1.0 GENERAL

* 1.1 A welder qualified under this standard may perform arc welding on all grades of pipe and fittings up to and including X-65. This would include all natural gas lines designed to operate at stress levels of 20% or more of the specified minimum yield strength to comply with CPUC General Order 112 (latest edition).

1.2 The standard definitions contained in API Standard 1104, latest edition referenced in Appendix "A" of General Order 112 (latest edition) shall apply to this standard.

2.0 QUALIFICATION TEST

* 2.1 Before any production welding is performed on pipelines or components designed to operate at over 20% of SMYS, welders shall be qualified under this section using a qualified procedure. The weld shall meet the visual inspection requirements of Section 4, Gas Standard D-40 and shall also be qualified by either the radiographic testing requirements of Section 2.0, Gas Standard D-31, (for butt welds only), or the destructive testing requirements of Section 3.0 and/or 4.0, Gas Standard D-31.

* 2.1.1 The following tests can be made on steel pipe of any grade; however, the qualification test described below is based on using API 5L GR B pipe. (See Section 2.2.4).

* 2.1.1.1 Butt weld - The welder shall make a butt weld on 12-3/4" O.D. x 0.375" w.t. pipe in the fixed position with the axis of the pipe either in the horizontal plane or inclined from the horizontal plane at an angle not exceeding 45° (see Page 5, Dwg. 084023).

* 2.1.1.2 Branch Connection For Full Qualification - The welder shall lay-out, cut, fit and weld a full size branch connection on 12-3/4" O.D. pipe. The weld shall be made with the run pipe axis in the horizontal position and the branch pipe axis extending vertically downward from the run (see Page 6, Dwg. 086406).

* Paragraph Revised

APPROVED BY		REV.	DATE	DESCRIPTION	GM	DWN.	CHKD.	SUPV.	APVD.
LWH	RCB	4	1-5-88	Revised as indicated by * and **		BFO	BFO		
PAL	PCH	3	3-3-84	Revised Para. 1.1.1.2.2.1.1.2.4.1 & Form 75-292				GS/PAL	
RLH	CJT	2	6-79	Revised Para. 2.6				RTA/PAL	
PEL/TET/JAF		1	10-17-77	Added Form 75-292 & Para. 2.6				RTA/PAL	

GM		B/M	
SUPV.		DWG. LIST	
DSGN.		SUPSDS	
DWN.		SUPSD BY	
CHKD.		SHEET NO. 1 of 4 SHEETS	
O.K.		DRAWING NUMBER	REV.
DATE 11/18/75	SCALE	086577	4
		MICROFILM	

PIPING - DATA SHEET
ARC WELDER QUALIFICATION FOR
OVER 20% OF SMYS
GAS STANDARD
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

88071

61-4344 (REV. 1-76) PRINTED ON DIEPO NO. 1080 CLEARPRINT 11-80

** 2.1.1.3 Branch Connection For Limited Qualification - At the discretion of the Region Gas Operation Manager, this limited qualification test may be performed. For Scope of this qualification, see Section 2.2.2 below.

The welder shall lay-out, cut, fit, and weld a full size branch connection on 6-5/8" O.D. pipe. The position of the weld shall be the same as in Section 2.1.1.2 above (see Page 6, Dwg. 086406).

2.2 Scope of Qualification

* 2.2.1 Full Qualification - A welder who has successfully completed the 12-3/4" O.D. butt weld qualification test described in Section 2.1.1.1 and a full size 12-3/4" O.D. branch connection weld described in Section 2.1.1.2 shall be qualified to weld on natural gas pipelines in all positions, on all wall thicknesses, joint designs (including fillet welds), fittings and on all pipe diameters and all grades of pipe if the essential variables in Section 2.3 remain unchanged.

** 2.2.2 Limited Qualification - A welder who has successfully completed the 12-3/4" O.D. butt weld qualification test described in Section 2.1.1.1 and a full size 6-5/8" O.D. branch connection weld described in Section 2.1.1.3 shall be considered qualified to weld the following:

Butt welds (8-5/8" O.D. to 12-3/4" O.D.)

Only in the fixed, horizontal position on wall thicknesses ranging from 3/16" to 3/4" for all grades of pipe 8-5/8" O.D. to 12-3/4" O.D., inclusive. A change in position from horizontal to vertical, a change from fixed to rolled, or if any other of the essential variables in Section 2.3 are changed, the welder shall be requalified using the new procedure.

All other welds (6-5/8" O.D. and smaller)

In all positions, on all wall thicknesses, joint designs (including fillet welds), fittings and on all grades of pipe 6-5/8" O.D. and smaller. If any of the essential variables in Section 2.3 are changed, the welder shall be requalified using the new procedure.

** 2.2.3 Qualification under Section 2.1.1 by destructive testing is required before welding compressor station piping or components.

* Paragraph Revised
** Paragraph Added

** 2.2.4 Note that when welding on high yield pipe such as X-65 or when welding with low hydrogen electrodes, the essential variables listed in Section 2.3 are changed from those used in the qualification procedure described in Section 2.1.1. Welders must be requalified using the new procedure before making these welds.

2.3 If any of the following essential variables are changed, the welder must be requalified using the new procedure:

2.3.1 A change from one welding process to any other welding process or combination of welding processes.

* 2.3.2 A change in the direction of welding from vertical up to vertical down or vice versa. (Direction of welding shall be only as allowed by Gas Standard D-22, Dwgs. 284361 and 284363).

* 2.3.3 A change in filler metal from one classification group to another classification group as shown in table below:

FILLER METAL CLASSIFICATION GROUPS

GROUP	AWS SPEC.	ELECTRODE
I	A5.1 A5.5	E6010, E6011 E7010, E7011
II	A5.5	E8010, E8011
III	A5.1 A5.5	E7015,E7016,E7018 E8015,E8016,E8018

2.4 Requalification of Arc Welders

2.4.1 Welders shall be requalified no later than the last day of the 6th calendar month following the calendar month in which the last previous test was satisfactorily passed. Requalification may consist of successful passing of a radiographic examination of a production butt weld, or by repeating the butt weld test in Section 2.1. If the 6th month expires before requalification, an entire qualification test (Section 2.1) must be repeated.

2.4.2 A requalification test, by destructive methods and in accordance with Section 2.1.1.1, may also be required if there is reason to question the welder's ability.

2.4.3 Annually, all welders who work on compressor station piping must pass a butt weld test in accordance with 2.1.1.1, by destructive methods.

* Paragraph Revised
** Paragraph Added

2.5 Qualification and requalification tests shall be performed under the supervision of a qualified welding inspector

This inspector shall not leave the immediate area while the testing is being performed. For the purposes of this standard, a qualified welding inspector is a designated employee that has the experience and knowledge to judge the quality of welds. The supervisor designating the person to inspect the welding for a job has the responsibility to determine that the person is qualified. (See Gas Standard D-40).

2.6 Retests

Welders who fail to pass the qualification test in Section 2.1 or the requalification test in Section 2.4 must:

2.6.1 Undergo further training or practice before retesting. The extent of training or practice required shall be determined by the welding inspector.

2.6.2 Pass both the "butt weld" test and the "branch connection" test outlined in Section 2.1 in order to be requalified.

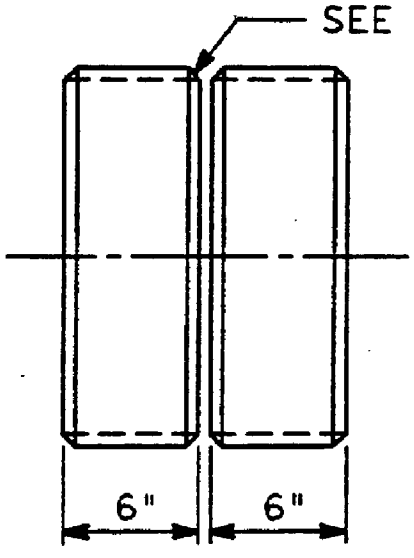
2.7 Records

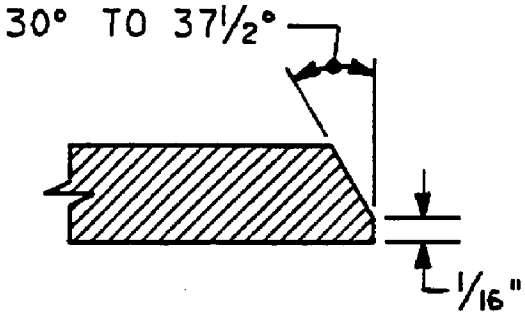
2.7.1 Records for all welders who have been qualified under this gas standard shall be retained as outlined below.

2.7.2 All Employee Qualification and Requalification records must be retained for a minimum duration of five years.

2.7.3 All Employee Qualification and Requalification records must be retained through temporary lapses in a welder's qualification.

2.7.4 The Record shall be made by filling out Attachment 1 of this gas standard.





DETAIL OF BEVEL

NOTES:

1. SPOOLS CAN BE USED FOR WELDER QUALIFICATION FOR BOTH CELLULOSE COATED AND LOW HYDROGEN ELECTRODES (GAS STD. D-22, DWGS. 284361 AND 284363).
2. REFER TO GAS STD. D-31, DWG 084027, FOR TYPE, NUMBER AND LOCATION OF BUTT WELD TEST SPECIMENS.
3. WELD MUST MEET THE VISUAL TESTING REQUIREMENTS OF SECTION 4, GAS STANDARD D-40 AND EITHER THE RADIOGRAPHIC TESTING REQUIREMENTS OF SECTION 2.0, GAS STANDARD D-31 OR THE DESTRUCTIVE REQUIREMENTS OF SECTION 3.0, GAS STANDARD D-31.

ORDERING INSTRUCTIONS:

SPECIFY:

SPOOL, TEST, 12-¾" O.D., 0.375" WALL, API 5L GR. B, 6" LENGTH W/30-37.5 DEG. BEVEL BOTH ENDS.
GAS STD. D-30.2.

CODE 02-2583

[200,210]084023.G24 11-20-87 DWH

APPROVED BY		REV	DATE	DESCRIPTION	GM	DWN	CHKD	SUPV	APVD
JLL	RFD	9	12-23-87	REVISED NOTE 1 & ORDERING INSTRUCTIONS; ADDED NOTE 3			BFO	JOB	RAK
JLL	RFD	8	3-16-84	ADDED NOTE 2.					GS/PAL
WER	KSA	7	4-4-83	REVISED NOTES, ADDED ORDERING INSTRUCTIONS					MOB-PAL
RSK	EHF	6	5-27-80	ADDED NOTES 1 & 2					RTA-PAL
	EFS	REV	DATE	DESCRIPTION	GM	DWN	CHKD	SUPV	APVD

GM DEPT. OF C.O.
SUPV
DSGN
DWG
CHKD
O K
DATE 1-4-65
SCALE NONE

PIPING - DATA SHEET

BUTT WELD TEST SPOOLS FOR WELDERS WORKING ON PIPE LINES OPERATING AT HOOP STRESSES OF MORE THAN 20% OF THE SPECIFIED MINIMUM YIELD

GAS STANDARD

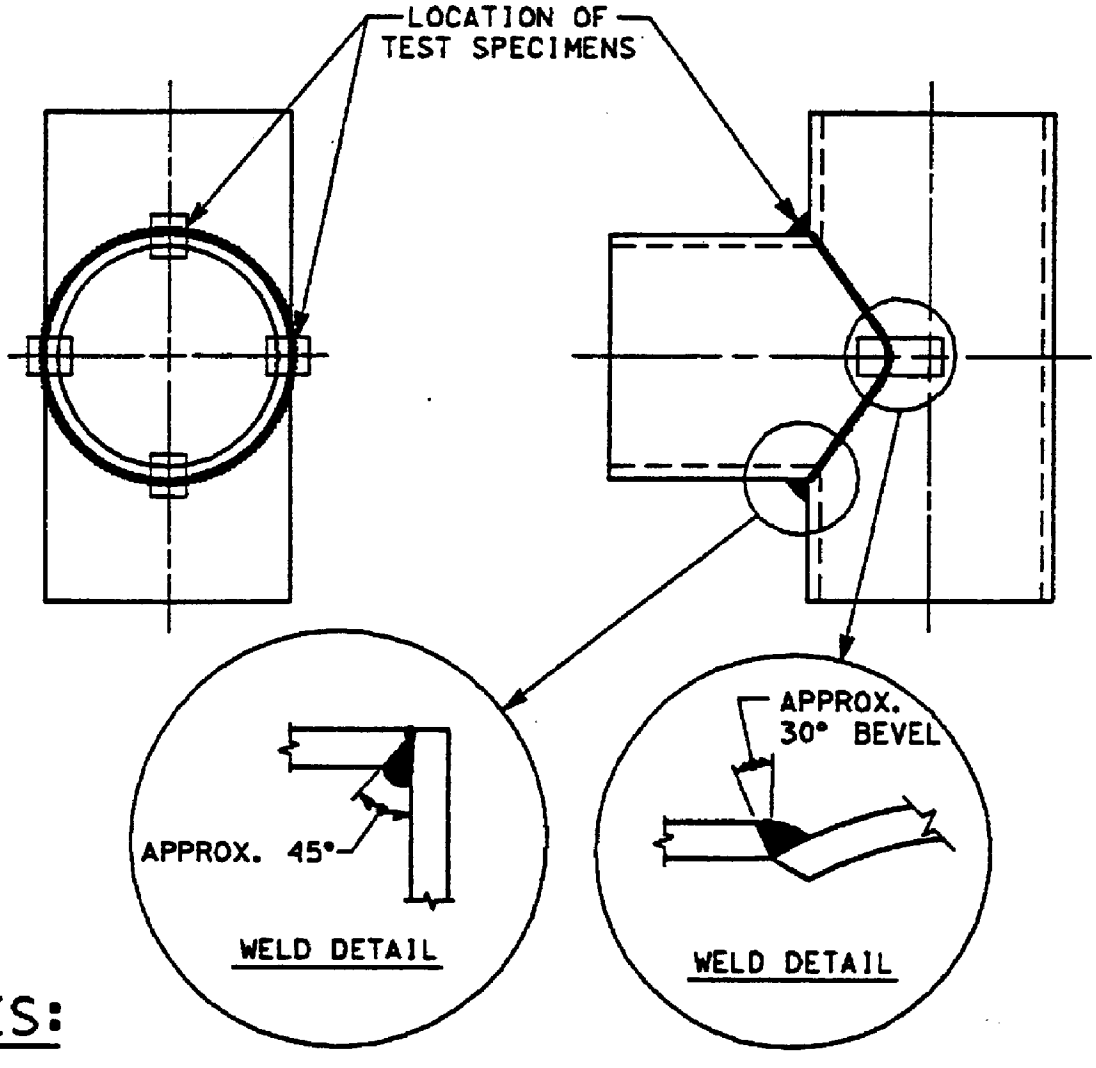
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CAL.

B/M
DWG LIST
SUPSDS 083466 SH 5
SUPSD BY
SHEET NO OF SHEETS
DRAWING NUMBER 084023
REV 9
MICROFILM

S1804

D-30.2

PAGE 6



NOTES:

I. BRANCH CONNECTION FOR FULL QUALIFICATION (WELDER QUALIFIED TO MAKE ANY SIZE BRANCH.)

1. PIPE IS 12 ¾" O.D. X 0.375" W.T. API 5L GR B.
2. WELDER MUST LAYOUT, CUT, FIT AND WELD BRANCH FITTING CONNECTION. A FULL HOLE IS TO BE CUT IN THE RUN.
3. THE WELD IS TO BE MADE WITH THE RUN PIPE AXIS FIXED IN THE HORIZONTAL POSITION, AND THE BRANCH PIPE AXIS EXTENDING VERTICALLY DOWNWARD FROM THE RUN.
4. WELD MUST MEET THE VISUAL TESTING REQUIREMENTS OF SECTION 4.0, GAS STANDARD D-40 AND THE DESTRUCTIVE TESTING REQUIREMENTS OF SECTION 4.0, GAS STANDARD D-31.
5. FOUR NICK BREAK SPECIMENS ARE REQUIRED FROM THE LOCATIONS INDICATED. SPECIMENS SHALL MEET THE REQUIREMENTS OF GAS STANDARD D-31.

II. BRANCH CONNECTION FOR LIMITED QUALIFICATION (WELDERS QUALIFIED TO MAKE 6-INCH AND SMALLER BRANCHES).

1. PIPE IS 6 ⅝" O.D. X 0.280" W.T., API 5L GR B.
2. SAME AS ITEMS 2 THRU 5 ABOVE.

TEST WELD FOR ARC WELDERS QUALIFICATION FOR FACILITIES OPERATING AT OVER 20% OF SMYS.

APPROVED BY		REV	DATE	DESCRIPTION	GM	DWN	CHKD	SUPV	APVD
		4	12-23-87	ADDED 6" BRANCH & REVISED NOTES			BFO		RTA/PAL
LWH	PAL	3	5-27-80	REVISED NOTE 1					RTA/PAL
RLH	JAF	2	10-19-79	ADDED WELD DETAILS		JH	MAA		RTA/PAL
RCB	PCH	1	11-30-77	CHANGED STD. PAGE NO. FROM PAGE 4					RTA/PAL
	CJT								

GM	
SUPV	
DSGN	
DWG	B. BECKER
CHKD	
O K	
DATE	6-25-75
SCALE	NONE

PIPING - DATA SHEET

BRANCH WELD TEST

GAS STANDARD

PACIFIC GAS AND ELECTRIC COMPANY

SAN FRANCISCO, CALIFORNIA

B/M	
DWG LIST	
SUPSDS	084029 & 085749
SUPSD BY	
SHEET NO	OF
DRAWING NUMBER	086406
REV	4
MICROFILM	

N1804

[200,210]086406 .G24 12-12-87 DWH

ARC WELDER QUALIFICATION TEST FOR PIPING SYSTEMS OPERATING AT HOOP STRESSES OF 20% OR MORE OF SPECIFIED MINIMUM YIELD STRENGTH

☐ PASSED DATE LAST TESTED:_____ DATE:_____

☐ FAILED. FURTHER TRAINING REQUIRED _____

WELDER: _____ S.S.NO.: _____

BUTT DIA._____ PIPE SPEC._____ GRADE _____ WALL THICKNESS _____

BRANCH DIA. _____

☐ EXX10 ☐ MICRO WIRE ☐ BUTT TESTER: _____ (P.G.& E.)

☐ EXX18 ☐ OTHER _____ ☐ BRANCH WELD POSITION:_____

ELECTRODE MATERIAL: ELECTRICAL: WELDING:

BEAD	MFG. & AWS CLASS	DIA.	POLARITY	AMPS	VOLTS	DIRECTION
1ST BEAD						
2ND BEAD						
OTHER BEADS						

TENSILE TESTS:

SPECIMEN	WIDTH	THICKNESS	AREA-SQ. IN.	LOAD-LB.	STRESS-PSI	REMARKS
1						
2						
3						
4						

FACE BEND OR SIDE BEND:

SPECIMEN	LOCATION	NO. CRACKS	MAX. DIMENSION	LOCATION	REMARKS
1					
2					

ROOT BEND OR SIDE BEND:

1					
2					

NICK BREAK:

SPECIMEN		GAS POCKETS			SLAG INCLUSION				
NO.	LOCATION	NO.	MAX. SIZE	BETWEEN	NO.	LENGTH	BETWEEN	FUSION	REMARKS
1									
2									
3									
4									

CONTRACTOR:_____ PROJECT:_____

[200,210]D302ATT1.G24 12-17-87 DWH