TEST REQUIREMENTS FOR PIPELINES, MAINS, SERVICES, INSTRUMENT LINES AND OTHER GAS FACILITIES

DESIGN PRESSURE (D.P.)		30% OR MORE		PRETESTED PIPE FOR EMERGENCY USE (SEE NOTE 7)	UNDER 30% SMYS AND OVER 100 PSIG	100 PSIG OR LESS (INCLUDING LOW PRESSURE)	PLASTIC (SEE NOTE 12)
		PIPELINE (INCLUDING FABRICATED UNITS TESTED IN PLACE)	FABRICATED UNITS, SHORT SECTIONS OF PIPE (SEE NOTE 6)		INCLUDING FABRICATED UNITS AND SHORT SECTIONS OF PIPE		
TYPE OF TEST		STRENGTH	STRENGTH	STRENGTH	LEAK	LEAK	LEAK
TEST MEDIUM		WATER, AIR, INERT GAS, OR GAS (SEE NOTES 1, 2 AND 16)	WATER, AIR, INERT GAS, OR GAS (SEE NOTES 1, 2 AND 16)	WATER	WATER, AIR, INERT GAS, OR GAS (SEE NOTES 1, 2 AND 16)	AIR OR GAS (SEE NOTE 16)	AIR OR GAS (SEE NOTE 16)
MAXIMUM TEST PRESSURE (SEE NOTES 1 AND 2)		100% SMYS OR FACTORY TEST PRESSURE OF FITTING (SEE NOTES 3 AND 5)	100% SMYS OR FACTORY TEST PRESSURE OF FITTING (SEE NOTES 3 AND 5)	100% SMYS	(SEE NOTES 3 AND 14)	110 PSIG	3 X DESIGN PRESSURE
MINIMUM TEST PRESSURE		1.5 X DESIGN PRESSURE (SEE NOTES 4 AND 5)	1.5 X DESIGN PRESSURE (SEE NOTES 4 AND 5)	90% SMYS (RECOMMENDED)	1.5 X DESIGN PRESSURE (SEE NOTE 4)	100 PSIG	100 PSIG OR 1.5 X MAOP WHICHEVER IS GREATER
DURATION OF TEST		8 HOURS MINIMUM (SEE NOTE 17)	4 HOURS MINIMUM (SEE NOTE 17)	4 HOURS MINIMUM	1 HOUR MINIMUM (SEE NOTE 17)	5 MINUTES	5 MINUTES (SEE NOTE 9)
TEST RECORDS REQUIRED (SEE NOTE 15)	FORMS REQUIRED	COMPLETED STRENGTH TEST PRESSURE REPORT	COMPLETED STRENGTH TEST PRESSURE REPORT	COMPLETED STRENGTH TEST PRESSURE REPORT	COMPLETED STRENGTH TEST PRESSURE REPORT	COMPLETE BOX ON W.O. FORM OR GAS SERVICE RECORD FORM	COMPLETE BOX ON W.O. FORM OR GAS SERVICE RECORD FORM
	TEST CHART	YES (SEE NOTE 11)	YES (SEE NOTE 11)	YES (SEE NOTE 11)	NO (SEE NOTE 13)	NO (SEE NOTE 13)	NO (SEE NOTE 13)

NOTES:

(1) MAXIMUM TEST PRESSURE PERMITTED, EXPRESSED AS A PERCENT OF SMYS:

CLASS LOCATION	1	2	3	4
AIR OR INERT GAS (SEE NOTE 10)	80	75	50	40
NATURAL GAS	80	30	30	30
WATER	100	100	100	100

(2) SAFETY - WHEN TESTING WITH AIR, INERT GAS, OR NATURAL GAS, THE PRESSURE SHALL BE HELD AT ABOUT 100 PSIG AND OBSERVED FOR LEAKAGE BEFORE RAISING TO THE REQUIRED TEST PRESSURE.

(3) MAXIMUM TEST CAPABILITIES OF FITTINGS SUCH AS VALVES AND ELBOWS MUST BE DETERMINED BEFORE TESTING. (SEE PARAGRAPH 9.0)

(4) THE MINIMUM TEST PRESSURE SHALL NOT BE LESS THAN 1.5 TIMES THE DESIGN PRESSURE IN CLASS 2, 3 AND 4 LOCATIONS, AND NOT LESS THAN 1.25 TIMES THE DESIGN PRESSURE IN CLASS 1 LOCATION. THE ONLY EXCEPTION IS FOR TRANSMISSION LINES WHERE TESTING TO 1.5 TIMES THE DESIGN PRESSURE CREATES PROBLEMS DUE TO LIMITATIONS IMPOSED BY VALVES (SEE NOTE 3) AND WHERE THE FUTURE MAOP TO BE ESTABLISHED IS BELOW THE DESIGN PRESSURE. THE MINIMUM TEST PRESSURE MAY THEN BE LIMITED TO 1.5 TIMES THE MAOP, WITH THE APPROVAL OF THE GAS SYSTEM DESIGN DEPARTMENT.

(5) ALL PIPELINES 6" AND LARGER, WHICH ARE DESIGNED TO OPERATE AT MORE THAN 40% OF SMYS, ARE TO BE TESTED TO A MINIMUM OF 90% OF SMYS, AND AS CLOSE TO 100% OF SMYS AS PRACTICAL. (TESTS OF ERW PIPE SHOULD BE LIMITED TO A MAXIMUM OF 95% OF SMYS). IN ADDITION, CONSIDERATION SHOULD BE GIVEN TO TESTING ALL OTHER TRANSMISSION AND DISTRIBUTION LINES 6" AND LARGER, WHICH ARE TO OPERATE AT OVER 20% OF SMYS, TO A MINIMUM OF 90% OF SMYS. A TEST TO THIS PRESSURE PROVIDES ADDITIONAL ASSURANCE OF THE INTEGRETY OF THE LINE, AND WILL MINIMIZE THE POSSIBILITY OF A FAILURE DUE TO STRESS RESULTING FROM SOIL SETTLEMENT OR OTHER ENVIRONMENTAL EFFECTS. THE DECISION TO CONDUCT THE TEST AT THE HIGHER PRESSURE SHOULD BE BASED ON ENGINEERING JUDGEMENT, CONSIDERING THE IMPORTANCE OF THE LINE, TO MEET SYSTEM DEMAND, AND THE POTENTIAL ENVIRONMENTAL EFFECTS ON THE LINE SUCH AS DEVELOPMENT, OR HEAVY CONSTRUCTION.

(6) ALL FACILITIES DESIGNED TO OPERATE AT 30% OR MORE OF SMYS SHALL BE TESTED AS A UNIT FOR A MINIMUM OF EIGHT HOURS AFTER INSTALLATION, EXCEPT FOR FABRICATED UNITS OR SHORT SECTIONS OF REPLACEMENT PIPE FOR WHICH A POST INSTALLATION TEST IS IMPRACTICAL. FABRICATED UNITS, FOR WHICH A POST INSTALLATION TEST IS IMPRACTICAL, SHALL BE TESTED AFTER COMPLETION AND BEFORE INSTALLATION FOR A MINIMUM OF FOUR HOURS. THIS TEST IS REQUIRED EVEN THOUGH PRETESTED PIPE WAS USED TO FABRICATE THE UNIT. SHORT SECTIONS OF REPLACEMENT PIPE SHALL BE TESTED FOR A MINIMUM OF FOUR HOURS PRIOR TO INSTALLATION. FOR GAS STANDARD A-34, THE FOLLOWING DEFINITIONS SHALL APPLY:

(a) A SHORT SECTION OF PIPE IS DEFINED AS A SINGLE PIECE OF PIPE CONTAINING NO GIRTH WELDS.
(b) A FABRICATED UNIT IS AN ASSEMBLY OF TWO OR MORE FITTINGS AND/OR PIECES OF PIPE JOINED TOGETHER. WHERE MORE THAN 40 FEET OF PIPE IS INCLUDED IN THE UNIT, THERE SHALL BE A FULL EIGHT HOUR TEST.

(7) TESTING EMERGENCY PIPE:
(a) THE "LOCATION CLASS," "DESIGN FACTOR," "PRESENT MAOP OF FACILITY," "MAOP TO BE ESTABLISHED BY THIS TEST," "DESIGN PRESSURE--THIS SECTION (FUTURE DESIGN PRESSURE)," AND "% OF SMYS AT DESIGN PRESSURE" SHOULD NOT BE SPECIFIED ON THE STRENGTH TEST PRESSURE REPORT FOR THE EMERGENCY PIPE SINCE IT IS NOT KNOWN AT THE TIME OF THE TEST WHERE THE PIPE WILL BE INSTALLED.
(b) IT IS RECOMMENDED THAT ALL EMERGENCY PIPE BE TESTED TO A MINIMUM OF 90% OF SMYS FOR A MINIMUM OF FOUR HOURS.
(c) THE EMERGENCY PIPE TEST INFORMATION FORM (SEE APPENDIX "H") SHALL BE COMPLETED SUBSEQUENT TO THE STRENGTH TEST AND ATTACHED TO THE STRENGTH TEST PRESSURE REPORT.
FOR EMERGENCY REPAIRS, SOME EXCEPTIONS TO THE DESIGN AND TEST REQUIREMENTS MAY BE PERMITTED BUT ONLY WITH THE APPROVAL OF THE GAS SYSTEM DESIGN DEPARTMENT.

(8) TESTING INSTRUMENT LINES:
ALL INSTRUMENT LINES MADE OF STEEL PIPE AND SUBJECTED DIRECTLY TO MAINLINE GAS PRESSURES SHALL BE TESTED IN ACCORDANCE WITH THE APPLICABLE TEST REQUIREMENTS IN THE ABOVE TABLE. IT IS NOT NECESSARY TO TEST TUBING, BUT ALL FITTINGS AND CONNECTIONS SHOULD BE CHECKED FOR LEAKS AFTER START-UP.

(9) ALTHOUGH THE TEST DURATION FOR PLASTIC PIPE IS 5 MINUTES, IF THE CONSTRUCTION SCHEDULE PERMITS, IT IS DESIRABLE TO MAINTAIN THE TEST PRESSURE FOR A LONGER PERIOD OF TIME. IF THE PIPE IS NOT GASSED UP ON THE SAME DAY AS THE TEST, IT MUST BE RETESTED BEFORE GASSING UP.

(10) ALL TESTS TO OVER 50% SMYS SHOULD BE PERFORMED WITH WATER AS THE TEST MEDIUM, UNLESS SUCH A TEST IS IMPRACTICAL. WHERE A HYDROSTATIC TEST IS IMPRACTICAL, AIR OR INERT GAS MAY BE USED, WITH THE LIMITATIONS SHOWN IN NOTE 1. BUILDINGS WITHIN 300' OF THE TEST SECTION MUST BE EVACUATED DURING THE TEST.

(11) TEST CHARTS MUST BE COMPLETED AND RETAINED AS OUTLINED IN A-34, PARAGRAPH 12.0

(12) TEMPERATURE OF THERMOPLASTIC MATERIAL MUST NOT BE MORE THAN 100°F DURING THE TEST.

(13) TABLE INDICATES TEST CHART REQUIREMENTS FOR NEW FACILITIES. TEST CHARTS ARE REQUIRED FOR ALL UPRATING JOBS REGARDLESS OF THE OPERATING PRESSURE OF THE LINE.

(14) FOR FACILITIES OPERATING AT UNDER 30% SMYS AND OVER 100 PSIG, THE MAXIMUM TEST PRESSURE IS TO BE DETERMINED BY THE PROJECT ENGINEER. A REASONABLE DIFFERENTIAL BETWEEN MAXIMUM AND MINIMUM TEST PRESSURES SHOULD BE ALLOWED, CONSIDERING ELEVATION DIFFERENTIALS AND THE REQUIREMENTS OF NOTE 3.

(15) ALL TEST RECORDS MUST BE RETAINED FOR THE LIFE OF THE FACILITY.

(16) TESTING USING WATER, AIR, OR INERT GAS IS NOT NORMALLY PERMITTED WHERE THE TEST SECTION IS ISOLATED FROM AN OPERATING LINE ONLY BY A CLOSED VALVE, SQUEEZE OFF EQUIPMENT, OR PLUGGING EQUIPMENT, SINCE LEAKAGE MAY OCCUR CREATING AN UNDESIRABLE AND POTENTIALLY HAZARDOUS SITUATION. IF THE TEST MUST BE PERFORMED UNDER THIS CIRCUMSTANCE, PRIOR APPROVAL MUST BE OBTAINED FROM THE GAS SYSTEM DESIGN DEPARTMENT, AND ADDITIONAL PRECAUTIONS MAY BE REQUIRED IN ORDER TO MINIMIZE THE POSSIBILITY OF AN ACCIDENT. FOR TEST LIMITATIONS ON VALVES, SEE PARAGRAPH 9.0.

CADD 820372 03-15-84 RES

APPROVED BY		REV	DATE	DESCRIPTION	DWN	CHKD	APVD
		4		REVISED NOTE 17 & 18(b) ON SHT. 2			
PAL	JLL	3	11-18-85	REVISED NOTE 5, ADDED SHEET 2 & NOTE 19; REVISED PAGE NO.	ATG	BFO	
TET	JWL	2	3-19-84	REVISED NOTES 3, 5, 11, 16 & 18(b)		EFO	
WER	EFS	1	2-25-83	ISSUED FOR USE		KAFL	PAL/CJT

GM	
SUPV	
DSGN	
DWN	CADD/BAL
CHKD	
O K	
DATE	11-1-82
SCALE	NONE

PIPING - DATA SHEET

DESIGN AND TEST REQUIREMENTS

GAS STANDARD

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

SUPERSEDES	283621
SUPERSEDED BY	
SHEET NO.	1 OF 2 SHEETS
DRAWING NUMBER	284283
REV	3 4
MICROFILM	

61-4345 REV. 7-75

(17) WHERE PIPELINES ARE INSTALLED ON STREET OR HIGHWAY BRIDGES UNDER PERMITS FROM GOVERNMENTAL AGENCIES, MORE STRINGENT TESTING MAY BE REQUIRED BY THE AGENCY THAN WOULD BE REQUIRED BY THIS GAS STANDARD. FOR PIPELINES DESIGNED TO OPERATE OVER 200 PSIG AND LOCATED ON CALIFORNIA STATE BRIDGES, THE TEST PRESSURE SHALL BE ~~100 PSIG~~ maintained for a minimum of 24 hours.

(18) INSTALLATION OF A HOT TAP BRANCH CONNECTION WITH REINFORCEMENT PAD OR SLEEVE:
(a) THE BRANCH TO HEADER WELD SHALL BE LEAK TESTED PRIOR TO THE INSTALLATION OF THE REINFORCEMENT PAD OR SLEEVE FOR A MINIMUM OF FIVE MINUTES. THE MINIMUM TEST PRESSURE SHALL BE 100 PSIG.

(b) AFTER THE REINFORCEMENT PAD OR SLEEVE IS WELDED IN PLACE AND PRIOR TO TAPPING THE HEADER, THE ASSEMBLY SHALL BE TESTED TO AT LEAST 1.5 TIMES THE MOAP OF THE HEADER. DO NOT TEST MORE THAN 1.6 TIMES THE MOAP OF THE HEADER. THE LIMITATIONS IN NOTE 1 SHALL BE OBESERVED. THE TEST DURATION IS ~~FIVE~~ given IN THE TABLE ABOVE.

(19) INSTALLATION OF LINE STOPPER FITTINGS:
(a) AFTER THE FITTING HAS BEEN COMPLETELY WELDED TO THE HEADER AND PRIOR TO TAPPING THE HEADER, THE FITTING SHALL BE TESTED TO 1.5 TIMES THE MAOP OF THE HEADER.

(b) DO NOT TEST MORE THAN 1.6 TIMES THE MAOP OF THE HEADER. THE TEST DURATION IS GIVEN IN THE TABLE ABOVE.

DESIGN AND TEST REQUIREMENTS	PG&E CO.	DRAWING NUMBER	REV.
	SHEET 2 OF 2 SHEETS	284283	3 4
		MICROFILM	