD 10-YEAR INTERVAL

I. System/Component for which relief is requested

Class 1, 2, 3, and MC component supports.

II. Code Requirements

Table IWF-2500-1, examination category F-A, items F1.10 through F1.70 of the 1989 edition of ASME Section XI code, requires visual and VT-3 examination of class 1, 2, and 3 supports in accordance with the schedule established for components under IWB, IWC, IWD and IWE.

III. Basis for code relief

The 1989 edition of the ASME Section XI code requires the examination of component supports be based on a frequency in accordance with the IWB, IWC, IWD, and IWE components for each interval. The proposed alternative method to be used by Cook Nuclear Plant and outlined in ASME Code Case N-491-1 provides a selection criteria based on applying a reasonable percentage of examinations for each class of component supports. Significant personnel radiation exposure and contamination savings are predicted to result from the implementation of these requirements compared with the requirements stated in the 1989 edition of the ASME Section XI code.

Code Case N-491-1 was approved by the ASME Section XI organization in April 1993, and provides an acceptable alternative to the code method for the examination of component supports.

IV. Alternative Method

As an alternative to the requirements of the 1989 edition of the ASME Section XI code, it is proposed to perform examination of component supports in accordance with the requirements established in ASME approved Code Case N-491-1.

V. Justification for granting code relief

The ASME Section XI code organization has approved the use of Code Case N-491-1 as an acceptable alternative to the code requirements for the examination of component supports.

Piping systems are examined frequently during plant walkdowns with the units operating or during planned or unplanned outages. If the failure or degradation of a support is observed during these walkdowns, whether they are formal visual/VT-3 examinations or informal observations, prompt action is taken including the evaluation, repair, and/or replacement of supports.

The use of the proposed alternative for the inspection and examination of component supports will result in significant labor and dose savings while providing an acceptable level of quality and safety.

Attachment 3 to AEP:NRC:0969AA

BACKGROUND INFORMATION AND JUSTIFICATION

TO USE CODE CASE N-509 AS ALTERNATIVE RULES FOR
THE SELECTION AND INSPECTION OF CLASS 1, 2, and 3

INTEGRALLY WELDED ATTACHMENTS

FOR COOK NUCLEAR PLANT UNITS 1 and 2

THIRD 10-YEAR INTERVAL

I. System/Component for which relief is requested

Class 1, 2, and 3 integrally welded attachments.

II. Code Requirements

Table IWB-2500-1, examination categories B-H and B-K-1; table IWC-2500-1, examination category C-C; and table IWD-2500-1, examination categories D-A, D-B, and D-C of the 1989 edition of ASME Section XI code require surface or volumetric examination for welded attachments of vessels, piping, pumps, and valves.

III. Basis for code relief

The 1989 edition of the ASME Section XI code requires the examination of integrally welded attachments to be based on the requirements indicated in tables IWB-2500-1 through IWD-2500-1. Frequency and extent of examination are in accordance with these tables and the inspection program chosen by the owner. The proposed alternative method to be used by Cook Nuclear Plant and outlined in ASME Code Case N-509 provides selection criteria based on identified deformation of the component support members found in the plant either during operation, refueling, maintenance, examination, inservice inspection, or testing. The criteria stated in Code Case N-509 are more reasonable than the random examination of all welded attachments in that they focus the examination and the evaluation on those component supports and welded attachments that are susceptible to early failure. Significant personnel radiation exposure and contamination savings are predicted to result from the implementation of these requirements.

Code Case N-509 was approved in November 1992 by the ASME Section XI organization and provides an acceptable alternative to the code method for the examination of welded attachments for vessels, piping, pumps, and valves.

IV. Alternative Method

As an alternative to the requirements of the 1989 edition of the ASME Section XI code, it is proposed to perform examination of welded attachments for vessels, piping, pumps, and valves in accordance with Code Case N-509.

V. Justification for granting code relief

The ASME Section XI code organization has approved the use of Code Case N-509 as an acceptable alternative to the code requirements for the examination of welded attachments for vessels, piping, pumps, and valves.

Component supports are examined frequently during plant walkdowns, both with the units operating or during planned or unplanned outages. If a failure or deformation of a component support is observed during these walkdowns, a surface examination of the appropriate boundary of the welded

attachment shall be performed in accordance with Code Case N-509. This examination strategy is more reasonable than the code method of random examination of welded attachments due to its focus on higher stressed component supports that would be more susceptible to failure in the attachment weld.

The use of the proposed alternative for the inspection and examination of welded attachments will result in significant labor and dose savings while providing an acceptable level of quality and safety.

Attachment 4 to AEP:NRC:0969AA

BACKGROUND INFORMATION AND JUSTIFICATION
FOR THE USE OF CODE CASE N-524 AS AN ALTERNATIVE FOR
THE EXAMINATION REQUIREMENTS FOR LONGITUDINAL WELDS
IN CLASS 1 AND 2 PIPING
FOR COOK NUCLEAR PLANT UNITS 1 AND 2
THIRD 10-YEAR INTERVAL

I. System/Component for which relief is requested

Class 1 and 2 longitudinal welds in piping.

II. Code Requirements

Table IWB-2500-1, examination category B-J, items B9.12 and B9.22, and table IWC-2500-1, examination categories C-F-1 and C-F-2 of ASME Section XI code, 1989 edition with no addenda, require volumetric and/or surface examination from the intersection of longitudinal and circumferential welds for a distance of one pipe diameter in length but no greater than one foot maximum for class 1 welds and two and one-half times the pipe wall thickness for class 2 welds.

III. Basis for code relief

The 1989 edition of ASME Section XI code requires the examination of longitudinal class 1 and 2 piping welds be in accordance with the requirements of tables IWB-2500-1 and IWC-2500-1. The length of weld examined shall be one pipe diameter but no greater than one foot maximum for class 1 welds and two and one-half times the wall thickness for class 2 welds. Class 1 and 2 longitudinal piping welds do exist in various Cook Nuclear Plant systems.

Code Case N-524 provides an acceptable alternative that examines the intersectional area of circumferential and longitudinal welds, which is the area most prone to failure.

This position is further supported by the approval of Code Case N-524 by the ASME Section XI organization as an acceptable alternative to the code examination of class 1 and 2 longitudinal piping welds.

IV. Alternative Method

As an alternative to the requirements of the 1989 edition of the ASME Section XI code, it is proposed to examine class 1 and 2 longitudinal piping welds in accordance with the requirements stated in ASME Code Case N-524.

V. Justification for granting code relief

Code Case N-524 was approved by the ASME Section XI code organization for the examination of class 1 and 2 longitudinal pipe welds as an alternate method to the code examination. This code case accepts the code examination of the circumferential weld volume as sufficient in determining the integrity of the intersection of circumferential and longitudinal welds. The intersection of the longitudinal and circumferential welds is expected to possess the highest residual stresses of the collective weld due to the manufacturing process and therefore, a thorough code examination of the circumferential weld volume would be adequate in determining the integrity of this area. Additionally, there have been no reported failures in the industry, where the failure was initiated outside the intersection area that would be examined during the ultrasonic testing of the circumferential weld.

The implementation of this code case will significantly reduce labor and radiation exposure due to decreased scaffolding installation and insulation removal for visual access to the longitudinal welds. The use of this code case provides an acceptable alternative to the current code method of examining class 1 and 2 longitudinal piping welds while providing an acceptable level of quality and safety.

