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August 11, 1982

Mr. Harold R. Denton, Director  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

Subject: Byron Station Unit 1  
Preservice Inspection  
Relief Requests  
NRC Docket No. 50-454

Reference (a): April 7, 1982 letter from  
T. R. Tramm to H. R. Denton.

Dear Mr. Denton:

This is to request relief from specific ASME Section XI requirements for automated pressure vessel preservice examination of Byron Station Unit 1. The program plan for this work was provided in reference (a).

Enclosed with this letter are relief requests NR-9 and NR-10. These requests identify the welds for which volumetric examination is not practical and provides a justification for the requested relief.

NRC action on these requests is needed by September 15, 1982, to support field activities. Please direct further questions regarding these relief requests to this office.

One signed original and fifteen copies of this letter are provided for your use.

Very truly yours,

T. R. Tramm  
Nuclear Licensing Administrator

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RELIEF REQUEST NR-9

1. SYSTEM: Reactor Pressure Vessel
2. NUMBER OF ITEMS: 3
3. A.S.M.E. CODE CLASS: 1
4. A.S.M.E. CODE SECTION XI REQUIREMENTS: Examination Category B-A, Figures IWB-2500-1, IWB-2500-3, IWB-2500-4, volumetric examination of the weld volume described in these figures is required over essentially 100% of the weld length.
5. BASIS FOR RELIEF:
  - a. Lower Shell Course-to-Dutchman Weld, WR-29, (IWB-2500-1) has six core barrel locating lugs welded to the interior surface of the pressure vessel just above Weld WR-29. The lugs are physical obstructions to the search unit for examinations from the top side of the weld and 100% coverage cannot be achieved. The areas that did not receive 100% examination are shown on Attachment NR-9 Figure 1 through 4.
  - b. Lower Disk to Dutchman Weld, WR-16 (IWB-2500-3) has instrument tubes that penetrate the lower head physically obstructing the search unit and/or the search unit positioning device which prevents 100% examination. The areas that did not receive 100% examination are shown on Attachment NR-9 Figures 5 through 7.

5. BASIS FOR RELIEF - (Continued)

c. Nozzle Shell Course to Reactor Vessel Flange Weld, WR-7 (IWB-2500-4), the reactor vessel flange contains a taper above Weld WR-7 which prevents 100% examination of the adjacent base metal for transverse reflectors from the top side of the weld. However, all the weld metal and 3 inches of adjacent base metal were examined. Attachment NR-9 Figure 1.

6. ALTERNATE TEST METHOD: None

7. JUSTIFICATION: Completing the remaining portions of the required examination is impractical and would result in undue hardship without a compensating increase in safety. The limited Section XI examination, the volumetric examination performed during fabrication and hydrostatic tests demonstrate an acceptable level of preservice structural integrity.

RELIEF REQUEST NR-9

ATTACHMENT 1

Figure 1

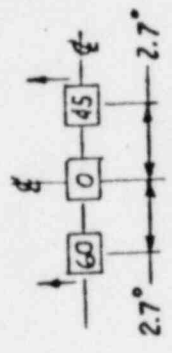
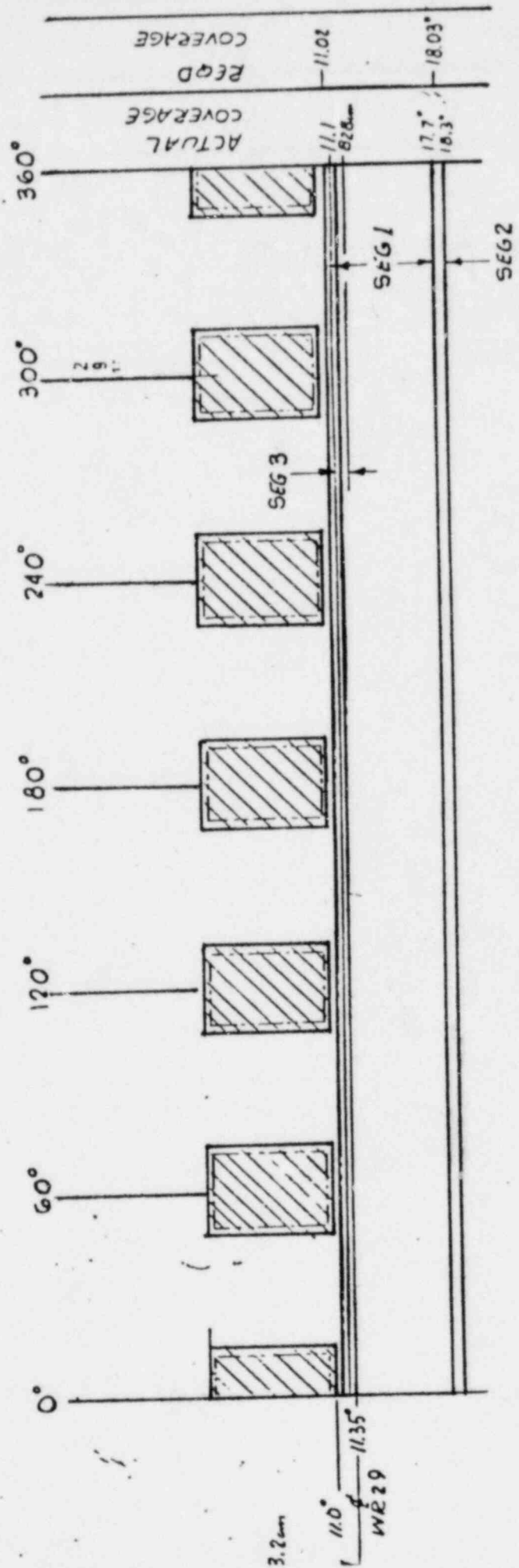
ESTIMATE of the Extent of Near Surface Volume not Effectively Examined:

| <u>WELD DESIGNATION</u> | <u>TRANSDUCER</u> | BASE METAL NEAR<br><u>SURFACE NOT EXAMINED</u> |
|-------------------------|-------------------|--|
| WR-16 and WR-29         | 60°               | .023 (Inches)                                  |
|                         | 45°               | .057   |
|                         | 0° Laminar        | 2.32   |
| WR-16                   | 0° Planar         | 1.40   |
| WR-19                   | 0° Planar         | 2.38   |
| WR-7 and Transverse     | 60° Transverse    | 0.41   |

NR-9

# WELD WR29 COVERAGE FOR PARALLEL REFLECTORS TRANSDUCERS LOOKING UP (MINUS)

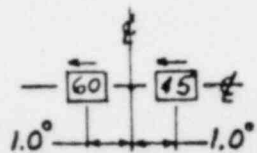
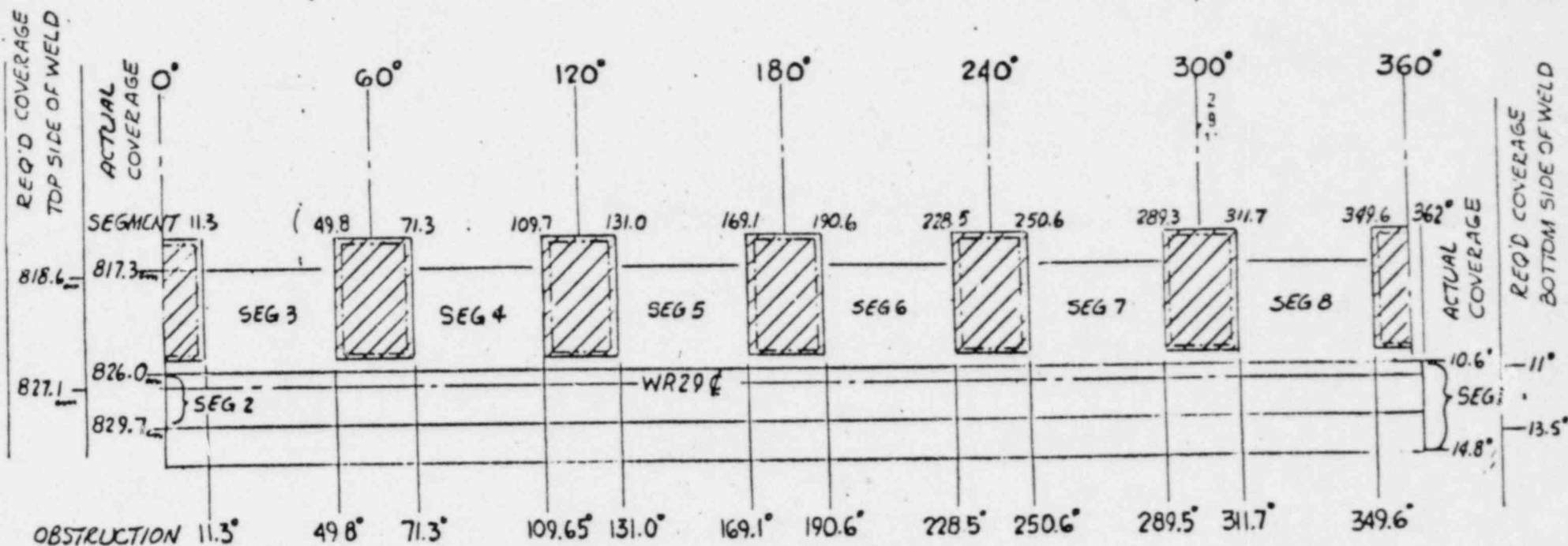
OBSTRUCTION @ 11° MIN



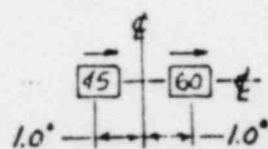
NR-9 Attachment #1  
Figure 2



WELD WR29 COVERAGE FOR TRANSVERSE REFLECTORS  
 TRANSDUCER LOOKING CW (PLUS) AND CCW (MINUS)



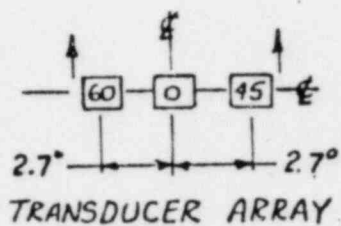
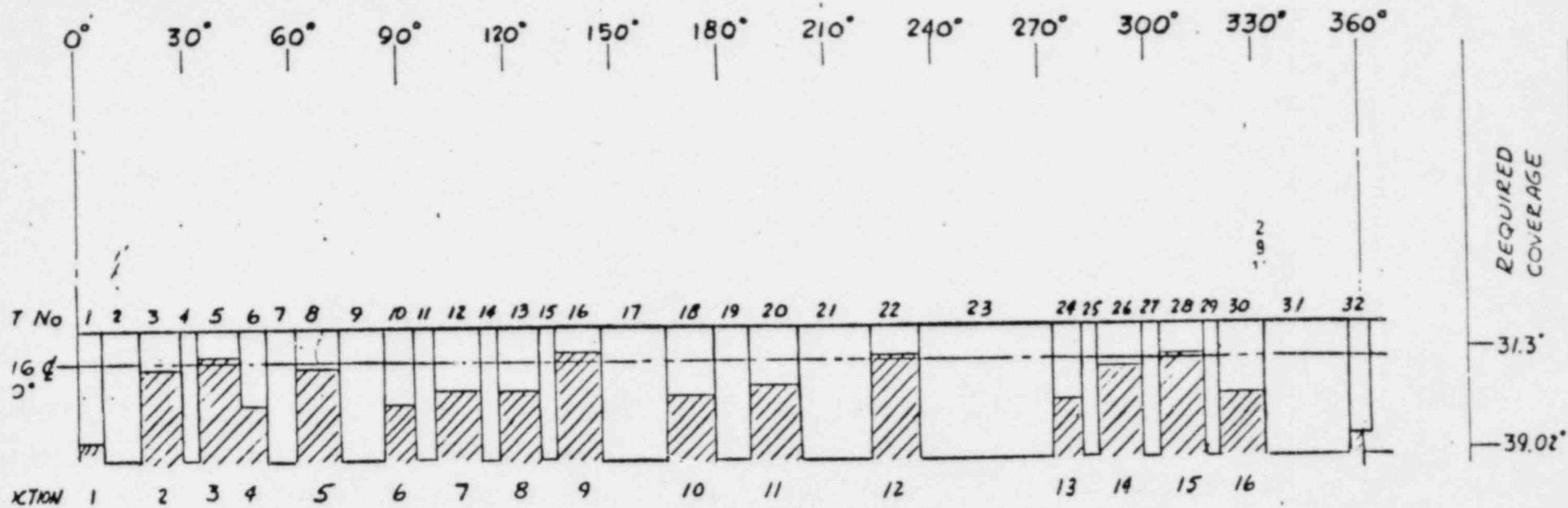
TRANSDUCER ARRAY CCW



TRANSDUCER ARRAY CW

WELD WRIG COVERAGE FOR PARALLEL REFLECTORS  
 TRANSDUCERS LOOKING UP (MINUS)

▨ OBSTRUCTIONS REFER TO FIGURE 5 FOR COORDINATES  
 □ SEGMENTS



NR-9 Attachment #1  
 Figure 5



WELD WRIG COVERAGE FOR PARALLEL REFLECTORS  
 TRANSDUCERS LOOKING UP (MINUS)

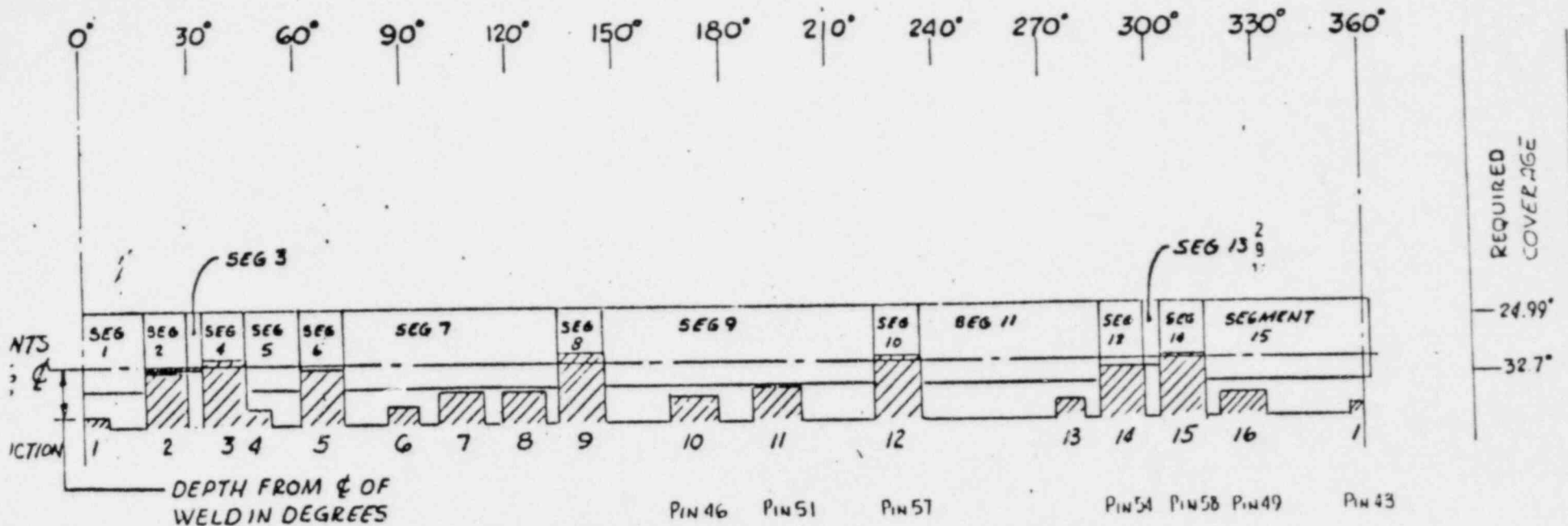
| SEGMENTS |             |       |           |      | SEGMENTS |             |       |           |      |
|----------|-------------|-------|-----------|------|----------|-------------|-------|-----------|------|
| SEG No.  | BOOM ROTATE |       | PIVOT ARM |      | SEG No.  | BOOM ROTATE |       | PIVOT ARM |      |
|          | START       | END   | START     | END  |          | START       | END   | START     | END  |
| 1P       | 0.0°        | 4.5°  | 29.6°     | 37.7 | 17P      | 146.7       | 165.4 | 29.6      | 39.3 |
| 2P       | 4.4°        | 17.5° | 29.6°     | 39.3 | 18P      | 165.4       | 178.3 | 29.6      | 36.3 |
| 3P       | 17.5        | 30.3  | 29.6      | 32.8 | 19P      | 178.3       | 188.9 | 29.6      | 39.4 |
| 4P       | 30.2        | 34.0  | 29.6      | 39.3 | 20P      | 188.9       | 202.2 | 29.6      | 35.4 |
| 5P       | 34.0        | 46.6  | 29.6      | 31.2 | 21P      | 202.2       | 222.8 | 29.6      | 39.4 |
| 6P       | 46.6        | 52.6  | 29.6      | 36.9 | 22P      | 222.8       | 236.1 | 29.6      | 31.6 |
| 7P       | 52.5        | 60.9  | 29.6      | 39.3 | 23P      | 236.1       | 274.1 | 29.6      | 39.4 |
| 8P       | 60.8        | 73.7  | 29.6      | 32.4 | 24P      | 274.1       | 282.1 | 29.6      | 37.3 |
| 9P       | 73.7        | 86.0  | 29.6      | 39.3 | 25P      | 282.1       | 287.0 | 29.6      | 39.4 |
| 10P      | 86.0        | 94.3  | 29.6      | 37.0 | 26P      | 287.0       | 299.5 | 29.6      | 33.0 |
| 11P      | 94.3        | 99.8  | 29.6      | 39.3 | 27P      | 299.5       | 303.8 | 29.6      | 39.4 |
| 12P      | 99.8        | 112.6 | 29.6      | 35.2 | 28P      | 303.8       | 316.3 | 29.6      | 31.6 |
| 13P      | 117.3       | 130.3 | 29.6      | 35.3 | 29P      | 316.3       | 320.2 | 29.6      | 39.4 |
| 14P      | 112.7       | 117.3 | 29.6      | 39.3 | 30P      | 320.2       | 333.4 | 29.6      | 36.3 |
| 15P      | 130.3       | 133.8 | 29.6      | 39.3 | 31P      | 333.4       | 356.0 | 29.6      | 39.4 |
| 16P      | 133.8       | 146.6 | 29.6      | 30.8 | 32P      | 356.0       | 361.0 | 29.6      | 37.7 |

NR-9 Attachment #1  
 Figure 5A

# WELD WRIG COVERAGE FOR PARALLEL REFLECTORS TRANSDUCERS LOOKING DOWN (PLUS)

NR-9

▨ OBSTRUCTIONS  
□ SEGMENTS



| OBSTRUCTIONS |              |                 |     |              |                  |
|--------------|--------------|-----------------|-----|--------------|------------------|
| No.          | DEPTH IN DEG | ROTATION IN DEG | No. | DEPTH IN DEG | ROTATION IN DEG  |
| 1            | 37.77°       | 356° - 4.49°    | 9   | 30.98°       | 133.84 - 146.68° |
| 2            | 32.81°       | 17.53° - 30.29° | 10  | 36.3°        | 165.36 - 178.27° |
| 3            | 31.25°       | 34.0° - 46.66°  | 11  | 35.35°       | 188.87 - 202.16° |
| 4            | 36.92°       | 46.66° - 52.58° | 12  | 31.56°       | 222.8° - 236.11° |
| 5            | 32.45°       | 60.89° - 73.72° | 13  | 37.33°       | 274.06 - 282.06° |
| 6            | 37.08°       | 86.06° - 99.32° | 14  | 32.95°       | 286.98 - 299.48° |
| 7            | 35.26°       | 99.8° - 112.63° | 15  | 31.60°       | 303.78 - 316.30° |
| 8            | 35.26°       | 117.28 - 130.3° | 16  | 36.38°       | 320.20 - 333.37° |

NR-9

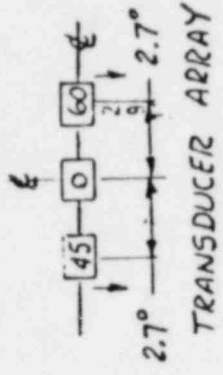
NOTE: SEE SHEET 2 FOR SEGMENT INFORMATION Attachment #1

Figure 6

NR-9

WELD WR16 COVERAGE FOR PARALLEL REFLECTORS  
 TRANSDUCERS LOOKING DOWN (PLUS)

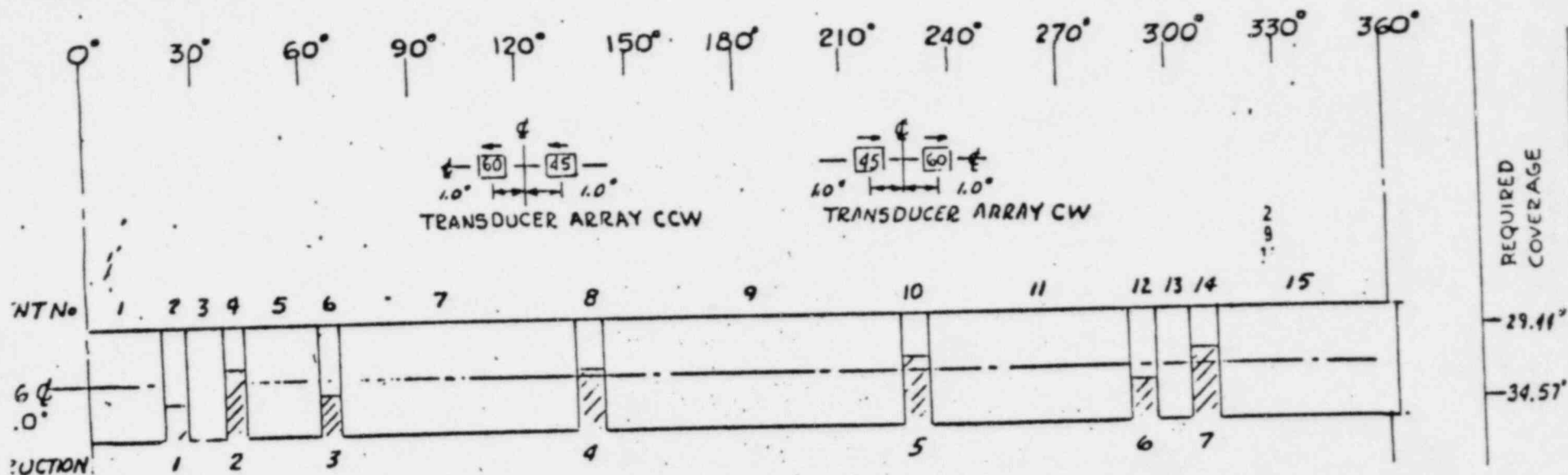
| SEG No. | BOOM ROTATE |       | PIVOT ARM |       |
|---------|-------------|-------|-----------|-------|
|         | START       | END   | START     | END   |
| 1       | 0.0         | 17.5  | 23.3      | 33.0  |
| 2       | 17.5        | 30.2  | 23.3      | 32.8  |
| 3       | 30.2        | 34.0  | 23.3      | 33.0  |
| 4       | 34.0        | 46.6  | 23.3      | 31.2  |
| 5       | 46.6        | 60.8  | 23.3      | 33.0  |
| 6       | 60.8        | 73.7  | 23.3      | 32.5  |
| 7       | 73.7        | 133.8 | 23.3      | 33.0  |
| 8       | 133.8       | 148.6 | 23.3      | 30.9  |
| 9       | 148.6       | 222.8 | 23.29     | 32.97 |
| 10      | 222.8       | 236.1 | 23.3      | 31.55 |
| 11      | 236.1       | 286.9 | 23.3      | 32.99 |
| 12      | 286.9       | 299.4 | 23.30     | 32.87 |
| 13      | 299.4       | 303.7 | 23.29     | 32.97 |
| 14      | 303.7       | 316.3 | 23.28     | 31.61 |
| 15      | 316.3       | 361.0 | 23.29     | 32.99 |



NR-9 Attachment # 1  
 Figure 6A

WELD WR16 COVERAGE FOR TRANSVERSE REFLECTORS  
 TRANSDUCERS LOOKING CW (PLUS) AND CCW (MINUS)

▨ OBSTRUCTIONS  
 □ SEGMENTS



| OBSTRUCTIONS |                  |
|--------------|------------------|
| DEPTH IN DEG | ROTATION IN DEG. |
| 33.12°       | 20.24°~27.33°    |
| 31.25°       | 37.21°~43.70°    |
| 32.91°       | 63.86°~70.88°    |
| 31.13°       | 136.31°~143.71°  |
| 31.21°       | 225.73°~233.92°  |
| 32.90°       | 289.5°~296.87°   |
| 31.37°       | 306.0°~313.67°   |

| ACTUAL COVERAGE SEGMENT |             |       |           |      |
|-------------------------|-------------|-------|-----------|------|
| SEG No                  | BOOM ROTATE |       | PIVOT ARM |      |
|                         | START       | END   | START     | END  |
| 1T                      | 0.0°        | 20.2° | 27.8      | 34.9 |
| 2T                      | 20.2        | 27.3  | 27.8      | 32.1 |
| 3T                      | 27.3        | 37.2  | 27.8      | 34.9 |
| 4T                      | 37.2        | 43.7  | 27.8      | 31.2 |
| 5T                      | 43.7        | 63.8  | 27.8      | 34.9 |
| 6T                      | 63.8        | 70.8  | 27.8      | 32.9 |
| 7T                      | 70.8        | 136.3 | 27.8      | 34.9 |
| 8T                      | 136.3       | 143.7 | 27.8      | 31.1 |

| ACTUAL COVERAGE SEGMENT |             |       |           |      |
|-------------------------|-------------|-------|-----------|------|
| SEG No                  | BOOM ROTATE |       | PIVOT ARM |      |
|                         | START       | END   | START     | END  |
| 9T                      | 143.7       | 225.7 | 27.8      | 34.9 |
| 10T                     | 225.7       | 233.4 | 27.8      | 31.2 |
| 11T                     | 233.4       | 289.5 | 27.8      | 34.9 |
| 12T                     | 289.5       | 296.8 | 27.8      | 32.9 |
| 13T                     | 296.8       | 306.0 | 27.8      | 34.9 |
| 14T                     | 306.0       | 313.6 | 27.8      | 31.3 |
| 15T                     | 313.6       | 362.0 | 27.8      | 34.9 |

NR9 Attachment #1  
 Figure 7

RELIEF REQUEST NR-10

1. SYSTEM: Reactor Pressure Vessel
2. NUMBER OF ITEMS: Four (4)
3. A.S.M.E. CODE CLASS: 1
4. A.S.M.E. CODE SECTION XI REQUIREMENTS: Examination Category B-D, Figure IWB-2500-7, Volumetric examination of the examination volume shown in Figure IWB-2500-7 is required over essentially 100% of the weld length.
5. BASIS FOR RELIEF: Nozzle to Vessel welds on nozzles A, D, E, and H, the examination for transverse reflectors is performed from the reactor vessel surface. The integral extension on the outlet nozzles is a physical obstruction to the search unit which prevents 100% coverage of adjacent base metal near the nozzle bore. However, all of the weld metal and 4 inches of adjacent base metal were examined. As shown on Attachment 1.
6. ALTERNATE TEST METHOD: None
7. JUSTIFICATION: Completing the remaining portions of the required examination is impractical and would result in undue hardship without compensating increase in safety. The limited Section XI Examination, the volumetric examination performed during fabrication and the Hydrostatic tests demonstrate an acceptable level of preservice structural integrity.

RELIEF REQUEST NR-10

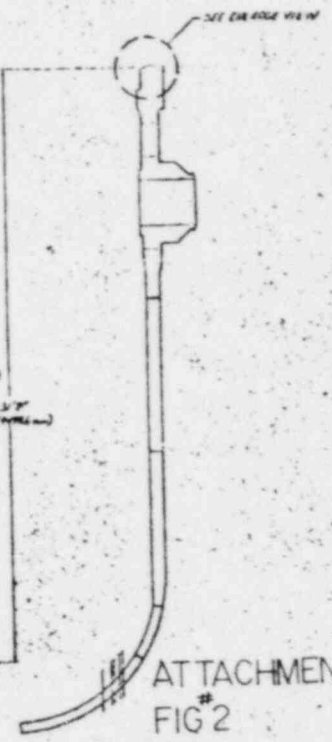
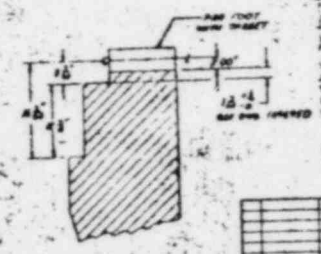
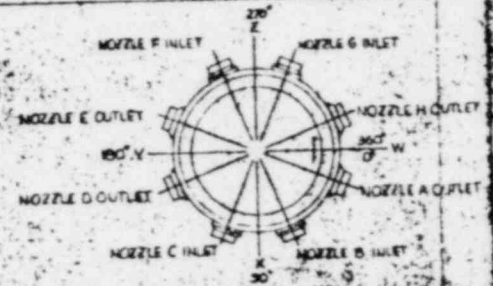
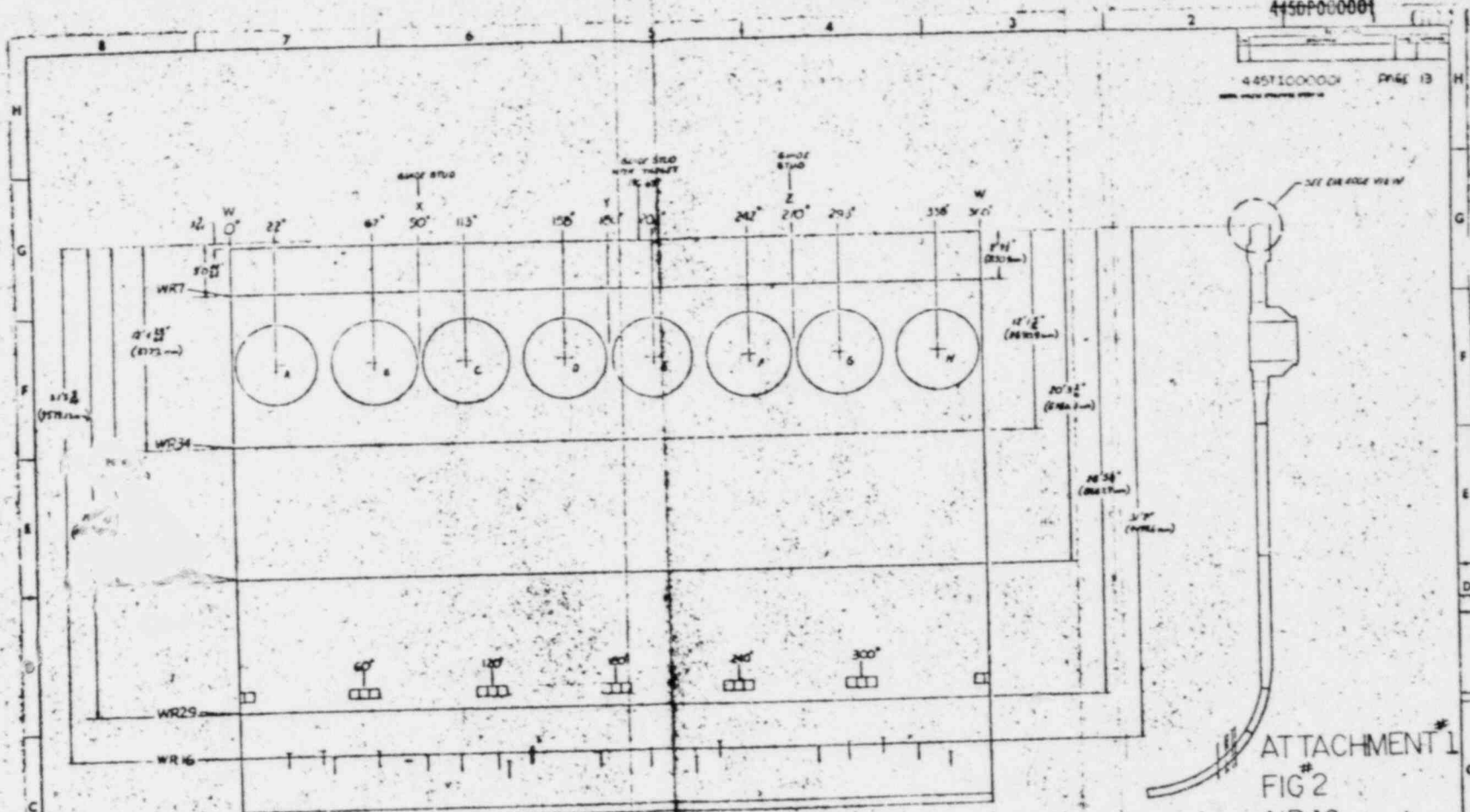
Attachment 1

Figure 1

Estimate of the Extent of Near Surface Volume not Effectively Examined:

| <u>WELD DESIGNATION</u>                          | <u>TRANSDUCER</u>     | <u>BASE METAL NEAR<br/>SURFACE NOT EXAMINED</u> |
|--|-----------------------|---|
| Examinations of<br>Nozzle-to-Vessel<br>Welds (8) | 45° Transverse        | 0.60  |
|  | 0° Laminar and Planar | 1.69  |





ATTACHMENT 1  
FIG 2  
NR-10

| PARTS LIST |                 | Material International Corporation |
|------------|-----------------|------------------------------------|
| QTY        | DESCRIPTION     | Stock Number                       |
| 1          | NOZZLE ASSEMBLY | NR-10                              |
| 1          | NOZZLE A        | NR-10A                             |
| 1          | NOZZLE B        | NR-10B                             |
| 1          | NOZZLE C        | NR-10C                             |
| 1          | NOZZLE D        | NR-10D                             |
| 1          | NOZZLE E        | NR-10E                             |
| 1          | NOZZLE F        | NR-10F                             |
| 1          | NOZZLE G        | NR-10G                             |
| 1          | NOZZLE H        | NR-10H                             |