

GPTC GUIDE FOR GAS TRANSMISSION AND DISTRIBUTION PIPING SYSTEMS

2003 EDITON

ADDENDUM NO. 10, December 2007

The changes in this addendum are marked by wide vertical lines inserted to the left of modified text, overwriting the left border of most tables, and use of a block symbol (■) where needed. The Federal Regulations were changed by one amendment action that affected one section of the Guide. Eight transactions affected 16 sections of the Guide.

Editorial updates include application of the Editorial Guidelines, updating reference titles, adjustments to page numbering, and adjustment of text on pages. While only significant editorial updates are marked, all affected pages carry the current addendum footnote. Editorial updates affected 17 sections of the Guide.

The following table shows the affected sections, the pages to be removed, and their replacement pages.

.....

FS Amendment - Amdt. Number
New or Updated GM - TR Number
GM Under Review - GMUR
Editorial Update – EU

Guide Section	Reason For Change	Pages to be Removed	Replacement Pages
Title Page	EU	i/ii	i/ii
Contents	EU	v/vi thru ix/x	v/vi thru ix/x
Historical Reconstruction of Part 192	Amdt RIN 2137-AE17	xxiii/xxiv, xxix/xxx	xxiii/xxiv, xxix/xxx
Historical Record of Amdts to Part 192	Amdt RIN 2137-AE17	xlix/l	xlix/l
GPTC Membership	EU	li/lii thru lix/lx	li/lii thru lix/lx
Subpart A 192.1	TR 04-08	11/12	11/12
192.3	TR 02-30	17/18	17/18
192.11	TR 04-08	28(c)/28(d)	28(c)/28(d)
Subpart F 192.273	EU, TR 03-07	97/98 thru 107/108	97/98 thru 107/108
192.281	EU		
192.283	EU		
Subpart G 192.321	EU, TR 04-19	117/118 thru 123/124	117/118 thru 123/124
192.325	EU		
Subpart H 192.353	EU, TR 03-35	125/126 thru 141/142	125/126 thru 142(a)/142(b)
192.355	EU		
192.357	EU, TR 02-30, TR 03-07		
192.361	EU, TR 02-30, TR 03-07, TR 07-07		
192.363	EU		
192.365	EU		
192.367	TR 07-07		
192.375	TR 03-35		
192.377	EU		
192.381	EU, TR 02-30		
192.383	EU		
Subpart L 192.616	Amdt RIN 2137-AE17	211/211(a) thru 215/216	211/211(a) thru 215/216
Subpart M 192.727	TR 02-30	239/240	239/240
Subpart O 192.911	TR 04-37	262(q)/262(r)	262(q)/262(r) and 262(r-1)/262(r-2)
GMA G-192-1	TR 03-07, TR 04-08	319/320, 323/324, 326(e)/326(f)	319/320, 323/324, 326(e)/326(f)
GMA G-192-17	TR 01-13	409/410, 411/412	409/410, 411/412
GMA G-192-21	TR 04-19	423/424	423/424

Guide for Gas Transmission and Distribution Piping Systems

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PLEASE NOTE

Addenda to this Guide will also be issued in loose-leaf format so that users will be able to keep the Guide up-to-date by replacing the pages that have been revised with the new pages. It is advisable, however, that pages which have been revised be retained so that the chronological development of the Federal Regulations and the Guide is maintained.

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Amdt 192-	Subject	Vol FR Pg#	Published Date	Docket No.	Effective Date	Affected Sections 192.
102	Gas Gathering Line Definition	71 FR 13289	03/15/06	RIN 2137- AB15	04/14/06	1, 7, 8, 9, 13, 452, 619
103	Update of Regulatory References to Technical Standards	71 FR 33402	06/09/06	RIN 2138- AD68	07/10/06	7, 121, 123, 145, 225, 227, 229, 241, 283, 616, 619, Header before 761, Subpart O Header, 903, 907, 911, 913, 917, 921, 923, 925, 927, 929, 931, 933, 935, 937, 939, 945, App. B
103 [Amended]	Update of Regulatory References to Technical Standards [Amending that published [06/09/06]	72 FR 4655	02/01/07	RIN 2137- AD68	03/05/07	1, 7, 227, 727, 903, 949, 951
[No Amdt No.]	Design and Construction Standards to Reduce Internal Corrosion in Gas Transmission Pipelines	72 FR 20055	04/23/07	RIN 2137- AE09	05/23/07	143, 476

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Amdt 192-	Subject	Vol FR Pg#	Published Date	Docket No.	Effective Date	Affected Sections 192.
104	Integrity Management Program Modifications and Clarifications	72 FR 39012	07/17/07	RIN 2137- AE07	08/16/07	933
[No Amdt No.]	Applicability of Public Awareness Regulations to Certain Gas Distribution Operators	72 FR 70808	12/13/07	RIN 2137- AE17	01/14/08	616
* Issued as a Direct Final Rule (DFR).						

GAS PIPING TECHNOLOGY COMMITTEE MEMBERSHIP LIST

Abbreviations: Chairperson: Chair First Vice Chairperson: 1 st V Chair Second Vice Chairperson: 2 nd V Chair Secretary: Sec Damage Prevention - Emergency Response: DP/ER Operation and Maintenance: O&M	Main Body	DIVISIONS			TASK GROUPS					SECTIONS			
		Distribution	Manufacturers	Transmission	Design	DP/ER	IMP/Corrosion	O&M/OQ	Plastic Pipe	Editorial	Executive	Liaison	Regulations
Abraham, Richard A. Marathon Pipe Line LLC, Findlay, OH	X	X				X				X			
Affonso, Joaquin J. Consumers Energy, Jackson, MI	X			X		X	X						
Alexander, Thomas D. Willbros Engineers, Inc., Tulsa, OK	X			X	X								
Arita, Richard T. Pacific Gas & Electric Co., Walnut Creek, CA		X			X			X					
Armstrong, Glen F. EN Engineering, Woodridge, IL	X	Chair				X	X		X		X		X
Ashcraft, Nicholas D. Kiefner & Associates, Worthington, OH		X					X						
Barkei, David E. We Engeries, Milwaukee, WI		X			X		X						
Beaver, Brett Advantica, Mechanicsburg, PA		X			X		X						
Becken, Robert C. Energy Experts International, Pleasant Hill, CA	X			X	X			X					
Benedict, Andrew G. Opvantek, Inc., Newtown, PA		X						X					
Bennett, Frank M. PPL Gas Utilities Corp., Lancaster, PA		X				X	X						

GAS PIPING TECHNOLOGY COMMITTEE MEMBERSHIP LIST

(Continued)

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Bervers, Bruce S. Williams Gas Pipeline, Houston, TX				X		X		X					
Blaney, Steven D. NY State Dept. of Public Service, Albany, NY	X	X				X	X			X			
Booth, Lloyd E. Southern Cross Corp., Coppell, TX			X		X			X					
Boros, Stephen Plastics Pipe Institute, Irving, TX			X						X				
Borski, Lawrence W. Transcontinental Gas Pipe Line Corp., Houston, TX				X				X					
Breaux, David A. Broen, Inc., Birmingham, AL			X		X			X					
Brown, Charles E. NTH Consultants, Ltd., Lansing, MI		X				X		X					
Bull, David E. ViaData LP, Tobyhanna, PA	X	X				Sec		X					
Cabot, Paul W. American Gas Association, Washington, DC	Sec										Sec		
Cadorin, Robert J. TransCanada Corp., Troy, MI	X			Sec				X					

GAS PIPING TECHNOLOGY COMMITTEE MEMBERSHIP LIST

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Cardin, Jeanne L. Southwest Gas Corp., Las Vegas, NV				X			X						
Carey, Willard S. Public Service Elec. & Gas Co., Newark, NJ	X	X				X		Chair			X		
Chin, John S. TransCanada Corp., Farmington Hills, MI	X			X	X	X	Chair				X		X
Clarke, Allan M. Spectra Energy Corp., Houston, TX				X	X	X	X						
Cody, Leo T. KeySpan Energy Delivery, Waltham, MA		X				X		X					
Craig, Jim M. McElroy Manufacturing, Inc., Tulsa, OK			X					X	X				
Del Buono, Amerigo J. Steel Forgings, Inc., League City, TX	X		X										
DeVore, James C. Consultant, Green Valley, AZ			X		X		X		X				
Dockweiler, Kenneth D. SourceGas Distribution LLC, Casper, WY	X			X		X		X					
Dolezal, Denise L. Metropolitan Utilities District, Omaha, NE		X			X		X						
Duncombe, Lauri Williams Gas Pipeline, Salt Lake City, UT				X	X			X					

GAS PIPING TECHNOLOGY COMMITTEE MEMBERSHIP LIST

(Continued)

	Main Body	DIVISIONS			TASK GROUPS					SECTIONS			
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Erickson, John P. American Public Gas Association, Washington, DC		X						X					
Faulkenberry, Michael J. Avista Utilities Corp., Spokane, WA		X			X			X					
Fleet, F. Roy F. Roy Fleet, Inc., Westmont, IL	X			X		X				X			
Frantz, John H. Consultant, Philadelphia, PA	X										X	Chair	
Frederick, Victor M., III Utility Line Services, Conshohocken, PA		X						X	X				
Friend, Mary S. Columbia Gas Trmn. Corp., Charleston, WV				X		X		X					
Fuller, William R. Xcel Energy Inc., Denver, CO	X	X			X		X		X				
Galante, Julie CYCLA Corp., Springfield, VA		X					X						
Gilchrist, Hart Intermountain Gas Co., Boise, ID		X						X					
Goble, Gregory H. R. W. Lyall & Co., Corona, CA	X		X		X				X				
Groeber, Steve A. Philadelphia Gas Works, Philadelphia, PA		X				X		X	X	X			
Gunther, Karl M. NTSB, Washington, DC	X	X							X				

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GAS PIPING TECHNOLOGY COMMITTEE MEMBERSHIP LIST

(Continued)

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Hansen, James P. Elster Perfection Corp., Madison, OH			X				X						
Hart, Thomas L. NSTAR Electric & Gas Corp., Westwood, MA		X				X		X					
Hazelden, Glyn Hazelden Group, Oak Park, IL		X				X		X					
Heintz, James R. UGI Utilities, Inc., Reading, PA	1 st V Chair										Chair		
Henningsgaard, David R. CenterPoint Energy, Minneapolis, MN		X			X	X		X					
Henry, Jill A. Ohio PUC, Columbus, OH	X	X				X			X				
Hotinger, James M. VA State Corp. Comm., Richmond, VA		X				X	X						
Humes, Dennis W. Mueller Co.- Gas Products Div., Decatur, IL	X		X										X
Hurbanek, Stephen F. Pennsylvania PUC, Harrisburg, PA		X				X							
Huriaux, Richard D. PHMSA - OPS, Washington, DC	X			X			X						
Kottwitz, John D. MO Public Service Comm., Jefferson City, MO	X	X				Chair		X		X	X		

GAS PIPING TECHNOLOGY COMMITTEE MEMBERSHIP LIST

(Continued)

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Krummert, Lawrence M. Columbia Gas of PA, Inc., New Castle, PA		X						X					
Lathrap, Philip A. Consultant, Lafayette, CA	X	X			X	X		X					
Lewis, Raymond D. Rosen USA, Houston, TX	X			X			X						
Loker, Jon O. Pipeline Safety Consultant, Saint Albans, WV	X			X						Chair	X		
Lomax, George S. Heath Consultants Inc., Montoursville, PA	X		X			X		X					
Lopez, Paul El Paso Corp., Colorado Springs, CO				X				X					
Lueders, John D. DTE Energy - MichCon, Grand Rapids, MI		X				X		X					
Mackay-Smith, Seth UMAC Inc., Malvern, PA	X		X		X	X							
Marek, Marti Southwest Gas Corp., Las Vegas, NV	Chair										X		
McKenzie, James E. Atmos Energy Corp., Jackson, MS		X					X						
Miller, D. Lane Transportation Safety Inst., Oklahoma City, OK	X	X					X		X	Sec			
Modha, Kirit Iroquois Pipeline Operating Co., Shelton, CT				X			X						

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GAS PIPING TECHNOLOGY COMMITTEE MEMBERSHIP LIST

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Naper, Robert C. KeySpan Energy Delivery, Waltham, MA		X				X							
Oleksa, Paul E. Oleksa & Assoc., Akron, OH	X	X			X		X			X			
Palermo, Eugene F. Palermo Plastics Pipe Consulting, Friendsville, TN	X		X		X				X				
Peters, Kenneth C. El Paso Corp. Pipeline Group, Birmingham, AL	X			Chair		X		Sec			X		
Pioli, Christopher A. Jacobs Consultancy, Pasadena, CA		X			X	X	X						
Quezada, Leticia Nicor Gas, Naperville, IL	X	X				X			X		X		Chair
Reynolds, Donald Lee NiSource Corporate Services, Columbus, OH		X			Chair		X				X		
Schmidt, Robert A. Hackney Ladish Inc., Russellville, AR	X		Chair		X						X		
Scott, Edward W. Ameren Illinois Utilities, Pawnee, IL		X					X		X				
Seamands, Patrick A. Laclede Gas Co., Saint Louis, MO		X				X			X	X			

GAS PIPING TECHNOLOGY COMMITTEE MEMBERSHIP LIST

(Continued)

	Main Body	DIVISIONS			TASK GROUPS					SECTIONS			
		Distribution	Manufacturers	Transmission	Design	DP/ER	IMP/Corrosion	O&M/OQ	Plastic Pipe	Editorial	Executive	Liaison	Regulations
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Sher, Philip CT Dept. Public Utility Control, New Britain, CT	2 nd V Chair							X					
Siedlecki, Walter AEGIS Insurance Services, Inc., East Rutherford, NJ		X											
Slagle, Richard Vectren Energy Delivery, Evansville, IN	X	Sec				X			Chair		X		
Sprenger, Roger W. San Diego Gas & Elec. Co., San Diego, CA		X				X		X					
Themig, Jerome S. Ameren Services Co., Pawnee, IL		X				X		X					
Torbin, Robert N. Cutting Edge Solutions LLC, Framingham, MA		X					X						
Troch, Steven J. Baltimore Gas & Electric Co., Baltimore, MD		X					X						
Ulanday, Alfredo S. Integrus Gas, Chicago, IL		X				X		X					
Veerapaneni, Ram DTE Energy – MichCon, Detroit, MI				X		X	X			X			
Vetter, Daniel J. GTI – Gas Technology Institute, Des Plaines, IL		X				X		X					
Volgstadt, Frank R. Volgstadt & Associates, Madison, OH	X		Sec						Sec				

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Weber, David E. Consultant Engineer, Barnstable, MA	X	X							X	X			
Wells, William M. New Jersey Natural Gas, Neptune, NJ		X				X		X					
White, Gary R. PI Confluence, Inc., Houston, TX		X					X						
Wilkes, Alfred L. Performance Pipe, Plano, TX			X		X				X				
Zapalac, Daniel P. R.W. Lyall & Co., Inc., Corona, CA			X						X				

Reserved

PART 192

MINIMUM FEDERAL SAFETY STANDARDS

Authority: 49 U.S.C. 5103, 60102, 60104, 60108, 60109, 60110, 60113, and 60118; and 49 CFR 1.53.

Source: 35 FR 13257, Aug. 19, 1970, unless otherwise noted.

SUBPART A GENERAL

§192.1

What is the scope of this part?

[Effective Date: 3-05-07]

(a) This part prescribes minimum safety requirements for pipeline facilities and the transportation of gas, including pipeline facilities and the transportation of gas within the limits of the outer continental shelf as that term is defined in the Outer Continental Shelf Lands Act (43 U.S.C. 1331).

(b) This part does not apply to—

(1) Offshore gathering of gas in State waters upstream from the outlet flange of each facility where hydrocarbons are produced or where produced hydrocarbons are first separated, dehydrated, or otherwise processed, whichever facility is farther downstream;

(2) Pipelines on the Outer Continental Shelf (OCS) that are producer-operated and cross into State waters without first connecting to a transporting operator's facility on the OCS, upstream (generally seaward) of the last valve on the last production facility on the OCS. Safety equipment protecting PHMSA-regulated pipeline segments is not excluded. Producing operators for those pipeline segments upstream of the last valve of the last production facility on the OCS may petition the Administrator, or designee, for approval to operate under PHMSA regulations governing pipeline design, construction, operation, and maintenance under 49 CFR 190.9;

(3) Pipelines on the Outer Continental Shelf upstream of the point at which operating responsibility transfers from a producing operator to a transporting operator;

(4) Onshore gathering of gas—

(i) Through a pipeline that operates at less than 0 psig (0 kPa);

(ii) Through a pipeline that is not a regulated onshore gathering line (as determined in §192.8); and

(iii) Within inlets of the Gulf of Mexico, except for the requirements in §192.612; or

(5) Any pipeline system that transports only petroleum gas or petroleum gas/air mixtures to—

(i) Fewer than 10 customers, if no portion of the system is located in a public place; or

(ii) A single customer, if the system is located entirely on the customer's premises (no matter if a portion of the system is located in a public place).

[Amdt. 192-27, 41 FR 34598, Aug. 16, 1976; Amdt. 192-67, 56 FR 63764, Dec. 5, 1991; Amdt. 192-78, 61 FR 28770, June 6, 1996 with Amdt. 192-78 Correction, 61 FR 30824, June 18, 1996; Amdt. 192-81, 62 FR 61692, Nov. 19, 1997 with Amdt. 192-81 Confirmation, 63 FR 12659, Mar. 16, 1998; Amdt. 192-92, 68 FR 46109, Aug. 5, 2003; RIN 2137-AD77, 70 FR 11135, Mar. 8, 2005; Amdt. 192-102, 71 FR 13289, Mar. 15, 2006; Amdt. 192-103, 72 FR 4655, Feb. 1, 2007]

GUIDE MATERIAL

This guide material is under review following Amendment 192-102.

- (a) The guide material presented in this Guide includes information and some acceptable methods to assist the operator in complying with the Minimum Federal Safety Standards. The recommendations contained in the Guide are based on sound engineering principles, developed by a committee balanced in accordance with accepted committee procedures, and must be applied by the use of sound and competent engineering judgment. The guide material is advisory in nature and should not restrict the operator from using other methods of complying. In addition, the operator is cautioned that the guide material may not be adequate under all conditions encountered.
- (b) While the GPTC Guide is intended principally to serve natural gas pipelines, it is a valuable reference for other pipelines covered by Part 192. The user is cautioned that the unique properties and characteristics associated with other gases (e.g., density, corrosivity, and temperature extremes) may require special engineering, operations, and maintenance considerations. Operators of petroleum gas distribution and master meter systems may benefit from information provided in the "Training Guide for Operators of Small LP Gas Systems" (also referred to as "Guidance Manual") available at http://ops.dot.gov/regs/small_lp/SmallLPGas.htm.
- (c) As used in the Guide, the terms Personnel, Employees, and Workers refer to operator employees and, unless specifically noted otherwise, include other personnel used by operators to perform Part 192 functions.
- (d) The operator is responsible for the work of a contractor performing tasks covered under Part 192. The operator should ensure that contract personnel are familiar with applicable procedures prior to the start of work.
- (e) A reference for hydrogen pipelines is OPS Report No. DOT.RSPA/DMT-10-85-1, "Safety Criteria for the Operation of Gaseous Hydrogen Pipelines," (Discontinued).
- (f) For offshore pipelines, responsibilities have been assigned to the Department of Transportation and the Department of the Interior in accordance with their Memorandum of Understanding dated December 10, 1996 (Implemented per Federal Register, Vol. 62, No. 223, November 19, 1997). See Guide Material Appendix G-192-19.
- (g) Additional state requirements may exist for intrastate facilities.

§192.3

Definitions.

[Effective Date: 5-6-05]

As used in this part:

Abandoned means permanently removed from service.

Administrator means the Administrator, Pipeline and Hazardous Materials Safety Administration or his or her delegate.

Customer meter means the meter that measures the transfer of gas from an operator to a consumer.

Distribution line means a pipeline other than a gathering or transmission line.

Exposed underwater pipeline means an underwater pipeline where the top of the pipe protrudes above the underwater natural bottom (as determined by recognized and generally accepted practices) in waters less than 15 feet (4.6 meters) deep, as measured from mean low water.

Gas means natural gas, flammable gas, or gas which is toxic or corrosive.

Gathering line means a pipeline that transports gas from a current production facility to a transmission line or main.

Gulf of Mexico and its inlets means the waters from the mean high water mark of the coast of the Gulf of Mexico and its inlets open to the sea (excluding rivers, tidal marshes, lakes, and canals).

Maximum allowable hoop stress is the maximum hoop stress permitted for the design of a piping system. It depends upon the material used, the class location of the pipe, and the operating conditions. See also *Hoop stress*.

Maximum allowable test pressure is the maximum internal fluid pressure permitted for testing, for the materials and class location involved.

Meters. See *Customer meter and Meter set assembly*.

Meter set assembly is that exposed portion of the service line extending from the service line riser valve to the connection of the customer's fuel line, including the meter, and (if present) the regulator and relief vent line. In the absence of a service line riser valve, the meter set assembly starts at the first exposed fitting. The meter set assembly does not include the customer's buried or exposed fuel line.

Monitoring regulator is a pressure regulator, set in series with another pressure regulator, for the purpose of providing automatic overpressure protection in the event of a malfunction of the primary regulator.

Nodular iron. See *Ductile iron*.

Nominal outside diameter (D) is the outside diameter, in inches, as listed in Table 192.105i for nominal pipe size 12 inches and less, and is the same as the nominal pipe size greater than 12 inches. It is used in the design formula for steel pipe in §192.105 and the calculation for hoop stress.

Nominal wall thickness (t) is the wall thickness, in inches, computed by, or used in, the design formula for steel pipe in §192.105. Pipe may be ordered to this computed wall thickness without adding an allowance to compensate for the under-thickness tolerances permitted in approved specifications.

Operating stress is the stress in a pipe or structural member under normal operating conditions.

Overpressure protection is the use of a device or equipment installed for the purpose of preventing pressure in a pipe system or other facility from exceeding a predetermined limit. See also *Pressure limiting station*, *Pressure regulating station*, *Pressure relief station*, and *Service regulator*.

Parallel encroachment pertains to that portion of the route of a transmission line or main that lies within, runs in a generally parallel direction to, and does not necessarily cross, the rights-of-way of a road, street, highway, or railroad.

Pipe. See *Bell-welded pipe*, *Cold expanded pipe*, *Continuous-welded pipe*, *Control piping*, *Double-submerged-arc-welded pipe*, *Electric-flash-welded pipe*, *Electric-fusion-welded pipe*, *Electric-resistance-welded pipe*, *Furnace-butt-welded pipe*, *Furnace-lap-welded pipe*, *Instrument piping*, *Length*, *Pipe-container*, *Pipe manufacturing processes*, *Pipe-type holder*, *Sample piping*, and *Seamless pipe*.

Pipe-container is a gastight structure assembled from pipe and end closures. See also *Pipe-type holder*.

Pipe manufacturing processes. A reference is ASME I00396 "History of Line Pipe Manufacturing in North America." Types and names of welded joints are used herein as defined in the American Welding Society (AWS) Publication A3.0 "Standard Welding Terms and Definitions" except for the following terms which are defined in this glossary.

- Bell-welded pipe*
- Continuous-welded pipe*
- Double-submerged-arc-welded pipe*
- Electric-flash-welded pipe*
- Electric-fusion-welded pipe*
- Electric-resistance-welded pipe*
- Furnace-butt-welded pipe*
- Furnace-lap-welded pipe*
- Seamless pipe*

Pipe-type holder is any pipe-container or group of interconnected pipe-containers installed at one location for the sole purpose of storing gas. See also *Pipe-container*.

Plastic (noun) is a material that contains one or more organic polymeric substances of high molecular weight as an essential ingredient, is solid in its finished state, and can be shaped by flow at some stage of its manufacture or processing into finished articles. The two general types of plastic referred to in this Guide are thermoplastic and thermosetting. See also *Thermoplastic* and *Thermosetting plastic*.

Plastic pipe joints. See *Adhesive joint*, *Heat fusion joint*, and *Solvent cement joint*.

Pressure (expressed in pounds per square inch above atmospheric pressure, i.e., gauge pressure (abbreviation: psig), unless otherwise stated). See also *Maximum allowable test pressure*, *Overpressure protection*, *Pressure limiting station*, *Pressure regulating station*, *Pressure relief station*, and *Standup pressure test*.

Pressure limiting station consists of apparatus which, under abnormal conditions, will act to reduce, restrict or shut off the supply of gas flowing into a transmission line, main, holder, pressure vessel or compressor station piping in order to prevent the gas pressure from exceeding a predetermined limit. While normal pressure conditions prevail, the pressure limiting station may exercise some degree of control of the flow of gas or may remain in the wide-open position. Included in the station are any enclosures and ventilating equipment, and any piping and auxiliary equipment, such as valves, control instruments, or control lines.

Pressure regulating station consists of apparatus installed for the purpose of automatically reducing and regulating the gas pressure in the downstream transmission line, main, holder, pressure vessel or compressor station piping to which it is connected. Included in the station are any enclosures and ventilating equipment, and any piping and auxiliary equipment, such as valves, control instruments, or control lines.

Pressure relief station consists of apparatus installed to vent gas from a transmission line, main, holder, pressure vessel, or compressor station piping in order to prevent the gas pressure from exceeding a predetermined limit. The gas may be vented into the atmosphere or into a lower pressure gas system capable of safely receiving the gas being discharged. Included in the station are any enclosures and ventilating equipment, and any piping and auxiliary equipment, such as valves, control instruments, or control lines.

Private rights-of-way are those that are not located on roads, streets or highways used by the public, or on railroad rights-of-way.

Proprietary items are items made by a company having the exclusive right of manufacture.

Public place is a place that is generally open to all persons in a community as opposed to being restricted to specific persons. A public place includes churches, schools, and commercial property, as well as any publicly owned right-of-way or property that is frequented by people.

Regulators. See *Pressure limiting station*, *Pressure regulating station*, *Pressure relief station*, and *Service regulator*.

Sample piping is pipe, valves, and fittings used for the collection of samples of gas or other fluids.

SCADA is supervisory control and data acquisition. SCADA is a remote control system that allows the transmission of data from a remote site (e.g., a delivery point) to a central control location. SCADA systems are used to monitor and control flow, pressure, and other parameters of the pipeline system. SCADA systems may generate an alarm when an event has occurred or an unusual situation is developing.

Seamless pipe is a wrought tubular product made without a welded seam. It is manufactured by hot working steel or, if necessary, by subsequently cold finishing the hot-worked tubular product to produce the desired shape, dimensions, and properties. See also *Pipe manufacturing processes*.

Secondary stress is stress created in the pipe wall by loads other than internal fluid pressure. Examples are backfill loads, traffic loads, beam action in a span and loads at supports and at connections to the pipe.

Service line valve is a valve located in the service line ahead of the service regulator, or ahead of the meter where there is no regulator.

Solvent cement joint is a joint made in PVC piping by using solvent cement to join the piping components.

Standup pressure test is a test to demonstrate that a pipe or piping system does not leak as evidenced by the lack of a drop in pressure over a specified period of time after the source of pressure has been isolated.

Steel is an iron-base alloy, malleable in some temperature range as initially cast, containing manganese, carbon, and often other alloying elements. See also *Carbon steel*.

Stress is the resultant internal force that resists change in the size or shape of a body acted on by external forces. See also *Hoop stress*, *Maximum allowable hoop stress*, *Operating stress*, *Secondary stress*, *Tensile strength*, and *Yield strength*.

Temperature (expressed in degrees Fahrenheit (°F) unless otherwise stated). See also *Ambient temperature* and *Ground temperature*.