

1. GENERAL

- 1.1 Each welder shall be required to demonstrate his ability to make sound welds in order to maintain quality construction for all piping systems. Welder qualification or re-qualification tests shall be made in accordance with the following procedures.
- 1.2 Employees shall pass a qualification test before being allowed to weld on pipe or fittings that are or will be part of a natural gas piping system. Trainees who have successfully completed the Apprentice Fitter Primary Shop Training will only be allowed to perform welding on pipe sizes in which they have qualified until subsequent qualification testing of these welders complies with qualification test requirements in this standard.
- 1.3 For persons who have previously qualified, requalifying tests shall be required as a result of any one of the following conditions:
 - 1.3.1 A period of one year has elapsed since the previous qualification test.
 - 1.3.2 A welder has not worked at the particular welding process for a period of six months or more.
 - 1.3.3 There is specific reason to question the ability of the welder to make sound welds.
 - 1.3.4 Change in welding process from gas to shielded arc welding or vice versa, from one gas or one arc welding process to another gas or another arc welding process, from manual to semi-automatic, or automatic.
 - 1.3.5 Change in pipe material from ASTM or API Standard 5L and 5LX grade X42 groups to API Standard 5LX groups in excess of grade X42 and vice versa.
 - 1.3.6 Change in position for Butt Welds only, a change from vertical to horizontal or vice versa.
 - 1.3.7 Change in filler metal from one classification group to another.
 - 1.3.8 Change in direction vertical-down to vertical-up or vice versa.

LIMITED TO WORK ON LINES DESIGNED TO OPERATE AT HOOP STRESSES LESS THAN 20% OF S.M.Y.S.

3	9-26-76	Redrawn	2	2-29-72	Rev. For Computer Listing																										
1	2-12-71	Redrawn	2		Rev. Par. 1.3.2 & Test Report Pg. 4																										
CHG.	DATE	DESCRIPTION	APPRD.	CHG.	DATE	DESCRIPTION	APPRD.																								
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">APPROVED</td> <td style="width: 50%; text-align: center;"> PIPING — DATA SHEET WELDER QUALIFICATION FOR UNDER 20% OF SMYS <small>GAS STANDARD</small> PACIFIC GAS AND ELECTRIC COMPANY </td> <td style="width: 25%;"> SUPERSEDES SUPERSEDED BY SHEET No. 1 OF 6 SHEETS DRAWING NUMBER 08 4 4 96 </td> </tr> <tr> <td>BY</td> <td></td> <td>CHANGE</td> </tr> <tr> <td>DSGN.</td> <td></td> <td></td> </tr> <tr> <td>DR.</td> <td></td> <td></td> </tr> <tr> <td>CH.</td> <td></td> <td></td> </tr> <tr> <td>O.K.</td> <td></td> <td></td> </tr> <tr> <td>DATE</td> <td>SCALE</td> <td></td> </tr> <tr> <td>10-12-67</td> <td>NONE</td> <td>3</td> </tr> </table>								APPROVED	PIPING — DATA SHEET WELDER QUALIFICATION FOR UNDER 20% OF SMYS <small>GAS STANDARD</small> PACIFIC GAS AND ELECTRIC COMPANY	SUPERSEDES SUPERSEDED BY SHEET No. 1 OF 6 SHEETS DRAWING NUMBER 08 4 4 96	BY		CHANGE	DSGN.			DR.			CH.			O.K.			DATE	SCALE		10-12-67	NONE	3
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- 1.4 After testing the specimens in accordance with the Qualification Tests, the report forms (Pages 5 & 6) shall be prepared.
- 1.5 The district offices are to retain all test reports in order to verify that the welder has maintained qualification.
- 1.6 The 4" or 6" testing spools in 4½" lengths with 37½° bevels on one end are available from Central Warehouse, Code 022579 for 4"x.156 (oxy-acetylene qualification), 022580 for 6"x.156 (arc welder qualification).
- 1.7 The ¾" x 4.5" EH Pipe Nipples BOE are also available from Central Warehouse, Code 022578.
- 1.8 4" sleeve and nipple for sleeve weld test is available from Central Warehouse, Code 02-2059.

2. WELDER QUALIFICATION & REQUALIFICATION TESTS

2.1 Arc Welder Qualification

2.1.1 The following tests are required for Arc Welder Qualification:

- (1) Butt weld with 6" diameter x 4.5" minimum length spools (.156" w.t. recommended).
- (2) Sleeve on 4" pipe (fillet welds), sleeve -.250 w.t. x 3" L, Pipe -.188" w.t. x 9" L.
- (3) Branch connection - ¾" x 4.5" long EH nipple on 2", 3" or 4" pipe.

See Section 2.3 for test weld procedures.

2.1.2 A welder passing the tests specified in 2.1.1 is qualified to arc weld pipe and fittings on all systems with a design pressure stress level of less than 20% of SMYS. See Standard ~~30.2~~ 30.2 for qualification requirements for higher stress levels.

2.2 Oxy-Acetylene Welder Qualification

2.2.1 The following tests are required for Oxy-Acetylene qualification:

- (1) Butt weld with 4" diameter x 4.5" minimum length spools (.156" w.t. recommended).

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(2) Sleeve on 4 pipe (Same as arc weld qualification)

(3) Branch connection - 3/4 x 4 5 long EH nipple on
2 3 or 4 pipe (Same as arc weld qualification)

See Section 2 3 for test weld procedure

2 2 2 A welder passing the test specified in 2 2 1 is qualified to oxy-acetylene weld pipe and fitting for 4 and smaller pipe and service connections on pipe 8 and smaller for all systems with a design pressure stress level of less than 20% of SMYS See Standard D-30 1 for qualification for butt welds at over 20% of SMYS

2 3 Test Weld Procedure

2 3 1 Arc welds are performed using the methods outlined in Standard D-22 Oxy-acetylene welds are performed using the methods outlined in Standard D-20

2 3 2 The butt welds and sleeve welds are made with the pipe in the horizontal fixed position The branch connection is made with the header in the horizontal fixed position and the branch not more than 45° from the top of the header For all test welds no movement or rotation of the pipe is allowed during welding

2 4 Test Weld Inspection Requirements

2 4 1 All test welds shall be visually inspected The weld shall be free of cracks inadequate penetration unrepaired burn-through and other defects It shall present a neat workman-like appearance Arc burn due to striking an arc out of the weld groove is not allowed Any weld not meeting these requirements shall be failed without performing any destructive tests

2 4 2 Butt welds shall be destructively tested in addition to visual tests Take samples shown on Page 7 (Drawing 282917) Four root bend samples are required See Standard D-31 for specimen tests and requirements

2 4 3 A knock off test in addition to the visual inspection is required for the branch connection

2 5 Requalification shall consist of the butt weld and branch connection tests as specified for welder qualification (Items 1 and 3 Sections 2 1 1 and 2 2 1)

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2 6 All test welds shall be performed in a fixed position under the supervision of a qualified weld inspector

3 SOLDER QUALIFICATION TEST

Personnel who are to make solder joints on copper piping shall satisfactorily demonstrate their ability to make sound joints by passing the following test A copper joint soldered in accordance with D-10 shall be made on 1/2 or 1 copper pipe with the axis of the pipe stationary in the horizontal fixed position Bonding must take place in 95% of the total telescoped surfaces All unbonded surfaces must lie in small isolated pockets

4 QUALIFICATION RETESTS

4 1 Employees who fail to meet the requirements for a qualification test may be retested immediately In such a case he shall make two welds of each type on which he was failed For the guided root bend test satisfactory welds will be indicated if no more than one specimen out of each weld is rejected (See 2 3) In addition rejection of specimens from both welds at the same specimen position shall be cause for rejection For the knock-off test both specimens must pass

4 2 If a horizontal fixed position solder joint fails to show adequate bonding, immediate retest may be made by preparing two soldered joints both of which must pass the test requirements

4 3 Employees who fail to meet the requirements for a qualification test shall be required to have further training or practice In such a case a complete retest shall be made subsequent to such training or practice

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ARC WELD TEST REPORT - DIVISION

FOR WELDERS ON PIPING SYSTEMS OPERATING AT HOOP STRESSES OF LESS THAN 20% OF THE SPECIFIED MINIMUM YIELD STRENGTH

(Check Appropriate Box)

CODE MARK _____ Passed Failed

FULL NAME _____ DATE OF ANNUAL QUALIFICATION WELD _____

SOCIAL SECURITY NO. _____ DATE OF INSPECTION OF WELD _____

CLASSIFICATION _____ DATE OF PREVIOUS ANNUAL QUALIFICATION _____

TOWN _____ DATE OF 6 MONTH VERIFICATION OF WELDING IN QUALIFICATION PROCESS _____

Butt Weld 6.625" O.D. Spools

TYPE TEST ROOT BEND	PENETRATION			FUSION			POROSITY		SLAG INCLUSION		APPEARANCE			REMARKS (1)-(6)	TEST RESULTS	
	(G)	(S)	(U)	(G)	(S)	(U)	(P)	(F)	(P)	(F)	(G)	(S)	(U)		(P)	(F)
BOTTOM																
SIDE																
TOP																
SIDE																

Branch Connection 3/4" on 2", 3" or 4" Run

KNOCK OFF																
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Sleeve Weld 4"

APPEARANCE (G) (S) (U)	
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KEY: Use these abbreviations in POROSITY, SLAG INCLUSION & TEST RESULTS columns:
 P = Pass F = Fail

Use these abbreviations in PENETRATION, FUSION, And APPEARANCE columns:
 G = Good S = Satisfactory U = Unsatisfactory

Use following in REMARKS section, as applicable:
 1 = Undercutting 4 = Insufficient weld reinforcement
 2 = Cold lap 5 = Lack of Penetration
 3 = Excessive weld reinforcement 6 = Burn through

Test Inspector _____

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FOR WELDERS ON PIPING SYSTEMS OPERATING AT HOOP STRESSES OF LESS THAN 20% OF THE SPECIFIED MINIMUM YIELD STRENGTH

CODE MARK _____ (Check Appropriate Box)
 Passed Failed
 FULL NAME _____ DATE OF ANNUAL QUALIFICATION WELD _____
 SOCIAL SECURITY NO. _____ DATE OF INSPECTION OF WELD _____
 CLASSIFICATION _____ DATE OF PREVIOUS ANNUAL QUALIFICATION _____
 TOWN _____ DATE OF 6 MONTH VERIFICATION OF WELDING IN QUALIFICATION PROCESS _____

Butt Weld 4.5" O.D. Spools

TYPE TEST ROOT BEND	PENETRATION			FUSION			POROSITY		SLAG INCLUSION		APPEARANCE			REMARKS (1)-(6)	TEST RESULTS	
	(G)	(S)	(U)	(G)	(S)	(U)	(P)	(F)	(P)	(F)	(G)	(S)	(U)		(P)	(F)
BOTTOM																
SIDE																
TOP																
SIDE																

Branch Connection 3/4" on 2", 3" or 4" Run

KNOCK OFF																
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Sleeve Weld 4"

APPEARANCE (G) (S) (U)

Solder Test

See Page 4	% OF LENGTH OF JOINT SOCKETED	% OF JOINT BONDED	REMARKS	TEST RESULTS	
				(P)	(F)

KEY: Use these abbreviations in POROSITY, SLAG INCLUSION & TEST RESULTS columns:
 P = Pass F = Fail
 Use these abbreviations in PENETRATION, FUSION, and APPEARANCE columns:
 G = Good, S = Satisfactory U = Unsatisfactory
 Use following in REMARKS section, as applicable:
 1 = Undercutting 3 = Excessive weld reinforcement 5 = Lack of Penetration
 2 = Cold lap 4 = Insufficient weld reinforcement 6 = Burn through

Test Inspector _____

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