

TYPE OF DEFECT

EXTENT OF DEFECT

PERMISSIBLE METHODS OF REPAIR

WELDING REPAIR SELECTIONS CHART FOR MAINS WITH MAXIMUM ALLOWABLE OPERATING PRESSURE GREATER THAN 100 PSIG BUT LESS THAN 20% OF SPECIFIED MINIMUM YIELD STRENGTH AND 500 PSIG

Table with 5 main categories: 1. MECHANICAL DAMAGE, 2. CORROSION DAMAGE, 3. LEAKS IN WELDS, 4. CRACKS OR DEFECTS IN WELDS, 5. LEAKS IN BODY OF FITTINGS OR IN CLAMPS. Each category has sub-rows for defect types and repair methods.

NOTE: FOR REPAIR PROCEDURES SEE PARAGRAPH 4 OF THIS GAS STANDARD AND THE FOLLOWING APPLICABLE GAS STANDARDS:

- A-60 SLEEVING
A-62 MUELLER NIPPLE, LEAK PATCH
A-63 CANNING
A-64 PATCHING
D-22 ARC WELDING

E200,210J283906SH2.G24 02-26-87 GLN

Table with columns: APPROVED BY, LWHP/PAL, PEL/JAF, RCB, PCH, CJT, REV, DATE

REVISED TYPE OF DEFECT NO. 4 AND ALL OTHER ASSOCIATED COLUMNS

Professional Engineer seal for BFO/PAL/EST, No. 10689, State of California.

Table with columns: GM, SUPV, DSGN, DWN, CHKD, O K, DATE, SCALE

PIPING-DATA SHEET
REPAIR REQUIREMENTS FOR DAMAGED OR LEAKING MAINS
GAS STANDARD
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO CALIFORNIA

Table with columns: SUPERSEDES, SHEET NO., DRAWING NUMBER, REV

61-4345 REV. 7-75

MICROFILM

CHART III
REPAIR SELECTION CHART FOR LINES WITH AN M.A.O.P. OF 20%
OR MORE OF SPECIFIED MINIMUM YIELD STRENGTH, OR OVER 500 PSI

TYPE OF DEFECT	EXTENT OF DEFECT	PERMISSIBLE METHODS OF REPAIR	LIMITATIONS ON METHODS
1. MECHANICAL DAMAGE: NOTCHES, SCRATCHES, GOUGES, GROOVES, DENTS.	A. DENT-LESS THAN 2% DISTORTION (1/4" FOR O.D. LESS THAN 12.750").	1. NO REPAIR REQUIRED.	NO NOTCHES, SCRATCHES, GOUGES, AND GROOVES IN DENT. NO WELDS AFFECTED BY DENT.
	B. DENT-MORE THAN 2% DISTORTION (1/4" FOR O.D. LESS THAN 12.750").	1. SLEEVING. 2. REPLACE SEGMENT OF PIPE	DENT MUST NOT PREVENT PROPER FIT UP. IF DENT AFFECTS A WELD, REPAIR AS IN 1.B.2 ENTIRE SECTION AFFECTED MUST BE REMOVED.
	C. NOTCH, SCRATCH, GOUGE, GROOVE-DEPTH LESS THAN 10% OF PIPE WALL THICKNESS AND LESS THAN 8X OF PIPE W.T. FOR WELDED PIPE 20" O.D. OR LARGER	1. GRINDING	PIPE WALL NOT TO BE REDUCED TO LESS THAN 90% OF NOMINAL WALL THICKNESS (92% ON WELDED PIPE 20" O.D. OR LARGER) DENT OR DISTORTION LESS THAN 2% OF O.D. (1/4" FOR O.D. LESS THAN 12.750").
	D. NOTCH, SCRATCH, GOUGE, GROOVE-DEPTH 10% OR MORE OF PIPE WALL THICKNESS, DESIGN PRESSURE LESS THAN 40% SMYS.	1. SLEEVING.	DENT OR DISTORTION MUST NOT PREVENT PROPER FIT UP.
	E. NOTCH, SCRATCH, GOUGE, GROOVE-DEPTH 10% OR MORE OF PIPE WALL THICKNESS, DESIGN PRESSURE 40% SMYS OR MORE. (8X OR MORE FOR WELDED PIPE 20" OR LARGER)	1. REPLACE SEGMENT OF PIPE	ENTIRE SECTION AFFECTED MUST BE REMOVED. IF NOT FEASIBLE TO TAKE MAIN OUT OF SERVICE, REPAIR WITH SLEEVE AS IN 1.B.1
2. CORROSION DAMAGE	A. DEPTH 10% OR LESS OF PIPE WALL THICKNESS*	1. NO REPAIR REQUIRED.	
	B. DEPTH OVER 10% OF PIPE WALL THICKNESS BUT LESS THAN 80%-NO LEAKAGE.	1. PATCHING	PIPE OF NOT MORE THAN 40,000 PSI SMYS. LENGTH OR WIDTH OF PATCH NOT TO EXCEED 1/2 PIPE CIRCUMFERENCE. A MINIMUM OF 3' CLEARANCE BETWEEN PATCHES.
		2. SLEEVING	NO LIMITATIONS.
	C. DEPTH 80% OF PIPE WALL THICKNESS OR MORE-INCLUDING LEAKING CORROSION PITS.	1. PATCHING	SAME AS 2.B.1.
2. SLEEVING		NO LIMITATIONS.	
3. LEAKS IN WELDS	A. ALL	1. REPLACE SEGMENT OF PIPE	ENTIRE SECTION AFFECTED MUST BE REMOVED. IF NOT FEASIBLE TO TAKE MAIN OUT OF SERVICE REPAIR AS IN 1.B.1
		2. SLEEVING	NO LIMITATIONS.
		3. REPLACE SEGMENT OF PIPE	ENTIRE SECTION AFFECTED MUST BE REMOVED.
4. CRACKS OR DEFECTS IN WELDS.	A. CRACK THAT IS MORE THAN 2" LONG OR PENETRATES EITHER THE ROOT OR SECOND BEAD.	1. REPLACE SEGMENT OF PIPE	ENTIRE SECTION AFFECTED MUST BE REMOVED. IF NOT FEASIBLE TO TAKE MAIN OUT OF SERVICE REPAIR AS IN 1.B.1
	B. DEFECTS	1. REMOVE DEFECT AND REWELD.	AT LEAST 1/8" WALL THICKNESS REMAINING. FOR MAXIMUM HOOP STRESS PERMITTED DURING WELDING SEE PARAGRAPH 2 OF THIS GAS STANDARD. INSPECT REPAIR. IF DEFECT REMAINS, REPAIR AS IN 4.A.1.
5. LEAKS IN BODY OF FITTINGS OR IN CLAMPS	A. ALL	1. REPLACE FITTING OR CLAMP.	X-RAY TIE-IN WELDS OF REPLACED FITTINGS.

* THE ALLOWABLE DEPTH IS LESS FOR ASTM A-381 MATERIAL. CONTACT GAS SYSTEM DESIGN.

NOTE: FOR REPAIR PROCEDURES SEE PARAGRAPH 4 OF THIS GAS STANDARD OR THE FOLLOWING APPLICABLE GAS STANDARD:

A-60 SLEEVING
A-64 PATCHING

C200, 210J283906SH3, G24 02-26-87 GLN

APPROVED BY		REVISED PAGE NO. FROM 7 TO 8							
PAL	LWH	3	3/4/87	REVISED ENTIRE CHART. ADDED 2.B.3, 2.C.1, 2.C.2, FOOTNOTE & REFERENCE TO G.S. A-60 & A-64.		SS/PAL/ET			
RCB	JAF	2	4/20/84	REMOVED REF TO TRANSMISSION LINES FROM TITLE, CHG'D "DP" TO DESIGN PRESSURE, ADDED 1.A & 1.B.		LWH/PAL			
TOB		1	12-28-76			TO			
CJT	REV	DATE		DESCRIPTION	DWN	CHKD	APVD		
GM GAS OPERATION				<p align="center">PIPING-DATA SHEET REPAIR REQUIREMENTS FOR DAMAGED OR LEAKING MAINS GAS STANDARD PACIFIC GAS AND ELECTRIC COMPANY SAN FRANCISCO CALIFORNIA</p>				SUPERSEDES 084491, SH6	
SUPV								SUPERSEDED BY	
DSGN								SHEET NO. 3 OF 3 SHEETS	
DWN								DRAWING NUMBER	
CHKD								REV	
O K				283906		3			
DATE		SCALE		MICROFILM					
7-14-83									

