October 16, 2018

Dear *Guide* Purchaser,


On behalf of the Gas Piping Technology Committee and the American Gas Association, thank you for your purchase and interest in the *Guide*.

Sincerely,

Secretary
GPTC Z380
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, or a block symbol (▌) where needed. There were no Federal Regulation updates for this period. Five GPTC transactions affected 4 sections of the Guide.

Editorial updates include application of the Editorial Guidelines, 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 as indicated “EU” affected 3 sections of the Guide (plus other sections impacted by page adjustments, etc.).

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

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**Key to Reasons for Change**

Amdt.19X-XXX or docket number: federal regulation amendment

TRYY-XX: GPTC transaction with new or updated guide material

EU: editorial update

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PLEASE NOTE
Addenda to this Guide will also be issued periodically to enable users 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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As part of document purchase, GPTC (using AGA as Secretariat) will try to keep purchasers informed on the current Federal Regulations as released by the Department of Transportation (DOT). This is done by periodically issuing addenda to update both the Federal Regulations and the guide material. It is the responsibility of the purchaser to obtain a copy of any addenda. Addenda are posted on the Committee’s webpage at www.aga.org/gptc. The GPTC assumes no responsibility in the event the purchaser does not obtain addenda. The purchaser is reminded that the changes to the Regulations can be found on the Federal Register’s web site.

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Committee Scope

The Gas Piping Technology Committee (GPTC) is an independent technical group of individuals with expertise in, and concern for, natural gas pipeline safety and is responsible for:

- Developing and maintaining ANSI Technical Reports regarding the application of natural gas pipeline technology and operating or maintenance practices.
- Promoting the use of voluntary consensus standards.
• Petitioning the United States Department of Transportation (DOT) for changes in Federal Natural Gas Pipeline Safety Regulations based on the technical expertise of the GPTC.
• When deemed appropriate by the Main Body, commenting on Advanced Notice of Proposed Rulemakings, Notice of Proposed Rulemakings, Final Rules, and other regulatory notices issued by DOT involving such regulations.
• Reviewing applicable National Transportation Safety Board (NTSB) reports, DOT and State Pipeline Safety Agency incident reports, and taking appropriate action including that of responding to recommendations issued to the GPTC.
• Taking such actions that are necessary and proper to further the safe application of natural gas pipeline technology.
### GAS PIPING TECHNOLOGY COMMITTEE: Listed by Member Participation

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**GAS PIPING TECHNOLOGY COMMITTEE: Listed by Member Participation (Continued)**

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PART 192

MINIMUM FEDERAL SAFETY STANDARDS


SUBPART A

GENERAL

§192.1
What is the scope of this part?

[Effective Date: 03/05/07]

(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).

1 GPTC GUIDE

(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 guide operators of natural gas pipelines, it is a valuable reference for operators of other pipelines covered by Part 192. The user is cautioned that the unique properties and characteristics associated with other gases (e.g., toxicity, density, corrosivity, and temperature extremes) may require special engineering, operations, and maintenance considerations. Also, the unique properties and toxicity of other gases can represent significant hazards that need to be considered but are not specifically addressed in the Guide. Operators of petroleum gas distribution systems may benefit from information provided in the "Guidance Manual for Operators of LP Gas Systems" available at https://www.phmsa.dot.gov/training/pipeline/guidance-manuals.

(c) As used in the Guide, the terms Personnel, Employees, and Workers refer to operator employees and, unless specifically noted otherwise, include other personnel (e.g. contractors) used by operators to perform Part 192 functions.

2 STATE REQUIREMENTS


3 CONTRACTORS

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.

4 OFFSHORE PIPELINES

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.

5 HYDROGEN PIPELINES


6 OSHA STANDARDS
The Occupational Safety and Health Administration has issued letters regarding application of their standards to working conditions that are regulated by PHMSA-OPS. See Guide Material Appendix G-192-21.

7 SPECIAL PERMITS

PHMSA-OPS considers applications from operators for special permits ( waivers) under §190.341 to use new technologies, alternative design, materials, or inspection frequencies providing the resulting level of safety is comparable to or exceeds that in the current regulations. See guide material under §§192.107, 192.328, 192.611, 192.939, 192.943, and 192.1013.

Note: A “special permit” was previously referred to as a “waiver” by PHMSA-OPS. State terminology may differ (e.g., waiver, variance).

§192.3 Definitions.

[Effective Date: 01/18/17]

As used in this part:

Abandoned means permanently removed from service.

Active corrosion means continuing corrosion that, unless controlled, could result in a condition that is detrimental to public safety.

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

Alarm means an audible or visible means of indicating to the controller that equipment or processes are outside operator-defined, safety-related parameters.

Control room means an operations center staffed by personnel charged with the responsibility for remotely monitoring and controlling a pipeline facility.

Controller means a qualified individual who remotely monitors and controls the safety-related operations of a pipeline facility via a SCADA system from a control room, and who has operational authority and accountability for the remote operational functions of the pipeline facility.

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.

Electrical survey means a series of closely spaced pipe-to-soil readings over pipelines which are subsequently analyzed to identify locations where a corrosive current is leaving the pipeline.

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) seaward to include the territorial sea and Outer Continental Shelf to a depth of 15 feet (4.6 meters), as measured from the mean low water.

Hazard to navigation means, for the purposes of this part, a pipeline where the top of the pipe is less than 12 inches (305 millimeters) below 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 the mean low water.

High pressure distribution system means a distribution system in which the gas pressure in the main is higher than the pressure provided to the customer.
**Line section** means a continuous run of transmission line between adjacent compressor stations, between a compressor station and storage facilities, between a compressor station and a block valve, or between adjacent block valves.

**Listed specification** means a specification listed in section I of Appendix B of this part.

**Low-pressure distribution system** means a distribution system in which the gas pressure in the main is substantially the same as the pressure provided to the customer.

**Main** means a distribution line that serves as a common source of supply for more than one service line.

**Maximum actual operating pressure** means the maximum pressure that occurs during normal operations over a period of 1 year.

**Maximum allowable operating pressure (MAOP)** means the maximum pressure at which a pipeline or segment of a pipeline may be operated under this part.

**Municipality** means a city, county, or any other political subdivision of a state.

**Offshore** means beyond the line of ordinary low water along that portion of the coast of the United States that is in direct contact with the open seas and beyond the line marking the seaward limit of inland waters.

**Operator** means a person who engages in the transportation of gas.

**Outer Continental Shelf** means all submerged lands lying seaward and outside the area of lands beneath navigable waters as defined in Section 2 of the Submerged Lands Act (43 U.S.C. 1301) and of which the subsoil and seabed appertain to the United States and are subject to its jurisdiction and control.

**Person** means any individual, firm, joint venture, partnership, corporation, association, state, municipality, cooperative association, or joint stock association, and including any trustee, receiver, assignee, or personal representative thereof.

**Petroleum gas** means propane, propylene, butane, (normal butane or isobutanes), and butylene (including isomers), or mixtures composed predominantly of these gases, having a vapor pressure not exceeding 208 psi (1434 kPa) gage at 100 °F (38 °C).

**Pipe** means any pipe or tubing used in the transportation of gas, including pipe-type holders.

**Pipeline** means all parts of those physical facilities through which gas moves in transportation, including pipe, valves, and other appurtenance attached to pipe, compressor units, metering stations, regulator stations, delivery stations, holders, and fabricated assemblies.

**Pipeline environment** includes soil resistivity (high or low), soil moisture (wet or dry), soil contaminants that may promote corrosive activity, and other known conditions that could affect the probability of active corrosion.

**Pipeline facility** means new and existing pipelines, rights-of-way, and any equipment, facility, or building used in the transportation of gas or in the course of transportation.

**Service line** means a distribution line that transports gas from a common source of supply to an individual customer, to two adjacent or adjoining residential or small commercial customers, or to multiple residential or small commercial customers served through a meter header or manifold. A service line ends at the outlet of the customer meter or at the connection to a customer's piping, whichever is further downstream, or at the connection to customer piping if there is no meter.

**Service regulator** means the device on a service line that controls the pressure of gas delivered from a higher pressure to the pressure provided to the customer. A service regulator may serve one customer or multiple customers through a meter header or manifold.

**SMYS** means specified minimum yield strength is:

1. For steel pipe manufactured in accordance with a listed specification, the yield strength specified in that specification; or

2. For steel pipe manufactured in accordance with an unknown or unlisted specification, the yield strength determined in accordance with §192.107(b).

**State** means each of the several states, the District of Columbia, and the Commonwealth of Puerto Rico.

**Supervisory Control and Data Acquisition (SCADA) system** means a computer-based system or systems used by a controller in a control room that collects and displays information about a pipeline.
facility and may have the ability to send commands back to the pipeline facility.

Transmission line means a pipeline, other than a gathering line, that: (1) Transports gas from a gathering line or storage facility to a distribution center, storage facility, or large volume customer that is not down-stream from a distribution center; (2) operates at a hoop stress of 20 percent or more of SMYS; or (3) transports gas within a storage field.

Note: A large volume customer may receive similar volumes of gas as a distribution center, and includes factories, power plants, and institutional users of gas.

Transportation of gas means the gathering, transmission, or distribution of gas by pipeline or the storage of gas, in or affecting interstate or foreign commerce.

Underground natural gas storage facility means a facility that stores natural gas in an underground facility incident to natural gas transportation, including—
(1) A depleted hydrocarbon reservoir;
(2) An aquifer reservoir; or
(3) A solution-mined salt cavern reservoir, including associated material and equipment used for injection, withdrawal, monitoring, or observation wells, and wellhead equipment, piping, rights-of-way, property, buildings, compressor units, separators, metering equipment, and regulator equipment.

Welder means a person who performs manual or semi-automatic welding.

Welding operator means a person who operates machine or automatic welding equipment.


GUIDE MATERIAL

Glossary of Commonly Used Terms
(For Glossary of Commonly Used Abbreviations, see Table 192.3i below.)

Abandoned pipeline is a pipeline that is physically separated from its source of gas and is no longer maintained under Part 192.

Abandonment is the process of abandoning a pipeline.

Adhesive joint is a joint made in thermosetting plastic piping by the use of an adhesive substance that forms a bond between the mating surfaces without dissolving either one of them.

Ambient temperature is the temperature of the surrounding medium, usually used to refer to the temperature of the air in which a structure is situated or a device operates. See also Ground Temperature and Temperature.

Bell-welded pipe is furnace-welded pipe that has a longitudinal butt joint that is forge-welded by the mechanical pressure developed in drawing the furnace-heated skelp through a cone-shaped die. The die, commonly known as a “welding bell,” serves as a combined forming and welding die. This type of pipe is produced in individual lengths from cut-length skelp. Typical specifications: ASTM A53, API Spec 5L. See also Furnace-butt-welded pipe and Pipe manufacturing processes.

Bottle is a gastight structure that is (1) completely fabricated by the manufacturer from pipe with integral drawn, forged, or spun end closures; and (2) tested in the manufacturer's plant. See also Bottle-type holder.

Bottle-type holder is any bottle or group of interconnected bottles installed in one location, and used for the
sole purpose of storing gas. See also *Bottle*.

*Carbon steel.* By common custom, steel is considered to be carbon steel where (i) no minimum content is specified or required for aluminum, boron, chromium, cobalt, columbium, molybdenum, nickel, titanium, tungsten, vanadium, zirconium, or any other element added to obtain a desired alloying effect; (ii) the specified minimum content for copper does not exceed 0.40 percent; or (iii) the specified maximum content does not exceed 1.65 percent for manganese, 0.60 percent for silicon or 0.60 percent for copper.

All carbon steels may contain small quantities of unspecified residual elements unavoidably retained from raw materials. These elements (copper, nickel, molybdenum, chromium, etc.) are considered incidental and are not normally determined or reported.

*Cast iron.* The unqualified term cast iron applies to gray-cast iron that is a cast ferrous material in which a major part of the carbon content occurs as free carbon in the form of flakes interspersed through the metal.

*Cold-expanded pipe* is seamless or welded pipe that is formed and then, expanded in the pipe mill while cold, so that the circumference is permanently increased by at least 0.50 percent.

*Compressor station* is a pipeline facility installed for the purpose of mechanically increasing the gas pressure on a pipeline system or for reducing back-pressure on upstream gas facilities to enhance flow. Other facilities that might be located at the same site but not actually part of the compressor station include measurement, treatment, processing, and pressure control.

*Continuous-welded pipe* is furnace-welded pipe which has a longitudinal butt joint that is forge-welded by the mechanical pressure developed in rolling the hot-formed skelp through a set of round pass welding rolls. It is produced in continuous lengths from coiled skelp and subsequently cut into individual lengths. Typical specifications (see §192.7): ASTM A53, API Spec 5L. See also *Furnace-butt-welded pipe* and *Pipe manufacturing processes*.

*Control piping* is pipe, valves, and fittings used to interconnect air, gas, or hydraulically operated control apparatus.

*Copper Tube Size (CTS)* is an alphanumeric sizing convention for copper or plastic components comprised of the letters CTS preceded by a dimensionless number (e.g., $\frac{1}{2}$ CTS). The CTS "size" is indirectly related to the nominal outside diameter used in the design of copper tubing (§192.125) or plastic tubing (§192.121). In all cases, the actual nominal outside diameter, using the CTS sizing convention, will measure 1/8 inch greater than the nominal CTS size. For example, $\frac{1}{2}$ CTS tubing has an actual nominal outside diameter of 0.625 inches ($0.500 + 0.125$ inch).

*Cross bore* is an intersection of an existing underground utility or underground structure by a second utility. This typically occurs when the use of trenchless technology results in direct contact between utilities or underground structures that compromises the integrity of either.

*Curb valve* is a type of service-line valve installed for the purpose of shutting off gas supply. It is typically installed below grade at or near the property line.

*Deactivation (Inactivation)* is the process of making the pipeline inactive.

*District regulator station or district pressure regulating station* is a pressure regulating station that controls pressure to a high- or low-pressure distribution main. It does not include pressure regulation whose sole function is to control pressure to a manifold serving multiple customers.

*Double submerged-arc-welded pipe* is a pipe having longitudinal or spiral butt joints. The joints are produced by at least two passes, including at least one each on the inside and on the outside of the pipe. Coalescence is produced by heating with an electric arc or arcs between the bare metal electrode or electrodes and the work. The welding is shielded by a blanket or granular, fusible material on the work. Pressure is not used and filler metal for the inside and outside welds is obtained from the electrode or electrodes. Typical specifications (see §192.7): ASTM A381, API Spec 5L. See also *Pipe manufacturing processes*.

*Dry gas* is gas above its dew point and without condensed liquids.

*Ductile iron* (sometimes called nodular iron) is a cast ferrous material in which the free graphite present is in a spheroidal form rather than a flake form. The desirable properties of ductile iron are achieved by means of chemistry and a ferritizing heat treatment of the castings.
moisture absorption and high electrical resistance.

(c) Each external protective coating must be inspected just prior to lowering the pipe into the ditch and backfilling, and any damage detrimental to effective corrosion control must be repaired.

(d) Each external protective coating must be protected from damage resulting from adverse ditch conditions or damage from supporting blocks.

(e) If coated pipe is installed by boring, driving, or other similar method, precautions must be taken to minimize damage to the coating during installation.

[Issued by Amdt. 192-4, 36 FR 12297, June 30, 1971]

GUIDE MATERIAL

1 REFERENCES

References are contained in Table 192.461i.

| REFERENCES |
|------------------|------------------|
| Federal Regulation | NACE Document ¹ |
| §192.461(a) | SP0169, Section 5 |
| §192.461(b) | SP0169, Section 5 |
| §192.461(c) | SP0274 |
| §192.461(d) | SP0169, Section 5 |
| | RP0375, Section 5 |

¹ For document titles, see Guide Material Appendix G-192-1, Section 1.9.

TABLE 192.461i

2 BORING OR DRIVING (§192.461(e))

See 2 of the guide material under §192.361.

§192.463

External corrosion control: Cathodic protection.

[Effective Date: 08/01/71]

(a) Each cathodic protection system required by this subpart must provide a level of cathodic protection that complies with one or more of the applicable criteria contained in Appendix D of this subpart. If none of these criteria is applicable, the cathodic protection system must provide a level of cathodic protection at least equal to that provided by compliance with one or more of these criteria.

(b) If amphoteric metals are included in a buried or submerged pipeline containing a metal of different anodic potential —

(1) The amphoteric metals must be electrically isolated from the remainder of the pipeline and cathodically protected; or

(2) The entire buried or submerged pipeline must be cathodically protected at a cathodic potential that meets the requirements of Appendix D of this part for amphoteric metals.
(c) The amount of cathodic protection must be controlled so as not to damage the protective coating or the pipe.

[Issued by Amdt. 192-4, 36 FR 12297, June 30, 1971]

GUIDE MATERIAL

Amphoteric metal, as defined in NACE SP0169, is a metal that is susceptible to corrosion in both acid and alkaline environments (e.g., aluminum and copper).

§192.465
External corrosion control: Monitoring.

[Effective Date: 10/01/10]

(a) Each pipeline that is under cathodic protection must be tested at least once each calendar year, but with intervals not exceeding 15 months, to determine whether the cathodic protection meets the requirements of §192.463. However, if tests at those intervals are impractical for separately protected short sections of mains or transmission lines, not in excess of 100 feet (30 meters), or separately protected service lines, these pipelines may be surveyed on a sampling basis. At least 10 percent of these protected structures, distributed over the entire system must be surveyed each calendar year, with a different 10 percent checked each subsequent year, so that the entire system is tested in each 10-year period.

(b) Each cathodic protection rectifier or other impressed current power source must be inspected six times each calendar year, but with intervals not exceeding 2½ months, to ensure that it is operating.

(c) Each reverse current switch, each diode, and each interference bond whose failure would jeopardize structure protection, must be electrically checked for proper performance six times each calendar year, but with intervals not exceeding 2½ months. Each other interference bond must be checked at least once each calendar year, but with intervals not exceeding 15 months.

(d) Each operator shall take prompt remedial action to correct any deficiencies indicated by the monitoring.

(e) After the initial evaluation required by §§192.455(b) and (c) and 192.457(b), each operator must, not less than every 3 years at intervals not exceeding 39 months, reevaluate its unprotected pipelines and cathodically protect them in accordance with this subpart in areas in which active corrosion is found. The operator must determine the areas of active corrosion by electrical survey. However, on distribution lines and where an electrical survey is impractical on transmission lines, areas of active corrosion may be determined by other means that include review and analysis of leak repair and inspection records, corrosion monitoring records, exposed pipe inspection records, and the pipeline environment.

§192.471
External corrosion control: Test leads.

(Effective Date: 08/01/71)

(a) Each test lead wire must be connected to the pipeline so as to remain mechanically secure and electrically conductive.
(b) Each test lead wire must be attached to the pipeline so as to minimize stress concentration on the pipe.
(c) Each bared test lead wire and bared metallic area at point of connection to the pipeline must be coated with an electrical insulating material compatible with the pipe coating and the insulation on the wire.

[Issued by Amdt 192-4, 36 FR 12297, June 30, 1971]

GUIDE MATERIAL

1 INSTALLATION METHODS

Some acceptable methods include the following.

1.1 Thermit welding.
(a) Steel. Attachment of electrical leads directly to steel pipe by the thermit welding process using copper oxide and aluminum powder. The thermit welding charge should be limited to a 15-gram cartridge.
(b) Cast iron. Attachment of electrical leads directly to cast or ductile-iron pipe by the thermit welding process using copper oxide and aluminum powder. The thermit welding charge should be limited to a 32-gram cartridge.

1.2 Solder connections.
Attachment of electrical leads directly to steel pipe with the use of soft solders or other materials that do not involve temperatures exceeding those for soft solders.

1.3 Brazing.
Attachment of electrical leads to steel pipe by brazing, provided that the pipeline operates at less than 29% SMYS.

1.4 Mechanical connections.
Mechanical connections which remain secure and electrically conductive.

2 OTHER CONSIDERATIONS

For convenience, conductors may be coded or permanently identified. Wire should be installed with slack. Damage to insulation should be avoided. Repairs should be made if damage occurs. Test leads should not be exposed to excessive heat or excessive sunlight.
§192.473
External corrosion control: Interference currents.

(a) Each operator whose pipeline system is subjected to stray currents shall have in effect a continuing program to minimize the detrimental effects of such currents.
(b) Each impressed current type cathodic protection system or galvanic anode system must be designed and installed so as to minimize any adverse effects on existing adjacent underground metallic structures.

[Issued by Amdt. 192-4, 36 FR 12297, June 30, 1971; Amdt. 192-33, 43 FR 39389, Sept. 5, 1978]

GUIDE MATERIAL

1 REFERENCE

A reference is NACE SP0169, Section 9.

2 INSTALLATION CONSIDERATIONS

(a) Attention should be given to a new pipeline’s physical location, particularly if the location may subject the pipeline to stray electrical currents from other facilities, such as the following.
   (1) Other pipelines or utilities with associated cathodic protection (CP) systems.
   (2) Rail transit systems.
   (3) Mining or welding operations.
   (4) Induced currents from electrical transmission lines.
(b) To the extent possible, the operator should identify and plan for the mitigation and control of anticipated stray electrical currents prior to construction. As soon as practicable after construction of the pipeline or facility to be protected is completed, the operator should implement monitoring, testing, and mitigation plans to control the effects of stray electrical currents. The rate of corrosion caused by stray electrical current can be higher than the rate of corrosion resulting from galvanic action.

3 EXTERNAL CORROSION CONTROL EFFECTIVENESS

Once the interference control methods have been established, periodic tests and inspections should be conducted to ensure their continued effectiveness.

§192.475
Internal corrosion control: General.

(a) Corrosive gas may not be transported by pipeline, unless the corrosive effect of the gas on the pipeline has been investigated and steps have been taken to minimize internal corrosion.
(b) Whenever any pipe is removed from a pipeline for any reason, the internal surface must be inspected for evidence of corrosion. If internal corrosion is found —
   (1) The adjacent pipe must be investigated to determine the extent of internal corrosion;
§192.551 Scope.

[Effective Date: 11/12/70]

This subpart prescribes minimum requirements for increasing maximum allowable operating pressures (uprating) for pipelines.

GUIDE MATERIAL

No guide material necessary.

§192.553 General requirements.

[Effective Date: 10/15/03]

(a) Pressure increases. Whenever the requirements of this subpart require that an increase in operating pressure be made in increments, the pressure must be increased gradually, at a rate that can be controlled, and in accordance with the following:

(1) At the end of each incremental increase, the pressure must be held constant while the entire segment of pipeline that is affected is checked for leaks.

(2) Each leak detected must be repaired before a further pressure increase is made, except that a leak determined not to be potentially hazardous need not be repaired, if it is monitored during the pressure increase and it does not become potentially hazardous.

(b) Records. Each operator who uprates a segment of pipeline shall retain for the life of the segment a record of each investigation required by this subpart, of all work performed, and of each pressure test conducted, in connection with the uprating.

(c) Written plan. Each operator who uprates a segment of pipeline shall establish a written procedure that will ensure that each applicable requirement of this subpart is complied with.

(d) Limitation on increase in maximum allowable operating pressure. Except as provided in §192.555(c), a new maximum allowable operating pressure established under this subpart may not exceed the maximum that would be allowed under §§192.619 and 192.621 for a new segment of pipeline constructed of the same materials in the same location. However, when uprating a steel pipeline, if any variable necessary to determine the design pressure under the design formula (§192.105) is unknown, the MAOP may be increased as provided in §192.619(a)(1).

1 GENERAL CONSIDERATIONS

In fulfilling the requirements of Subpart K (and any state and local requirements for uprating), it is recommended that the written plan required by §192.553(c) include, as applicable, the following.

(a) The purpose of pressure increase.
(b) The amount of increase and the proposed MAOP.
(c) The location class(es) of the segment being uprated.
(d) A review of the requirements in §§192.619, 192.621, and 192.623 to ensure that the proposed new maximum allowable operating pressure may be adopted.
(e) A review of the overpressure protection requirements in §§192.195, 192.199, and 192.201.
(f) A review to ensure proper capacity, set points, and function of the devices in accordance with §§192.739, 192.740, 192.741, and 192.743.
(g) A description of the facility. This can be a schematic map to clearly define the pipeline segment to be uprated and all adjacent pipelines and mains. This map should indicate the following.
   (1) Construction dates.
   (2) Size, wall thickness, and grade of pipe.
   (3) Laterals, side connections and other appurtenances.
(h) A review of the uprating’s effect on the operator’s integrity management program and the control room management procedures.
(i) A schedule of proposed work. The steps to be taken to accomplish the uprating should be listed.
(j) The definition and assignment of responsibility to complete the various phases of a line uprating including a check and verification procedure which will ensure that all steps have been completed in compliance with the federal standards before higher pressure is introduced into the system to be uprated.
(k) The sequence of steps necessary to isolate adjacent piping from the system to be uprated. Remaining connections to adjacent piping, which will operate at a lower pressure, should be at points where pressure reducing equipment has been installed in compliance with §§192.195 and 192.201.
(l) A determination that adequate pressure can be maintained in adjacent systems when the section to be uprated is isolated. If additional interconnections with a higher operating pressure system are required to maintain the lower pressure system, these connections should conform to the federal standards.
(m) A procedure for the instruction of all personnel involved in the uprating procedure to ensure familiarity with the plan.
(n) The notification of all affected customers sufficiently in advance to ensure maximum accessibility of premises during the uprating operation.
(o) The alterations to pressure regulation and pressure relief facilities necessary to meet the requirements of §§192.195 and 192.201.
(p) The precautions to be taken to protect employees and the general public during the uprating operation.
(q) Provision for monitoring pressure in adjacent facilities during uprating. This should be done to ensure that there are no connections, from the higher pressure system to a lower pressure system, that do not have pressure reducing equipment conforming to the federal standards.
(r) Provision for a final leak survey to confirm the integrity of the facility after uprating is completed.

2 DISTRIBUTION SYSTEMS

The following additional items, as applicable, are recommended for the written plans of uprating projects in distribution systems.

(a) A list of locations where sectionalizing valves are to be installed to meet the requirements of §192.181.
(b) A list of service lines on the main segments to be uprated.
(c) Provision for checking in the field the source of gas supply for all properties.
Appendix C to Part 192
Qualification of Welders for Low Stress Level Pipe.

[Effective Date: 07/14/04]

I. Basic test. The test is made on pipe 12 inches (305 millimeters) or less in diameter. The test weld must be made with the pipe in a horizontal fixed position so that the test weld includes at least one section of overhead position welding. The beveling, root opening, and other details must conform to the specifications of the procedure under which the welder is being qualified. Upon completion, the test weld is cut into four coupons and subjected to a root bend test. If, as a result of this test, two or more of the four coupons develop a crack in the weld material, or between the weld material and base metal, that is more than 1/8-inch (3.2 millimeters) long in any direction, the weld is unacceptable. Cracks that occur on the corner of the specimen during testing are not considered. A welder who successfully passes a butt-weld qualification test under this section shall be qualified to weld on all pipe diameters less than or equal to 12 inches.

II. Additional tests for welders of service line connections to mains. A service line connection fitting is welded to a pipe section with the same diameter as a typical main. The weld is made in the same position as it is made in the field. The weld is unacceptable if it shows a serious undercutting or if it has rolled edges. The weld is tested by attempting to break the fitting off the run pipe. The weld is unacceptable if it breaks and shows incomplete fusion, overlap, or poor penetration at the junction of the fitting and run pipe.

III. Periodic tests for welders of small service lines. Two samples of the welder’s work, each about 8 inches (203 millimeters) long with the weld located approximately in the center, are cut from steel service line and tested as follows:

1. One sample is centered in a guided bend testing machine and bent to the contour of the die for a distance of 2 inches (51 millimeters) on each side of the weld. If the sample shows any breaks or cracks after removal from the bending machine, it is unacceptable.

2. The ends of the second sample are flattened and the entire joint subjected to a tensile strength test. If failure occurs adjacent to or in the weld metal, the weld is unacceptable. If a tensile strength testing machine is not available, this sample must also pass the bending test prescribed in subparagraph (1) of this paragraph.

[Amendment 192-85, 63 FR 37500, July 13, 1998; Amendment 192-94, 69 FR 32886, June 14, 2004]

GUIDE MATERIAL

1 GENERAL

(a) When qualifying welders under Appendix C, the following should be considered to ensure that the welders are qualified to weld on pipe to be operated at a hoop stress of less than 20% SMYS. Test weld sample preparation should be observed by qualified personnel.

(b) A welder should successfully complete the Service Line Connection Test to be qualified to weld service-line connections to mains. A welder should successfully complete the Tests for Welders of Small Service Lines to be qualified to weld pipe less than NPS 2.

(c) For qualification of welding operators, see guide material under §192.227.
2 BASIC TEST

(a) The test welds must be made on NPS 12 or less pipe. It is suggested the specific pipe sizes for tests be typical of those anticipated to be encountered most frequently by the welder.

(b) Four test specimen coupons should be prepared. For pipe sizes NPS 2 or above, the test specimen coupons should be prepared as shown in Figure CA (1) and taken from the locations shown in Figure CA (2). Two test welds are needed for pipe sizes less than NPS 2 with the specimen coupons taken at alternate quadrants of each weld as shown in Figure CA (3).

(c) A guided bend test jig proportioned as shown in Figure CB is suggested for the root bend test. The root of the weld should be placed down on the die with the weld at mid-span. The plunger should be forced down until the curvature of the test coupon is approximately "U" shaped.

3 ADDITIONAL TESTS FOR WELDERS OF SERVICE-LINE CONNECTIONS TO MAINS

(a) This test is made by welding a service-line connection fitting to a segment of pipe having a nominal pipe size typical of that frequently encountered, or an NPS 4 pipe segment. Nipples may be used for welder tests in place of a service-line connection fitting.

(b) Where large-diameter service-line connection fittings or large main branching tees are anticipated to be encountered by the welder, it may be appropriate to give the welder an additional test for such configurations. The test weld branch nipple should be destructively tested following API Std 1104, Section 5.8, Testing of Welded Joints — Fillet Welds, and Section 6.5.6, Sampling of Test — Fillet Welds (see §192.7).

4 PERIODIC TESTS FOR WELDERS OF SMALL SERVICE LINES

(a) This weld test should be accomplished using pipe of NPS ¾ to NPS 1 or other size typically encountered by the welder when qualifying to weld pipelines of less than NPS 2.

(b) The beveling, root opening, and weld details should conform to the specifications of the procedure under which the welder is to be qualified.

(c) One test specimen coupon is needed from each of two weld samples prepared as shown in Figure CA (1). The test jig should conform to Figure CB.