

1. SCOPE

- 1.1 This standard covers repairs, welding, preheating, and stress relieving on operating pipelines.
- 1.2 The following criteria are established:
  - 1.2.1 Maximum hoop stress permitted during welding.
  - 1.2.2 Approved types of welding repairs.
  - 1.2.3 Limitations and restrictions on permissible methods of repair for welded steel mains.
- 1.3 It is not the intent of this standard to preclude the use of methods of repair other than welding, such as temporary emergency methods or mechanical clamps, when these other methods are more appropriate (such as anticipated early retirement of the main). However, any alternate action taken must be in compliance with G.O. 112-D.

2. MAXIMUM HOOP STRESS PERMITTED DURING WELDING

- 2.1 For seamless and double submerged arc welded pipe, the maximum pressure permitted during welding shall be determined using the formula given below or the MAOP, or a pressure which will produce a hoop stress of 50% of the specified minimum yield strength, whichever is lowest:

$$p = \frac{2S(t - 0.094 \text{ in.}) (0.72)}{D}$$

*Revised 5/1/85  
with Revision 5*

P = Internal Pressure, psig  
 S = Specified Minimum Yield Strength, psi  
 t = Nominal Pipe Wall Thickness, Inches  
 D = Nominal Pipe Diameter, Inches

For all other pipe, the maximum pressure permitted during welding shall be determined by the formula given above or the MAOP, or a pressure which will produce a hoop stress of 40% of the specified minimum yield strength, whichever is lowest.

- 2.2 Under the following conditions, the maximum hoop stress permitted during welding shall not exceed 20% of the specified minimum yield strength.



<b>APPROVED BY</b>															
WER	JLL														
RFS	TOB	4	4-20-84	Rev'd Sec. 1.1, 1.2, 1.3, 2.1, 3.1, 4.3&4.4											
EFS	JAF			Added Sec. 4.5, 4.6, 4.7 & 7.											
		<b>REV.</b>	<b>DATE</b>	<b>DESCRIPTION</b>							<b>GM</b>	<b>DWN.</b>	<b>CHKD.</b>	<b>SUPV.</b>	<b>APVD.</b>
<b>GM</b>		PIPING - DATA SHEET REPAIRS INCLUDING REPAIRS MADE BY WELDING ON MAINS UNDER PRESSURE GAS STANDARD  <b>PACIFIC GAS AND ELECTRIC COMPANY</b> SAN FRANCISCO, CALIFORNIA										<b>B/M</b>			
<b>SUPV.</b>												<b>DWG. LIST</b>			
<b>DSGN.</b>												<b>SUPSDS</b>			
<b>DWN.</b>												<b>SUPSD BY</b>			
<b>CHKD.</b>												<b>SHEET NO. 1 of 4 SHEETS</b>			
<b>O.K.</b>		<b>DRAWING NUMBER</b>		<b>REV.</b>											
<b>DATE</b>	<b>SCALE</b>	10/12/67		None							084491		4		
												<b>MICROFILM</b>			