

PROPOSED RULE MAKING

[14 CFR Part 71]

[Airspace Docket No. 69-CE-122]

TRANSITION AREA

Proposed Designation

The Federal Aviation Administration is considering amending Part 71 of the Federal Aviation Regulations so as to designate a transition area at Point Lookout, Mo.

Interested persons may participate in the proposed rule making by submitting such written data, views, or arguments as they may desire. Communications should be submitted in triplicate to the Director, Central Region, Attention: Chief, Air Traffic Division, Federal Aviation Administration, Federal Building, 601 East 12th Street, Kansas City, Mo. 64106. All communications received within 45 days after publication of this notice in the FEDERAL REGISTER will be considered before action is taken on the proposed amendment. No public hearing is contemplated at this time, but arrangements for informal conferences with Federal Aviation Administration officials may be made by contacting the Regional Air Traffic Division Chief. Any data, views, or arguments presented during such conferences must also be submitted in writing in accordance with this notice in order to become part of the record for consideration. The proposal contained in this notice may be changed in the light of comments received.

A public docket will be available for examination by interested persons in the Office of the Regional Counsel, Federal Aviation Administration, Federal Building, 601 East 12th Street, Kansas City, Mo. 64106.

A new public use instrument approach procedure has been developed for the School of the Ozarks Airport, Point Lookout, Mo., utilizing a privately owned radio beacon located on the airport as a navigational aid. Consequently, it is necessary to provide controlled airspace protection for aircraft executing this new approach procedure by designating a transition area at Point Lookout, Mo. The new procedure will become effective concurrently with the designation of the transition area. IFR air traffic at Point Lookout will be controlled by the Memphis Air Route Traffic Control Center.

In consideration of the foregoing, the Federal Aviation Administration proposes to amend Part 71 of the Federal Aviation Regulations as hereinafter set forth:

In § 71.181 (35 F.R. 2134), the following transition area is added:

POINT LOOKOUT, Mo.

That airspace extending upward from 700 feet above the surface within an 8-mile radius of School of the Ozarks Airport (latitude 36°37'25" N., longitude 93°13'45" W.); and that airspace extending upward from 1,200 feet above the surface within 4½ miles southwest and 9½ miles northeast of the 127° bearing from School of the Ozarks Airport, extending from the airport to 18½ miles southeast of the airport.

This amendment is proposed under the authority of section 307(a) of the

Federal Aviation Act of 1958 (49 U.S.C. 1348), and of section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

Issued in Kansas City, Mo., on December 12, 1969.

DANIEL E. BARROW,

Acting Director, Central Region.

[F.R. Doc. 70-1024; Filed, Jan. 27, 1970; 8:45 a.m.]

Office of Pipeline Safety

[49 CFR Part 192]

[Notice 70-1; Docket No. OPS-3A]

MINIMUM FEDERAL SAFETY STANDARDS FOR GAS PIPELINES

Welding and Other Joining of Pipe and Components

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 rulemaking is the second 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 April 13, 1970, will be considered before taking final action on the 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 also proposed, without stating specific regulatory language, several requirements for inclusion in the minimum Federal standards. This notice and subsequent notices in this series will set forth the specific regulations that are being proposed, including those items that were discussed in Notice 69-3. The following is an outline of the proposed organization of the comprehensive Federal standards:

Subpart A—General, §§ 192.1-192.50: This subpart will set forth the scope of the standards, all definitions of terms used in the standards, and certain general requirements.

Subpart B—Materials, §§ 192.51-192.100: This subpart will prescribe requirements for selection and qualifica-

tion of materials used in the construction of pipeline facilities.

Subpart C—Pipe Design, §§ 192.101-192.150: This subpart will prescribe the pipe design requirements that are to be followed in designing a pipeline system. Requirements for steel, cast iron, ductile iron, plastic, and copper pipe will be included. Service lines will be covered by Subpart H.

Subpart D—Component Design, §§ 192.151-192.200: This subpart will prescribe design requirements to be followed in designing all other components of a pipeline system, including valves, fittings, flanges, supports, accessories, compressor stations, vaults, holders, and pressure control and relief devices.

Subpart E—Welding of Steel Materials, §§ 192.201-192.250: This subpart will prescribe requirements for the welding of steel materials, including qualification of welders and welding procedures.

Subpart F—Joining of Materials Other than by Welding of Steel Materials, §§ 192.251-192.270: This subpart will prescribe requirements for the joining of pipe other than the welding of steel materials. This will include the joining of cast iron, ductile iron, plastic, and copper pipe.

Subpart G—Construction Requirements, §§ 192.301-192.400: This subpart will prescribe requirements for installation, protection, and inspection of pipelines other than service lines.

Subpart H—Installation of Service Lines and Meters, §§ 192.401-192.450: This subpart will prescribe requirements for the installation of service lines of all types of material and service line regulators and meters.

Subpart I—Corrosion Control, §§ 192.451-192.500: This subpart will prescribe requirements for providing protection from external and internal corrosion and for operating, inspecting, and maintaining corrosion control systems.

Subpart J—Testing, §§ 192.501-192.550: This subpart will prescribe initial test requirements for all pipelines, including gathering, transmission, distribution, and service lines. It will cover both leak and strength tests.

Subpart K—Upgrading, §§ 192.551-192.600: This subpart will prescribe requirements for qualifying and converting pipelines, mains and distribution systems for new and higher operating pressures.

Subpart L—General Operating Rules, §§ 192.601-192.700: This subpart will prescribe requirements governing the operating of pipeline systems and facilities, including pressure limitations, emergency procedures, surveillance, marking, odorization, and handling of special situations such as failure investigations and the abandonment of facilities.

Subpart M—Inspection and Maintenance, §§ 192.701-192.750: This subpart will prescribe requirements for inspection and maintenance of pipeline systems and facilities, including preparation of an inspection and maintenance plan, repair of leaks and failures, and general preventive maintenance.

Included in this notice are proposed Subparts E and F of Part 192 which contain (1) the requirements for welding and for other methods of joining pipe and components that are presently contained in Chapters II and IV of the 1968 edition of the USAS B31.8 Code; (2) the additional requirements discussed in Notice 69-3, particularly those described under welding and those under Cast Iron Pipe with reference to bell and spigot joints; and (3) certain other additional requirements that were not proposed in Notice 69-3 but which are discussed in detail below.

The first comprehensive regulations are derived from the existing State standards, which for the most part have been based on the B31.8 Code; therefore, they will be very similar to the code.

For several reasons, however, it is necessary to substantially reorganize and revise the language that will be incorporated into the Federal standards. One major consideration is that the code, whose purpose is to serve only as a recommended industry standard, is not written as a regulatory document, while standards will be Government regulations that each pipeline company will be required to follow. Violations of these standards will be subject to a penalty of up to \$1,000 per day for each violation up to a maximum of \$200,000 for any related series of violations. Therefore, it is important that the regulatory requirements be written in terms that indicate clearly to the persons being regulated what the minimum requirements are. Further, the Department intends to state the requirements in performance terms, rather than as detailed specifications, wherever it is possible to do so without lowering the level of safety. In some cases it may not be possible to substitute a performance requirement without further research. The time within which these standards are to be published is such that it will be necessary to retain some specification requirements, because there is not time to develop an adequate performance type substitute.

As mentioned in the first notice of this series, the Department recognizes the need for improvements in the existing State standards that are being used as a basis for these standards. Efforts to define the problem areas and develop proper solutions are underway. It is also important in this situation to establish a basic set of Federal regulations that are consistent in style, format, and approach, as a foundation to which these needed improvements can be added. Therefore the Department is moving simultaneously to accomplish both of these objectives.

On December 31, 1969, the first leak and failure reporting requirements for gas pipelines were issued, to become effective on February 9, 1970. As the information from these reports is collected and analyzed, problems will be identified and solutions will be developed. Independent studies on corrosion control and the sealing of pipe are in progress and other studies are being undertaken. In the near future, the Department will survey the gas pipeline

industry to determine those areas where individual companies have identified safety problems and the steps they have taken to solve those problems.

As these efforts produce specific regulatory solutions, the Department will propose new requirements to be included in the minimum Federal standards. The issuance of these proposals will begin as soon as the necessary work in each area is completed and will not necessarily await final action on this series of notices of proposed rulemaking. Thus, it is possible that in some areas the first set of comprehensive Federal standards will include improvements in addition to those proposed in Notice 69-3.

All of the notices of this series will be issued before comments are due on this notice in order to permit commenters to consider these proposals in light of the other notices. This will be of particular importance in areas such as "class location" since, as indicated in Notice 69-3, new and more specific definitions of class location will be proposed. Therefore where class locations are referred to, the proposals in this notice should be commented on in light of the new definitions proposed in a subsequent notice.

Source of each proposed regulation. To assist persons in reviewing and commenting on the proposed regulations, this notice, as will the later notices in this series, contain a distribution table showing, to the extent possible, the source of proposed requirements. In the majority of cases this is the USAS B31.8 Code although a number of requirements are derived in whole or part from 49 CFR Part 195, "Transportation of Liquids by Pipeline." As discussed above, a number of Code provisions are not being used because the omitted language contained 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 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.

Effective date of proposed regulations. Notice 69-3 discussed the general approach to be taken on effective dates where significant additional substantive requirements are concerned. Since most of the proposed requirements in this series of notices will be based on existing recommended industry standards, a long lead time should not be necessary for compliance. Therefore, in accordance with section 3(c) of the Natural Gas Pipeline Safety Act the minimum standards will be made effective 30 days after they are issued, unless we find that additional time is required for compliance with some individual requirements. Any person who identifies a requirement that needs a longer lead time should indicate the problems that would arise from an early requirement of compliance and the

time that would be needed to solve those problems.

Cost/benefit determination. Notice 69-3 also discussed the general cost/benefit philosophy that will be followed with respect to these regulations. Where commenters believe that a cost/benefit problem exists they should be guided by the discussion of this subject in Notice 69-3.

Comment period. As indicated previously, the Department expects to issue the first comprehensive Federal regulations by August 12, 1970. However, under section 4(b) of the Act, these proposed standards must be submitted to the Technical Pipeline Safety Standards Committee before final adoption and that committee must be afforded a reasonable opportunity for review and for preparation of a report on the technical feasibility, reasonableness, and practicality of each proposal. This statutory requirement will probably preclude any extension of the comment period. However, comments received after the end of the comment period will be considered to the extent practicable.

Location of regulations in Code of Federal Regulations. At the present time the Department's regulations relating to pipeline safety (both liquid and gas) have been included in Chapter I of Title 49 of the Code of Federal Regulations. A Departmental task force is studying the organizational structure within the Department for both the liquid and gas pipeline safety functions. The ultimate location of the gas pipeline regulations within Title 49 will depend on the final organizational decision of the Secretary as a result of the recommendations of the task force study. Therefore, the final regulations adopted as a result of this series of notices may have different part numbers than those proposed and may be located in another part of Title 49.

Discussion of significant substantive proposals in this notice. Notice No. 69-3 indicated some of the substantive changes from the 1968 edition of the USAS B31.8 Code that would be proposed in this series of notices. These are contained in §§ 192.221, 192.223, and 192.555. Since the issuance of that notice, other changes have been identified that appear to be necessary to afford the public an adequate level of safety. These latter changes are discussed below under the individual section headings.

Welding. Pipeline systems that are to operate at 20 percent or more of specified minimum yield strength (SMYS) would require visual inspection in addition to nondestructive testing. There would be a requirement for 100 percent nondestructive testing of these lines (1) in Class 3 and 4 locations, (2) within railroad or public highway rights-of-way, including bridges and tunnels, (3) at tie-ins, (4) at overhead road crossings, and (5) whenever welds are repaired. The testing percentage for Class 1 and 2 locations would remain the same. All welds tested would be tested over their entire circumference. There would no longer be an option of testing an equivalent length of welds over a part of the circumference. When conducting

PROPOSED RULE MAKING

nondestructive testing on these lines, each welder's work would be sampled to at least the same percentage as the overall nondestructive testing requirement of the area.

Records would have to be retained for the life of the facility, showing the number of welds made, the number nondestructively tested, the number of rejects, and the disposition of the rejects. In addition, detailed records of testing, including exposed X-ray film, would have to be retained for 3 years after construction.

Comments are particularly invited on the following matters: Describe the problems in determining that each welder's work is sampled to the percentage required. Should the percentage be based on the number of completed welds or on length of welds? Would it be sufficient to assure that each welder is checked every day and eliminate the fixed percentages? Does a requirement to test the entire circumference present any different problems on large pipe than on smaller pipe and if so, at what point in pipe size do these differences become significant? How difficult is 100 percent testing in Class 3 and 4 locations? What percentage of welds are nondestructively tested today in these locations? Would the cost of 100 percent testing be substantially more than the cost of 90 and 95 percent nondestructive testing in these locations? Specify any problems associated with testing of all tie-in-welds. What is the present practice as to retention of nondestructive testing records?

Cast iron pipe. Presently all caulked bell and spigot joints on pipelines operated above 25 p.s.i.g. must be reinforced by mechanical clamps. This would be extended to new construction and the reinstallation of used pipe on pipelines operated at or below 25 p.s.i.g. In addition all other caulked bell and spigot joints on these lower pressure lines would have to be reinforced, either by clamps or other means.

Threaded cast iron joints would be prohibited in both new construction and reinstallation of used pipe. How much and what sizes of threaded cast iron pipe are presently in operation?

Sections 192.213 and 192.215(c). The requirement for the strength of filler metal and for offsetting longitudinal seams in welding are derived from similar requirements in the liquid pipeline regulations. These requirements conform to good construction practice and compliance should present no difficulty in most cases. However, the filler metal requirement may prove to be too stringent for the welding of high strength steel and specific comments on this problem are requested.

Section 192.225. The standards of acceptability set forth in API Standard 1104-1968 edition are much more descriptive of defects than the standards contained in the B31.8 Code and this

change should improve the quality of completed welds.

Section 192.253. This is a specific requirement contained in section 842.396 for mechanical plastic joints and is covered in sections 842.165 and 842.223 for cast and ductile iron joints. It is now proposed as a requirement for all types of nonsteel joints.

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 contain Subparts E and F 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 January 23, 1970.

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

DISTRIBUTION TABLE

New section	Source
192.201	821.1.
192.203 (a) and (b)	821.3.
192.203 (c)	821.6.
192.203 (d)	823.2.
192.205 (a)	824.21.
192.205 (b)	824.25 and 825.1.
192.205 (c)	824.23.
192.207 (a)	824.21.
192.207 (b)	824.22.
192.207 (c)	824.24.
192.207 (d)	824.23.
192.209 (a)	824.11.
192.209 (a) (1)	Appendix G (1).
192.209 (a) (2) (i)	Appendix G (1).
192.209 (a) (2) (ii)	Appendix G (6).
192.209 (b)	Appendix G (5).
192.211	825.2.
192.213	49 CFR 195.220.
192.215 (a), (b), and (d)	823.1.
192.215 (c)	49 CFR 195.218.
192.217	826.
192.219	827.
192.221 (a)	828.1 and NARUC Model Code.
192.221 (b)	828.2 (a).
192.221 (c)	828.2 (e).
192.223 (a), (b), (c), and (e)	828.2 and 49 CFR 195.234.
192.223 (d)	828.2 (b) and Washington, New York, and North Carolina Codes.
192.223 (f)	49 CFR 195.234 and 195.260.
192.225	829.
192.227	829.9.
192.229	841.244, 841.245, and 49 CFR 195.226.
192.251	New.
192.253	842.165, 842.223, and 842.396.
192.255	842.15.
192.257	842.215.
192.259	842.614.
192.261	842.39.
Appendix A-I	Appendix G (2), (3), and (4).
Appendix A-II	Appendix G (5).
Appendix A-III	Appendix G (6) (a).

Sec.	
192.201	Scope.
192.203	General.
192.205	Qualification of welding procedures.
192.207	Qualification of welders.
192.209	Qualification of welders for low stress level piping.
192.211	Protection from weather.
192.213	Filler metal.
192.215	Preparation for butt welding.
192.217	Preheating.
192.219	Stress relieving.
192.221	Inspection and testing of welds.
192.223	Nondestructive testing and testing records.
192.225	Acceptability of welds.
192.227	Repair or removal of defects.
192.229	Arc burns.

Subpart F—Joining of Materials Other Than by Welding of Steel Materials

192.251	Scope.
192.253	General.
192.255	Cast iron pipe.
192.257	Ductile iron pipe.
192.259	Copper pipe and tubing joints.
192.261	Plastic pipe.

Subpart E—Welding of Steel Materials

§ 192.201 Scope.

(a) This subpart prescribes minimum requirements for arc and gas welding of steel materials when constructing new pipeline facilities and when relocating, replacing, repairing or otherwise changing existing pipeline facilities.

(b) This subpart does not apply to welding that occurs during the manufacture of steel pipe or steel components of pipeline facilities.

§ 192.203 General.

(a) Welding must be performed in accordance with established written welding procedures that have been qualified under § 192.205 to produce sound, ductile welds.

(b) Each welder must be qualified in the welding procedure that is used under either § 192.207 or § 192.209.

(c) Before beginning any welding in or around a structure or area containing gas facilities, a thorough check must be made to determine that a combustible gas mixture is not present and that conditions are safe for welding.

(d) Each fillet weld must be of a size that will withstand the stresses to which it will be subjected during use.

§ 192.205 Qualification of welding procedures.

(a) Each welding procedure must be qualified under either section IX of the ASME Boiler and Pressure Vessel Code (1968 edition) or section 2 of API Standard 1104 (1968 edition).

(b) Each welding procedure must be recorded in detail during the qualifying tests. This record must be retained and followed whenever the procedure is used.

(c) For the purposes of the Essential Variables of section IX of the ASME Boiler and Pressure Vessel Code, the following steels are considered to fall within the P-Number 1 grouping and do not require separate qualification of welding procedures:

(1) Carbon steels that have a carbon content of 0.32 percent (ladle analysis) or less.

(2) Carbon steels that have a carbon equivalent (C+¼ Mn) of 0.65 percent (ladle analysis) or less.

(3) Alloy steels with weldability characteristics that have been demonstrated to be similar to the carbon steels listed in subparagraphs (1) and (2) of this paragraph.

Alloy steels and carbon steels that are not within subparagraphs (1), (2), and (3) of this paragraph require separate qualification of procedures for the particular specification of pipe in accordance with sections VIII and IX of the ASME Boiler and Pressure Vessel Code (1968 edition).

§ 192.207 Qualification of welders.

(a) Except as provided in paragraphs (b) and (c) of this section and as permitted under § 192.209, each welder must be qualified in accordance with either section IX of the ASME Boiler and Pressure Vessel Code (1968 edition) or section 3 of API Standard 1104 (1968 edition).

(b) A welder who is qualified under section 3 of API Standard 1104 may not be used to weld on compressor station piping unless his qualifying test has been based on the guided bend test.

(c) A welder who has not engaged in a particular welding process within the preceding 6 months may not perform that type of welding until he has requalified in that process.

(d) For the purposes of the Essential Variables of section IX of the ASME Boiler and Pressure Vessel Code, the following steels are considered to fall within the P-Number 1 grouping and do not require separate qualification of welders:

(1) Carbon steels that have a carbon content of 0.32 percent (ladle analysis) or less.

(2) Carbon steels that have a carbon equivalent (C+¼ Mn) of 0.65 percent (ladle analysis) or less.

(3) Alloy steels with weldability characteristics that have been demonstrated to be similar to the carbon steels listed in subparagraphs (1) and (2) of this paragraph.

Alloy steels and carbon steels that are not within subparagraphs (1), (2), and (3) of this paragraph require separate qualification of welders for the particular specification of pipe in accordance with sections VIII and IX of the ASME Boiler and Pressure Vessel Code (1968 edition).

§ 192.209 Qualification of welders for low stress level piping.

(a) Except as provided in paragraph (b) of this paragraph, a welder may qualify to perform oxyacetylene or manual arc welding on piping operating at pressures that result in hoop stresses of less than 20 percent of specified minimum yield strength if he has performed, within the preceding 12 calendar months, an acceptable test weld under the test set forth in section I of appendix A to this part. After 12 months from his initial

qualification, a welder may not perform welding unless—

(1) Within the preceding 12 calendar months, he has requalified by performing an acceptable test weld under the test set forth in section I of appendix A to this part; or

(2) Within the preceding 6 calendar months, he has had—

(i) A production weld cut out and tested under section I of appendix A to this part; or

(ii) For welders who work only on service lines 2 inches or smaller in diameter, two sample welds tested as prescribed in section III of appendix A to this part.

(b) A welder who makes welded service line connections to mains must, in addition to meeting the requirements of paragraph (a) of this paragraph, also perform an acceptable test weld under section II of appendix A to this part as a part of his qualifying test.

§ 192.211 Protection from weather.

Welding must be protected from weather conditions that would impair the quality of the completed weld.

§ 192.213 Filler metal.

Filler metal must be at least equal in strength to the highest specified minimum yield strength of the pieces being welded and must fuse the pieces together.

§ 192.215 Preparation for butt welding.

Before beginning any butt welding—

(a) The welding surfaces must be clean and free of any material that may be detrimental to the weld;

(b) The pipe or component must be aligned to provide the most favorable condition for the deposition of the root bead and this alignment must be preserved while the root bead is being welded;

(c) Seams on adjacent pipe lengths must be offset; and

(d) The pipe ends must be shaped so that the deposition of weld metal will provide adequate strength and minimize stress concentration.

§ 192.217 Preheating.

(a) Carbon steel that has a carbon content in excess of 0.32 percent (ladle analysis) or a carbon equivalent (C+¼ Mn) in excess of 0.65 percent (ladle analysis) must be preheated as prescribed in ASME Boiler and Pressure Vessel Code section VII (1968 edition).

(b) Carbon steel that has a lower carbon content or carbon equivalent than that prescribed in paragraph (a) of this section must be preheated as prescribed in paragraph (a) of this section when conditions exist that either limit the welding technique that can be used, or that tend to adversely affect the quality of the weld.

(c) When welding dissimilar materials that have different preheat temperature requirements, the higher temperature must be used in preheating.

(d) Preheat temperature must be monitored to assure that the required preheat temperature is attained before

and is maintained during the welding operation.

§ 192.219 Stress relieving.

(a) Except as provided in paragraph (f) of this section, each weld on carbon steel that has a carbon content in excess of 0.32 percent (ladle analysis) or a carbon equivalent (C+¼ Mn) in excess of 0.65 percent (ladle analysis) must be stress relieved as prescribed in the ASME Boiler and Pressure Vessel Code, section VIII (1968 edition).

(b) Except as provided in paragraph (f) of this section, each weld on carbon steel that has a carbon content of less than 0.32 percent (ladle analysis) or a carbon equivalent (C+¼ Mn) of less than 0.65 percent (ladle analysis) must be thermally stress relieved when conditions exist which cool the weld too rapidly.

(c) Except as provided in paragraph (f) of this section, each weld on carbon steel pipe must be stress relieved when the wall thickness of the pipe exceeds 1¼ inches.

(d) When a weld connects pipe or components that are of different thicknesses but similar materials, the thickness to be used in applying the rules in paragraphs (a) and (c) of this section is—

(1) The thicker of the two pipes joined; or

(2) In the case of branch connections, slip-on flanges, or socket weld fittings, the thickness of the pipe run or header.

(e) In welds between dissimilar materials, if either material requires stress relieving under this section, the weld must be stress relieved.

(f) Notwithstanding the provisions of paragraphs (a), (b), and (c) of this section, stress relieving is not required of the following welds:

(1) A fillet or groove weld one-half inch or less in size (leg) that attaches a connection 2 inches or less in diameter.

(2) A fillet or groove weld three-eighths inch or less in groove size that attaches a supporting member or other nonpressure attachment.

(g) Stress relieving must be performed at a temperature of at least 1,100° F. for carbon steels, and at least 1,200° F. for ferritic alloy steels. When stress relieving a weld between dissimilar metals with different stress relieving temperatures, the higher temperature must be used.

(h) A uniform temperature must be maintained during stress relieving and the temperature must be checked to assure that the proper stress relieving cycle has been accomplished.

§ 192.221 Inspection and testing of welds.

(a) The welds and welding on each pipeline system must be visually inspected.

(b) Except as provided in paragraph (c) of this section, the welds and welding on each pipeline system operated at a pressure that produces a hoop stress of 20 percent or more of specified minimum yield strength must be nondestructively tested in accordance with § 192.223.

(c) Welds that are visually inspected and approved by a qualified welding inspector need not be nondestructively tested if—

(1) The pipe has a nominal diameter of less than 6 inches; or

(2) The pipe is operated at a pressure that produces a hoop stress of 40 percent or less of specified minimum yield strength and the construction has such a limited number of welds that nondestructive testing is impractical.

§ 192.223 Nondestructive testing and testing records.

(a) A weld may be nondestructively tested by any process that will clearly indicate any defects that may affect the integrity of the weld.

(b) Nondestructive testing of welds must be performed—

(1) In accordance with a written set of procedures for nondestructive testing; and

(2) With personnel that have been trained in the established procedures and in the use of the equipment employed in the testing.

(c) Procedures for the proper interpretation of each weld inspection must be established to ensure the acceptability of the weld under § 192.225.

(d) The following percentages of each day's field butt welds, selected at random by the operator, must be nondestructively tested over their entire circumference:

(1) At least 10 percent of the welds in class 1 locations.

(2) At least 15 percent of the welds in class 2 locations.

(3) 100 percent of the welds—

(i) In class 3 or 4 locations;

(ii) At crossings of major or navigable rivers;

(iii) Within railroad or public highway rights-of-way, including tunnels and bridges;

(iv) At overhead road crossings; or

(v) At pipeline tie-ins.

(e) Each welder's work for each day must be sampled to at least the percentages in paragraph (d) of this section.

(f) A record of the nondestructive testing must be retained by the operator of the pipeline, including (if radiography is used) the developed film with, so far as practicable, the location of the weld. This record must be retained for 3 years after the line is placed in operation. In addition, a record showing the total number of girth welds made, the number nondestructively tested, the number rejected, and the disposition of the rejects, must be retained by the operator for the life of the facility.

(g) The trepanning method of testing is not permitted.

§ 192.225 Acceptability of welds.

The acceptability of a weld is determined according to the standards in section 6, API Standard 1104 (1968 edition).

§ 192.227 Repair or removal of defects.

(a) A weld that is unacceptable under § 192.225 may not be repaired unless—

(1) There are no cracks in the weld other than minor cracks 2 inches or less

in length which do not penetrate either the root or second beads;

(2) The segment of the weld to be repaired was not previously repaired; and

(3) The weld is inspected after repair to assure its acceptability.

(b) Before any weld is repaired, injurious defects must be removed by chipping, grinding, or oxygen gouging to clean metal. All slag and scale must be removed by wire brushing. The segment of the weld to be repaired must be preheated in accordance with § 192.217.

(c) A cylinder of the pipe containing a weld must be removed and the ends rebeveled whenever—

(1) The weld contains one or more cracks other than a crack permitted under paragraph (a) of this section;

(2) The weld is not acceptable under § 192.225 and is not repaired; or

(3) The weld was repaired and the repair did not meet the requirements of § 192.225.

§ 192.229 Arc burns.

(a) Each arc burn on pipe that is to be operated at a pressure that produces a hoop stress of 40 percent or more of specified minimum yield strength must be repaired.

(b) An arc burn may be repaired by completely removing the notch by grinding, if the grinding does not reduce the remaining wall thickness to less than the minimum thickness required by the tolerance in the specification to which the pipe was manufactured. Arc burns may not be repaired by insert patching.

(c) If an arc burn is not repairable by grinding, a cylinder of the pipe containing the entire notch must be removed.

Subpart F—Joining of Materials Other Than by Welding of Steel Pipe and Components

§ 192.251 Scope.

(a) This subpart prescribes minimum requirements for the joining of materials, other than the welding of steel pipe and components, when constructing new pipeline facilities and when relocating, replacing, repairing, or otherwise changing existing pipeline facilities.

(b) This subpart does not apply to the joining of pipe or components that occurs during the manufacturing process.

§ 192.253 General.

Each joint must be designed and installed to effectively sustain the longitudinal pull-out or thrust forces caused by contraction or expansion of the piping or by external or internal loading.

§ 192.255 Cast iron pipe.

(a) *Caulked bell and spigot joints.* Each cast iron caulked bell and spigot joint must comply with one of the following:

(1) If the pipeline is operated at more than 25 p.s.i.g., each joint must be reinforced with mechanical clamps.

(2) If the pipeline is operated at 25 p.s.i.g. or less—

(i) Each new or reinstalled joint must be reinforced by mechanical clamps; and

(ii) Each other joint must be reinforced by mechanical clamps or by other means.

(b) *Mechanical joints.* Each mechanical joint in cast iron pipe must have a gasket made of a resilient material as the sealing medium. The material selected for gaskets must be of a type not adversely affected by the gas or condensates in the main. Each gasket must be suitably confined and retained under compression by a separate gland or follower ring.

(c) *Threaded joints.* Threaded joints may not be used to couple lengths of cast iron pipe in new construction or to replace joints on existing cast iron pipe.

(d) *Flanged joints.* The dimensions and drilling of each flange must conform to the USAS Standard B16.1 (1967 edition)—Cast Iron Pipe Flanges and Flanged Fittings. Each flange must be cast integrally with the fitting or valve.

§ 192.257 Ductile iron pipe.

(a) *Mechanical joints.* Each mechanical joint in ductile iron pipe must conform to USAS A21.52 (1965 edition) and USAS A21.11 (1964 edition), U.S.A. Standards for Rubber Gasket Joints for Cast Iron Pressure Pipe and Fittings.

(b) *Threaded joints.* Threaded joints may not be used to couple lengths of ductile iron pipe.

§ 192.259 Copper pipe and tubing joints.

(a) Copper pipe or tubing must be jointed by either a compression type coupling or a brazed or soldered lap joint.

(b) Copper pipe or tubing may not be threaded, except that copper pipe used for connecting screw fittings or valves may be threaded if the wall thickness is equivalent to the comparable size of standard wall pipe as defined in USAS B36.10, "Wrought Steel and Wrought-Iron Pipe" (1959).

§ 192.261 Plastic pipe.

(a) *General.* Plastic pipe, tubing, and fittings must be joined by the solvent cement method, adhesive method, heat-fusion method, by means of compression couplings or flanges, or by other method that is compatible with the materials being joined. However, plastic pipe and tubing may not be threaded. Solvent cement joints, adhesive joints, and heat-fusion joints must be made in accordance with procedures which have been proven by test to produce gas tight joints at least as strong as the pipe or tubing being joined. Heat-fusion or mechanical joints must be used when joining polyethylene pipe, tubing, or fittings.

(b) *Solvent cement joints.* Each solvent cement joint must comply with the following:

(1) A joint may not be made between different kinds of plastics.

(2) The mating surfaces of the joint must be clean, dry, and free of material which might be detrimental to the joint.

(3) The solvent cement must conform to ASTM D 2513 (1968 edition).

(4) The safety requirements of appendix A of ASTM D 2513 (1968 edition) must be met.

(5) The joint may not be heated to accelerate the setting of the cement.

(c) *Heat-fusion joints.* Each heat-fusion joint must comply with the following:

(1) A joint may not be made between different kinds of plastic.

(2) A butt heat-fusion joint must be joined by a jointing device that holds the heater element square to the ends of the piping, compresses the heated ends together, and holds the pipe in proper alignment while the plastic hardens.

(3) A socket heat-fusion joint must be joined by a jointing device that heats the mating surfaces of the joint uniformly and simultaneously to essentially the same temperature.

(4) A completed joint must not be disturbed until properly set.

(5) Heat may not be applied with a torch or other open flame.

(d) *Adhesive joints.* Each adhesive joint must comply with the following:

(1) The adhesive must conform to ASTM D 2517 (1967 edition).

(2) A thorough investigation must be made to determine that the materials

and adhesive are compatible with each other.

(3) The joined materials must be clamped or otherwise prevented from moving until the adhesive is properly set.

(e) *Mechanical joints.* The rubber gasket material in the coupling of a compression type mechanical joint must be compatible with the plastic and an internal tubular rigid stiffener, other than a split tubular stiffener, must be used in conjunction with the coupling.

APPENDIX A

QUALIFICATION OF WELDERS FOR LOW STRESS LEVEL PIPING

I. *Basic test.* The test is made on pipe 12 inches 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 one-eighth inch long in any direction, the weld is unacceptable. Cracks

that occur on the corner of the specimen during testing are not considered.

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 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 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.

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