

# NATIONAL TRANSPORTATION SAFETY BOARD

Office of Research and Engineering  
Materials Laboratory Division  
Washington, D.C. 20594



June 7, 2011

MATERIALS LABORATORY FACTUAL REPORT—ERRATA SHEET Report No. 10-119

---

## A. ACCIDENT INFORMATION

Place : San Bruno, California  
Date : September 9, 2010  
Vehicle : Pacific Gas & Electric Natural Gas Transmission Pipeline  
NTSB No. : DCA10MP008  
Investigator : Ravindra Chhatre, RPH-20

## B. COMPONENTS EXAMINED

Three pieces of 30-inch diameter pipe from Line 132, Segment 180, located at the intersection of Earl Avenue and Glenview Drive, San Bruno, California, with the following lengths:

- 1) 12 foot 4 inch
- 2) 27 foot 8 inch
- 3) 15 foot 9 inch

## C. DETAILS OF THE EXAMINATION

Page 2, Paragraph 3, Line 3

Delete: "The minor radius, measured from inner wall to inner wall ..."

Replace with: "The minor diameter, measured from inner wall to inner wall..."

Page 2, Paragraph 3, Line 5

Delete: "By comparison, the inner radius ..."

Replace with: "By comparison, the inner diameter ..."

Page 4, Paragraph 2, Line 9

Delete: "The markings included the number "30", two instances of a backwards "P", five lines arranged in a "zigzag", and two stamps similar in appearance to a circle-with-a-half-moon."

Replace with: "The markings included the number "9309", five lines arranged in a "zigzag", two circle stamps, and two half-moon stamps. The latter two were similar in appearance to commercially available steel inspection and date code stamps (Durable Mecco, personal communication, 2011), (Mecco Marking, 2008).

Page 5, Paragraph 3, Line 10

Delete: "The measured mean wall thickness values varied between 0.359 inch and 0.381 inch from pup 2 to pup 4, respectively."

Replace with: "The measured mean wall thickness varied from a low of 0.359 inch for pup 2 to a high of 0.381 inch for pup 4."

Page 9, Paragraph 3, Line 14

Delete: "A micrograph of the fracture surface at the 22.7 inch mark is shown in figure 36."

Replace with: "A macrograph of the fracture surface at the 22.7 inch mark is shown in figure 36."

Page 12, Paragraph 1, Line 3

Delete: "Example weld microstructures for pup 2 taken 9 inch south ..."

Replace with: "Example cross-sections for pup 2 taken 9 inch south..."

Page 12, Paragraph 2, Line 1

Delete: "The plane of fracture started offset 0.041 inch from the seam as shown in figure 45 before displacing back in line with the seam..."

Replace with: "The plane of fracture started offset 0.041 inch from the seam as shown in figure 47 before displacing back in line with the seam..."

Page 12, Paragraph 4, Line 3

Delete: "Example microstructures for pup 4 taken 8 inch south of girth weld C5..."

Replace with: "Example cross-sections for pup 4 taken 8 inch south of girth weld C5..."

Page 12, Paragraph 4, Line 8

Delete: "The weld along the outer diameter appeared to have been completed in two passes as illustrated in figure 48."

Replace with: "The weld along the outer diameter appeared to have been completed in two passes as illustrated in figure 49."

Page 12, Paragraph 4, Line 14

Delete: "There was apparent grinding on the outer diameter surface on the left side of the seam as depicted in the micrograph..."

Replace with: "There was apparent grinding on the outer diameter surface on the left side of the seam as depicted in the macrograph..."

Page 13, Paragraph 1, Line 4

Delete: "The inner diameter surface was undercut by 0.018 inch as indicated in figure 49."

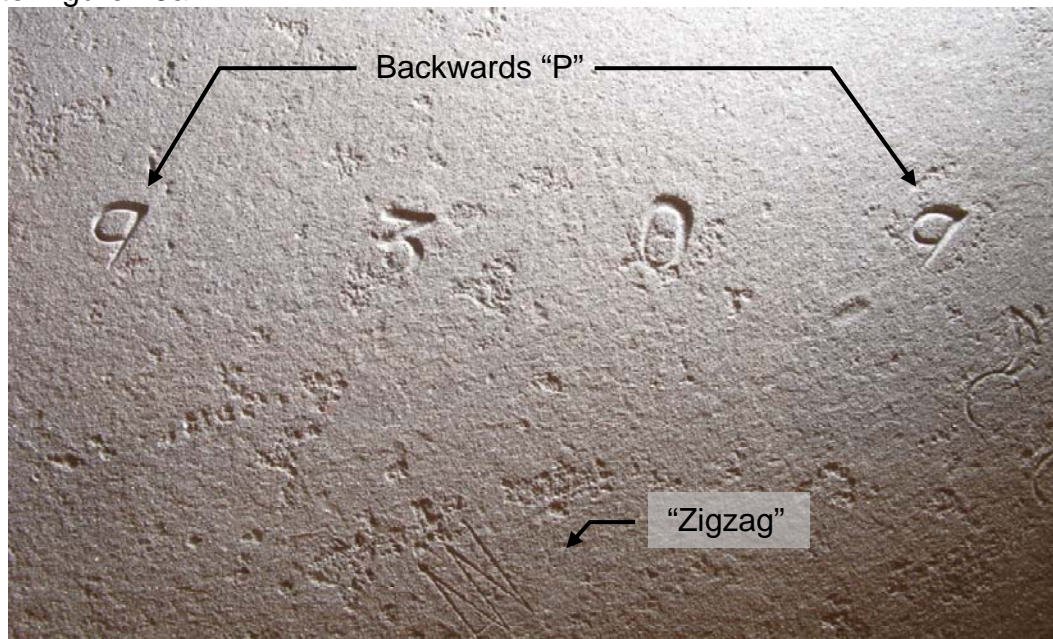
Replace with: "The inner diameter surface was undercut by 0.018 inch as indicated in figure 50."

Page 16, Table 5, Column 3

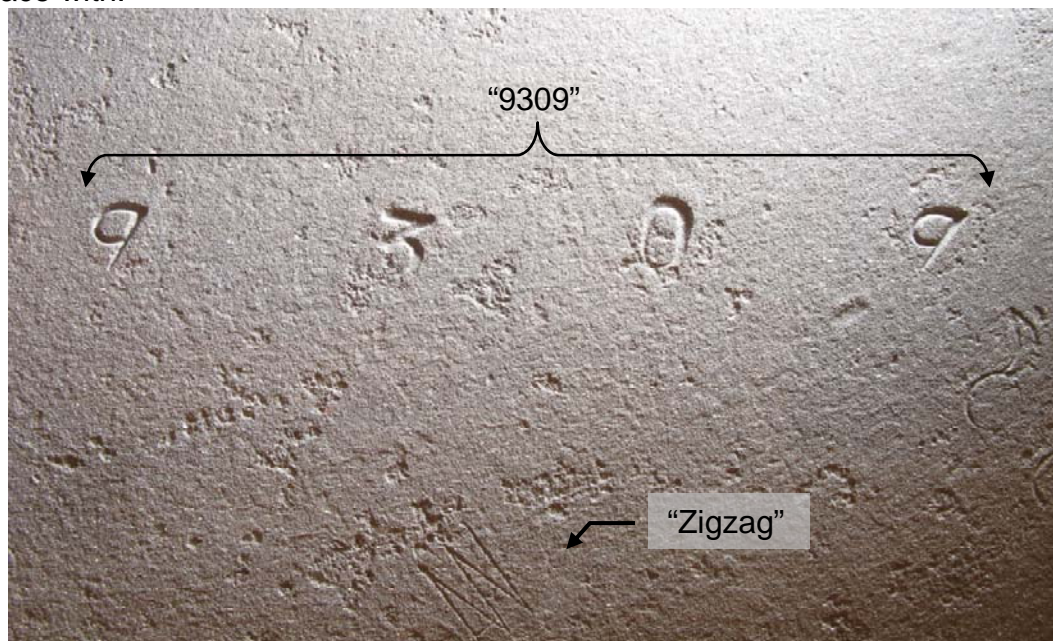
Delete all occurrences of "N/A" in the "Outside Diameter" column and replace with "No defects noted."

Page 36

Delete Figure 19a:



Replace with:



Page 52, Figure 34 caption

Delete: "Optical micrographs of the fracture initiation site in pup 1. Top: Unlabelled micrograph, Bottom: Same micrograph with a crack arrest mark indicated by a yellow dotted line and the three fracture surface morphologies identified by scanning electron microscopy, 1 - ductile overstress (dimple rupture), 2 – progressive fracture, 3 – quasicleavage. The black arrows indicate the approximate direction of crack propagation. Note: The micrographs were taken after an inhibited acid solution was used to remove iron oxides."

Replace with: "Optical macrographs of the fracture initiation site in pup 1. Top: Unlabelled macrograph, Bottom: Same macrograph with a crack arrest mark indicated by a yellow dotted line and the three fracture surface morphologies identified by scanning electron microscopy, 1 - ductile overstress (dimple rupture), 2 – progressive fracture, 3 – quasicleavage. The black arrows indicate the approximate direction of crack propagation. Note: The macrographs were taken after an inhibited acid solution was used to remove iron oxides."

Page 53, Figure 35 caption

Delete: "Micrograph..."

Replace with: "Macrograph..."

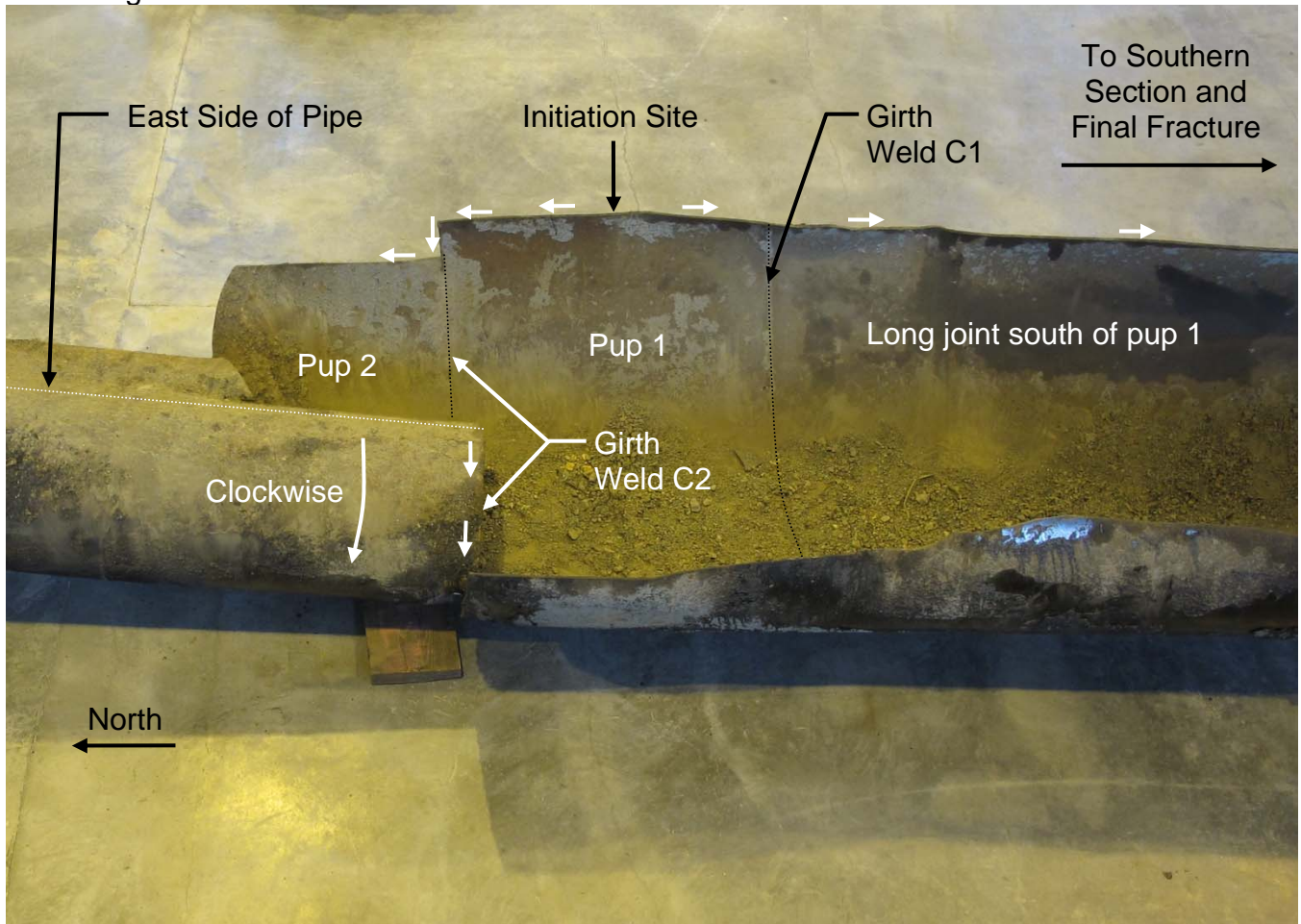
Page 54, Figure 36 caption

Delete: "Micrograph..."

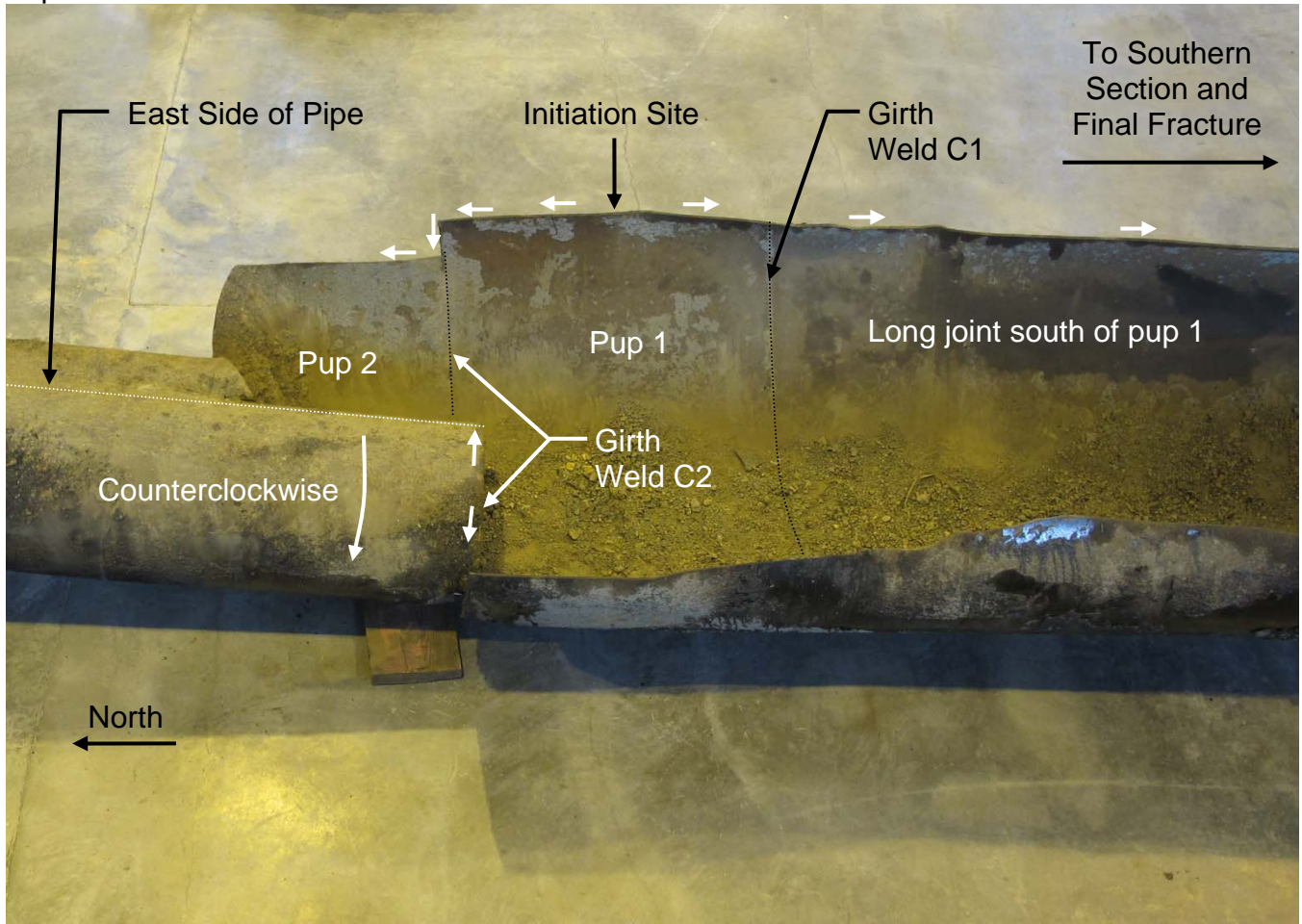
Replace with: "Macrograph..."

Page 59

Delete Figure 41:



Replace with:



Page 66, Figure 46 caption

Delete: "see figure 44"

Replace with: "see figure 45"

Page 71

Delete: "**Table A2:** Ultrasonic thickness measurements for the 6 pups measured at approximately 30° intervals."

Replace with: "**Table A2:** Ultrasonic wall thickness measurements along the bottom of the length of pipe south of pup 1. The measurements were taken on the southern section inside the pipe along longitudinal lines starting at the cut end (south end) of the pipe."

Page 76

Delete: "**Table B2 (cont.):**"

Replace with: "**Table B3 (cont.):**"

#### **D. REFERENCES**

Mecco Marking. (2008). Retrieved May 17, 2011, from <http://www.mecco.com/MECCO-history.html>

Donald Kramer  
Materials Engineer