subpart if the substitute provides an equivalent level of safety.

(b) In any case where it is shown to the satisfaction of the Commandant that the use of any particular equipment, apparatus, arrangement, or test is unreasonable or impracticable, the Commandant may permit the use of alternate equipment, apparatus, arrangement, or test to such an extent and upon such condition as will insure, to his satisfaction, a degree of safety consistent with the minimum standards set forth in this subpart.

§ 58.60–3 Pressure vessel.

A pressure vessel that is a component in an industrial system under this subpart must meet the applicable requirements in § 54.01–5 of this subchapter.

[CGD 73–251, 43 FR 58601, Dec. 4, 1978, as amended by CGD 77–147, 47 FR 21811, May 20, 1982; USCG–2020–0634, 89 FR 50183, June 12, 2024]

§ 58.60–5 Industrial systems: Locations.

An industrial system under this subpart must not be in a space that is—

(a) Concealed; or

(b) Inaccessible to industrial personnel.

§ 58.60–7 Industrial systems: Piping.

The piping for industrial systems under this subpart must meet ASME B31.3 (incorporated by reference, see § 58.03–1), except that blow out preventor control systems must also meet API STD 53 (incorporated by reference, see § 58.03–1).57.

[USCG–2020–0634, 89 FR 50183, June 12, 2024]

§ 58.60–9 Industrial systems: Design.

Each system under this subpart must be designed and analyzed in accordance with the principles of API RP 14C (incorporated by reference, see § 58.03–1).

[USCG–2020–0634, 89 FR 50183, June 12, 2024]

§ 58.60–11 Analyses, plans, diagrams and specifications: Submission.

(a) Each industrial system must be analyzed by a registered professional engineer to certify that the system has been designed in accordance with applicable standards.

(b) The certification must—

(1) Appear on all diagrams and analyses; and

(2) Be submitted under § 50.20–5 of this chapter.

(c) Standards or specifications for non-pressurized, mechanical or structural systems, and components such as derricks, drawworks, and rotary tables which comply with standards or specifications not referenced in this subchapter must be referenced on the plans or in the specifications of the unit.

§ 58.60–13 Inspection.

An industrial system is accepted by the Coast Guard if the inspector finds—

(a) The system meets this subpart;

(b) There are guards, shields, insulation or similar devices for protection of personnel; and

(c) The system is not manifestly unsafe.

PART 59—REPAIRS TO BOILERS, PRESSURE VESSELS, AND APPURTENANCES

Subpart 59.01—General Requirements

Sec.

Subpart 59.10—Welding Repairs to Boilers and Pressure Vessels in Service

Subpart 59.15—Miscellaneous Boiler Repairs

Subpart 59.20—Welding Repairs to Castings

AUTHORITY: 46 U.S.C. 3306, 3703; E.O. 12234, 45 FR 58801, 3 CFR, 1980 Comp., p. 227; Department of Homeland Security Delegation No. 00170.1, Revision No. 01.3.

SOURCE: CGFR 68–82, 33 FR 18887, Dec. 18, 1968, as amended by USCG–2020–0634, 89 FR 50183, June 12, 2024, unless otherwise noted.

Subpart 59.01—General Requirements

§ 59.01–1 Scope.

The regulations in this part apply to the repairs of all boilers, appurtenances, and pressure vessels subject to inspection by the Coast Guard.

§ 59.01–2 Incorporation by reference.

Certain material is incorporated by reference into this part with the approval of the Director of the Federal Register under 5 U.S.C. 552(a) and 1 CFR part 51. To enforce any edition other than that specified in this section, the Coast Guard must publish a document in the FEDERAL REGISTER and the material must be available to the public. All approved incorporation by reference (IBR) material is available for inspection at the U.S. Coast Guard and the National Archives and Records Administration (NARA). Contact U.S. Coast Guard Headquarters at: Commandant (CG–ENG), Attn: Office of Design and Engineering Standards, U.S. Coast Guard Stop 7509, 2703 Martin Luther King Jr. Avenue SE, Washington, DC 20593–7509; phone (202) 372–1375; email *typeapproval@uscg.mil*. For information on the availability of this material at NARA, visit *www.archives.gov/federal-register/cfr/ibr-locations* or email *fr.inspection@nara.gov*. The material may be obtained from: *American Society of Mechanical Engineers* (*ASME*), Two Park Avenue, New York, NY 10016–5990; 800–843–2763; *CustomerCare@asme.org*; *www.asme.org*.

(a) ASME BPVC.I–2019, 2019 ASME Boiler and Pressure Vessel Code, Section I, Rules for Construction of Power Boilers, 2019 Edition, issued July 1, 2019 (''Section I of the ASME BPVC''); IBR approved for § 59.10–5(i), (j), and (k).

(b) ASME BPVC.VII–2019, 2019 ASME Boiler and Pressure Vessel Code, Section VII, Recommended Guidelines for the Care of Power Boilers, 2019 Edition, issued July 1, 2019 (''Section VII of the ASME BPVC''); IBR approved for § 59.01–5(e).

(c) ASME BPVC.VIII.1–2019, 2019 ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, Rules for Construction of Pressure Vessels, 2019 Edition, issued July 1, 2019 (''Section VIII of the ASME BPVC''); IBR approved for §§ 59.10–5(i), (j), and (k); 59.10–10(f).

(d) ASME BPVC.IX–2019, 2019 ASME Boiler and Pressure Vessel Code, Section IX, Qualification Standard for Welding, Brazing, and Fusing Procedures; Welders; Brazers; and Welding, Brazing, and Fusing Operators, 2019 Edition, issued July 1, 2019 (''Section IX of the ASME BPVC''); IBR approved for § 59.10–5(i).

[USCG–2003–16630, 73 FR 65188, Oct. 31, 2008, as amended by USCG–2009–0702, 74 FR 49229, Sept. 25, 2009; USCG–2012–0832, 77 FR 59778, Oct. 1, 2012; USCG–2013–0671, 78 FR 60148, Sept. 30, 2013]

§ 59.01–5 Repairs, replacements, or alterations.

(a) No repairs, replacements, or alterations, except emergency repairs, must be made to boilers, pressure vessels, their mountings or internal fittings, safety valves, piping systems, or pressure appliances without prior approval by the Officer in Charge, Marine Inspection.

(b) Emergency repairs, replacements, or alterations must be reported as soon as practicable to the Officer in Charge, Marine Inspection, at or nearest the first port where the vessel may call after such repairs are made.

(c) Plan approval must be obtained from the Officer in Charge, Marine Inspection, for all alterations to systems in service as listed in § 56.01–10(c) of this subchapter and those items listed in paragraph (a) of this section.

(d) Repairs, replacements, or alterations to machinery or items not covered by other sections of this part must be made in a manner consistent with the part of this subchapter containing the construction standards for the item in question.

(e) Where applicable, manufacturers' instruction books, manuals, and the like, and Section VII of the ASME

BPVC (incorporated by reference; see § 59.01–2) must be used for guidance.

[CGFR 68–82, 33 FR 18887, Dec. 18, 1968, as amended by USCG–2003–16630, 73 FR 65189, Oct. 31, 2008]

Subpart 59.10—Welding Repairs to Boilers and Pressure Vessels in Service

§ 59.10–1 Scope.

(a) Repairs to boilers or pressure vessels in service may be performed by welding provided the welding meets the applicable requirements of part 57 of this subchapter.

(b) No repairs by welding must be made except temporary emergency repairs without prior approval of the Officer in Charge, Marine Inspection. Emergency repairs must be replaced with permanent repairs meeting the requirements of this subchapter when the vessel returns to a port in which an Officer in Charge, Marine Inspection, is located.

(c) Repair welding of power boilers not meeting the requirements of subpart 52.05 of this subchapter is prohibited.

(d) Only welded repairs as specified in this subchapter are permitted on boilers and pressure vessels. The welding repairs allowed by this subpart apply only to boilers and pressure vessels fabricated of carbon steel. Welding repairs to boilers and pressure vessels fabricated of alloy steel will be given special consideration by the Commandant. Such other method of repairs by means of welding not covered in this subchapter must be referred to the Commandant.

§ 59.10–5 Cracks.

(a) Cracks extending from the calking edge of plates to the rivet holes of circumferential joints may be welded provided the cracks are veed out so that complete penetration of the weld metal is secured.

(b) Circumferential cracks from rivet hole to rivet hole in girth joints may be welded provided there are not more than three consecutive cracked ligaments nor more than a total of six cracked ligaments in any one girth joint.

(c) Cracks in staybolted plates may be welded provided they are located entirely within staybolted areas and the total length of any crack or series of consecutive cracks does not exceed two staybolt pitches.

(d) Cracks in furnaces may be welded provided any one crack does not exceed 12 inches in length and after completion the weld is stress-relieved. Cracks in corrugated furnaces may be repaired by welding provided any one crack does not exceed 20 inches in length.

(e) Fire cracks may be welded at riveted door openings extending from the edge of the plate, but not more than 2 inches beyond the centerline of the rivet holes.

(f) Cracks may be welded between tube holes in the shell of water tube boiler drums, provided there are not more than two cracks in any one row in any direction, nor more than a total of four cracks in a drum, and further provided the welding meets the requirements of this subchapter for Class I welded pressure vessels.

(g) Cracks that occur in superheater manifolds, water wallheaders, water drums, sectional headers, and other appurtenances including steam manifolds of water tube boilers may be repaired in accordance with paragraph (h) of this section.

(h) All cracks permitted to be repaired under this subpart must be excavated to sound metal by grinding, flame or arc gouging or chipping out the defective metal to form a clean welding groove. Either a V groove or U groove wherein complete penetration of the weld metal is secured may be used. After excavation is completed and prior to welding, the excavated area must be examined by magnetic particle, dye penetrant, or other acceptable test method. When the reverse side of the weld is accessible, the root of the weld must be chipped or ground out to ensure a clean surface of the originally deposited metal and the resultant groove welded to obtain a sound weld having complete penetration. When the weld cannot be back chipped because the reverse side is inaccessible, a backing strip or other approved means of assuring full penetration must be employed.

(i) During welding of cracks, a preheat must be maintained by controlled temperatures. The degree of preheat must be determined by the rules listed in accordance with the materials P-number groupings of PW–38, Section I of the ASME BPVC, appendix R, Section VIII of the ASME BPVC, and Appendix D, Section IX of the ASME BPVC (all incorporated by reference; see §59.01–2). For thicknesses exceeding three-fourths inch, suitable U grooves should be employed. A welding sequence must be used so as to equalize welding stresses.

(j) Postweld heat treatment of repaired cracks must be performed in accordance with the rules specified in PW–39, Section I of the ASME BPVC and UW–40, Section VIII of the ASME BPVC for boilers and pressure vessels respectively.

(k) Welded repairs of cracks must be nondestructively tested in accordance with the rules specified in PW–40, Section I of the ASME BPVC, and UW–51, Section VIII of the ASME BPVC for boilers and pressure vessels respectively.

(l) After cracks originating in tube or rivet holes are repaired by welding, the holes must be properly reamed and the weld reinforcing ground flush with the plate in way of rivet heads.

(m) Flat tube sheets in fire-tube boilers which have corroded or where cracks exist in the ligaments may be repaired by welding.

(n) Welding repairs to drums of power boilers, except as otherwise permitted in this subpart, are prohibited.

[CGFR 68–82, 33 FR 18887, Dec. 18, 1968, as amended by USCG–2003–16630, 73 FR 65189, Oct. 31, 2008]

§59.10–10 Corroded surfaces.

(a) Corroded surfaces in the calking edges of circumferential seams may be built up by welding to the original thickness under the following conditions:

(1) The thickness of the original metal to be built up between the rivet holes and the calking edge must not be less than one-fourth of the diameter of the rivet hole, and the portion of the calking edge to be thus reinforced must not exceed 30 inches in length in a circumferential direction.

(2) In all repairs to circumferential seams by welding, the rivets must be removed over the portions to be welded for a distance of at least 6 inches beyond the repaired portion.

(3) After repairs are made the rivet holes must be reamed before the rivets are redriven.

(b) It is not permissible to build up or reinforce a grooved or corroded area of unstayed internal surfaces by means of welding, except that widely scattered pit holes may be built up by welding.

(c) Where external corrosion has reduced the thickness of flat plates around hand holes to an extent of not more than 40 percent of the original thickness and for a distance not exceeding 2 inches from the edge of the hole, the plate may be built up by welding.

(d) Where stayed sheets have corroded to a depth not exceeding 40 percent of their original thickness, they may be reinforced or built up by welding. Where the staybolts are fitted with riveted heads, the staybolts in the reinforced area must be renewed, but where the staybolts are fitted with nuts, the nuts may be removed and after reinforcing has been applied; collars may be welded around the staybolts in lieu of the nuts. Such reinforced areas must not exceed 400 square inches nor more than 30 inches in one direction. Two such areas in any one plate may be reinforced provided that the distance between the reinforced surfaces is not less than 30 inches.

(e) When the corroded portion of a staybolted surface exceeds 400 square inches, it is permissible to make repairs by cutting out the defective portion and replacing it with a new plate, the edges of the new plate to be welded in position. In such cases, new staybolts must be fitted, and where welding is performed through a line of staybolts, welded collars must be used to attach the staybolts.

(f) Eroded seams of welded pressure vessels may be repaired by rewelding the wasted portion. The wasted section of the seam must be excavated sufficiently by grinding, flame or arc gouging or chipping to ensure proper weld penetration. Rewelded seams must be nondestructively tested in accordance with Section VIII of the

ASME BPVC (incorporated by reference, see § 59.01–2).

[CGFR 68–82, 33 FR 18887, Dec. 18, 1968, as amended by USCG–2003–16630, 73 FR 65189, Oct. 31, 2008]

§ 59.10–15 Rivets and staybolts.

(a) It is not permitted to reinforce or build up by welding the heads of rivets or staybolts that have deteriorated. Such rivets or staybolts must be replaced. The seal welding of rivet heads to secure tightness is prohibited.

(b) Where leaks develop around staybolts which are otherwise in good condition, the nuts may be replaced with a beveled collar formed around the end of the stay by means of welding. In such cases, the depth of collar measured on the stay and the width measured on the plate, must be equal to one-half the diameter of the staybolt.

§ 59.10–20 Patches in shells and tube sheets.

(a) Unreinforced openings in the shells or drums of boilers or pressure vessels may be closed by the use of a patch or plate inside the drum or shell and sealed against leakage by welding. Such plates must have a diameter of at least 2 inches larger than the diameter of the hole and must have a thickness equal to the thickness of the plate to which it is attached. It is not permissible to insert such patches in the shell or head flush with the surrounding plate unless the requirements of this subchapter for Class I welded pressure vessels are met.

(b) Portions of tube sheets which have deteriorated may be renewed by replacing the wasted portion with a new section. The ligaments between the tube holes may be joined by means of welding and staytubes.

§ 59.10–25 Stayed areas.

Welding repairs are permitted in staybolted areas or areas adequately stayed by other means so that should failure of the welds occur the stress will be carried by the stays. The welds must be located entirely within staybolted areas and must not pass through the outer row of stays.

§ 59.10–30 Seal welding.

Where leaks occur in riveted joints or connections, they must be carefully investigated to determine the cause. Such leaks may be made tight by seal welding the edge, if accepted by the Officer in Charge, Marine Inspection.

§ 59.10–35 Wrapper plates and back heads.

Wrapper plates and back heads may be renewed in whole or repaired as follows:

(a) Wrapper plates or back heads must be cut between two rows of staybolts or on a line of staybolts where the thickness is approximately the same as the original construction. If welding is employed on a line of staybolts, the staybolts must be fitted with a welded collar.

(b) The edges of wrapper plates riveted to tube sheets and back heads must be removed by cutting out the rivets.

(c) The edges of existing plates and new plates must be beveled by chipping, flame cutting or grinding so as to form a suitable groove whereby complete penetration of the weld metal will be obtained. The edge preparation and preheat must comply with the requirements of § 59.10–5(h).

(d) The edges of the new plate must be butt-welded, and the plate must be riveted to the flanges of the tube sheet and back heads and the staybolts renewed.

(e) Sections of wrapper plates of combustion chambers outside of stayed areas may be repaired by welding provided the welded joints are stress-relieved by means of controlled heat and the joints are nondestructively tested.

Subpart 59.15—Miscellaneous Boiler Repairs

§ 59.15–1 Furnace repairs.

(a) Where corrugated or plain furnaces or flues are distorted by 1.5 inches or more, they must be repaired by either of the following methods:

(1) The furnace must be forced back to a true circular shape, and the Officer in Charge, Marine Inspection, may require strongbacks or other acceptable

means of support to hold the furnace; or

(2) The furnace must be adequately stayed as determined by the Officer in Charge, Marine Inspection.

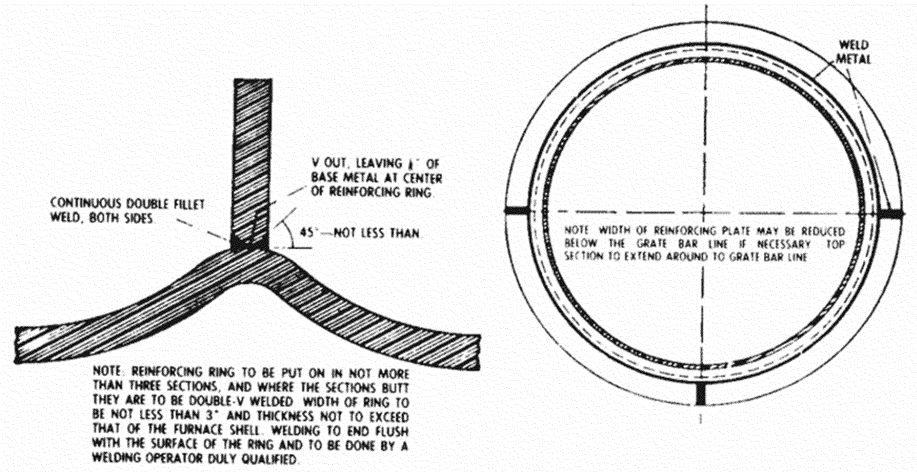
(b) Distortion means the difference between any single measured diameter of the furnace and the diameter of a true circle at the same location.

(c) Where the distortion does not exceed 1.5 inches it will not be necessary to force the furnace back to a true circle if the allowable pressure is reduced in the ratio of 1.5 percent for each one-tenth of an inch of distortion. However, if the maximum distortion does not exceed 1 inch, the repairs or reduction in pressure will not be required unless considered necessary by the marine inspector.

(d) When it becomes necessary to rivet a patch to a furnace or other part of the heating surface, the riveted patch must be placed on the waterside of the plate in order not to form a pocket in which sediment may collect.

(e) Furnace crowns which have become distorted, not in excess of the limitations provided in paragraph (c) of this section, may be repaired by forcing back the distorted section to as nearly a true circle as possible and reinforcing the same by means of a ring, arc- or gas-welded to the distorted corrugation as shown in figure 1 to §59.15–1, the welding to be done by welders and welding processors qualified in accordance with part 57 of this subchapter.

FIGURE 1 TO §59.15–1—APPROVED METHOD OF REINFORCING FURNACES BY MEANS OF ARC OR GAS WELDING



§59.15–5 Stayed furnaces and combustion chambers.

(a) Where the plate forming the walls of stayed furnaces or combustion chambers become bulged between staybolts, repairs may be made by inserting an additional staybolt in the center of such space supported by the four staybolts.

(b) Where it is desired to rivet a patch to the wall of a stayed furnace or combustion chamber, the defective portion of the plate must be cut away until solid material is reached, the patch must be riveted on the waterside, and the staybolts renewed, and extended through the new plate.

§59.15–10 Bagged or blistered shell plates.

(a) When the shell plates of cylindrical boilers which are exposed to the radiant heat of the fire become bagged

or blistered, it is the duty of the chief engineer to notify the Officer in Charge, Marine Inspection, for examination before raising steam on the boiler.

(b) Where the shell plate is bagged due to overheating, the Officer in Charge, Marine Inspection, may, if in their judgment it is practicable, permit the same to be driven back to its original position.

(c) Where the shell plate has blistered, bagged, or bulged to such an extent that there is an appreciable thinning of the plate, the Officer in Charge, Marine Inspection, must require the defective portion to be cut away and the shell repaired by fitting a patch of steel plate conforming to the requirements of § 52.01–90 of this subchapter in place of the defective portion. Care must be taken that the riveting schedule of the patch is so arranged as to give the plate sufficient strength to withstand the stress placed on it in service.

Subpart 59.20—Welding Repairs to Castings

§ 59.20–1 Carbon-steel or alloy-steel castings.

Defects in carbon-steel or alloy-steel castings may be repaired by welding. The repairs must be performed in accordance with the material specification to which the casting was originally supplied.

PART 60 [RESERVED]

PART 61—PERIODIC TESTS AND INSPECTIONS

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Subpart 61.03—Incorporation of Standards

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Subpart 61.35—Design Verification and Periodic Testing for Automatic Auxiliary Boilers

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Subpart 61.40—Design Verification and Periodic Testing of Vital System Automation

61.40–1 General.
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61.40–10 Test procedure details.

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SOURCE: CGFR 68–82, 33 FR 18890, Dec. 18, 1968, unless otherwise noted.