

RS-15-126

10 CFR 50.55a

May 21, 2015

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555-0001

Dresden Nuclear Power Station, Units 2 and 3  
Renewed Facility Operating License Nos. DPR-19 and DPR-25  
NRC Docket Nos. 50-237 and 50-249

Subject: Additional Information Supporting Relief Request I4R-17, Inservice Inspection Program Relief Request Regarding Examination Coverage for the Fourth Inservice Inspection Interval

- References:
1. Letter from P. R. Simpson (Exelon Generation Company, LLC (EGC)) to U.S. NRC, "Relief Request I4R-17, Inservice Inspection Program Relief Request Regarding Examination Coverage for the Fourth Inservice Inspection Interval," dated December 30, 2013
  2. Email from B. Mozafari (U. S. NRC) to M. Mathews (EGC), "FINAL - Request for Additional Information Regarding Dresden Fourth 10-Year Inservice Inspection Interval - Request for Relief I4R-17 (TAC MF3352 and MF3353)," dated September 5, 2014 (ADAMS Accession No. ML14251A081)
  3. Letter from P. R. Simpson (Exelon Generation Company, LLC (EGC)) to U.S. NRC, "Additional Information Supporting Relief Request I4R-17, Inservice Inspection Program Relief Request Regarding Examination Coverage for the Fourth Inservice Inspection Interval," dated October 16, 2014
  4. Email from B. Mozafari (U. S. NRC) to M. Mathews (EGC), "Draft Request for Additional Information (RAI) Regarding Dresden Relief I4-17," dated April 21, 2015 (ADAMS Accession No. ML15111A3171)

In Reference 1, Exelon Generation Company, LLC (EGC), requested NRC approval of a relief request associated with the fourth inservice inspection interval for Dresden Nuclear Power Station (DNPS), Units 2 and 3. Relief was requested due to the impracticality of satisfying the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," due to plant design. The relief request was based on the limitations that precluded completion of full Code examination requirements of ASME Class 1 and 2 components during the fourth interval. Code examination of the components was limited due to the materials of construction and design configurations.

The NRC requested additional information that is needed to complete the evaluation in Reference 2. In response to this request, EGC provided supplemental information in Reference 3. Based on its review of Reference 3, the NRC determined that additional information was necessary to complete its review. The request is contained in Reference 4. The response to the NRC's Reference 4 request is provided in the attachment to this letter.

There are no regulatory commitments contained in this letter. Should you have any questions concerning this letter, please contact Mr. Mitchel Mathews at (630) 657 2819.

Respectfully,



Patrick R. Simpson  
Manager – Licensing

Attachments:

1. Response to Second Request for Additional Information
2. Drawing of Weld Identification No. 2/1/1001A-16/16-11
3. Drawing of Weld Identification No. 2/1/1001B-16/16-2
4. Drawing of Weld Identification No. 2/1/1005B-14/14-7
5. Drawing of Weld Identification No. 2/1/1403-10/W-103
6. Drawing of Weld Identification No. 2/1/1404-10/W-112
7. Drawing of Weld Identification No. 3/2/3204B-18/18-1
8. Drawing of Weld Identification No. 3/1/1302-14/14-9(A)

cc: NRC Regional Administrator, Region III  
NRC Senior Resident Inspector, Dresden Nuclear Power Station

**SECOND REQUEST FOR ADDITIONAL INFORMATION**  
**ON THE FOURTH TEN YEAR 10-YEAR INSERVICE INSPECTION INTERVAL REQUEST**  
**FOR RELIEF I4R-17**  
**FOR**  
**EXELON GENERATION COMPANY, LLC. DRESDEN NUCLEAR POWER STATION,**  
**UNITS 2 AND 3 - DOCKET NUMBERS: 50-237 AND 50-249**

**1. SCOPE**

*By letter dated December 30, 2013, (Agencywide Documents Access & Management System (ADAMS) Accession Number ML13364A361), the licensee, Exelon Generation Company, LLC, submitted Request for Relief I4R-17 from the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, Rules for Inservice Inspection of Nuclear Power Plant Components for Dresden Nuclear Power Station, Units 2 and 3 (DNPS 2 and 3). The request for relief applies to the fourth 10-year inservice inspection (ISI) interval, in which the licensee adopted the 1995 Edition through the 1996 Addenda of ASME Code Section XI as the code of record. The U.S. Nuclear Regulatory Commission (NRC) requested that the licensee provide further information, and the licensee provided a response to the Request for Additional Information (RAI) in a letter dated October 16, 2014 (ADAMS Accession Number ML14293A255).*

*However, certain requested information was not provided and/or requires clarification in order for the staff to complete the evaluation of the licensee's request. Please submit answers to the following questions.*

**2. REQUEST FOR ADDITIONAL INFORMATION**

**NRC Request No. 2.1. Request for Relief I4R-17, Examination Category B-A, Item B1.40, Pressure Retaining Welds in Vessels in Reactor Vessels, DNPS 2 and 3**

- 1) *The licensee states that, for Unit 2, only 41.7 percent coverage was obtained on the top head-to-flange weld. The drawing submitted in the RAI response appears to support the claim that examinations may only be conducted from the head side of the weld due to geometry. However, it is stated that Unit 3 was able to get 72 percent volumetric coverage, while the drawing shows the top head-to-flange welds at DNPS 2 and 3 to be geometrically similar. Please clarify why the licensee was able to obtain a marked increase in volumetric coverage on DNPS 3.*

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**Exelon Generation Company, LLC (EGC) Response to NRC Request No. 2.1.1:**

Based on discussions with the vendor that performed the examinations referenced above, General Electric Hitachi (GEH), the Dresden Nuclear Power Station (DNPS), Unit 2 top head-to-flange weld coverage plot and the closure head configuration was found to be non-representative of the closure head design drawings. Additionally, the achieved coverage cross sectional area was apparently entered into the coverage calculation spreadsheet incorrectly. The actual examination coverage area value for the DNPS, Unit 2 top head-to-flange weld during the fourth DNPS Inservice Inspection (ISI) interval was 65 percent (%).

The DNPS, Unit 3 weld coverage plot was reviewed and it was determined that the closure head flange inside diameter was drawn using an incorrect dimension. Specifically, this change in flange configuration resulted in a slight increase in the measured cross sectional area. The coverage value for DNPS, Unit 3 was actually 67%.

The identified discrepancies in the coverage plots are attributed to the use of marginally legible fabrication drawings. This is a common problem for reactor pressure vessels built in the same time period as DNPS, Units 2 and 3. This error has been entered into the EGC Corrective Action Program as Issue Report No. 2503064.

- 2) ***In Attachment 2 of the licensee's RAI response, it appears that the top head-to-flange weld drawing on page 333 has different coverage values than the coverage calculation sheet on page 334. Please verify the information provided for the Unit 2 top head-to-flange weld in the RAI response and provide a corrected coverage sketch or coverage calculation sheet, whichever one is currently incorrect.***

**EGC Response to NRC Request No. 2.1.2:**

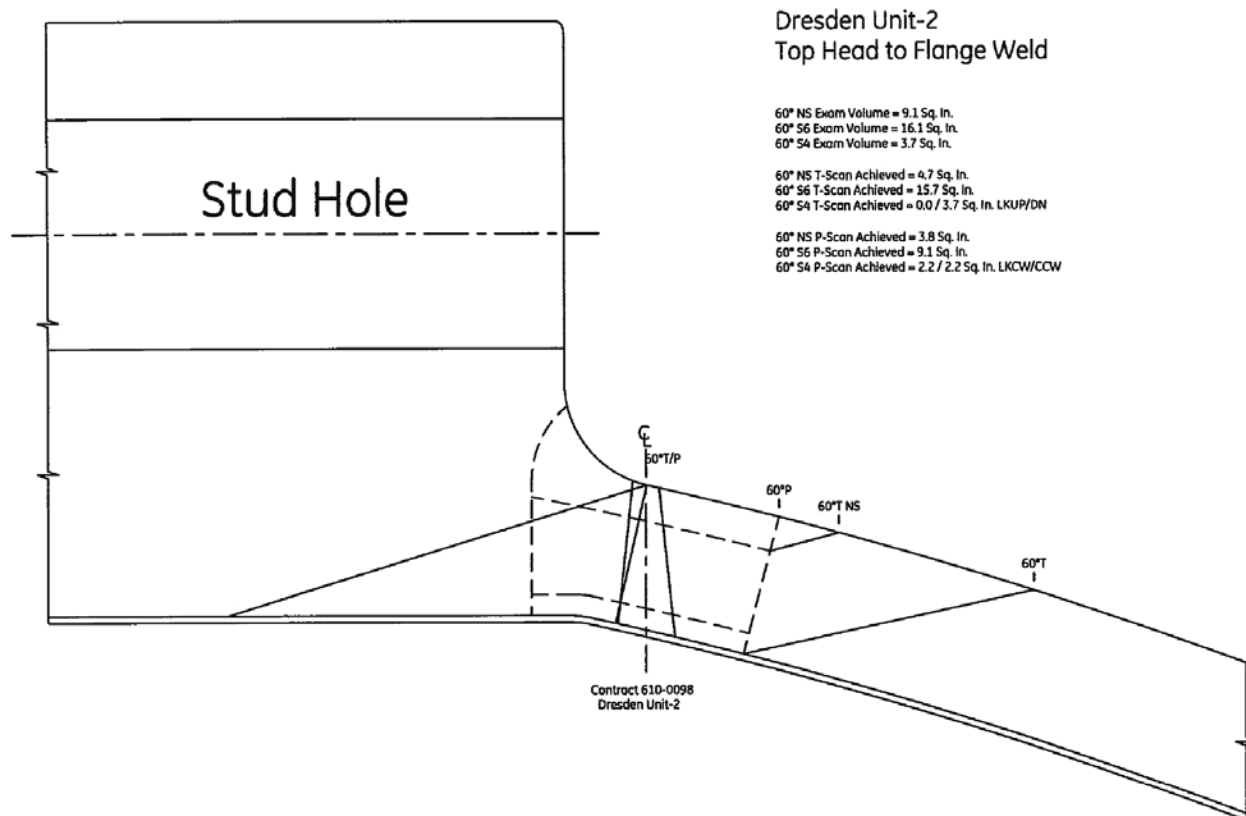
As stated above the coverage values for the DNPS, Unit 2 and 3 top head-to-flange welds are revised above. New coverage sheets and diagrams for both DNPS Units are included as Figures 1 through 4 below.

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Dresden Unit-2 Head to Flange Weld 2-THD-FLG						
Weld Length = Exam Volume =	360. 28.9	CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
		Required Exam Area Sq. In.	Area Scanned Manual	Percent of Area Manual	Weld Length Manual (deg)	Percent Manual
60° NS T-Scan	A	9.1	4.7	16.3%	360.0	8.1%
60° S6 T-Scan	A	16.1	15.7	54.3%	360.0	27.2%
60° S4 T-Scan LKUP	A	3.7	0.0	0.0%	360.0	0.0%
60° S4 T-Scan LKDN	A	3.7	3.7	6.4%	360.0	3.2%
60° NS P-Scan	A	9.1	3.8	13.1%	360.0	6.6%
60° S6 P-Scan	A	16.1	9.1	31.5%	360.0	15.7%
60° S4 P-Scan LKCW	A	3.7	2.2	3.8%	360.0	1.9%
60° S4 P-Scan LKCC	A	3.7	2.2	3.8%	360.0	1.9%
60° NS T-Scan						
60° S6 T-Scan						
60° S4 T-Scan LKUP						
60° S4 T-Scan LKDN						
60° NS P-Scan						
60° S6 P-Scan						
60° S4 P-Scan LKCW						
60° S4 P-Scan LKCC						
60° NS T-Scan						
60° S6 T-Scan						
60° S4 T-Scan LKUP						
60° S4 T-Scan LKDN						
60° NS P-Scan						
60° S6 P-Scan						
60° S4 P-Scan LKCW						
60° S4 P-Scan LKCC						
% Total Composite Coverage =						65%
Comments: A - Examination limited due to the flange configuration. Lutoff due to the OD flange blend radius.						
Note - Coverage for the inner 15%T volume requires examination in four orthogonal directions.						
Note - Rounding methods may affect calculated values. Weld length in degrees.						

**Figure 1:** Updated DNPS, Unit 2 Head-to-Flange Weld Coverage Record Sheet

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**Figure 2:** Updated DNPS, Unit 2 Head-to-Flange Weld Inservice Examination Coverage Diagram

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Dresden Unit-3  
Head to Flange Weld 3-THD-FLG

Weld Length = 360. Exam Volume = 25.4		CODE CROSS-SECTIONAL AREA		TOTAL CODE COVERAGE		
		Required Exam Area Sq. In.	Area Scanned Manual	Percent of Area Manual	Weld Length Manual (deg)	Percent Manual
60° NS T-Scan	A	7.8	4.4	17.3%	360.0	8.7%
60° S6 T-Scan	A	14.3	14.1	55.5%	360.0	27.8%
60° S4 T-Scan LKUP	A	3.3	0.0	0.0%	360.0	0.0%
60° S4 T-Scan LKDN	A	3.3	3.3	6.5%	360.0	3.2%
60° NS P-Scan	A	7.8	3.5	13.8%	360.0	6.9%
60° S6 P-Scan	A	14.3	8.3	32.7%	360.0	16.3%
60° S4 P-Scan LKCW	A	3.3	2.1	4.1%	360.0	2.1%
60° S4 P-Scan LKCC	A	3.3	2.1	4.1%	360.0	2.1%
60° NS T-Scan						
60° S6 T-Scan						
60° S4 T-Scan LKUP						
60° S4 T-Scan LKDN						
60° NS P-Scan						
60° S6 P-Scan						
60° S4 P-Scan LKCW						
60° S4 P-Scan LKCC						
60° NS T-Scan						
60° S6 T-Scan						
60° S4 T-Scan LKUP						
60° S4 T-Scan LKDN						
60° NS P-Scan						
60° S6 P-Scan						
60° S4 P-Scan LKCW						
60° S4 P-Scan LKCC						

% Total Composite Coverage = 67%

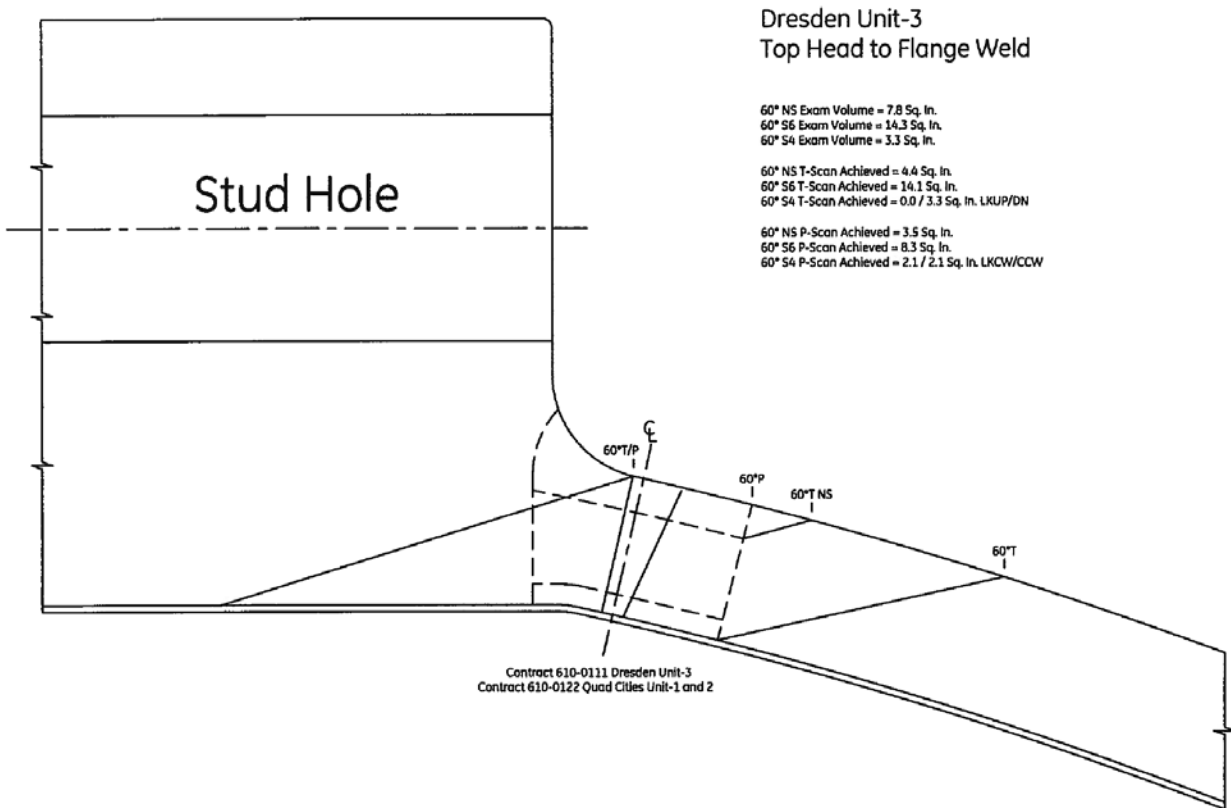
Comments: A - Examination limited due to the flange configuration. Liftoff due to the OD flange blend radius.

Note - Coverage for the inner 15%T volume requires examination in four orthogonal directions.

Note - Rounding methods may affect calculated values. Weld length in degrees.

**Figure 3:** Updated DNPS, Unit 3 Head-to-Flange Weld Coverage Record Sheet

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**Figure 4:** Updated DNPS, Unit 3 Head-to-Flange Weld Inservice Examination Coverage Diagram

**NRC Request No. 2.2.**     **Request for Relief I4R-17, Examination Category B-D, Items B3.90 and B3.100, Full Penetration Welded Nozzles in Vessels, DNPS 2 and 3**

- 1)     **Please provide a coverage plot for Unit 2 RPV nozzle inside radius Weld 2/1/RPVSHELL/N5B-1 as there was no sketch provided in the licensee's RAI response.**

**EGC Response to NRC Request No. 2.2.1:**

Cross-sectional coverages are not normally performed on inner radius welds. Weld Identification No. (ID) 2/1/RPVSHELL/N5B-1 is an inner radius examination, and is the only one included in Relief Request I4R-17. Coverage for inner radius welds is determined utilizing computer modeling. Due to the DNPS, Unit 2 configuration, a coverage plot could not be created.



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- 2) *Please verify that the base materials near the inside surface of the weld joints, particularly the high regions of stress, where examined in the B-D, Items B3.90 welds in DNPS 2 and 3.*

**EGC Response to NRC Request No. 2.2.2:**

Based on a review of the Item B3.90 exams in the relief request, the base materials near the inside surface of the weld joints including the regions of high stress were examined to the full extent possible in the B-D, Items B3.90 welds for DNPS, Units 2 and 3. The volumetric examination coverage was limited due to configuration of the nozzles and interferences, which limited access to portions of these welds. Full volumetric coverage, including regions near the inside surface of the weld joints that experience high stress were examined, where accessible.

**NRC Request No. 2.3. Request for Relief I4R-17, Part G, Examination Category R-A, Items R1.11 and R1.20, Risk Informed Piping Examinations, DNPS 2 and 3**

Table 2.3.1- Examination Category R-A (Unit 2)			
Code Item	Weld ID	Weld Type	Coverage Obtained
R1.11	2/1/1001A-16/16-11	Tee-to-Pipe	36.0 %
R1.11	2/1/1001B-16/16-2	Flange-to-Pipe	85.0 %
R1.11	2/1/1005B-14/14-7	Valve-to-Pipe	50.0 %
R1.20	2/1/1403-10/W-103	Valve-to-Pipe	81.0 %
R1.20	2/1/1404-10/W-112	Valve-to-Pipe	85.0 %

Table 2.3.2- Examination Category R-A (Unit 3)			
Code Item	Weld ID	Weld Type	Coverage Obtained
R1.11	3/2/3204B-18/18-1	Valve-to-Tee	78.9 %
R1.20	3/1/1302-14/14-9(A)	Flange-to-Pipe	50.0%

*Provide coverage plots for all RI-ISI welds listed in Tables 2.3.1 and 2.3.2 above. From the coverage sketches provided in the licensee's RAI response, it is difficult for the staff to determine how the licensee determined the coverage percentages on the welds in Table 2.3.1 and 2.3.2 as the supplied diagrams are very similar to each other yet yield very different coverage percentages.*

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**EGC Response to NRC Request No. 2.3:**

Coverage plots of the weld ID points above are not available. Based on the requirements (i.e., timeframe, certification requirements, and dimensional restrictions) to create new coverage plots, the following is provided for each weld ID listed in Tables 2.3.1 and 2.3.2 above:

Four equally weighted scans are performed on each weld, where possible. The scans are axial upstream, axial downstream, clockwise, and counterclockwise.

**Weld ID 2/1/1001A-16/16-11** is a single sided stainless steel joint. Therefore, no coverage can be obtained for one of the axial scans. Credit cannot be claimed for the far side (i.e., tee side) and the coverage for the clockwise and counterclockwise scans is limited by the configuration of the tee. This results in the examination coverage for this weld being limited to 36%. Attachment 2 provides a visual representation of the physical configuration of this welded joint and provides some insight into the difficulty in obtaining examination coverage for this weld.

**Weld ID 2/1/1001B-16/16-2** is a carbon steel weld so credit can be claimed for the far side, but the clockwise and counterclockwise scans are limited by the configuration of this joint. The area to the right of the straight line (i.e., the flue side of the weld) is subtracted from the total volume. This is approximately 30% of the total weld volume. This affects both the clockwise and counterclockwise scans, resulting in 70% coverage for those scans. When added to the 100% for both upstream and downstream axial (i.e., 50% apiece) the end result is 85% coverage for this weld. Attachment 3 provides a visual representation of the physical configuration of this welded joint and provides some insight into the difficulty in obtaining examination coverage for this weld.

**Weld ID 2/1/1005B-14/14-7** is a single sided stainless steel joint. Therefore, no coverage can be obtained for one of the axial scans, so the maximum coverage is 50%. There were no other coverage limitations for this weld. Attachment 4 provides a visual representation of the physical configuration of this welded joint and provides some insight into the difficulty in obtaining examination coverage for this weld.

**Weld ID 2/1/1403-10/W-103** is a dissimilar metal (DM) weld. 100% credit can be claimed on a single-sided exam in accordance with the ASME Code but due to physical limitations all the required areas could not be scanned due to valve body configuration. The axial scan missed 15% on the valve side and the clockwise and counterclockwise scans were unable to obtain 23% coverage on the valve side. This resulted in a composite coverage of 81%. Attachment 5 provides a visual representation of the physical configuration of this welded joint and provides some insight into the difficulty in obtaining examination coverage for this weld.

**Weld ID 2/1/1404-10/W-112** is a dissimilar metal (DM) weld. 100% credit can be claimed on a single-sided exam in accordance with the ASME Code but due to physical limitations all the required areas could not be scanned due to valve body configuration. The axial scan missed 12.2% on the valve side and the clockwise and counterclockwise scans were unable to obtain 23% coverage on the valve side. This results in a composite coverage of 86.7%. The area for the missed valve side due to the Risk-Informed Inservice Inspection Program (RISI) volume (i.e., an extra 0.25 inches (") on each side) was calculated out resulting in 91.3% and 80.1% for a composite average of 85.7%. Attachment 6 provides a visual representation of the physical

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configuration of this welded joint and provides some insight into the difficulty in obtaining examination coverage for this weld.

**Weld ID 3/2/3204B-18/18-1** is a carbon steel weld and is single sided due to valve configuration. All axial scanning was performed from the Tee side. The ASME Code allows single sided exams for carbon steel; however, the saddle weld on the Tee side limits the scan for 22 " and a weldolet limits the scan for 2" for a total of 24" that are not scanned at all. This results in an axial scan of 57.9% coverage plus 100% for the clockwise and counterclockwise scans scans for total coverage of 78.9%. Attachment 7 provides a visual representation of the physical configuration of this welded joint and provides some insight into the difficulty in obtaining examination coverage for this weld.

**Weld ID 3/1/1302-14/14-9(A)** is a stainless steel weld. This is also a single sided exam due to the flued head configuration. The axially scans were unable to be performed on the flued head. Therefore, 50% maximum allowable coverage was claimed in accordance with the ASME Code. Attachment 8 provides a visual representation of the physical configuration of this welded joint and provides some insight into the difficulty in obtaining examination coverage for this weld.

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**NRC Request No. 2.4.     Request for Relief I4R-17, Examination Category C-B, Item C2.21, Pressure Retaining Nozzle Welds in Class 2 Vessels, DNPS 2 and 3**

<b>Table 2.4.1- Examination Category C-B (Unit 2)</b>			
<b>Code Item</b>	<b>Weld ID</b>	<b>Weld Type</b>	<b>Coverage Obtained</b>
C2.21	2/2/1302A-12/12-9	ISO Condenser Nozzle Weld	50.0 %
C2.21	2/2/1302B-12/12-8	ISO Condenser Nozzle Weld	50.0 %
C2.21	2/2/1303A-8/8-9	ISO Condenser Nozzle Weld	50.0 %
C2.21	2/2/1203B-8/8-8	ISO Condenser Nozzle Weld	50.0 %

<b>Table 2.4.2- Examination Category C-B (Unit 3)</b>			
<b>Code Item</b>	<b>Weld ID</b>	<b>Weld Type</b>	<b>Coverage Obtained</b>
C2.21	3/2/1302A-12/12-8	ISO Condenser Nozzle Weld	37.8 %
C2.21	3/2/1302B-12/12-9	ISO Condenser Nozzle Weld	37.8 %
C2.21	3/2/1303A-8/8-8	ISO Condenser Nozzle Weld	50.0 %
C2.21	3/2/1303B-8/8-9	ISO Condenser Nozzle Weld	52.3 %

- a.     *Verify that for the welds described in Table 2.4.1 and 2.4.2 that the examination volumes included in the welds and the base materials near the inside surface of the weld joint, particularly the high regions of stress were examined.***

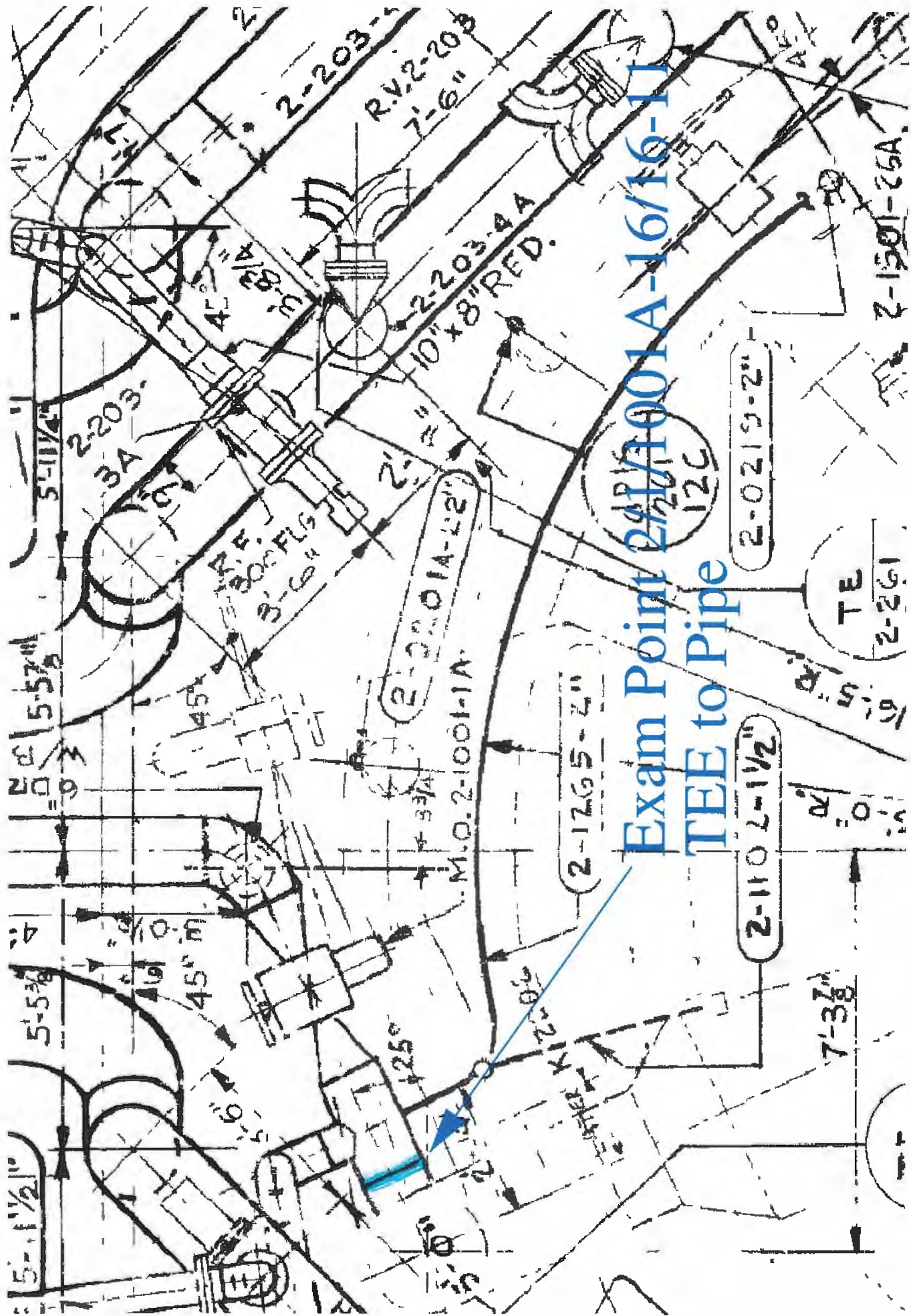
**EGC Response to NRC Request No. 2.4.a:**

Accessible portions of the base materials near the inside surface of the weld joint, including the high regions of stress were examined for the Code Item C2.21 weld IDs listed above. The volumetric examination coverage was limited due to configuration of the nozzles and interferences.

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**ATTACHMENT 2**

Drawing of Weld Identification No. 2/1/1001A-16/16-11



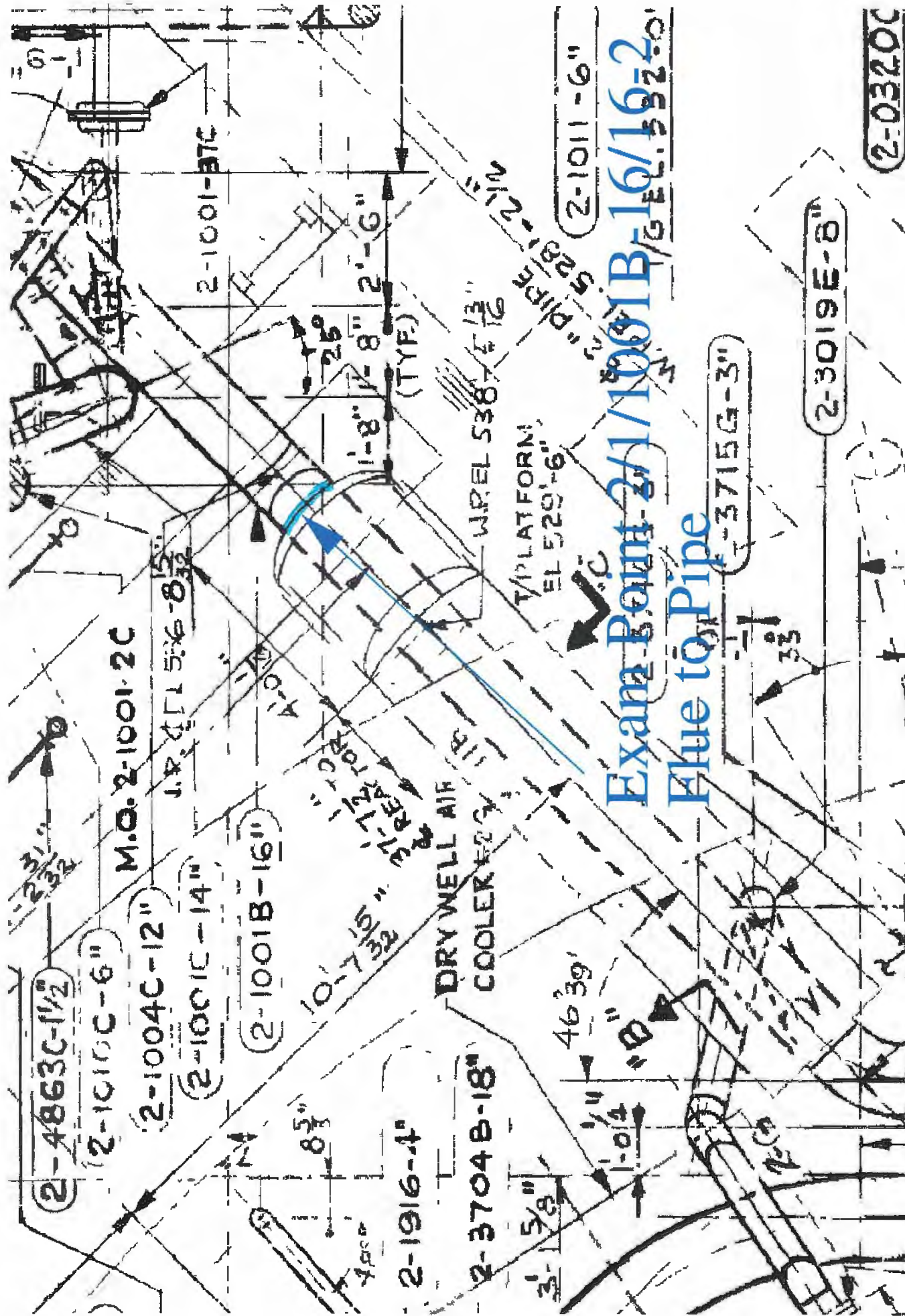
Exam Point 291/A-1001A-16/16-11  
TEE to Pipe

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**ATTACHMENT 3**

Drawing of Weld Identification No. 2/1/1001B-16/16-2



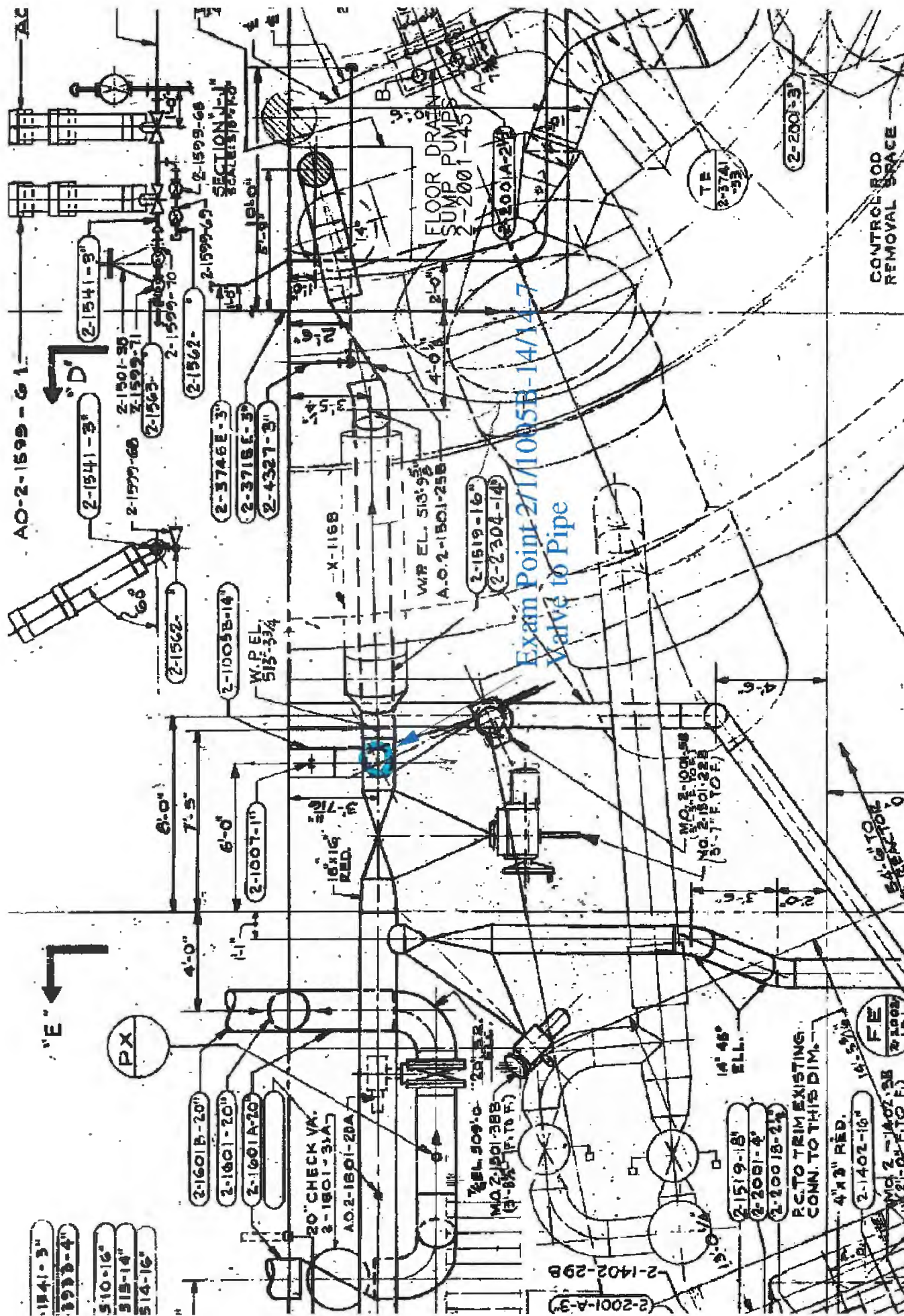




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**ATTACHMENT 4**

Drawing of Weld Identification No. 2/1/1005B-14/14-7



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**ATTACHMENT 5**

Drawing of Weld Identification No. 2/1/1403-10/W-103



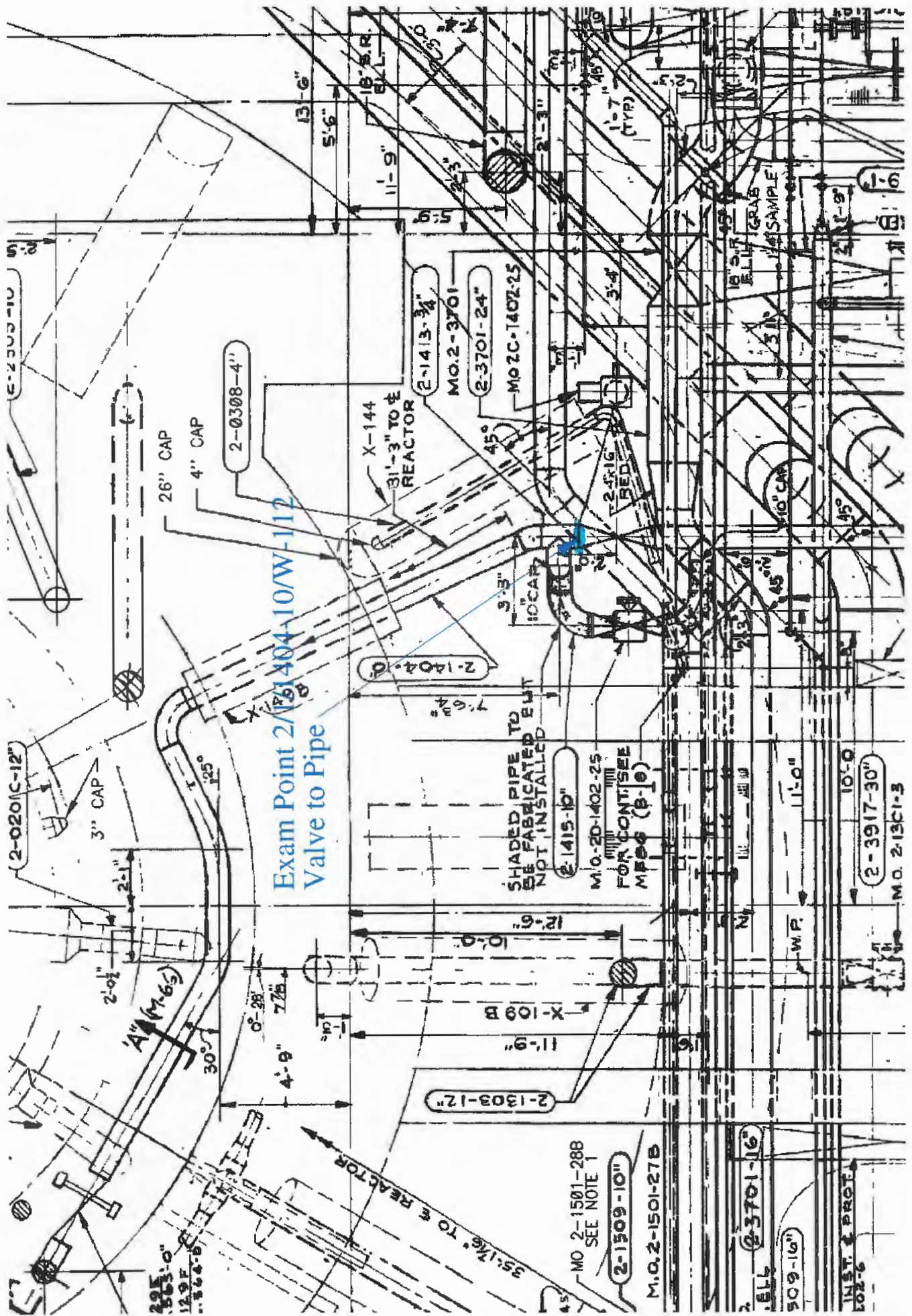


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**ATTACHMENT 6**

Drawing of Weld Identification No. 2/1/1404-10/W-112

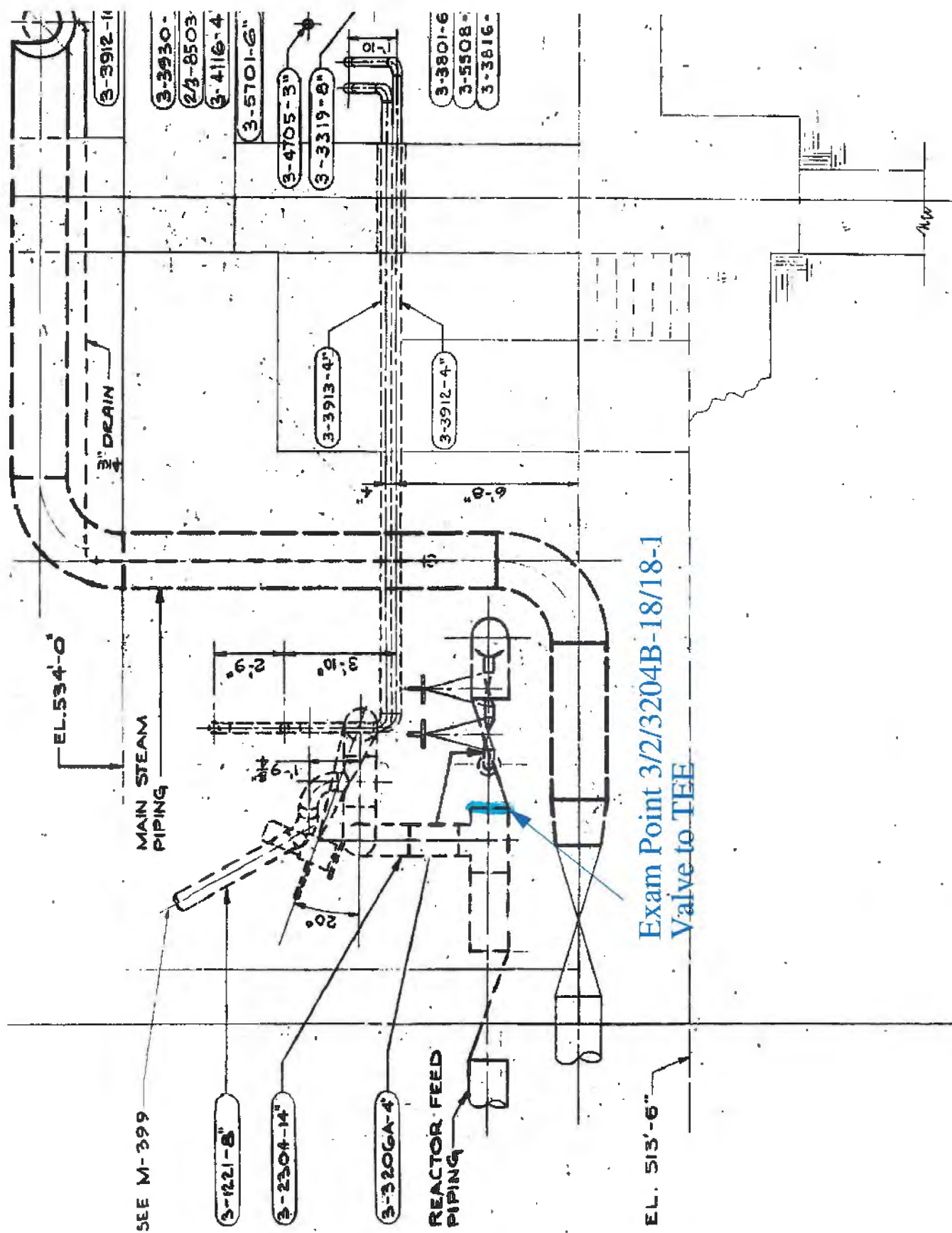




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**ATTACHMENT 7**

Drawing of Weld Identification No. 3/2/3204B-18/18-1





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**ATTACHMENT 8**

Drawing of Weld Identification No. 3/1/1302-14/14-9(A)

