

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

5N 157B Lookout Place

APR 13 1990

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

Gentlemen:

In the Matter of the Application of)
Tennessee Valley Authority)

Docket Nos. 50-390
50-391

WATTS BAR NUCLEAR PLANT (WBN) UNITS 1 AND 2 - 10 CFR 50.55a(a)(3) - PROPOSED
ALTERNATIVE ACCEPTANCE TO AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
SECTION III

In accordance with 10 CFR 50.55a(a)(3), enclosed is TVA's proposed alternative
to ASME Section III requirements for certain containment penetrations at WBN
Unit 1. This request supersedes TVA's letter dated November 21, 1989.


Review of the records supporting TVA's request found that the circumferential
welds in question greater than 2-inch nominal pipe size were volumetrically
examined. The circumferential welds 2-inch and less in nominal pipe size were
mistakenly identified as circumferential welds which had been volumetrically
examined. TVA review of the vendor drawings identified these pipe connections
as socket welds which had been fillet welded. Also, the review identified
that the attachment welds (lugs) were omitted from the original request.
These socket welds and attachment welds were surface examined in accordance
with ASME Section III requirements. The fillet welds, lug welds, and butt
welds associated with this request are identified in Attachment 1 to
Enclosure 1.

Enclosure 2 lists the commitments made in this report.

If there are any questions, please telephone G. R. Ashley at (615) 365-8527.

Very truly yours,

TENNESSEE VALLEY AUTHORITY


E. G. Wallace, Manager
Nuclear Licensing and
Regulatory Affairs

Enclosures
cc: See page 2

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U.S. Nuclear Regulatory Commission

cc (Enclosures):

Ms. S. C. Black, Assistant Director
for Projects
TVA Projects Division
U.S. Nuclear Regulatory Commission
One White Flint, North
11555 Rockville Pike
Rockville, Maryland 20852

Mr. B. A. Wilson, Assistant Director
for Inspection Programs
TVA Projects Division
U.S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

NRC Resident Inspector
Watts Bar Nuclear Plant
P.O. Box 700
Spring City, Tennessee 37381

ENCLOSURE 1

TUBE TURNS PENETRATIONS ASSEMBLIES
HYDROSTATIC TEST EXAMINATION REQUEST FOR NRC
APPROVAL OF A PROPOSED ALTERNATIVE

During construction of Watts Bar Unit 1, it was discovered that the vendor of certain containment penetration assemblies had exercised specific provisions of the American Society of Mechanical Engineers (ASME) Code, Section III, that permitted them to substitute the system hydrostatic tests for the component hydrostatic test. This fact was not discovered by the WBN construction forces until the Unit 1 system hydrostatic tests in which the penetration assemblies had been installed were completed. Therefore, although the system pressure tests were performed and the penetration assemblies were exposed to the required ASME Section III hydrostatic test pressure, no provisions were made to examine the vendor welds during this test. Nonconformance Report (NCR) 5609 was initiated to document this condition.

NCR 5609 was originally dispositioned use-as-is. It was subsequently decided that the NCR 5609 disposition did not result in a request for an exemption from our commitments to ASME Section III. Condition Adverse to Quality Report (CAQR) WBP 880310 was issued to change the disposition of NCR 5609 to require that the hidden vendor welds on the penetration assemblies be brought to the ASME Section III examination pressure and visually examined for leakage in accordance with ASME Section III. It has now been determined that this disposition will result in hardship and unusual difficulties without a compensating increase in the quality and safety of Watts Bar.

Pursuant to 10 CFR 50.55a(a)(3), TVA is requesting NRC approval to apply an alternative to the ASME Section III requirements for visual examinations during hydrostatic testing for the vendor welds that are not accessible and were not examined during the original system hydrostatic test. TVA proposes to accept the original use-as-is disposition which provides an acceptable level of safety.

In order to make the welds in question accessible for examination, as proposed in the disposition to CAQR WBP 880310, it will require cutting several "windows" in the guard pipe protecting the process pipe. Experience gained during similar work on Unit 2 indicates that this effort will be very difficult, especially replacing the "windows." Even with the "windows" cut in the guard pipe, some of the unexamined welds will only be accessible for examination by using remote viewing devices such as mirrors or fiberoptics. This type of examination is difficult to execute to ensure both complete examination and accurate interpretation.

The penetration assemblies for which an alternative is being proposed are tabulated in Attachment 1 along with various information about the assemblies. Sketches depicting the physical configuration of the various types of penetration assemblies are included in Attachment 2. TVA believes that a use-as-is disposition of these welds is technically acceptable for the following reasons:

1. The welds in question were fabricated and inspected in accordance with ASME III, Division 1, with Authorized Nuclear Inspector (ANI) involvement at the manufacturer.
2. A hydrostatic or pneumatic test to ASME III, NC-6000 was performed on the field welds installing the penetration assemblies in the piping system. Each of these was visually examined in accordance with ASME Section III and accepted.
3. Pressure boundary pipe containing longitudinal weld seams used by the manufacturer to fabricate the penetration assemblies was hydrostatically tested by the material manufacturer in accordance with the ASME material specification. Therefore, all longitudinal welds were pressure tested and inspected as required by the ASME code.
4. Many of the vendor welds not visually inspected during field hydrostatic testing are so close to TVA field welds which were inspected that it is reasonable to assume leakage from these welds would have been detected during the inspection of field welds. The distance from the field weld to the unexamined vendor weld is listed in Attachment 1.
5. The circumferential welds in question which are greater than 2-inch nominal pipe size were volumetrically examined (radiography) by the vendor in accordance with ASME Section III Class 2 requirements and accepted. The circumferential welds in question which are 2 inches nominal pipe size and less (socket weld ends with fillet welds) were surface examined (dye penetrant or magnetic particle) by the vendor in accordance with ASME Section III Class 2 requirements and accepted. The attachment welds (lugs) were surface examined (dye penetrant or magnetic particle) by the vendor in accordance with ASME Section III Class 2 requirements and accepted.
6. The systems involved include the Safety Injection, Residual Heat Removal, Containment Spray, and Auxiliary Feedwater Systems. These systems are safety-related and are necessary to achieve and maintain cold shutdown. Also affected is the relief valve discharge line from the Safety Injection System which carries relief valve discharge back to the Reactor Coolant Drain Tank and is classified as part of the Reactor Coolant System, and the reactor coolant pump seal water injection lines. The other systems involved (main steam, ventilation, control air, demineralized water, ice condenser, chemical and volume control, waste disposal, fuel handling, primary makeup water, and spares originally associated with the upper head injection system) either isolate or are already isolated during accidents. The likelihood of compromising the safe function of any of the affected systems by accepting this condition is believed to be minimal for the following reasons.
 - a. Penetrations involved were part of a system test and therefore have been subjected to hydrostatic or pneumatic test pressure. If a discontinuity large enough to cause total loss of function existed and was of such a nature as to cause failure during operation, it would have failed during testing whether or not the visual examination was performed.

- b. Involved penetrations were either radiographed (circumferential welds with a nominal pipe size greater than 2 inches) or surface examined (circumferential welds with a nominal pipe size 2 inches and less [socket weld ends with fillet welds] and attachment welds [lugs]). These examinations provide reasonable assurance that a defect which would have caused leakage during the hydrostatic test would not have gone undetected.

For certain penetration assemblies (Types I and II) a spool piece was attached to the outboard side of the flued head by the vendor in order to meet overall dimensional requirements for the design. These welds will be examined during hydrostatic testing for the affected systems. Penetration assemblies having an outboard spool piece are identified in Attachment 1.

TVA will revise the Final Safety Analysis Report (FSAR) and CAQR WBP 880310 to document NRC approval of the proposed alternative to ASME Section III for visual examinations of welds during hydrostatic testing.

TUBE TURNS PENETRATION ON ASSEMBLIES HYDROSTATIC TEST EXAMINATION
REQUEST FOR APPROVAL OF A PROPOSED ALTERNATIVE ACCEPTANCE

ATTACHMENT 1

| Penetration Number | Distance to TVA Weld | System | Weld Type | Penet. Type | Weld Number |
|-----------------------|----------------------------|--------|---------------|----------------|-------------------|
| 1K-14 | 5'-7" 9" | 74 | butt lug | XI | 12 8,9,10,11 |
| 1K-15 | 5'-7" 9" | 74 | butt lug | XI | 12 8,9,10,11 |
| 1K-16 | 5'-7" 9" | 72 | butt lug | XI | 12 8,9,10,11 |
| 1K-17 | 5'-7" 9" | 72 | butt lug | XI | 12 8,9,10,11 |
| 1X-8A ¹ | 10'-7" | 03A | butt | II | 15 |
| 1X-8B ¹ | 24'-3" | 03A | butt | II | 15 |
| 1X-8C ¹ | 24'-3" | 03A | butt | II | 15 |
| 1X-8D ¹ | 10'-7" | 03A | butt | II | 15 |
| 1X-12A ¹ | 23'-6" | 03A | butt | II | 15 & 16 |
| 1X-12B ¹ | 23'-6" | 03A | butt | II | 15 |
| 1X-12C ¹ | 23'-6" | 03A | butt | II | 15 |
| 1X-12D ¹ | 23'-6" | 03A | butt | II | 16 & 17 |
| 1X-13A ¹ | 10'-6" | 01A | butt | I | 15 & 16 |
| 1X-13B ¹ | 10'-6" | 01A | butt | I | 15 & 16 |
| 1X-13C ¹ | 10'-6" | 01A | butt | I | 15 & 16 |
| 1X-13D ¹ | 10'-6" | 01A | butt | I | 15 & 16 |
| 1X-14A | 3'-7" 9" | 15 | fillet lug | IV | 12 8,9,10,11 |
| 1X-14B | 3'-7" 9" | 15 | fillet lug | IV | 12 8,9,10,11 |
| 1X-14C | 3'-7" 9" | 15 | fillet lug | IV | 12 8,9,10,11 |
| 1X-14D | 3'-7" 9" | 15 | fillet lug | IV | 12 8,9,10,11 |
| 1X-15 | 3'-7 5/8" 9" | 62 | fillet lug | IV | 12 8,9,10,11 |
| 1X-16 | 1'-4" | 62 | butt | VII | 1 |
| 1X-17 | 10'-1" 1'-7" | 63 | butt lug | III | 30 26,27,28,29 |
| 1X-20A | 3'-5" 9" | 63 | butt lug | V | 12 8,9,10,11 |
| 1X-20B | 3'-5" 9" | 63 | butt lug | V | 12 8,9,10,11 |
| 1X-21 | 3'-6 3/4" 9" | 63 | butt lug | V | 12 8,9,10,11 |
| 1X-22 | 3'-7" 9" | 63 | butt lug | V | 12 8,9,10,11 |
| 1X-24 | 3'-7 1/2" 9" | 68 | butt lug | V | 12 8,9,10,11 |
| 1X-30 | 4'-8" 9" | 63 | fillet lug | IV | 12 8,9,10,11 |
| 1X-32 | 3'-6 3/4" 9" | 63 | butt lug | V | 12 8,9,10,11 |
| 1X-33 | 3'-6 3/4" 9" | 63 | butt lug | V | 12 8,9,10,11 |

TUBE TURNS PENETRATION ON ASSEMBLIES HYDROSTATIC TEST EXAMINATION
REQUEST FOR APPROVAL OF A PROPOSED ALTERNATIVE ACCEPTANCE

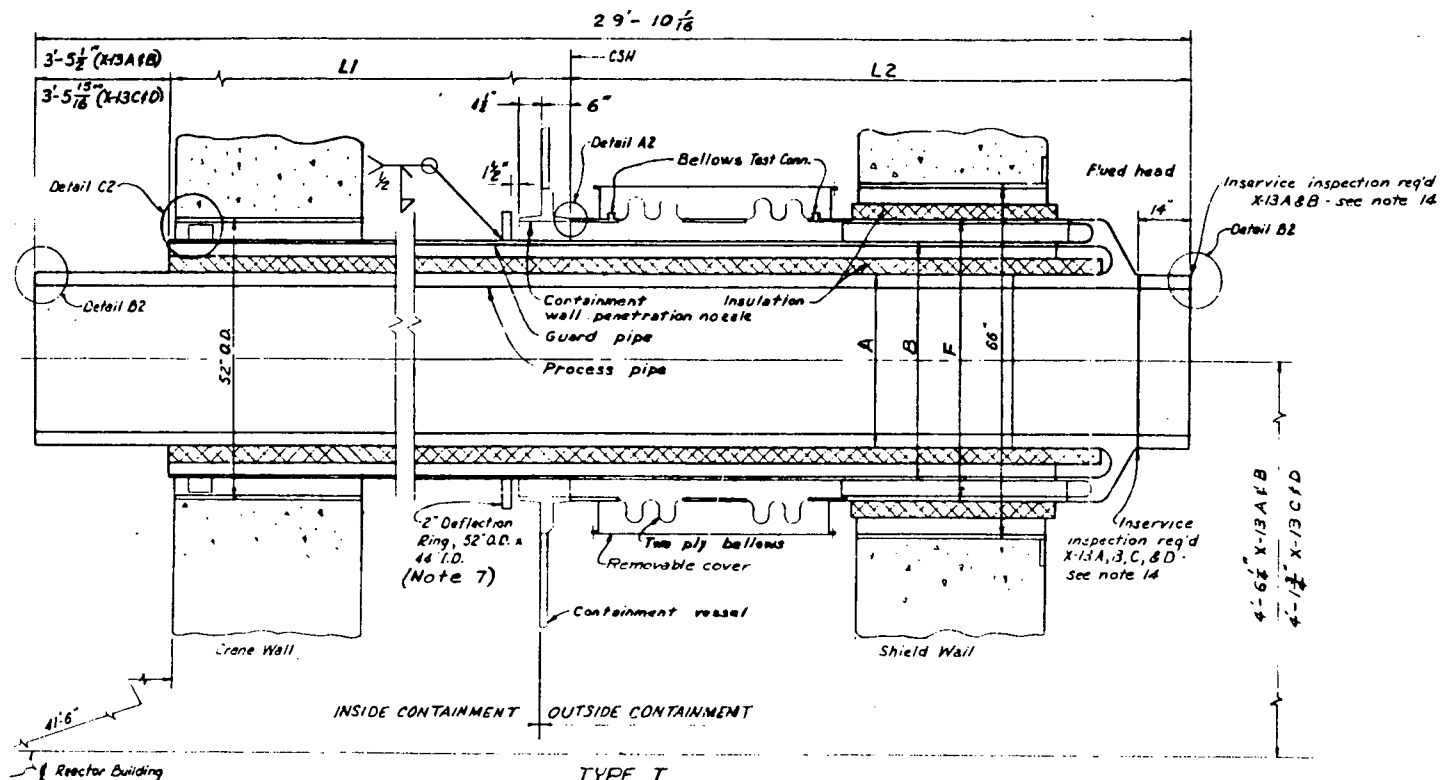
ATTACHMENT 1 (cont'd)

| Penetration Number | Distance to TVA Weld | System | Weld Type | Penet. Type | Weld Number |
|-----------------------|----------------------------|--------|--------------|----------------|----------------|
| 1X-34 ² | 1'-4 1/2" | 32 | fillet | VI | 1 |
| 1X-40A | 0'-9" | 03B | butt | VIII | 1 |
| 1X-40B | 0'-9" | 03B | butt | VIII | 1 |
| 1X-41 | 1'-4 1/2" | 77 | fillet | VI | 1 |
| 1X-42 | 1'-4" | 81 | butt | VII | 1 |
| 1X-43A | 1'-4 1/2" | 62 | fillet | VI | 1 |
| 1X-43B | 1'-4 1/2" | 62 | fillet | VI | 1 |
| 1X-43C | 1'-4 1/2" | 62 | fillet | VI | 1 |
| 1X-43D | 1'-4 1/2" | 62 | fillet | VI | 1 |
| 1X-44 | 1'-3" | 62 | butt | VII | 1 |
| 1X-45 | 3'-8" | 77 | fillet | IV | 12 |
| | 9" | | lug | | 8,9,10,11 |
| 1X-46 | 3'-7 1/2" | 77 | butt | V | 12 |
| | 9" | | lug | | 8,9,10,11 |
| 1X-47A | 3'-7 1/2" | 61 | butt | V | 12 |
| | 9" | | lug | | 8,9,10,11 |
| 1X-47B | 3'-7 1/2" | 61 | butt | V | 12 |
| | 9" | | lug | | 8,9,10,11 |
| 1X-48A | 2'-11" | 72 | butt | IX | 1 |
| 1X-48B | 2'-11" | 72 | butt | IX | 1 |
| 1X-49A | 3'-0" | 72 | butt | IX | 1 |
| 1X-49B | 3'-0" | 72 | butt | IX | 1 |
| 1X-77 | 1'-4 1/2" | 59 | fillet | VI | 1 |
| 1X-81 | 3'-8" | 77 | fillet | IV | 12 |
| | 9" | | lug | | 8,9,10,11 |
| 1X-82 | 1'-4" | 78 | butt | VII | 1 |
| 1X-83 | 1'-4" | 78 | butt | VII | 1 |
| 1X-90 ² | 1'-4 1/2" | 32 | fillet | VI | 1 |
| 1X-91 ² | 1'-4" | 32 | fillet | VI | 1 |
| 1X-97 ² | 1'-4" | 30 | fillet | VI | 1 |
| 1X-107 | 10'-6" | 74 | butt | III | 30 |
| | 1'-7" | | lug | | 26,27,28,29 |
| 1X-108 ³ | 2'-5" | 87 | butt | XIV | 8 |
| 1X-109 ³ | 2'-5" | 87 | butt | XIV | 8 |

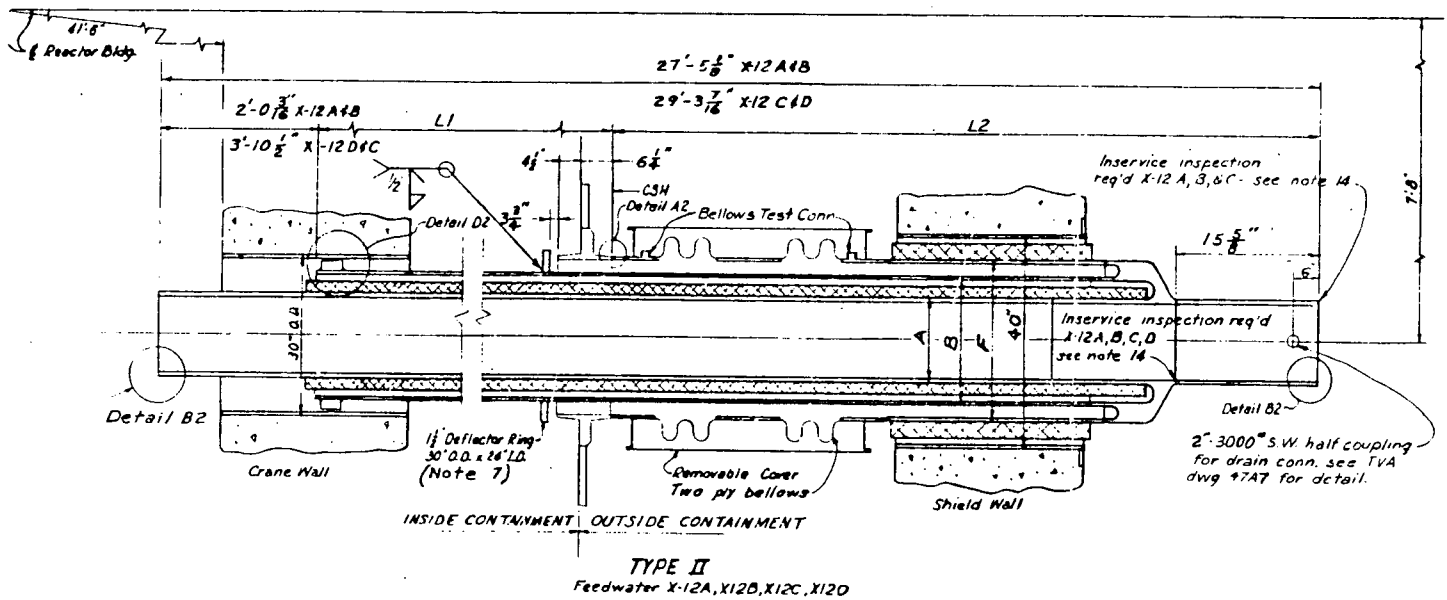
¹ THESE PENETRATION ASSEMBLIES HAVE A SPOOL PIECE WELDED TO THE OUTBOARD SIDE OF THE FLUED HEAD WHICH WILL BE EXAMINED DURING HYDROSTATIC TESTING.

² THESE PENETRATION ASSEMBLIES WERE PNEUMATICALLY TESTED RATHER THAN HYDROSTATICALLY TESTED. THE REQUESTED RELIEF IS FOR EXAMINATION DURING PNEUMATIC TESTING RATHER THAN HYDROSTATIC TESTING.

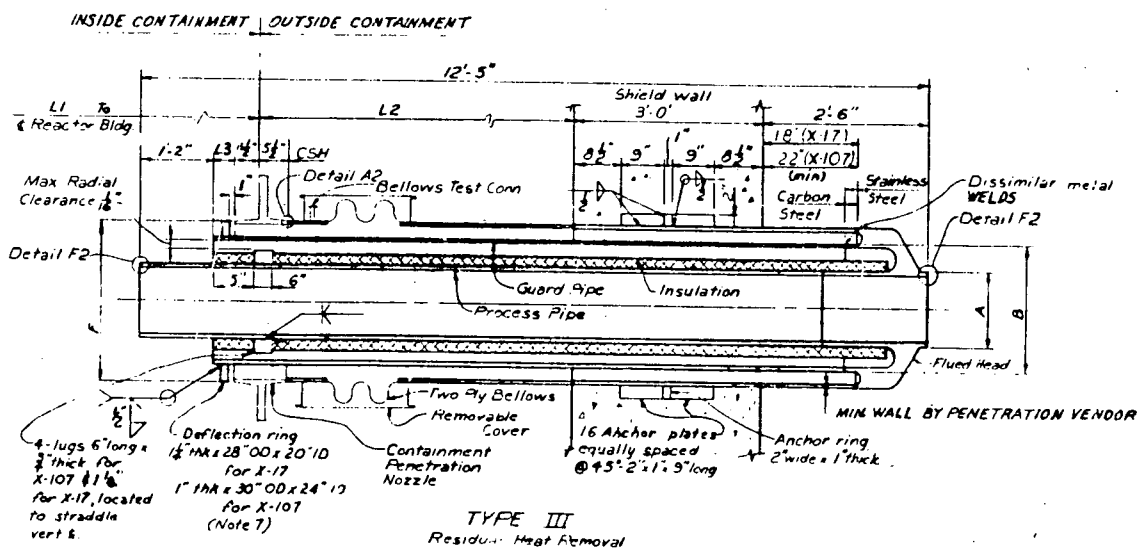
³ THESE PENETRATION ASSEMBLIES HAVE BEEN CONVERTED TO SPARES, HOWEVER WE ARE REQUESTING RELIEF IN THE EVENT THAT WE MAY USE THEM IN THE FUTURE.



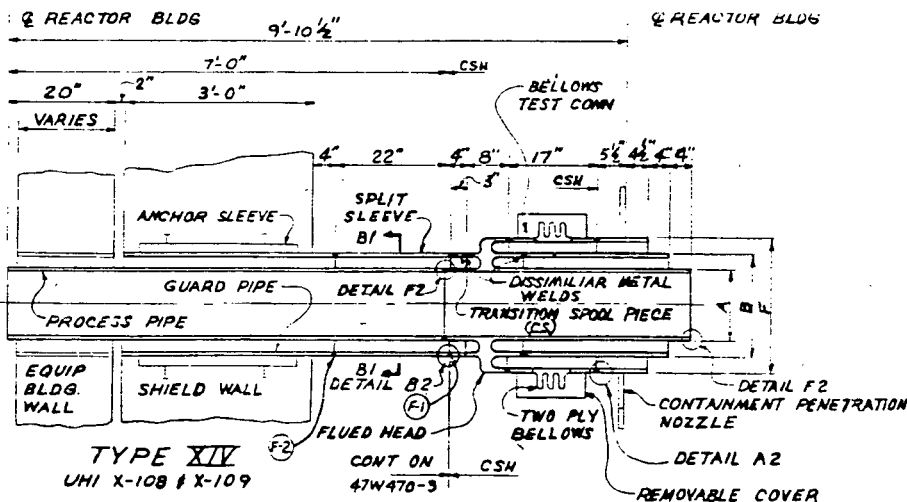
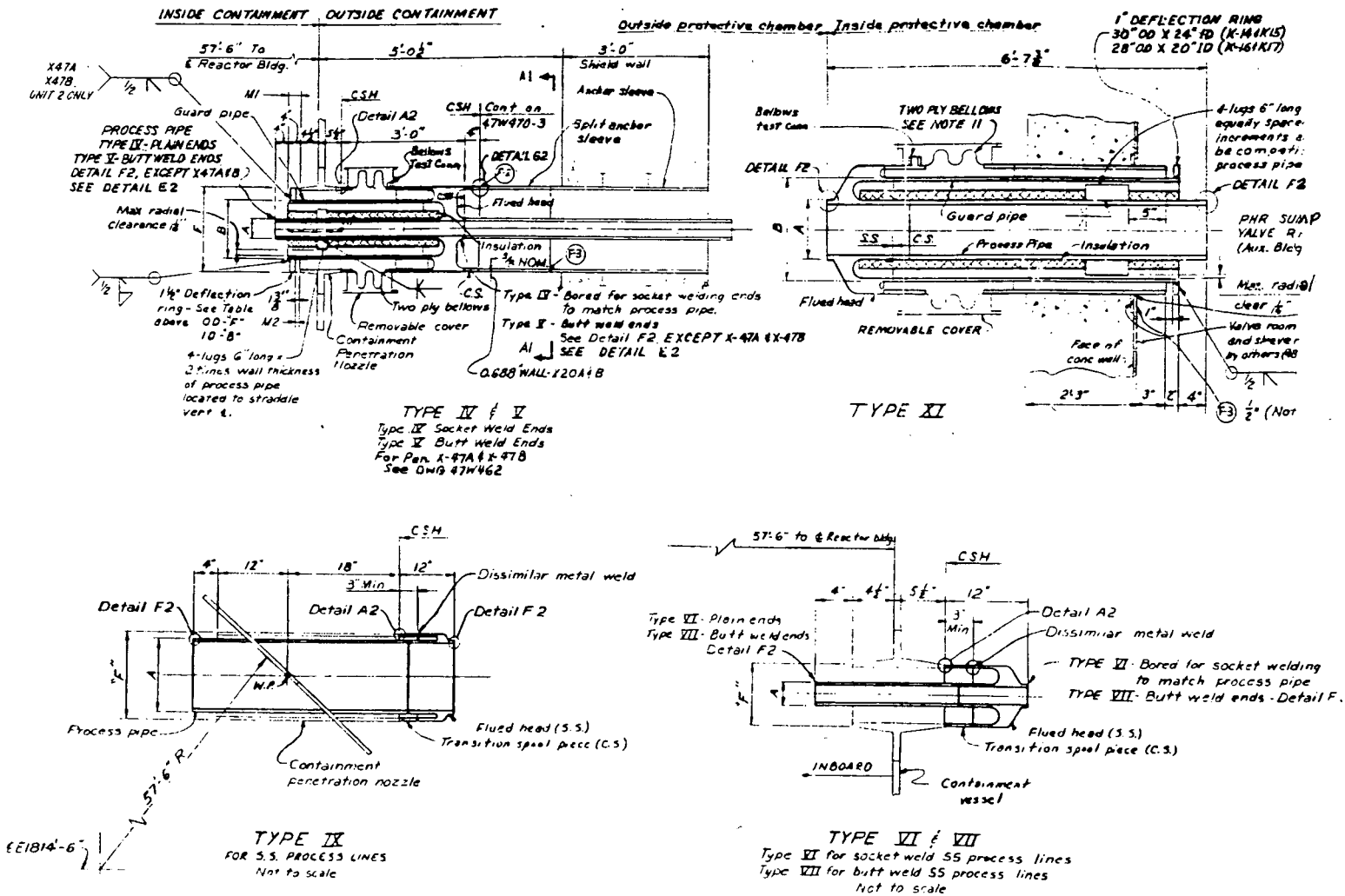
TYPE I
Main Steam X-13A, X-13B, X-13C, X-13D



TYPE II
Feedwater X-12A, X-12B, X-12C, X-12D



TYPE III
Residual Heat Removal



ENCLOSURE 2

LIST OF COMMITMENTS

1. TVA will revise the Final Safety Analysis Report (FSAR) to document NRC approval of the proposed alternative to ASME Section III for visual examinations of welds during hydrostatic testing.
2. Spool piece welds on the outboard of Type I and II penetration assemblies will be examined during hydrostatic testing.
3. TVA will revise Condition Adverse to Quality Report (CAQR) WBP 880310 to document approval of the proposed alternative to ASME Section III for visual examinations of welds during hydrostatic testing.