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SUBJECT: Forwards response to addl info re ASME Section XI relief for volumetric weld testing of selected RCS branch connection welds.

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AEP
INDIANA
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January 19, 1996

AEP:NRC:0969AK

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
ASME SECTION XI RELIEF FOR REACTOR COOLANT SYSTEM BRANCH CONNECTION WELDS ADDENDUM

In our letter of AEP:NRC:0969AH dated June 5, 1995, we requested relief from the requirements of ASME Section XI Code for the pre-service and first inservice inspection interval volumetric examination (ultrasonic) of reactor coolant system (RCS) branch connection welds pursuant to 10 CFR 50.55a(g)(6)(i).

During a teleconference held on November 20, 1995, the NRC and the Idaho National Laboratory (INEL) reviewers requested additional information related to the examination techniques and coverage used on the RCS branch connection welds. In addition, the bases for projected exposure estimates for performing a volumetric exam of 10 RCS branch connection welds per unit was requested. The responses to these requests are included in the attachment to this letter.

Based on the time of discovery (i.e., late in the second inspection interval), the NRC and INEL reviewers interpretation indicated that the distribution of branch connection weld inspections for the second inspection interval was not in accordance with ASME Section XI paragraph IWB-2420(a) which states that the distribution of component examinations established during the first inspection interval shall be repeated each successive inspection interval to the extent practical. As a result, by copy of this letter, relief is requested for a permanent exemption from the requirements of ASME Section XI 1983 Edition plus Addenda through Summer 1983 paragraph IWB-2420(a), for three in-service volumetric examinations per unit (Table IWB-2500, Category B-J, item 9.31), from the second inspection interval for both unit one and unit two (July 1, 1986 through June 30, 1996). As an alternative, volumetric examinations will be performed during the last inspection period of the second

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interval for both units. Furthermore, for the third and fourth inspection intervals, we plan to evenly distribute these branch connection weld examinations over the inspection periods.

Volumetric examinations were successfully performed on three RCS branch connection welds during the recent Unit One refueling outage. As discussed in the attachment to letter AEP:NRC:0969AH, the Unit Two RCS branch connection welds will be inspected during the upcoming refueling outage scheduled late in the first quarter of 1996.

Based on the successful examinations performed on Unit One and the technical bases provided in AEP:NRC:0969AH we believe that granting the additional relief request for the second inspection interval, will not endanger life or property or the common defense and security.

We remain available to address any additional questions the NRC staff may have related to the RCS branch connection weld issue.

Sincerely,

S J Brewer for EEF

E. E. Fitzpatrick
Vice President

SWORN TO AND SUBSCRIBED BEFORE ME

THIS 19th DAY OF January 1996

Notary Public

My Commission Expires: 6-28-99

eh

Attachment

cc: A. A. Blind
G. Charnoff
J. B. Martin
NFEM Section Chief
NRC Resident Inspector - Bridgman
J. R. Padgett

ATTACHMENT TO AEP:NRC:0969AK

RESPONSE TO A REQUEST FOR INFORMATION

ASME SECTION XI RELIEF

FOR VOLUMETRIC WELD TESTING

OF SELECTED RCS BRANCH CONNECTION WELDS

This attachment provides responses to requests for information regarding the previously transmitted relief request from the requirements of the ASME Section XI Code related to the RCS branch connection welds. On November 20, 1995, in a telephone conversation, the NRC requested that additional information for the ultrasonic examinations be provided to their contractor who is performing an evaluation of this request.

NRC REQUEST ONE:

Provide a discussion of the examination results, examination techniques, weld examination coverage and direction of coverage.

RESPONSE:

In September of 1995, during the last refueling outage of the second 10-year ISI interval for Cook Nuclear Plant Unit 1, three branch connection welds were volumetrically examined, using techniques and procedures based on standard industry methodology, by our vendor Southwest Research.

The RCS branch connections are composed of type 316 stainless steel forged nozzles attached to centrifugally cast stainless steel reactor coolant system piping. The acoustic properties of forged type 316 stainless steel nozzles are excellent while the attenuation characteristics of centrifugally cast stainless steel piping make it extremely difficult to perform an adequate examination from the reactor coolant system piping. Furthermore, the set-on nozzle arrangement with the weld orientation normal to the branch pipe axis precludes weld examination coverage from the reactor coolant piping using code calibration techniques. For these reasons, the examination was conducted from the branch pipe surface adjacent to the weld seam (Appendix III-4100). The code required volume is illustrated in Figure 1 and Table 1 summarizes the techniques, and essential parameters for these examinations. In summary, the ultrasonic examination meets the scan coverage requirements of the 1983 edition of ASME Section XI, through Summer 1983 addenda for reflectors parallel to the weld seam (Appendix III-4420) and for reflectors transverse to the weld seam (Appendix III-4430) with limitations noted in Table 1 (attached). No recordable indications other than geometric reflectors were reported during these examinations.

NRC REQUEST TWO

In your June 5, 1995, submittal, a 30 man-rem exposure estimate was projected for the examination of 10 RCS branch connection welds per unit. Please provide additional information related to the specific sources that result in this exposure estimate.

RESPONSE

To facilitate examination of the RCS branch connection welds, three specific work activities are performed. These activities, scaffolding installation, pipe insulation removal and the performance of the branch weld examination, are all factored into the overall estimated man-rem exposure.

The two primary contributors to the exposure estimates for the branch weld examinations are insulation removal/installation and scaffolding installation. The man-hour and man-rem estimates provided in our June 5, 1995, submittal were based on historic experience from previous outages. The estimates provided below were further refined based on the three reactor coolant system branch connection welds examined during the recent Unit One outage. The exposure estimates below represent an extrapolation of the exposures realized during the Unit One outage and are best estimates based on our current work practices.

Reactor coolant system branch connection welds are located approximately fifteen feet above the lower containment floor. To support inspection of these welds, scaffolding platforms must be constructed for each weld location. The transportation of materials into and out of containment and the subsequent installation/removal of the scaffolding constitute the bases for the man-hour and man-rem exposure estimates.

SCAFFOLDING MAN-HR/MAN-REM ESTIMATES PER UNIT

Activity	Est. Man-hrs	Est. Man-Rem
Transportation of scaffolding into containment	182	1.589
Transportation of scaffolding from containment (includes decontamination)	182	1.589
Scaffolding Installation	317	2.772
Scaffolding Removal (tear down)	91	0.794
Total	772 man-hrs/unit	6.744 man-rem/unit

Insulation removal and installation represents the greatest contribution to the projected exposure estimates. Insulation activity estimates include the need to remove large areas of insulation (resulting from the interlocking design of the RCS "mirror" insulation used), removing the insulation from containment (due to the limited storage area available in an ice condenser containment) and the decontamination of the insulation removed from containment.

INSULATION MAN-HR/MAN-REM ESTIMATES PER UNIT

Activities	Est. Man-hrs	Est. Man-rem
De-insulation	240	1.305
Removal of insulation from containment (including decontamination)	829	4.511
Transportation of insulation into containment	160	0.870
Re-insulation	480	2.611
Total	1709 man-hrs/unit	9.297 man-rem/unit

The above estimates represent the per unit efforts required to inspect the branch welds. This activity would result in an estimated 2481 man-hours of work and 16.041 man-rem of exposure.

Table 1
Summary of ultrasonic techniques used at the Cook Nuclear Plant - Unit 1 Reactor Coolant System branch connections.

I.D.	Branch Size (in)	Main Run Size (in)	Angle beam Tech. (Size, Freq. and Angle)	Straight beam Tech. (Size, Freq. and Angle)	Transverse Tech. (Size, Freq. and Angle)
1-RC-3-32N	6	29	0.375" Dia., 1.5 MHz. transducer, 60° & 45°	0.5"- Dia., 2.25 MHz transducer, 0°	0.375" Dia., 1.5 MHz transducer, 34°
1-RC-2-27N	10	27.5	0.375" Dia., 1.5 MHz transducer, 60° & 45°	0.5"- Dia., 2.25 MHz transducer, 0°	0.375" Dia., 1.5 MHz transducer, 38°
1-RC-3-33N	14	29	0.375" Dia., 1.5 MHz transducer, 60° & 45°	0.5"- Dia., 2.25 MHz transducer, 0°	0.375" Dia., 1.5 MHz transducer, 40°

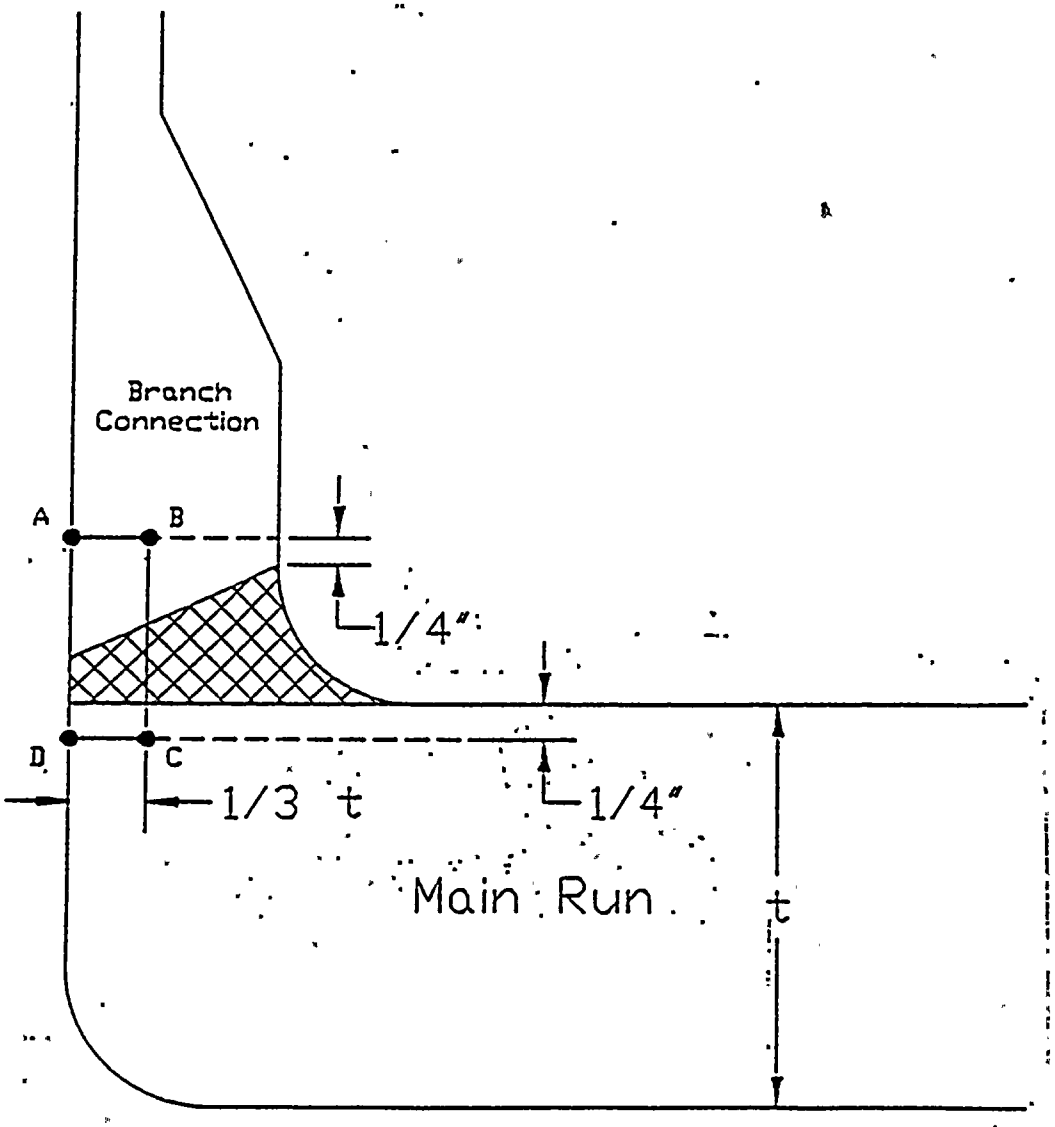
Notes

Angle beam examinations were conducted from branch pipe side only.

1983 Edition of the ASME Section XI code, through Summer 1983 Addenda applies. Mandatory Appendix III of ASME Section XI applied.

SWRI procedure DCC-UT56, Rev 0, Chg. 0 was used for the examination of RCS branch piping welds. Sound transmission and examination volume coverage limited on transverse angle beam technique due to weld configuration and pipe geometry. Examined to the extent possible.

Figure 1
(Note: Figure Not to Scale)



**EXAMINATION VOLUME (A-B-C-D)
FOR SET-ON TYPE
BRANCH CONNECTION
WELDS**