

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

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May 24, 1984

U.S. Nuclear Regulatory Commission
Region II
ATTN: James P. O'Reilly, Regional Administrator
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30303

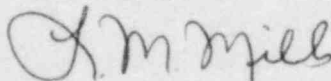
Dear Mr. O'Reilly:

Enclosed is our response to R. C. Lewis' April 27, 1984 letter to H. G. Parris transmitting Inspection Report Nos. 50-259/84-11, -260/84-11, -296/84-11 regarding activities at our Browns Ferry Nuclear Plant which appeared to have been in violation of NRC regulations. We have enclosed our response to the Notice of Violation. If you have any questions, please call Jim Domer at FTS 858-2725.

To the best of my knowledge, I declare the statements contained herein are complete and true.

Very truly yours,

TENNESSEE VALLEY AUTHORITY



L. M. Mills, Manager
Nuclear Licensing

Enclosure

RESPONSE - NRC INSPECTION REPORT NOS.
50-259/84-11, 50-260/84-11, AND 50-296/84-11
RICHARD C. LEWIS'S LETTER TO H. G. PARRIS
DATED APRIL 27, 1984

259, 260, 296/84-11-01

10 CFR 50.55a requires the licensee to perform inservice inspections in accordance with the ASME Boiler and Pressure Vessel Code, Section XI (hereafter the "Code"). The Code requires ultrasonic examination of reactor vessel skirt welds and describes requirements for the examinations including requirements, in part, that,

- Examination area include the weld to the vessel and the base metal beneath the weld zone and along the support skirt for a distance of two support thicknesses.
- Calibration block thickness and calibration hole size for skirt material 2 inches and less in thickness must not exceed material thickness and calibration hole size must be 1/8 inch.
- Transfer be used to compensate for differences between calibration block material and material examined.

Contrary to the above requirements,

- Adequate examination coverage was not obtained for 1983 Unit 1, 1982 Unit 2 and 1981 Unit 3 support skirt weld examinations. The near surface support skirt materials for Units 1 and 3 and weld material for Unit 2 was in the near zone during stated scanning and, therefore, did not receive (satisfactory) examination. The stated start point for scanning resulted in about an additional 1/4 of the required skirt material examination not being performed in the Unit 1 and Unit 3 examinations.
- A 3 inch thick calibration block with a 3/16 inch hole was used for the 1982 Unit 2 examination of skirt material less than two inches thick.
- Transfer was not used in the 1983 Unit 1, 1982 Unit 2 or 1981 Unit 3 examinations.

This is a Severity Level IV violation (Supplement I).

1. Admission or Denial of the Alleged Violation

TVA admits the violation occurred as stated.

2. Reasons for the Violation

- a. The first and second parts of the violation were caused by inadequate instructions to inspectors on completion of examination reports.
- b. The third part of the violation was caused by an incomplete examination procedure.

3. Corrective Steps Which Have Been Taken and the Results Achieved

- a. Subsequent to discussion of this problem with the NRC inspector, a visual examination of the unit 3 support skirt revealed that ultrasonic examination of the minimum code-required volume is not possible because of the presence of nonremovable insulation. It is very probable that this condition also exists on units 1 and 2. Relief from this requirement was authorized by Request for Relief ISI-3 (Attachment I). However, Section 7.0 of the surveillance instruction, SI-4.6.G, and the applicable NDE procedure, N-UT-7, require that the examination reports shall include the examination limits when full compliance is not possible. The reports submitted to the NRC inspector do not include this information. TVA admits the unit 3 examination reports reviewed by the NRC inspector were deficient in this regard and it is very likely the examination reports for units 1 and 2 are also deficient. The unit 3 report has been corrected (Attachment II). Visual examination to verify the examination limits of units 1 and 2 will be added to the appropriate in-service inspection plans for the next scheduled unit 1 (now February 1985) outage and unit 2 (now August 1984) outage. Should similar limitations be verified, the applicable examination reports will be supplemented to include this information. If it is not possible to verify similar scan limitations, the area will be reexamined in accordance with procedure requirements. These corrective steps should be completed on unit 2 by February 1985 and on unit 1 by July 1985.
- b. A copy of the manufacturer's fabrication drawing is included as Attachment III. Review of Detail D of this drawing indicates the weld and adjacent base material are approximately 2-1/2 inches thick. The base material thickness then decreases approximately 1/8 inch per inch as the measurement point is moved downwards away from the weld. It is likely the measurement recorded on the examination report was taken in the tapered area rather than adjacent to the weld, resulting in a smaller reading. While there is no requirement to make the thickness measurement, the examination report as written now is not clear and subject to question. TVA will therefore add an inspection to the in-service inspection plan for the next scheduled outage to recheck the wall thickness adjacent to the weld. If the wall thickness is verified

to be as shown on the drawing, the examination report will be corrected. If the wall thickness is found to be too thin for the calibration block used, a reexamination using the correct calibration block will be performed. These corrective steps should be completed by February 1985.

- c. The intent of the transfer requirement in the Code was to provide a method for adjusting examination system sensitivity on the production part to the same level achieved by calibration on the calibration block. The significant variations which the transfer method attempts to compensate for are:

1. Differences in surface finishes,
2. Differences in acoustical properties, and
3. Differences in search unit contact areas

Industry experience with the transfer technique was generally not good, i.e., different acoustic properties were observed in different areas of the same calibration block and the technique is prohibited on vessel examinations in accordance with Appendix I of Section XI and deleted from later revisions of the Code. It is TVA's policy to provide the following alternates to transfer:

1. Calibration blocks are fabricated with surface finishes representative of examination surfaces in lieu of the 125 rms finish required by the Code.
2. Calibration blocks are fabricated from materials having a chemical composition, tensile strength, and metallurgical structure similar to the material under examination in lieu of the equivalent "P" numbers allowed by the Code.
3. Differences in search unit contact areas are maintained at conservative values by limiting the radius of curvature on examination surfaces less than 20 inches in diameter to no less than 9/10 of the calibration block diameter of curvature.

It is TVA's position that these practices provide examination results at least equivalent to those provided by use of transfer techniques and are therefore acceptable in accordance with IWA-2240 of Section XI of the ASME Code. It is also noted that these practices meet the applicable requirements of Appendix I of Section XI of the ASME Code for vessel welds 2-1/2 inches or greater which specifically excludes the use of transfer techniques.

As a result of this notice of violation, the applicable examination procedure was reviewed. In course of this review it was noted that while later ultrasonic testing (UT) procedures accurately reflect TVA practices in this area, the specific procedure in question, N-UT-7, does not. TVA will therefore revise this procedure to more accurately specify our practices in this area. This action will be completed by August 30, 1984, in time for the next scheduled outage.

4. Corrective Steps Which Will Be Taken To Avoid Further Violations

TVA's review of this violation has revealed discrepancies associated with the support skirt examinations of Browns Ferry; however, they are not the same discrepancies listed in the notice of violation. The following conclusions are still speculative in regard to units 1 and 2 at this time; however, it appears the actual discrepancies fall into two major categories:

1. Incomplete and/or inaccurate examination records
2. Failure to revise an examination procedure to reflect use of an improved technique

To provide recurrence control for the inspection record discrepancies, a Quality Engineering Branch Instruction Letter will be issued to specify inspector responsibilities in completion of examination records. Also, the NDE inspection supervisor will issue a memorandum indicating failure to comply with these requirements will result in disciplinary action. These actions will be completed by July 1, 1984.

To provide recurrence control for the examination procedures, all ultrasonic examination procedures will be reviewed to ensure accurate representation of TVA practices in regard to calibration block criteria is included or appropriate revisions initiated. This action will be completed by August 30, 1984.

5. Date When Full Compliance Will Be Achieved

Browns Ferry will be in full compliance by July 1985 with completion of examination report revision or reexamination of the unit 1 support skirt weld.

SEP 29 1981

REQUEST FOR RELIEF ISI-3

Components: Reactor Pressure Vessel Support Skirt

Class: 1

Function: Support component.

Test Requirement: Volumetric examination of support attachment weld to vessel, examination category B-H.

Basis for Relief: Approximately 6 feet of the attachment weld would require examination to meet code requirements.

However, nonremovable reactor vessel insulation limits inservice examination. Two access ports, approximately 180 degrees apart, provide access for examination of two 2-foot lengths. Four feet of the support skirt-to-reactor vessel weld will be ultrasonically examined during each inspection interval.

Alternate Inspection: None.

- Attachment I -

NONDESTRUCTIVE EXAMINATION
PROCEDURE

LOCATION BNP UNIT 3

TVA DIVISION OF NUCLEAR POWER

REPORT NO. R-173

CALIBRATION NO. C-059

EXAM.TIME 1245

REF.CK.TIME 1310

DATE 12-10-81

AUTHORIZED INSPECTOR _____

17
ANii
B.T.L.
12-11-81

REPORT OF ULTRASONIC EXAMINATION

SYSTEM RPV REF.DWG. CHM1091-C SIZE RPV/SS MAT'L CS

WELD NO. SUPPORT SKIRT LOCATION RAYWELL TEMP. 92°F

PREPARATION A/F

EXAMINER/LEVEL M. Robbins/II ^{MOR} EXAMINER/LEVEL M. Hammond/I

REVIEW/LEVEL _____

- ATTACHMENT II -

EXAMINATION PROCEDURE N-WT-7 REV. 3

NAD=NO APPARENT DISC L=LINEAR G=GEOMETRY S=SPOT M=MULTIPLES

SCAN	TYPE	DISP.	SCAN	TYPE	DISP.	SCAN	TYPE	DISP.
1	VT	NAD	7		NA	13		NA
2	BM	NAD	8			14		
3	W/FT	NAD	9			15		
4	PT	NA	10			16		
5	CCWII	NAD	11			17		
6	CCWII		12			18		

EXAMINATION

SKETCH	SCAN	UPSTREAM	CENTER-LINE	DOWNSTREAM
	4	NA	NA	NA
		REMARKS/DESCRIPTION OF INDICATIONS		
NO SCAN 4 due to INSULATION				

NONDESTRUCTIVE EXAMINATION
PROCEDURE

TVA DIVISION OF NUCLEAR POWER

LOCATION B&NP UNIT 3

REPORT NO. R-174

CALIBRATION NO. C-060

EXAM.TIME 1000

REF.CK.TIME 1030

DATE 12/10/81

AUTHORIZED INSPECTOR _____

R
ANL
B.F.L.
12-11-81

REPORT OF ULTRASONIC EXAMINATION

SYSTEM R.P.V. REF.DWG. Chm 1091-C SIZE R.P.V. S.S. MAT'L C.S.

WELD NO. SUPPORT SKIRT LOCATION DRY WELL TEMP. 92°F
TO VESSEL

PREPARATION AS FOUND

EXAMINER/LEVEL M. ROBBINS / II MDR EXAMINER/LEVEL M. HAMMOND / I

REVIEW/LEVEL _____

EXAMINATION PROCEDURE N-WT 7 REV. 3

NAD=NO APPARENT DISC L=LINEAR G=GEOMETRY S=SPOT M=MULTIPLES

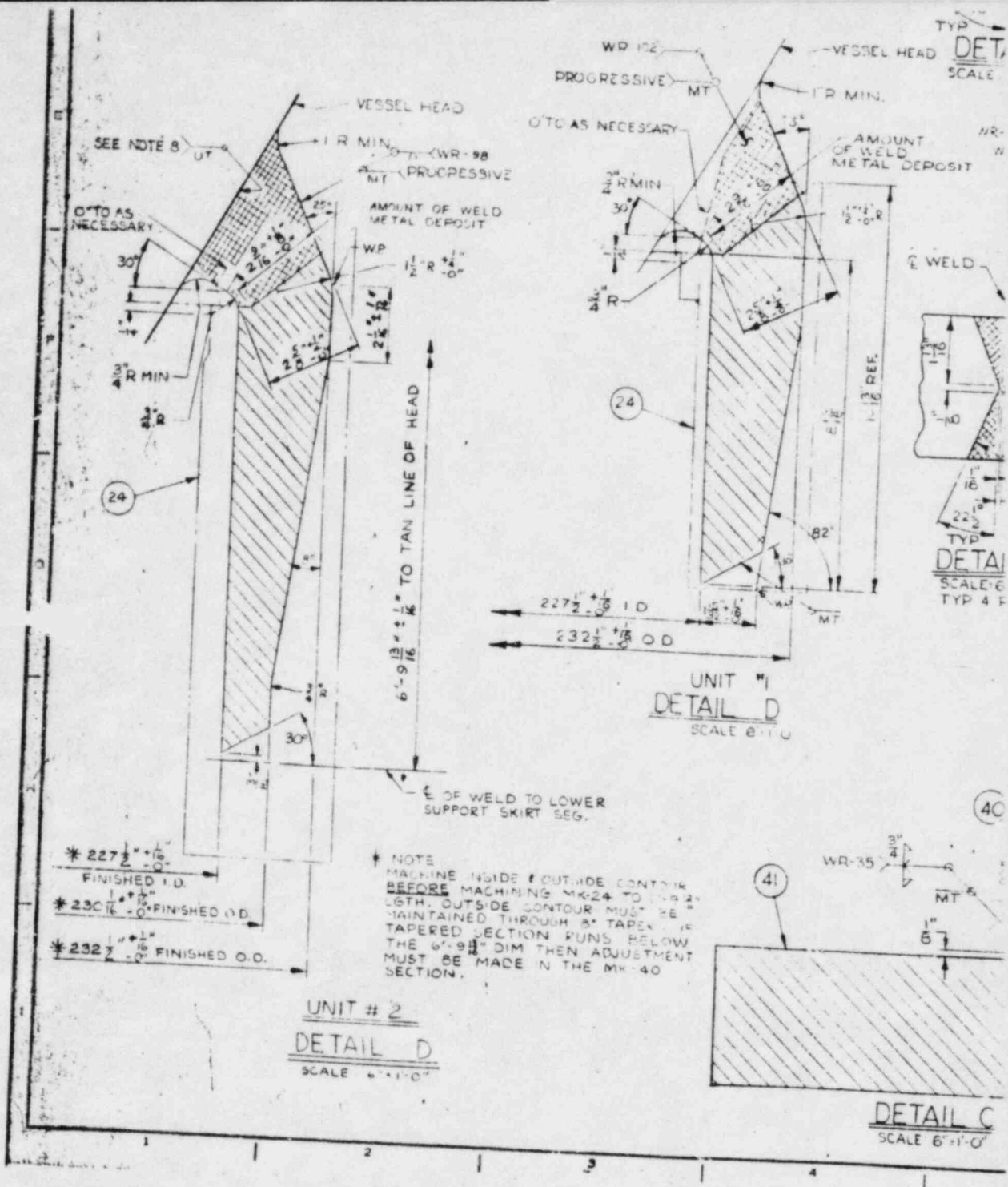
SCAN	TYPE	DISP.	SCAN	TYPE	DISP.	SCAN	TYPE	DISP.
1	VT	NAD	7		NA	13		NA
2	BM	NAD	8			14		
3		NA	9			15	WELD	NAD
4			10			16		NA
5			11			17		
6			12			18		

EXAMINATION

SKETCH	SCAN	UPSTREAM	CENTER-LINE	DOWNSTREAM
		N/A	2.57	2.31

REMARKS/DESCRIPTION OF INDICATIONS

NO SCAN ON RPV SIDE
DUE TO INSULTATION



- ATTACHMENT III -

