would realign VOR Federal airway No. 14 south segment from Oklahoma City, Okla.

Interested persons may participate in the proposed rule making by submitting such written data, views, or arguments as they may desire. Communications should identify the airspace docket number and be submitted in triplicate to the Director, Southwest Region, Attention: Chief, Air Traffic Division, Federal Aviation Administration, Post Office Box 1689, Fort Worth, Tex. 76101. All communications received within 30 days after publication of this notice in the FEDERAL REGISTER will be considered before action is taken on the proposed amendment. The proposal contained in this notice may be changed in the light of comments received.

An official docket will be available for examination by interested persons at the Federal Aviation Administration, Office of the General Counsel, Attention: Rules Docket, 800 Independence Avenue SW., Washington, D.C. 20590. An informal docket also will be available for examination at the office of the Regional Air Traffic Division Chief.

The Federal Aviation Administration proposes to realign VOR Federal airway No. 14 south alternate segment from Oklahoma City, Okla., via the intersection of Oklahoma City 087° T (078° M) and Tulsa, Okla., 228° T (220° M) radials; to Tulsa. This realigned south alternate segment would serve all eastbound aircraft departing Oklahoma City destined to land at Tulsa or terminals east of Tulsa.

This amendment is proposed under the authority of section 307(a) of the Federal Aviation Act of 1958 (49 U.S.C. 1348) and section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

Issued in Washington, D.C., on April 2, 1970.

H. B. HELSTROM,
Chief, Airspace and Air Traffic Rules Division.

[F.R. Doc. 70-4240; Filed, Apr. 7, 1970; 8:48 a.m.]

Office of Pipeline Safety

[49 CFR Part 192]

[Notice 70-7; Docket No. OPS-3G]

MINIMUM FEDERAL SAFETY STANDARDS FOR GAS PIPELINES

Definitions; Materials; and Pipe, Piping System Components and Facilities, Design

The Department of Transportation is developing proposals for the comprehensive minimum Federal safety standards for gas pipeline facilities and for the transportation of gas, as required by section 3(b) of the Natural Gas Pipeline Safety Act of 1968. This notice of proposed rule making is the last of a series of notices by which the proposed Federal safety standards will be issued for public comment.

Interested persons are invited to participate in the making of these proposed rules by submitting written data, views, or arguments as they may desire. Communications should identify the regulatory docket and notice number and be submitted in duplicate to the Office of Pipeline Safety, Department of Transportation, 400 Sixth Street SW., Washington, D.C. 20590. Communications received before May 25, 1970, will be considered before taking final action on this notice. All comments will be available for examination by interested persons at the Office of Pipeline Safety before and after the closing date for comments. The proposals contained in this notice may be changed in light of comment received.

The first notice in this series was published in the FEDERAL REGISTER on November 21, 1969 (Notice 69-3; 34 F.R. 18556). That notice discussed both the Department's plan for establishing the minimum Federal standards and the source materials to be used in developing proposals for these standards. It proposed, without stating specific regulatory language, several requirements for inclusion in the minimum Federal standards.

This notice proposes specific regulations that contain the scope of Part 192, definition of terms, and requirements for the qualification of materials and design of piping system components and facilities. These proposed regulations are derived from—

(1) The scope and definitions of the Natural Gas Pipeline Safety Act; and

(2) The definitions, Chapter I, and the design provisions of Chapters III and IV, of the USAS B31.8 Code.

SUBPART A—GENERAL

Section 192.1 sets forth the scope of the minimum standards and is as broad as the coverage of the Act itself. It also clearly states the applicability of these standards to offshore pipelines that lie on the outer continental shelf, outside the boundaries of any State. Paragraph (b) excludes gathering lines outside of certain specified areas from applicability of this part. In effect, these specified areas are being defined as nonrural areas as provided for in the definition of "transportation of gas" that is set forth in the Act.

Section 192.3 contains the definitions of section 2 of the Act, with the exception of a few terms that are not used in this regulation. Some minor changes have been made to adopt them to these proposed standards. Gathering lines in nonrural areas are not excepted in the proposed definition of "transportation of gas." These lines will be excluded from the scope of the part by § 192.1(b). Other definitions are based on the definitions in the USAS B31.8 Code.

Section 192.5 will contain the class location definitions which were formally proposed in Notice 70-4 (34 F.R. 5012, Mar. 24, 1970) and are not included herein. Although these are primarily used in determining pipeline design, they will be referred to frequently in other subparts and are proposed for inclusion in Subpart A.

Section 192.7 contains a list of all documents that are incorporated by reference into Part 192. This is included to meet the requirements of the Freedom of Information Act (5 U.S.C. sec. 552) that all incorporated matter be reasonably available to the public. To assure this, the full title of each such document and addresses at which it is available or may be obtained are listed. This list will include all specifications which would qualify pipe for use under this part.

Section 192.9 sets forth special requirements for liquefied petroleum gas (LPG) systems which are presently contained in section 862 of the B31.8 Code. Although the Act does not apply to "liquefied" gas, it does apply to any pipeline facilities that are used in the transportation of a gaseous product. The USAS B31.8 Code required these systems to comply with both the B31.8 Code and NFPA Standards 58 and 59. This has been clarified slightly by adding a sentence to provide that, in the event of conflicting provisions, Part 192 standards will govern.

SUBPART B—MATERIALS

Subpart B is based entirely on Chapter I of the B31.8 Code. Much of the detail on qualifying materials other than pipe has been omitted from this proposal and general performance type requirements, as set forth in § 192.53, would be relied upon to assure the suitability of these materials. These would be specific requirements for both new and used pipe similar to those in the existing regulations.

Steel pipe, both new and used, would have to be qualified under § 192.55. This section would permit the use of new pipe made in accordance with a listed specification (see discussion below on Appendix B). Used pipe and new pipe of unlisted specification would be required to meet certain tests or be restricted to low stress level lines. The procedures and limits contained in section 811.253 of the USAS B31.8 Code have been divided into two groups. Those that contained qualifying tests have been placed in Appendix B while the others, which involved determining values for use in the design formula, would be set forth in the appropriate provisions dealing with steel pipe design. The provisions for hydrostatic testing need not be stated since this is covered by proposed Subpart J.

The requirements for new and used pipe of other materials are proposed in § 192.57 through 192.61. The requirements for qualifying used cast iron and ductile iron pipe would not require a minimum wall thickness as this will be covered by the design requirement of proposed Subpart C. The provisions of section 814 with respect to cold climates are adequately covered by the performance requirements of § 192.53 which require consideration of environmental conditions when selecting materials.

SUBPART C.—PIPE DESIGNS

This subpart sets forth pipe design requirements and limitations that are derived from sections of chapter IV of the B31.8 Code. Section 192.103 contains the design formula for steel pipe and §§ 192.105 through 192.113 contain requirements for determining certain of

the values which are used in the design formula. Sections 192.105, 192.107, and 192.111 include the provisions taken from section 811.253 of the B31.8 Code, as discussed above. One significant change in this area is the elimination of construction types A, B, C, and D. Since these types of construction were virtually synonymous with the various values of design factor F, these values can easily be substituted by relating class location directly to design factor as it is done elsewhere in the B31.8 Code. This direct relationship has a few exceptions which are expressed in paragraphs (b) and (c) of § 192.109. A new performance requirement has been added to replace all of the various tables that are used to determine wall thickness. This would require that the pipe be sufficiently thick to withstand any external pressures such as cover and those external loads that can reasonably be anticipated after installation. In addition, certain provisions that related to testing have been placed in proposed Subpart J.

Appendix B—Qualification of Pipe. This appendix would set forth the two methods by which pipe could be qualified for use under this part. Section I would contain a list of all acceptable pipe specifications. It would not list any specification for structural materials or components which would be governed by performance requirements in Subparts B and D. Section II of the appendix would contain several tests that are designed to qualify used steel pipe or new steel pipe of an unknown or unlisted specification. These are derived from paragraphs A, B, E, F, and G of section 811.253 of the B31.8 Code.

Appendix C—Documents Incorporated by Reference. The appendix will contain a list of all documents incorporated by reference in Part 192 as well as the names and addresses of the organizations that issue these documents. The list of documents will contain the number of the specification or standard, its full title and the applicable edition. The edition listed in proposed Appendix C corresponds to that listed in the B31.8 Code. However, upon issuing the final regulations, this list may be updated by incorporating the most recent edition of the referenced standard or specification. Interested persons are requested to comment on this proposed change by indicating whether the use of the newer editions would cause a significant change in the impact of the regulations involved.

SUBPART D—DESIGN OF PIPING SYSTEM COMPONENTS AND FACILITIES

This subpart prescribes minimum requirements for the design and installation of components of piping systems, including valves, flanges, bolting, standard and special fittings, special components fabricated by welding, extruded outlets, anchorage for exposed or buried piping, and also those additional materials referred to below.

Please note that the organization of Subpart D differs from that of chapter III of the B31.8 Code (Piping System Components and Fabrication Details). In addition to the subjects covered in that chapter, Subpart D also deals with certain subjects now included in chapter IV of the B31.8 Code (Design, Installation and Testing), that were thought to be appropriately classified as piping system components or facilities. These additional subjects include compressor stations, pipe-type and bottle-type holders, and vaults, as well as the design and installation of pressure relief and pressure limiting devices to protect against accidental overpressuring.

Section 192.146 (partly based on section 821.33 of the B31.8 Code) would prohibit the use of threaded taps in cast iron pipe 5 inches in nominal diameter or smaller, except for existing taps used for replacement service that are free of cracks and have good threads, and taps used for gas control equipment which are closed after use by means of a threaded plug or reinforcing sleeve. In cast iron pipe larger than 6 inches nominal diameter, threaded taps would be permitted without reinforcement to a size not more than 25 percent of the nominal diameter of the pipe, but larger taps would have to be covered by reinforcing sleeves. These additional requirements are based on the proposed NARUC Model Code and the Michigan State Code.

Section 192.187(d) (based on section 845.61 of the B31.8 Code), would provide that support for pressure relief or pressure limiting devices would have to be made of noncombustible material. This requirement is based on the Massachusetts and Vermont Codes.

Section 192.188 (partly based on section 845.72 of the B31.8 Code) would require that when more than one pressure regulating station or compressor station feeds into a pipeline or distribution system, each station would be required to have a relief valve or other protective device installed to insure that the complete failure of the largest capacity of any single run or lesser capacity regulators or compressors in that station would not impose pressures on any part of the distribution system, in excess of those it was designed for or protected against, whichever is lower. In addition, relief valves or other pressure limiting devices would be required at or near regulator stations in low pressure systems, with the capacity to limit the maximum pressure in the main to 2 p.s.i.g. These additional requirements are based on the Vermont State Code.

Section 192.165 would substitute the design factors required by § 192.109, for the table included in section 844.32(a) of the B31.8 Code, in order to make both of these sections consistent.

In consideration of the foregoing, the Department proposes to amend Title 49 of the Code of Federal Regulations by adding a new Part 192 to include Subparts A, B, C, and D as set forth below.

This notice is issued under the authority of the Natural Gas Pipeline Safety Act of 1968 (49 U.S.C. sec. 1671 et seq.), Part 1 of the Regulations of the Office of the Secretary of Transportation (49 CFR Part 1), and the delegation of authority to the Director, Office of Pipeline Safety, dated November 6, 1968 (33 F.R. 16468).

Issued in Washington, D.C., on April 3, 1970.

W. C. JENNINGS,
Acting Director,
Office of Pipeline Safety.

DERIVATION TABLE

New section	*Source*
192.1	New.
192.3	New.
192.5	841.01.
192.7	New.
192.9(a)	862.3.
192.9(b)	862.4.
192.51	New.
192.53(a)(1)	810.1.
192.53(a)(2)	810.1 and 814.
192.53(b)	813.1.
192.55(a)(1)	811.21.
192.55(a)(2)	811.253.
192.55(a)(3)	811.252.
192.55(b)(1)	811.253.
192.55(b)(2)	811.253.
192.55(b)(3)	811.251.
192.55(b)(4)	811.252.
192.55(c)	811.252.
192.55(d)	813.2.
192.57(a)	811.21.
192.57(b)	811.26.
192.59(a)	811.27.
192.59(b)	811.28.
192.61	New.
192.63	812.
192.65	
192.101	816.
192.103	New.
192.105(a)	841.1.
192.105(b)	841.1.
102.107	811.253G.
192.109(a)	811.253C.
192.109 (b) and (c)	841.11.
192.109(d)	841.02.
192.111	841.011(b).
192.113	841.12 and 811.253D.
192.115(a)	841.13.
192.115(b)	841.171.
192.117(a)	841.122. 841.14(e).
192.117(b)	841.14(d) and 841.141.
192.119(a)	842.11 and 842.12. 842.13, 842.14.
192.119(b)	842.141 and 842.142.
192.121	842.211 through 842.214.
192.123	
192.125	842.32 and 842.33.
192.127	842.611.
192.142	831.
192.143	841.11(b).
192.144(a)	831.22(a).
192.144(b)	831.22(g).
192.144(c)	831.23.
192.145	831.31.
192.146(a) and (b)	Michigan Code and NARUC Model Code.
192.146(c) and (d)	831.33.
192.147	831.34.
192.148	831.41.
192.149	831.6.
192.150	832.31.
192.151	834.
192.152	835.
192.153	843.1.
192.154	843.2.
192.155	843.41.
192.156	843.42.
192.157	843.432.
192.158	843.441, 843.444.
192.159	843.45.
192.160	843.46.
192.161	843.47.
192.162	843.5.

New Section	*Source*
192.163	844.1.
192.164	844.2, 844.3.
192.165	844.32(a).
192.166	844.32 (b) and (c).
192.167	844.4.
192.168	844.5.
192.169	846.1.
192.170	846.21.
192.171	846.22.
192.172	847.1.
192.173	847.2.
192.174	847.3.
192.175	847.4.
192.180	842.33.
192.181	842.34.
192.182	842.35.
192.185(a)	845.1, 845.21, 845.41 and 845.42.
192.185(b)	845.31, 845.32, and 845.41.
192.186	845.5.
192.187	845.6 and Massachusetts and Vermont Codes.
192.188	845.7 and Vermont Code.
192.189	845.9.

Subpart A—General

Subpart B—Materials

Subpart C—Pipe Design

Subpart D—Design of Piping System Components and Facilities

Subpart A—General

§ 192.1 Scope of part.

(a) This part prescribes minimum safety requirements for pipeline facilities and the transportation of gas—

(1) Within any State; and

(2) 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 the gathering of gas outside of the following areas:

(1) An area within the limits of any incorporated or unincorporated city, town, or village.

(2) Any designated residential or commercial area such as a subdivision, business or shopping center, or community development.

§ 192.3 Definitions.

As used in this part—

"Gas" means natural gas, flammable gas, or gas which is toxic or corrosive;

"High pressure distribution systems" means a distribution system in which the gas pressure in the mains and service lines is higher than the pressure provided to the customer.

"Low pressure distribution system" means a distribution system in which the gas pressure in the mains and service lines is substantially the same as the pressure provided to the customer.

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

"Maximum allowable operating pressure" means the maximum pressure at which a particular gas system or segment of a gas system may be operated under the provisions of this part.

"Municipality" means a city, county, or any other political subdivision of a State;

"Operator" means a person who engages in the transportation of gas;

"Person" means any individual, firm, joint venture, partnership, corporation, association, State, municipality, cooperative association, or joint stock association, and includes any trustee, receiver, assignee, or personal representative thereof;

"Pipeline facilities" includes, without limitation, new and existing pipe, rights-of-way, and any equipment, facility, or building used in the transportation of gas or the treatment of gas during the course of transportation.

"Secretary" means the Secretary of Transportation or any person to whom he has delegated authority in the matter concerned;

"State" means each of the several States, the District of Columbia, and the Commonwealth of Puerto Rico,

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

"SMYS" means specified minimum yield strength or the yield strength specified as a minimum in the specification under which the pipe was manufactured.

§ 192.5 Class location.

[See OPS Notice No. 70-4, 34 F.R. 5012, Mar. 24, 1970]

§ 192.7 Incorporations by reference.

(a) Any documents or parts thereof incorporated by reference in this part are hereby made a part of this regulation as though set out in full herein.

(b) All incorporated documents are available for inspection in the Office of Pipeline Safety, Room 107, 400 Sixth

Street SW., Washington, D.C. In addition, materials incorporated by reference are available at the addresses provided in Appendix C to this part.

(c) The full titles for the publications incorporated by reference in this part are listed in Appendix C to this part.

§ 192.9 Propane and other petroleum gas systems.

(a) No operator may transport propane or other gas, or gas mixture, unless the gas system meets the requirements of this part and of NFPA Standards No. 58 and No. 59. In the event of a conflict, the requirements of this part prevail.

(b) Liquified petroleum gas systems must comply with the following:

(1) Above ground structures must have open vents near the floor level.

(2) Below ground structures must have forced ventilation that will prevent any accumulation of gas.

(3) Relief valve discharge vents must be located so as to prevent any accumulation of gas at or below ground level.

(4) Special precautions must be taken to provide adequate ventilation where excavations are made to repair an underground system.

Subpart B—Materials

§ 192.51 Scope.

This subpart prescribes minimum requirements for the selection and qualification of materials for pipe and components that become part of pipeline facilities.

§ 192.53 General.

(a) Materials for pipe and components that become part of a pipeline facilities must be—

(1) Qualified in accordance with any applicable requirements of this subpart; and

(2) Capable of maintaining the structural integrity of the pipeline facility under reasonably anticipated temperature and other environmental conditions.

(b) For the purposes of this subpart, a listed specification is one that is listed in Appendix B to this part.

§ 192.55 Steel pipe.

(a) New steel pipe is qualified for use under this part if—

(1) It was manufactured in accordance with a listed specification;

(2) It meets the requirements of paragraphs II–A through II–D of Appendix B to this part;

(3) It is used in accordance with paragraph (c) of this section.

(b) Used steel pipe is qualified for use under this part if—

(1) It was manufactured in accordance with a listed specification and it meets the requirements of paragraph II–C of Appendix B to this part;

(2) It meets requirements of paragraphs II–A through II–D of Appendix B to this part;

(3) It has been used in an existing line of the same or higher pressure and it meets the requirements of paragraph II–C of Appendix B to this part; or

(4) It is used in accordance with paragraph (c) of this section.

(c) New or used steel pipe may be used at a pressure resulting in a hoop stress of less than 6,000 p.s.i. where no close coiling or close bending is to be done, if visual examination indicates that the pipe is in good condition and is free of split seams and other defects that would cause leakage. Pipe of unlisted specification that is to be welded must also satisfactorily pass the weldability tests prescribed in paragraph II–B of Appendix B to this part.

(d) New steel pipe that has been cold expanded must meet the mandatory requirements of API Standard 5LX.

§ 192.57 Cast iron or ductile iron pipe.

(a) New cast iron or new ductile iron pipe is qualified for use under this part if it has been manufactured in accordance with a listed specification.

(b) Used cast iron or used ductile iron pipe is qualified for use under this part if inspection shows that the pipe is sound and permits the makeup of tight joints and—

(1) It has been removed from an existing pipeline that operated at the same or higher pressure, or

(2) It was manufactured in accordance with a listed specification.

§ 192.59 Plastic pipe.

(a) New plastic pipe is qualified for use under this part if—

(1) It is manufactured in accordance with a listed specification; and

(2) It is adequately resistant to chemicals with which it may come in contact.

(b) Used plastic pipe is qualified for use under this part if it meets the requirements of paragraph (a) of this section and—

(1) It has been used only in natural gas service;

(2) It has known dimensions; and

(3) It is free of visible defects.

§ 192.61 Copper pipe.

New copper pipe is qualified for use under this part if it has been manufactured in accordance with a listed specification.

§ 192.63 Marking of materials.

(a) Each valve, fitting, length of pipe, and other component used in a pipeline or pipeline facility must be marked as prescribed in—

(1) The specification or standard to which it was manufactured; or

(2) MSS SP–25, Standard Marking System for Valves, Fittings, Flanges, and Unions.

(b) If any item is marked by die stamping, the die must have blunt or rounded edges that will minimize stress concentrations.

§ 192.65 Transportation of line pipe.

No person may use any line pipe transported by railroad unless that transportation was performed in accordance with API RP5L1, Recommended Practice for Railroad Transportation of Line Pipe.

Subpart C—Pipe Design

§ 192.101 Scope.

This subpart prescribes the minimum requirements for the design of pipe that is used in constructing, relocating, replacing, or otherwise changing pipeline facilities.

§ 192.103 Design formula for steel pipe.

The design pressure for steel pipe is determined in accordance with the following formula:

$$P = \frac{2St}{D} \times F \times E \times T$$

P = Design pressure in pounds per square inch gage.

S = Yield strength in pounds per square inch determined in accordance with § 192.105.

D = Nominal outside diameter of the pipe in inches.

t = Nominal wall thickness of the pipe in inches. If this is unknown, it is determined in accordance with § 192.107.

F = Design factor determined in accordance with § 192.109.

E = Longitudinal joint factor determined in accordance with § 192.111.

T = Temperature derating factor determined in accordance with § 192.113.

§ 192.105 Yield strength for steel pipe(s).

(a) For pipe that is manufactured in accordance with a specification listed in section I of Appendix B of this part, the yield strength to be used in the design formula in § 192.103 is the specified minimum yield strength stated in the listed specification, if that value is known.

(b) For pipe that is manufactured in accordance with a specification not listed in section I of Appendix B to this part or whose specification or tensile properties are unknown, the yield strength to be used in the design formula in § 192.103 is one of the following:

(1) If the pipe is tensile tested in accordance with section II–D of Appendix B to this part, the yield strength is the lower of—

(i) Eighty percent of the average yield strength determined by the tensile tests; or

(ii) The lowest yield strength determined by the tensile tests, but not more than 52,000 p.s.i.

(2) If the pipe is not tensile tested as provided in subparagraph (1) of this section, the yield strength is 24,000 p.s.i.

§ 192.107 Nominal wall thickness for steel pipe (t).

If the nominal wall thickness for steel pipe is not known, it is determined by measuring the thickness of each piece of pipe at quarter points on one end. However, if the pipe is of uniform grade, size, and thickness, and there are more than 10 lengths, only 10 percent of the individual lengths, but not less than 10 lengths, need be measured and the thickness of the lengths that are not measured is verified by applying a gage set to the minimum thickness found by the measurement. The nominal wall thickness of the pipe is the next wall thickness

found in commercial specifications below the average of all the measurements taken, but not more than 1.14 times the smallest measurement taken on pipe less than 20 inches in outside diameter, nor more than 1.11 times the smallest measurement taken on pipe 20 inches or more in outside diameter.

§ 192.109 Design factor for steel pipe (F).

(a) Unless otherwise provided in paragraphs (b), (c), and (d) of this section, the design factor to be used in the design formula in § 192.103 is determined in accordance with the following table:

Class locations:	*Design factor (F)*
1	0.72
2	0.60
3	0.50
4	0.40

(b) A design factor of 0.60 must be used in the design formula in § 192.103 for steel pipe in Class 1 locations that:

(1) Crosses an unimproved public road without a casing;

(2) Crosses without a casing, or makes a parallel encroachment on, a hard surfaced road, a highway, a public street, or a railroad;

(3) Is supported by a vehicular, pedestrian, railroad, or pipeline bridge; or

(4) Is used in a fabricated assembly, including separators, mainline valve assemblies, cross-connections, and river crossing headers, or is used within five pipe diameters in any direction from the last fitting (other than a transition piece or an elbow used in place of a pipe bend) of a fabricated assembly.

(c) A design factor of 0.50 must be used in the design formula in § 192.103 for steel pipe in Class 2 locations that crosses without a casing a hard surfaced road, a highway, a public street, or a railroad.

(d) A design factor of at least 0.50 must be used in the design formula in § 192.103 for compressor stations, regulator stations and measuring stations.

(e) If a physical barrier or other factor exists in a particular class location that will limit the expansion of population, a design factor may be used that would be appropriate if the class location had been determined without regard to the adjacent populated areas.

§ 192.111 Longitudinal joint factor for steel pipe (E).

The longitudinal joint factor to be used in the design formula in § 192.103 is determined in accordance with the following table:

Specification	Pipe class	Longitudinal joint factor (E)
ASTM A 53	Seamless	1.00
	Electric resistance welded	1.00
	Furnace butt welded	.60
ASTM A 106	Seamless	1.00
ASTM A 134	Electric fusion arc welded	.80
ASTM A 135	Electric resistance welded	1.00
ASTM A 139	Electric fusion welded	.80
ASTM A 155	Electric fusion arc welded	1.00
ASTM A 211	Spiral welded steel pipe	.80
ASTM A 381	Double submerged arc welded.	1.00
API 5 L	Seamless	1.00
	Electric resistance welded	1.00
	Electric flash welded	1.00
	Furnace butt welded	.60
	Furnace lap-welded	.80
API 5LX	Seamless	1.00
	Electric resistance welded	1.00
	Electric flash welded	1.00
	Submerged arc welded	1.00
API 5 LS	Electric resistance welded	1.00
	Submerged arc welded	1.00
Other	Pipe over 4 inches	.80
Other	Pipe 4 inches or less	.60

If the longitudinal joint cannot be determined with certainty, it must be considered as "Other."

§ 192.113 Temperature derating factor for steel pipe (T).

The temperature derating factor to be used in the design formula in § 192.103 is determined as follows:

Temperature degrees fahrenheit	*Temperature derating factor (T)*
250 or less	1.000
300	0.967
350	0.933
400	0.900
450	0.867

For intermediate temperatures, the derating factor is determined by interpolation.

§ 192.115 Corrosion factor for steel pipe.

(a) After design pressure for steel pipe has been established under § 192.103, the wall thickness must be increased as follows:

(1) If corrosive gas is transported, the wall thickness must be increased by 0.075 inch.

(2) If the pipe is laid in corrosive soil and protection against external corrosion is not provided, the wall thickness must be increased by 0.05 inch.

(b) For the purpose of this section, corrosive gas is—

(1) Any gas whose water dewpoint equals or exceeds the pipeline temperature at any time, unless testing or experience have demonstrated that the gas is noncorrosive; or

(2) Any gas that experience has demonstrated to be corrosive.

§ 192.117 Design limitations for steel pipe.

(a) The design pressure for steel pipe that has been cold worked to meet specified minimum yield strength is limited to 75 percent of the pressure determined under § 192.103 if the pipe is heated, other than by welding to 600° Fahrenheit or more.

(b) The nominal wall thickness of steel pipe must be sufficient to withstand any external pressure and anticipated external loads that will be imposed on the pipe after installation.

§ 192.119 Design of cast iron pipe.

(a) Cast iron pipe must be designed in accordance with USAS A 21.1 using the following values for S (bursting tensile strength) and R (modulus of rupture) in the design equations:

Specification	Type of pipe	S	R
		p.s.i	*p.s.i*
USAS A 21.3	Pit cast	11,000	31,000
USAS A 21.7	Centrifugal (metal mold).	18,000	40,000
USAS A 21.9	Centrifugal (sand-lined mold).	18,000	40,000

(b) The nominal wall thickness for cast iron pipe must be sufficient to withstand any external pressure and anticipated external loads that will be imposed on the pipe after installation.

§ 192.121 Design of ductile iron pipe.

(a) Ductile iron pipe must be designed in accordance with USAS A 21.50 using the following values in the design equations:

s (design hoop stress) = 16,800 p.s.i.
f (design hoop stress) = 16,800 p.s.i.

(b) The nominal wall thickness for ductile iron pipe must be sufficient to withstand any external pressure and anticipated external loads that will be imposed on the pipe after installation.

(c) Ductile iron pipe must be grade (60–42–10) and must conform to the requirements of USAS A21.52.

§ 192.123 Design of plastic pipe.

(a) The design pressure for plastic pipe is determined in accordance with the following formula and is subject to the limitations of § 192.125:

$$P = 2S\frac{t}{(D-t)} \times F$$

P= Design pressure in pounds per square inch.
S= Long term hydrostatic strength in pounds per square inch as stated in the specification to which the pipe was manufactured.
t= Specified wall thickness in inches.
D= Specified outside diameter in inches.
F= Design factor for plastic pipe.

(b) The design factor for plastic pipe is determined as follows:

Class location:	*Design factor*
1	0.32
2	0.25
3	0.25
4	0.20

§ 192.125 Design limitations for plastic pipe.

(a) The design pressure for plastic pipe used in mains and service lines of distribution systems and in all Class 3 and 4 locations may not exceed 100 p.s.i.g.

(b) Plastic pipe must not be used where operating temperatures will be—

(1) Below 20° F.; or

(2) Above 100° F. for thermoplastic pipe or above 150° F. for reinforced thermosetting plastic pipe.

(c) The wall thickness for thermoplastic pipe must not be less than 0.062 inches.

§ 192.127 Design of copper pipe.

(a) Except for service lines, copper pipe must have a minimum wall thickness of 0.065 inches and must be hard drawn.

(b) Copper pipe must not be used at pressures in excess of 100 p.s.i.g.

(c) Copper pipe must not be used to carry gas that contains more than an average of 0.3 grains of hydrogen sulfide per 100 standard cubic feet of gas.

(d) The nominal wall thickness for copper pipe must be sufficient to withstand any external pressure and anticipated external loads that will be imposed on the pipe after installation.

APPENDIX B—QUALIFICATION OF PIPE

I. Listed Specifications.

The following are listed specifications for steel, cast iron, ductile iron, copper and plastic pipe.

API 5 L—Steel and Iron Pipe.
API 5 L S—Steel Pipe.
API 5 L X—Steel Pipe.
ASTM A 53—Steel Pipe.
ASTM A 106—Steel Pipe.
ASTM A 134—Steel Pipe.
ASTM A 135—Steel Pipe.
ASTM A 139—Steel Pipe.
ASTM A 155—Steel Pipe.
ASTM A 211—Steel and Iron Pipe.
ASTM A 333—Steel Pipe.
ASTM A 377—Cast Iron Pipe.
ASTM A 381—Steel Pipe.
USAS A 21.3—Cast Iron Pipe.
USAS A 21.7—Cast Iron Pipe.
USAS A 21.9—Cast Iron Pipe.
USAS A 21.52—Ductile Iron Pipe.
ASTM A 72—Wrought Iron Pipe.
ASTM B 42—Copper Pipe.
ASTM B 68—Copper Tubing.
ASTM B 75—Copper Tubing.
ASTM B 88—Copper Tubing.
ASTM B 251—Copper Pipe and Tubing.
ASTM D 2513—Plastic Pipe.
ASTM D 2517—Plastic Pipe.

II. Steel pipe of unknown or unlisted specification.

A. *Bending properties.* For pipe 2 inches or less in diameter, a length of pipe containing a weld must be cold bent through at least 90° around a cylindrical mandrel that has a diameter 12 times the diameter of the pipe, without developing cracks at any portion and without opening the weld.

For pipe more than 2 inches in diameter, the pipe must meet the requirements of the flattening tests set forth in ASTM A 53 except that the number of tests must be at least equal to the minimum required in paragraph II–D of this appendix to determine yield strength.

B. *Weldability.* A girth weld must be made in the pipe by a welder who is qualified under Subpart E of this part. The weld must be made under the most severe conditions under which welding will be permitted in the field and using the same procedure that will be used in the field. On pipe more than 4 inches in diameter, at least one test weld must be made for each 100 lengths of pipe. On pipe 4 inches or less in diameter at least one test must be made for each 400 lengths of pipe. The weld must be tested in accordance with API Standard 1104. If these requirements cannot be met, weldability may be established by making chemical tests for carbon and manganese, and proceeding in accordance with the provisions of the ASME Boiler and Pressure Vessel Code, section IX. The same number of chemical tests must be made as are required for testing girth weld.

C. *Inspection.* The pipe must be clean enough to permit adequate inspection. It must be visually inspected to insure that it is reasonably round and straight, to discover any defects which might impair its strength or tightness, and to assure the absence of gouges, grooves, and dents in the pipe.

D. *Tensile properties.* If the tensile properties of the pipe are not known, the minimum yield strength may be taken as 24,000 p.s.i.g. or less, or the tensile properties may be established by performing tensile tests as set forth in API Standards 5LX. All test specimens shall be selected at random and the number of tests must be as follows:

NUMBER OF TENSILE TESTS—ALL SIZES

Lot of—	
10 lengths or less	1 set of tests for each length.
11 to 100 lengths	1 set of tests for each 5 lengths, but not less than 10.
Over 100 lengths	1 set of tests for each 10 lengths, but not less than 20.

If the yield-tensile ratio, based on the properties determined by these tests, exceeds 0.85, the pipe may be used only as provided in § 192.55(c).

APPENDIX C—MATERIALS INCORPORATED BY REFERENCE

I. List of organizations and addresses.

A. American Petroleum Institute (API), 1271 Avenue of the Americas, New York, N.Y. 10020, or 300 Corrigan Tower Building, Dallas, Tex. 75201.

B. The American Society of Mechanical Engineers (ASME), United Engineering Center, 345 East 47th Street, New York, N.Y. 10017.

C. American National Standards Institute (ANSI), 1430 Broadway, New York, N.Y. 10018 (Formerly the United States of American Standards Institute (USASI). All current standards issued by USASI and ASI have been redesignated as American National Standards and continue in effect.

D. American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pa. 19103.

E. National Fire Protection Association, 60 Batterymarch Street, Boston, Mass. 02110.

F. Manufacturers Standardization Society of the Valve and Fittings Industry, 420 Lexington Avenue, New York, N.Y. 10017.

II. Listed standards or specifications.

A. American Petroleum Institute:

1. API Standard 5L entitled "API Specification for Line Pipe." (1967 edition)

2. API Standard 5LS entitled "API Specification for Spiral-Weld Line Pipe." (1967 edition)

3. API Standard 5LX entitled "API Specification for High-Test Line Pipe." (1967 edition)

4. API Recommended Practice 5L1 entitled "API Recommended Practice for Railroad Transportation of Line Pipe." (1967 edition)

5. API Standard 5A entitled "API Specification for Casing, Tubing, and Drill Pipe." (1967 edition)

B. The American Society for Testing and Materials:

1. ASTM Specification A53 entitled "Standard Specification for Welded and Seamless Steel Pipe." (A53–65)

2. ASTM Specification A72 entitled "Tentative Specification for Welded Wrought-Iron Pipe." (A72–64T)

3. ASTM Specification A106 entitled "Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service." (A106–66)

4. ASTM Specification A134 entitled "Standard Specification for Electric-Fusion (ARC)-Welded Steel Plate Pipe, Sizes 16 in. and over." (A134–64)

5. ASTM Specification A135 entitled "Tentative Specification for Electric-Resistance-Welded Steel Pipe." (A135–63T)

6. ASTM Specification A139 entitled "Standard Specification for Electric-Fusion (ARC)-Welded Steel Pipe, Sizes 4 in. and over." (A139–64)

7. ASTM Specification A155 entitled "Standard Specification for Electric-Fusion-Welded Steel Pipe for High-Temperature Service." (A155–65)

8. ASTM Specification A333 entitled "Standard Specification for Seamless and Welded Steel Pipe for Low-Temperature Service." (A333–64)

9. ASTM Specification A377 entitled "Standard Specification for Cast Iron and Ductile Iron Pressure Pipe." (A377–66)

10. ASTM Specification A381 entitled "Standard Specification for Metal-Arc-Welded Steel Pipe for High-Pressure Transmission Service." (A381–66)

11. ASTM Specification B42 entitled "Standard Specification for Seamless Copper Pipe, Standard Sizes." (B42–62)

12. ASTM Specification B68 entitled "Standard Specification for Seamless Copper Tube, Bright Annealed." (B68–65)

13. ASTM Specification B75 entitled "Standard Specification for Seamless Copper Tube." (75–65)

14. ASTM Specification B88 entitled "Standard Specification for Seamless Copper Water Tube." (B88–66)

15. ASTM Specification B251 entitled "Standard Specification for General Requirements for Wrought Seamless Copper and Copper-Alloy Tube." (B251–66)

16. ASTM Specification D2513 entitled "Standard Specification for Thermoplastic Gas Pressure Pipe, Tubing, and Fittings." (D2513–66T)

17. ASTM Specification D2517 entitled "Tentative Specification for Reinforced Thermosetting Plastic Gas Pressure Pipe and Fittings." (D2517–66T)

18. ASTM Specification A372 entitled "Standard Specification for Carbon and Alloy Steel Forgings for Pressure Vessel Shells." (A372–65)

C. The American National Standards Institute, Inc.:

1. ANSI A21.3 is titled "Specifications for Cast Iron Pit Cast Pipe for Gas." (A21.3–1953)

2. ANSI A21.7 is titled "Cast-Iron Pipe Centrifugally Cast in Metal Molds for Gas." (A21.7–1962)

3. ANSI A21.9 is titled "Cast-Iron Pipe Centrifugally Cast in Sand-Lined Molds for Gas." (A21.9–1962)

4. ANSI A21.11 is titled "Rubber Gasket Joints for Cast-Iron Pressure Pipe and Fittings." (A21.11–1964)

5. ANSI A21.52 is titled "Ductile-Iron Pipe, Centrifugally Cast, in Metal Molds or Sand-Lined Molds for Gas." (A21.52–1965)

6. ANSI B16.1 is titled "Cast Iron Pipe Flanges and Flanged Fittings." (B16.1–1966)

7. ANSI B36.10 is titled "Wrought-Steel and Wrought-Iron Pipe." (B36.10–1959)

8. ANSI C1 is titled "National Electrical Code, 1965." (C1–1965)

D. National Fire Protection Association:

1. NFPA Standard 30 is titled "Flammable and Combustile Liquids Code." (1963 edition)

2. NFPA Standard 58 is titled "Storage and Handling, Liquefied Petroleum Gases." (1963 edition)

3. NFPA Standard 59 is titled "LP Gases at Utility Gas Plants." (1962 and 1963 addendum)

E. The American Society of Mechanical Engineers:

1. ASME Boiler and Presure Vessel Code, Section VIII is titled "Pressure Vessels, Division 1." (1965 edition and 1966 Addenda)

2. ASME Boiler and Pressure Vessel Code, Section IX is titled "Welding Qualifications." (1965 edition and 1966 Addenda)

Subpart D—Design of Piping System Components and Facilities

§ 192.141 Scope.

This subpart prescribes minimum requirements for the design and installation of piping system components and facilities such as valves, flanges (including bolts, nuts and gaskets) standard fittings, branch connections, special components fabricated by welding, extruded outlets, anchorage for exposed or buried piping, compressor stations, pipe-type and bottle-type holders, and vaults. In addition, it covers requirements relating to protection against accidental overpressuring, including the design and installation of presure relief or pressure limiting devices.

§ 192.142 General requirements.

Each component of a piping system must be able to withstand operating pressures and other specified loadings with unit stresses equivalent to those permitted for comparable material in pipe in the same location and type of service.

§ 192.143 Valves.

(a) Each valve must be used in accordance with the service recommendation of the manufacturer.

(b) No valve having pressure containing parts made of ductile iron may be used at pressures exceeding 80 percent of the pressure ratings for comparable steel valves at their listed temperature.

(c) A valve having pressure containing parts made of ductile iron may be used at pressures up to 80 percent of the pressure ratings for comparable steel valves at their listed temperature, if—

(i) The adjusted service pressure does not exceed 1,000 p.s.i.g.; and

(ii) Welding is not employed on any ductile iron component in the fabrication of the valve shells or their assembly.

(d) No valve having pressure containing parts made of ductile iron may be used in the gas piping components of compressor stations.

§ 192.144 Flanges.

(a) *Bolting.* Each bolt or studbolt used for flange joints must extend completely through the nuts when secured.

(b) *Nuts.* Nuts cut from bar stock so that the axis is parallel to the direction of rolling of the bar—

(1) May be used in all sizes for joints in which one or both flanges are cast iron, and for joints with steel flanges where the pressure does not exceed 250 p.s.i.g.; but

(2) Except for nut sizes one-half inch and smaller, may not be used for joints in which both flanges are steel and the pressure exceeds 250 p.s.i.g.

(c) *Gaskets.* Each gasket must meet the following requirements as applicable:

(1) All material used for gaskets must be capable of withstanding the maximum pressure at which the pipeline is to be operated, and of maintaining its physical and chemical properties, at any temperature to which it might reasonably to subjected in service.

(2) Each gasket used under pressure and at temperatures above 250° F. must be of noncombustible material.

(3) Metallic gaskets may not be used with 150-pound standard or lighter flanges.

(4) Material used in rings for ring joints must be suitable for the service conditions encountered and must be softer than the flanges.

§ 192.145 Standard fittings.

(a) The minimum metal thickness of flanged or threaded fittings may not be less than specified for the pressures and temperatures in the applicable USA Standards or the MSS Standard Practice.

(b) Each steel butt-welding fitting must have pressure and temperature ratings based on stresses for pipe of the same or equivalent material. To insure adequacy of fitting design, the actual bursting strength of the fitting must at least equal the computed bursting strength of pipe of the designated material and wall thickness.

§ 192.146 Branch connections.

(a) Threaded taps in cast iron pipe 6 inches nominal size and smaller may not be used, except for the following:

(1) Existing taps used for replacement service, that are free of cracks and have good threads.

(2) Taps used for gas control equipment, which are not more than 25 percent of the nominal diameter of the pipe, and are closed after use by means of a threaded plug or reinforcing sleeve.

(b) Threaded taps in cast iron pipe larger than 6 inches nominal diameter may be used without reinforcement to a size not more than 25 percent of the nominal diameter of the pipe. Larger taps must be covered by reinforcing sleeves.

(c) Threaded taps in ductile iron pipe may be used without reinforcement to a size not more than 25 percent of the nominal diameter of the pipe. The extent of full-thread engagement necessary, and the necessity for use of outside-sealing service connections, tapping saddles, or other fixtures must be determined by service conditions.

(d) Mechanical fittings may be used for making hot taps on pipelines and mains, provided they are designed for the operating pressure of the pipeline or main.

§ 192.147 Special components fabricated by welding.

(a) This section covers piping system components other than assemblies consisting of standard pipe and fittings joined by circumferential welds.

(b) All welding must be performed using procedures and operators that are qualified in accordance with the requirements of §§ 192.205, 192.207, and 192.209.

(c) Each branch connection must meet the design requirements of §§ 192.148 and 192.149.

(d) The design of other components must be in accordance with applicable requirements of this part. When the strength of a component cannot be determined with reasonable accuracy under the provisions of this part, the allowable working pressure must be established as prescribed by paragraph UG–101, section VIII, ASME Boiler and Pressure Vessel Code.

(e) Each prefabricated unit which employs plate and longitudinal seams must be designed, constructed, and tested under requirements of the ASME Boiler and Pressure Vessel Code. However, the requirements of that code do not apply to regularly manufactured butt-welding fittings, to pipe that has been produced and tested under the specifications listed in this part, or to such partial assemblies as split rings or collars or other field welded details.

(f) No orange-peel bull plug or orange-peel swage may be used on systems operating at stress levels of 20 percent or more of the specified minimum yield strength of the pipe material.

(g) Fish tails and flat closures may be used for 3-inch diameter pipe and smaller, operating at less than 100 p.s.i.g.

(h) No fish tail may be used on pipe larger than 3 inch diameter.

(i) Each flat closure larger than 3 inches in diameter must be designed according to section VIII, Unfired Pressure Vessels, of the ASME Boiler and Pressure Vessel Code.

§ 192.148 Reinforcement of welded branch connections.

(a) When branch connections are made to pipe in the form of a single connection, or in a header or manifold as a series of connections, the design must be adequate to control the stress levels in the pipe within safe limits. The design must also assure that the addition of any fabricated branch connection will not reduce the strength of the pipeline system.

(b) The construction must take into account the stresses in the remaining pipe wall due to the opening in the pipe or header, the shear stresses produced by the pressure acting on the area of the branch opening, and any external loadings due to thermal movement, weight, and vibration.

§ 192.149 Extruded outlets.

Each extruded outlet must be designed so as to be suitable for the intended service and must be at least as strong as the pipe and other fittings in the pipeline system to which it is attached.

§ 192.150 Flexibility.

Each piping system must be designed to have sufficient flexibility to prevent

thermal expansion or contraction from causing excessive stresses in the piping material, excessive bending or unusual loads at joints, or undesirable forces or movements at points of connection to equipment, or at anchorage or guide points.

§ 192.151 Supports and anchorage for exposed piping.

(a) *General requirements.* All piping and equipment must be supported so as to prevent or damp out excessive vibration, and must be anchored sufficiently to prevent undue strains on connected equipment.

(b) *Provision for expansion.* Each support, hanger, or anchor must be installed in such a manner as not to interfere with the free expansion and contraction of the piping between anchors.

(c) *Materials, design, and installation.* Each permanent hanger, support, or anchor must be fabricated from durable, incombustible material, and designed and installed for the service conditions involved. Each part of the supporting equipment must be designed and installed so that it will not be disengaged by movement of the supported piping.

(d) *Forces on pipe joints.* Each exposed pipe joint must be able to sustain the maximum end force due to the internal pressure, i.e., the design pressure (p.s.i.g.) times the internal area of the pipe (sq. in.), as well as any additional forces due to temperature expansion or contraction, or to the weight of the pipe and its contents.

(e) *Attachment of supports or anchors.* (1) Where pipe is designed to operate at a hoop stress of less than 50 percent of the specified minimum yield strength, structural supports or anchors may be welded directly to the pipe. Proportioning and welding strength requirements of each attachment must conform to standard structural practice.

(2) Where pipe is designed to operate at a hoop stress of 50 percent or more of the specified minimum yield strength, support of the pipe must be furnished by a member which completely encircles it. Where it is necessary to provide positive attachment, as at an anchor, the pipe must be welded to the encircling member only, and the support must be attached to the encircling member. The connection of the pipe to the encircling member must be by continuous welds.

§ 192.152 Anchorage for buried piping.

(a) *General requirements.* Each longitudinal force caused by a bend or offset in buried pipe must be resisted.

(b) *Supports for buried piping.* (1) Uniform and adequate support of the pipe in the trench must be provided. At branch connections, the fill must be thoroughly consolidated, or other provision must be made to resist the thrust.

(2) When openings are made in a consolidated backfill to connect new branches to an existing line, firm foundation for both the header and the branch must be provided to prevent both vertical and lateral movements.

(c) *Interconnection of underground lines.* If a connection is made to a relatively unyielding line or other fixed object at a location adjacent to a bend or an end, the interconnection must have ample flexibility to care for possible movement, or the line must be provided with an anchor sufficient to develop the forces necessary to limit the movement.

§ 192.153 Compressor stations; Design and construction.

(a) *Location of compressor building.* Each main compressor building for a gas compressor station must be located at such a clear distance from adjacent property not under control of the operator, as to minimize the hazard of communication of fire to the compressor building from structures on adjacent property. Sufficient open space must be provided around the building to permit the free movement of firefighting equipment.

(b) *Building construction.* Each compressor station building which houses gas piping in sizes larger than 2 inches in diameter, or equipment handling gas (except equipment for domestic purposes), must be constructed of noncombustible materials.

(c) *Exits.* Each exit from an operating floor of a main compressor building must be an unobstructed doorway so located as to provide a convenient possibility of escape and to provide unobstructed passage to a place of safety. Each door latch must be of a type which can be readily opened from the inside without a key. Each swinging door located in an exterior wall must swing outward.

(d) *Fenced areas.* Each fence gate in the vicinity of a compressor station must be located to provide a convenient opportunity for escape to a place of safety. Each gate located within 200 feet of any compressor plant building must open outward and must be unlocked, or capable of being opened from the inside without a key, when the area within the enclosure is occupied, or other facilities affording a similarly convenient exit from the area must be provided.

§ 192.154 Compressor stations: Electrical facilities.

All electrical equipment and wiring installed in gas transmission and distribution compressor stations must conform to the requirements of the National Electric Code, USAS C1.

§ 192.155 Compressor stations: Gas treating facilities for liquid removal.

(a) The suction stream to each stage of compression (or to each unit, for centrifugal compressors) must be protected against the introduction of dangerous quantities of entrained liquids into the compressor.

(b) Each liquid separator used for this purpose must be provided with manually operated facilities for removal of liquids from the separator.

(c) Where slugs of liquid might be carried into the compressors, automatic liquid removal facilities or an automatic compressor shutdown device, or a high liquid level alarm must be used.

(d) Each liquid separator constructed of pipe and fittings without internal welding must be fabricated with a design factor of 0.4. All other liquid separators must be manufactured in accordance with section VIII, Unfired Pressure Vessels, of the ASME Boiler and Pressure Vessel Code.

§ 192.156 Compressor stations: Fire protection.

Each compressor station must be equipped with adequate fire protection facilities. If fire pumps are a part of these facilities, their operation must be unaffected by emergency shutdown facilities.

§ 192.157 Compressor stations: Safety devices.

(a) *Emergency shutdown facilities for transmission compressor stations.* Except for unattended field compressor stations of 1,000 horsepower or less, each transmission compressor station must have an emergency shutdown system meeting the following requirements:

(1) Except as provided in subparagraph (2) of this paragraph, the emergency shutdown system must provide means by which all gas compressing equipment, all gas fires, and all electrical facilities in the vicinity of gas headers and in the compressor building can be shut down, and the gas can be blocked out of the station and the station gas piping blown down.

(2) Electrical circuits supplying emergency lighting required to assist station personnel in evacuating the compressor building and the area in the vicinity of the gas headers, may remain energized after the actuation of the station emergency shutdown system.

(3) The emergency shutdown system must be operable from any one of at least two locations outside the gas area of the station, preferably near exit gates in the station fence, but not more than 500 feet from the limits of the station.

(4) Blowdown piping must extend to a location where the discharge of gas is not likely to create a hazard to the compressor station or surrounding area.

(b) *Emergency shutdown facilities for distribution compressor stations.* Each compressor station supplying gas directly to a distribution system must be provided with emergency shutdown facilities located outside of the compressor station buildings, by means of which all gas can be blocked out of the station, provided there is another adequate source of gas for the distribution system. When no other gas source is available, then no shutdown facilities may be installed that might function at the wrong time and cause an outage on the distribution system.

(c) *Engine overspeed stops.* Each compressor prime mover, except electrical induction or synchronous motors, must be provided with an automatic device to shut down the unit before the speed of the prime mover or the driven unit exceeds the maximum safe speed of either.

§ 192.158 Compressor stations: Pressure limiting requirements.

(a) Pressure relief or other suitable protective devices of sufficient capacity

and sensitivity must be installed and maintained to assure that the maximum allowable operating pressure of the station piping and equipment is not exceeded by more than 10 percent.

(b) Each vent line provided to exhaust the gas from the pressure relief valves to the atmosphere must be extended to a location where the gas may be discharged without undue hazard.

§ 192.159 Compressor stations: Fuel gas control.

Each gas engine operating with pressure gas injection must be provided with an automatic device designed to shut off the fuel gas when the engine stops. The engine distribution manifold must be simultaneously automatically vented.

§ 192.160 Compressor stations: Cooling and lubrication failures.

Each gas compressor unit must be equipped with a shutdown or alarm device to operate in the event of inadequate cooling or lubrication of the unit.

§ 192.161 Compressor stations: Explosion prevention.

(a) *Mufflers.* Each muffler for engines using gas as fuel must be constructed with all compartments having vent slots or holes in the baffles to prevent gas from being trapped in the muffler.

(b) *Building ventilation.* Ventilation equipment must be ample to assure that employees are not endangered by accumulations of hazardous concentrations of flammable or noxious vapors or gases in rooms, sumps, attics, pits, or similarly enclosed places.

§ 192.162 Compressor stations: Piping.

The materials, construction, installation, testing, types of valves and type of pressure limiting devices used on compressor station gas piping must conform to the applicable requirements of this part.

§ 192.163 Pipe-type holders in rights-of-way not under exclusive use and control of the operator.

Each pipe-type holder installed in a street, highway or in a private right-of-way not under the exclusive control and use of the operator, must be designed, installed, and tested in accordance with the provisions of this part applicable to a pipeline installed in the same location and operated at the same maximum operating pressure.

§ 192.164 Pipe-type and bottle-type holders located on property under the exclusive use and control of the operator: Installation and testing.

(a) Each bottle-type holder must be located on land owned or under the exclusive control and use of the operator.

(b) Each storage site must be entirely surrounded by fencing to prevent access by unauthorized persons.

(c) Each pipe container must be buried with the depth of cover required by § 192.333.

(d) Each bottle must be buried with the top of each container below the normal frost line, but in no case with a depth of cover less than that required by § 192.333.

(e) Each pipe-type holder must be tested in accordance with the provisions of § 192.505, for a pipeline located in the same class location as the holder site.

§ 192.165 Pipe-type and bottle-type holders located on property under the exclusive use and control of the operator: Design factors.

Each pipe-type or bottle-type holder installed on property under the exclusive control and use of the operator must be designed in accordance with design factors required by § 192.109.

§ 192.166 Pipe-type and bottle-type holders located on property under the exclusive use and control of the operator: Minimum clearance.

(a) *Minimum clearance between containers and fenced boundaries.* The minimum clearance between containers and the fenced boundaries of the site is fixed by the maximum operating pressure of the holder as follows:

Maximum operating pressure:	*Minimum clearance (feet)*
Less than 1,000 p.s.i.g.	25
1,000 p.s.i.g. or more	100

(b) *Minimum clearance between pipe containers or bottles.* The minimum distance in inches between pipe containers or bottles is determined by the following formula:

$$C = \frac{3D \times P \times F}{1{,}000}$$

in which:

C = Minimum clearance between pipe containers or bottles in inches.
D = Outside diameter of pipe container or bottle in inches.
P = Maximum allowable operating pressure, p.s.i.g.
F = Design factor (§ 192.109).

§ 192.167 Special provisions applicable to bottle-type holders.

A bottle-type holder may be manufactured from steel which is not weldable under field conditions, subject to each of the following limitations:

(a) Each bottle-type holder made from alloy steel must meet the chemical and tensile requirements for the various grades of steel in API Standard 5A, "Specifications for Casing, Tubing and Drill Pipe," or ASTM A372, "Specification for Carbon and Alloy Steel Forgings for Pressure Vessel Shells."

(b) In no case may the actual yield-tensile ratio exceed 0.85.

(c) Welding may not be performed on such a bottle after it has been heat treated, stress relieved, or both, except that copper wires may be attached to the small diameter portion of the bottle end closure for cathodic protection, using a localized thermit welding process.

(d) Each such bottle must be given a hydrostatic test in the mill, and need not be retested hydrostatically at the time of installation. The mill test pressure may not be less than that required to produce a hoop stress equal to 85 percent of the specified minimum yield strength of the steel. Careful inspection of the bottle at the time of installation must be made, and no damaged bottle may be used.

(e) Each such bottle and connecting piping must be leak tested after installation as required by Subpart J of this part.

§ 192.168 General provisions applicable to both pipe-type and bottle-type holders.

(a) Suitable measures must be taken to protect the storage system against external corrosion.

(b) No gas containing more than 0.1 grain of hydrogen sulfide per 100 cubic feet at 14.7 p.s.i.a. and 60° F. may be stored.

(c) Provision must be made to prevent the formation or accumulation of liquids in the holder, connecting piping and auxiliary equipment, that might cause corrosion or might interfere with the safe operation of the storage equipment.

(d) Relief valves on pipe-type and bottle-type holders must be installed in accordance with provisions of this part, which will have relieving capacity able to limit the pressure imposed on the filling lines, and thereby on the storage holder, to 100 percent of the design pressure of the holder, or to that pressure which produces a hoop stress of 75 percent of the specified minimum yield strength of the steel, whichever is less.

§ 192.169 Required spacing of valves.

(a) *Transmission lines.* Each sectionalizing block valve on a transmission line must be installed at a spacing not to exceed 20 miles within areas conforming to Class 1 Location, 15 miles within areas conforming to Class 2 Location, 8 miles within areas conforming to Class 3 Location, and 5 miles within areas conforming to Class 4 Location.

(b) *High-pressure distribution systems.* Valves must be installed in high-pressure distribution systems in accessible locations in order to reduce the time to shut down a section of main in an emergency. The spacing of the valves must be determined by the operating pressure, the size of the mains, and the local physical conditions.

§ 192.170 Location of transmission system valves.

(a) Each sectionalizing block valve must be accessible and protected from damage and tampering.

(b) Each operating device to open or close a valve must be readily accessible to authorized persons.

(c) Each valve must be suitably supported to prevent settlement, or movement by the attached piping.

(d) Blow-down valves must be provided so that each section of pipeline between main line valves can be blown down rapidly. Each blow down valve must be located where the gas can be blown to the atmosphere without hazard.

§ 192.171 Location of distribution system valves.

(a) Each regulator station controlling the flow or pressure of gas in a distribution system must have a valve installed on the inlet piping. The distance between

the valve and the regulator or regulators must be sufficient to permit the operation of the valve during an emergency.

(b) Each valve on a distribution main, whether for operating or emergency purposes, must be located in a manner that will provide ready access, and facilitate its operation during an emergency.

(c) Where a valve is installed in a buried box or enclosure, only ready access to the operating stem or mechanism is required. The box or enclosure must be installed in a manner to avoid transmitting external loads to the main.

§ 192.172 Vaults: Structural design requirements.

(a) Each underground vault or pit for valves, pressure relieving, pressure limiting or pressure regulating stations, must be designed and constructed to meet the loads which may be imposed upon it.

(b) Sufficient working space must be provided so that all of the equipment required in the vault or pit can be properly installed, operated and maintained.

(c) In the design of such a vault or pit, consideration must be given to the protection of the installed equipment from damage, such as that resulting from an explosion within the vault or pit, which may cause portions of the roof or cover to fall into it.

(d) All pipe entering or within regulator vaults or pits must be steel for sizes 10 inches and less, except that control and gage piping may be copper. Where piping extends through the vault or pit structure, provision must be made to prevent the passage of gasses or liquids through the opening and to avert strains in the piping.

§ 192.173 Vaults: Accessibility.

Each vault must be located in an accessible location, away from street intersections or points where traffic is heavy or dense, and away from points of minimum elevation, catch basins, or places where the access cover will be in the course of surface waters. Each vault must be located as far as practical from water, electric, steam, or other facilities.

§ 192.174 Vaults: Sealing, venting and ventilation.

Each underground vault or closed top pit containing either a pressure regulating or reducing station, or a pressure limiting or relieving station, must be sealed, vented or ventilated, as follows:

(a) When the internal volume exceeds 200 cubic feet—

(1) The vault or pit must be ventilated with two ducts, each having at least the ventilating effect of a pipe 4 inches in diameter;

(2) The ventilation provided must be sufficient to minimize the possible formation of combustible atmosphere in the vault or pit; and

(3) The ducts must extend to a height above grade adequate to disperse any gas air mixtures that might be discharged.

(b) When the internal volume is between 75 cubic feet and 200 cubic feet—

(1) If the vault or pit is sealed, all openings must be equipped with tight fitting covers without open holes through which an explosive mixture might be ignited, and means must be provided for testing the internal atmosphere before removing the covers;

(2) If the vault or pit is vented, provision to prevent external sources of ignition from reaching the vault atmosphere must be provided; or

(3) If the vault or pit is ventilated, the provisions of paragraph (a) or (c) of this section are applicable.

(c) If vaults or pits referred to in paragraph (b) of this section are ventilated by means of openings in the covers or gratings and ratio of the internal volume, in cubic feet, to the effective ventilating area of the cover or grating, in square feet, is less than 20 to 1, no additional ventilation is required.

§ 192.175 Vaults: Drainage and waterproofing.

(a) Provisions must be made to minimize the entrance of water into vaults.

(b) A vault containing gas piping may not be connected by means of a drain connection to any other substructure, such as a sewer.

(c) All electrical equipment in vaults must conform to the requirements of Class 1, Group D, of the National Electrical Code, USAS C1.

§ 192.180 Reinforced thermosetting plastic design.

The wall thickness for reinforced thermosetting plastic pipe may not be less than that shown in the following table:

DIAMETER AND WALL THICKNESS FOR REINFORCED THERMOSETTING PLASTIC PIPE (SHOWN IN INCHES)

Nominal size	Outside diameter	Minimum wall thickness
2	2.375	0.060
3	3.500	0.060
4	4.500	0.070
6	6.625	0.100

§ 192.181 Design pressure of plastic fittings.

(a) Thermosetting fittings for plastic pipe must conform to ASTM D 2517.

(b) The design pressure of ABS and PVC Schedule 40 and 80 thermoplastic fittings must be obtained from the following table:

DESIGN PRESSURE OF THERMOPLASTIC FITTINGS, P.S.I., OF VARIOUS STRENGTHS, MATERIALS AND CLASS LOCATIONS

Size inches	Schedule	ABS Type I and PVC Type II class location			PVC Type I class location		
		1	2 and 3	4	1	2 and 3	4
½	40	100	100	100	100	100	100
	80	100	100	100	100	100	100
¾	40	100	100	96	100	100	100
	80	100	100	100	100	100	100
1	40	100	100	90	100	100	100
	80	100	100	100	100	100	100
1¼	40	100	92	74	100	100	100
	80	100	100	100	100	100	100
1½	40	100	83	66	100	100	100
	80	100	100	94	100	100	100
2	40	89	69	55	100	100	100
	80	100	100	81	100	100	100
2½	40	93	76	61	100	100	100
	80	100	100	85	100	100	100
3	40	84	66	53	100	100	100
	80	100	94	75	100	100	100
3½	40	77	60	48	100	100	96
	80	100	86	69	100	100	100
4	40	71	56	44	100	100	89
	80	100	81	65	100	100	100
5	40	62	49	39	100	97	78
	80	93	72	58	100	100	100
6	40	56	44	35	100	88	71
	80	89	70	56	100	100	100

NOTE: These pressure ratings are the same value as the design pressure of the corresponding pipe size and schedule in the same class location, as determined by the formula given in § 192.123 and the limitations in § 192.125 of this part.

§ 192.182 Valve installation in plastic piping.

Each valve installation in plastic piping must be so designed as to protect the plastic material against excessive torsional or shearing loads when the valve or shutoff is operated, and from any other secondary stresses which might be exerted through the valve or its enclosure.

§ 192.185 Protection against accidental overpressuring.

(a) *In general.* Each pipeline, main, distribution system, customer's meter and connected facilities, compressor station, pipe-type holder, bottle-type holder, container fabricated from pipe and fittings, and any special equipment that is connected to a compressor or to a gas source so that the maximum allowable operating pressure of the facility could be exceeded as the result of pressure control failure or of some other type of failure, must be equipped with pressure relieving or pressure limiting devices that will ensure that the maximum allowable operating pressure of the facility will not be exceeded.

(b) *Additional requirements for high pressure and low pressume distribution systems.* Each high pressure or low pressure distribution system or main that is supplied from a source of gas that is at a higher pressure than the maximum allowable operating pressure for the system must—

(1) Be equipped with pressure regulation devices capable of meeting the pressure, load, and other service conditions that will be experienced in normal operation of the system, and that could be activated in the event of failure of some portion of the system; and

(2) Be designed so as to prevent accidental overpressuring.

§ 192.186 Control and limiting of the pressure of gas delivered to domestic, small commercial and small industrial customers from high-pressure distribution systems.

(a) If the maximum actual operating pressure of the distribution system is between 2 p.s.i.g. and 60 p.s.i.g., and a service regulator having the characteristics listed below is used, no other pressure limiting device is required:

(1) A pressure regulator capable of reducing distribution line pressure (pounds per square inch) to pressures recommended for household appliances (inches of water column).

(2) Single port valve with proper orifice for the maximum gas pressure at the regulator inlet.

(3) A valve seat made of resilient material designed to withstand abrasion of the gas, impurities in gas, cutting by the valve, and to resist permanent deformation when it is pressed against the valve port.

(4) Pipe connections to the regulator not exceeding 2 inches in diameter.

(5) A regulator of a type that is capable under normal operating conditions of regulating the downstream pressure within the necessary limits of accuracy and of limiting the build-up of pressure under no-flow conditions to 50 percent or less of the discharge pressure maintained under flow conditions.

(6) A self-contained service regulator with no external static or control lines.

(b) If the maximum actual operating pressure of the distribution system is between 2 p.s.i.g. and 60 p.s.i.g. and a service regulator not having all of the characteristics listed in paragraph (a) of this section is used, or if the gas contains materials that seriously interfere with the operation of service regulators, suitable protective devices must be installed to prevent unsafe overpressuring of the customer's appliances should the service regulator fail.

(c) If the maximum actual operating pressure of the distribution system exceeds 60 p.s.i.g., one of the following methods must be used to regulate and limit, to the maximum safe value, the pressure of gas delivered to the customer:

(1) A service regulator having the characteristics listed in paragraph (a) of this section, and a secondary regulator located upstream from the service regulator. The secondary regulator in no case may be set to maintain a pressure higher than 60 p.s.i.g. A device must be installed between the secondary regulator and the service regulator to limit the pressure on the inlet of the service regulator to 60 p.s.i.g. or less in case the secondary regulator fails to function properly. This device may be either a relief valve, or an automatic shutoff that shuts, if the pressure on the inlet of the service regulator exceeds the set pressure (60 p.s.i.g. or less), and remains closed until manually reset.

(2) A service regulator and a monitoring regulator set to limit, to a maximum safe value, the pressure of the gas delivered to the customer.

(3) A service regulator with a relief valve vented to the outside atmosphere, with the relief valve set to open so that the pressure of gas going to the customer does not exceed a maximum safe valve. The relief valve may either be built into the service regulator or it may be a separate unit installed downstream from the service regulator. This combination may be used alone only in those cases where the inlet pressure on the service regulator does not exceed the manufacturer's safe working pressure rating of the service regulator, and may not be used where the inlet pressure on the service regulator exceeds 125 p.s.i.g. For higher inlet pressures, the method in subparagraph (1) or (2) of this paragraph must be used.

(d) When the pressure of the gas and the demand by the customer are greater than that which is applicable under the provisions of this section, the requirements for control and limiting of the pressure of gas delivered are covered by § 192.185.

§ 192.187 Requirements for design of pressure relief and pressure limiting installations.

Each pressure relief or pressure limiting device must—

(a) Be constructed of materials such that the operation of the device will not be impaired by corrosion;

(b) Have valves and valve seats that are designed not to stick in a position that will make the device inoperative;

(c) Be designed and installed so that it can be readily operated to determine if the valve is free, can be tested to determine the pressure at which it will operate, and can be tested for leakage when in the closed position;

(d) Have support made of noncombustible material;

(e) Have discharge stacks, vents or outlet ports protected with rain caps, located where gas can be discharged into the atmosphere without undue hazard for any exposures in the immediate vicinity;

(f) Be designed and installed so that the size of the openings, pipe and fittings located between the system to be protected and the pressure relieving device, and the size of the vent line, are adequate to prevent hammering of the valve and to prevent impairment of relief capacity; and

(g) Where installed at a district regulator station to protect a piping system from overpressuring, be designed and installed to prevent any single incident such as an explosion in a vault or damage by a vehicle from affecting the operation of both the overpressure protective device and the district regulator.

§ 192.188 Required capacity of pressure relieving and pressure limiting stations.

(a) Each pressure relief station or pressure limiting station or group of such stations installed to protect a piping system or pressure vessel must have sufficient capacity, and must be set to operate, to prevent the pressure from exceeding the maximum allowable operating pressure plus 10 percent, or the pressure which produces a hoop stress of 75 percent of the specified minimum yield strength, whichever is lower, or in a low-pressure distribution system, a pressure which would cause the unsafe operation of any connected and properly adjusted gas burning equipment.

(b) When more than one pressure regulating or compressor station feeds into a pipeline or distribution system, relief valves, or other protective devices, must be installed at each station to insure that the complete failure of the largest capacity of any single run or lesser capacity regulators or compressors in that station will not impose pressures on any part of the distribution system, in excess of those it was designed for, or protected against, whichever is lower.

(c) Relief valves or other pressure limiting devices must be installed at or near regulator stations in low pressure systems, with a capacity to limit the maximum pressure in the main to 2 p.s.i.g.

§ 192.189 Instrument, control and sampling piping.

(a) *Applicability.* (1) The requirements in this section apply to the design of instrument, control and sampling piping for safe and proper operation of the piping itself, and do not cover design of piping to secure proper functioning of instruments for which the piping is installed.

(2) This section does not apply to permanently closed piping systems, such as fluid-filled temperature-responsive devices.

(b) *Materials and design.* (1) All materials employed for valves, fittings, tubing, and piping must be designed to meet the particular conditions of service.

(2) Each takeoff connection and attaching boss, fitting, or adapter must be made of suitable material, be capable of withstanding the maximum service pressure and temperature of the piping or equipment to which it is attached, and be designed to satisfactorily withstand all stresses without failure by fatigue.

(3) A shutoff valve must be installed in each takeoff line as near as practicable to the point of takeoff. Blowdown valves must be installed where necessary.

(4) Brass pipe or copper pipe or tubing may not be used for metal temperatures greater than 400° F.

(5) Piping which may contain liquids must be protected by heating or other suitable means from damage due to freezing.

(6) Piping in which liquids may accumulate must be provided with drains or drips.

(7) The arrangement of piping and supports must be designed to provide safety under operating stresses.

(8) Suitable precautions, such as increasing the pipe wall thickness, must be taken where internal corrosive conditions may exist. All underground piping must be protected against corrosion where soil tests or experience indicate that the soil is corrosive.

(9) Each joint between sections of tubing and pipe, and between tubing or pipe and valves or fittings, must be made in a manner suitable for the pressure and temperature condition. Slip type expansion joints may not be used. Expansion must be taken care of by providing flexibility within the piping or tubing system itself.

(10) Each control line must be protected from predictable causes of damage and must be designed and installed to prevent damage to any one control line from making both the district regulator and the overpressure protective device inoperative.

[F.R. Doc. 70-4344; Filed, Apr. 7, 1970; 8:52 a.m.]

Office of Pipeline Safety

[49 CFR Parts 192, 195]

[Notice 70-6; Docket No. OPS-3F]

MINIMUM FEDERAL SAFETY STANDARDS FOR GAS PIPELINES

Testing and Uprating

The Department of Transportation is developing proposals for the comprehensive minimum Federal safety standards for gas pipeline facilities and for the transportation of gas, as required by subsection 3(b) of the Natural Gas Pipeline Safety Act of 1968. This notice of proposed rulemaking is the seventh of a series of notices by which the proposed Federal safety standards will be issued for public comment.

Interested persons are invited to participate in the making of these proposed rules by submitting written data, views, or arguments as they may desire. Communications should identify the regulatory docket and notice number and be submitted in duplicate to the Office of Pipeline Safety, Department of Transportation, 400 Sixth Street SW., Washington, D.C. 20590. Communications received before May 25, 1970, will be considered before taking final action on this notice. All comments will be available for examination by interested persons at the Office of Pipeline Safety before and after the closing date for comments. The proposals contained in this notice may be changed in light of comments received.

The first notice in this series was published in the FEDERAL REGISTER on November 21, 1969 (Notice 69-3; F.R. 18556). That notice discussed both the Department's plan for establishing the minimum Federal standards and the source materials to be used in developing proposals for these standards. It also proposed, without stating specific regulatory language, several requirements for inclusion in the minimum Federal standards. This notice sets forth the specific regulations that are being proposed as testing and uprating requirements.

Included in this notice are proposed Subparts J and K of Part 192 which contain—

(1) The general requirements for strength testing new, relocated, or replaced pipelines, mains, and related facilities that are presently contained in sections 841 and 842 of chapter IV of the USAS B31.8 Code;

(2) The general requirements for qualifying pipelines, mains, and related facilities for higher operating pressures that are presently contained in section 845 of chapter IV of the USAS B31.8 Code; and

(3) Certain of the additional requirements that were discussed in Notice 69-3 and other additional requirements the basis for which is discussed in this preamble.

Although these proposed regulations closely parallel the presently effective interim standards that are set forth in the USAS B31.8 Code, a number of differences will be noted. For the most part these are nonsubstantive in nature.

A number of Code provisions are not included because they contain unnecessarily detailed specifications for which a performance requirement already existed or could be readily substituted. Any person reviewing the proposed regulation who feels that the omission of any language or the manner of revision would decrease the presently required level of safety should state his conclusions and supporting reasons in his comments. Similarly, if a proposed performance requirement does not appear to be an adequate substitute for an omitted specification requirement this should also be stated with supporting reasons.

To assist persons in reviewing and commenting on the proposed regulations, this notice contains a derivation table showing, to the extent possible, the source of proposed requirements. In most cases this is the USAS B31.8 Code. Some are derived from various State regulations, and others are based on recommendations made by the National Transportation Safety Board. Changes from the present requirements of USAS B31.8 of particular note are discussed below:

SUBPART J—LEAK AND STRENGTH TEST REQUIREMENTS

Section 192.501. The leak and strength test requirements of this subpart apply to relocations and replacement of pipelines and mains as well as to new installations. This broadening of the present applicability of the comparable code requirements has been made since it appears reasonable to require pipe that is replaced or relocated to meet the same test requirements as new pipe before it is put into operation.

Section 192.503(b). Presently the B31.8 Code only allows water as a test medium. This proposed section would authorize the use of any liquid as a test medium as long as it meets the stated criteria.

Section 192.505. This section is based for the most part on sections 841.411 through 416 of the B31.8 Code. However, the authorization to use air as a test medium in class 3 and 4 locations under certain circumstances that are presently contained in section 841.413 is omitted. It is recognized that this may require more advanced scheduling requirements than is presently the case and comments on the lead time problems and any other problems that could arise from eliminating this authorization are invited. In addition, the required minimum test pressure for pipelines and mains in class 3 and 4 locations would be 150 percent of maximum operating pressure.

An additional provision has been added to the present test requirements to require that a hydrostatic test must be conducted at a test pressure of at least 1.25 times the maximum operating pressure for any point on a pipeline within 300 feet of a building intended for human occupancy. In no event may the length of pipe tested under this requirement be less than 600 feet.

At present there is no minimum time limit for the strength test requirements in the code. Section 192.505 proposes to require that test pressure should be maintained for at least 24 consecutive hours.

A new provision has been included in § 192.505(c), comparable to § 195.304, to eliminate the need for a field test for a component other than pipe, such as a valve or fitting, if it is the only item being added or replaced and if the manufacturer certifies that it was previously tested to certain stated criteria. This provision also permits a shorter test for above ground pipeline facilities and certain fabricated units.

Section 192.511. This section for the most part reflects the present requirements of section 841.44. However, as indicated in Notice 69-3, specific minimum pressure requirements have been included that are not contained in the present requirements. In addition, the proposed test pressure for pipe with a coating that is able to seal a leak is 125 p.s.i.g. rather than the present 100 p.s.i.g.

Section 192.515(b). As Notice 69-3 stated, a provision has been included to require that the person conducting a test shall dispose of the test medium in a manner that will not be detrimental to the environment.

Section 192.517. The recordkeeping requirements of present section 841.417 have been expanded to state additional information that it is felt must be recorded to comply with the spirit and intent of chapter V of the code.

SUBPART K—UPRATING

Section 192.553. This proposed section contains new requirements for increasing pressure in existing pipeline systems. Presently sections 845.23(c), 845.34(c), 845.35(c), and 845.44(c) contain some general requirements for increasing pressure "gradually" or "by steps" when qualifying a pipeline or main