are required, unless specifically exempted by other regulations in this subchapter.

(b) The first inspection of Class II welded pressure vessels shall be performed during the welding of the longitudinal joint. At this time the marine inspector shall check the material and fit-up of the work, and ascertain that only welders who have passed the required tests are employed.

(c) A second inspection of Class II welded pressure vessels shall be made during the welding of the circumferential joints. At this time the marine inspector shall check any new material being used which may not have been examined at the time of the first inspection, also the fit-up of the vessel at this stage of fabrication, and in addition, observe the welding and ascertain that only welders who have passed the required tests are employed.

§ 50.30–20 Class III pressure vessels.

(a) Class III pressure vessels shall be subject to shop inspection at the plant where they are being fabricated, as or when determined necessary by the Officer in Charge, Marine Inspection. The inspection described in this section is required, unless specifically exempted by other regulations in this subchapter.

(b) For Class III welded pressure vessels, one inspection shall be made during the welding of the longitudinal joint. If there is no longitudinal joint, the inspection shall be made during the welding of a circumferential joint. At this time the marine inspector shall check the material and fit-up of the work and see that only welders who have passed the required tests are employed.

PART 51 [RESERVED]

PART 52—POWER BOILERS

Subpart 52.01—General Requirements

Sec.

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52.01–140 Certification by stamping (modifies PG–104 through PG–113).
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52.05–20 Radiographic and ultrasonic examination (modifies PW–11 and PW–41.1).
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Subpart 52.15—Requirements for Watertube Boilers

52.15–1 General (modifies PWT–1 through PWT–15).
52.15–5 Tube connections (modifies PWT–9 and PWT–11).

Subpart 52.20—Requirements for Firetube Boilers

52.20–1 General (modifies PFT–1 through PFT–49).
52.20–17 Opening between boiler and safety valve (modifies PFT–44).
52.20–25 Setting (modifies PFT–46).

Subpart 52.25—Other Boiler Types

52.25–1 General.
52.25–3 Feedwater heaters (modifies PFH–1).
52.25–5 Miniature boiler (modifies PMB–1 through PMB–21).

52.25–7 Electric boilers (modifies PEB–1 through PEB–19).
52.25–10 Organic fluid vaporizer generators (modifies PVG–1 through PVG–12).
52.25–15 Fired thermal fluid heaters.
52.25–20 Exhaust gas boilers.

AUTHORITY: 46 U.S.C. 3306, 3703; E.O. 12234, 45 FR 58801, 3 CFR, 1980 Comp., p. 277; 49 CFR 1.46.

SOURCE: CGFR 68–82, 33 FR 18815, Dec. 18, 1968, unless otherwise noted.

Subpart 52.01—General Requirements

§ 52.01–1 Incorporation by reference.

(a) Certain material is incorporated by reference into this part with the approval of the Director of the Federal Register in accordance with 5 U.S.C. 552(a). To enforce any edition other than that specified in paragraph (b) of this section, the Coast Guard must publish notice of change in the FEDERAL REGISTER and make the material available to the public. All approved material is on file at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC, and at the U.S. Coast Guard, Office of Design and Engineering Standards (G–MSE), 2100 Second Street SW., Washington, DC 20593–0001 and is available from the sources indicated in paragraph (b) of this section.

(b) The material approved for incorporation by reference in this part and the sections affected are:

American Society of Mechanical Engineers (ASME)

United Engineering Center, 345 East 47th Street, New York, NY 10017

Boiler and Pressure Vessel Code, Section I, Power Boilers, July 1989 with 1989 addenda 52.01–2; 52.01–5; 52.01–50; 52.01–90; 52.01–95; 52.01–100; 52.01–105; 52.01–110; 52.01–115; 52.01–120; 52.01–135; 52.01–140; 52.01–145; 52.05–1; 52.05–15; 52.05–20; 52.05–30; 52.05–45; 52.15–1; 52.15–5; 52.20–1; 52.20–17; 52.20–25; 52.25–3; 52.25–5; 52.25–7; 52.25–10

[CGD 88–032, 56 FR 35821, July 29, 1991, as amended by CGD 95–072, 60 FR 50462, Sept. 29, 1995; CGD 96-041, 61 FR 50727, Sept. 27, 1996]

§ 52.01–2 Adoption of section I of the ASME Code.

(a) Main power boilers and auxiliary boilers shall be designed, constructed, inspected, tested, and stamped in accordance with section I of the ASME (American Society of Mechanical Engineers) Code, as limited, modified, or replaced by specific requirements in this part. The provisions in the appendix to section I of the ASME Code are adopted and shall be followed when the requirements in section I make them mandatory. For general information Table 52.01–1(a) lists the various paragraphs in section I of the ASME Code which are limited, modified, or replaced by regulations in this part.

TABLE 52.01–1(A)—LIMITATIONS AND MODIFICATIONS IN THE ADOPTION OF SECTION I OF THE ASME CODE

Paragraphs in section I, ASME Code[1] and disposition	Unit of this part
PG–1 replaced by	54.01–5(a)
PG–5 through PG–13 modified by	52.01–90
PG–16 through PG–31 modified by	52.01–95
PG–32 through PG–39 modified by	52.01–100
PG–42 through PG–55 modified by	52.01–100
PG–58 and PG–59 modified by	52.01–105
PG–60 modified by	52.01–110
PG–61 modified by	52.01–115 (56.50–30)
PG–67 through PG–73 modified by	52.01–120
PG–90 through PG–100 modified by	52.01–135 (52.01–95)
PG–91 modified by	52.01–135(b)
PG–99 modified by	52.01–135(c)
PG–100 modified by	52.01–95(e)
PG–104 through PG–113 modified by	52.01–140(a)
PG–112 and PG–113 modified by	52.01–145
PW–1 through PW–54 modified by	52.05–1
PW–10 modified by	52.05–15
PW–11.1 modified by	52.05–20
PW–16 modified by	52.05–30
PW–41 modified by	52.05–20, 52.05–45
PWT–1 through PWT–15 modified by	52.15–1
PWT–9 modified by	52.15–5
PWT–9.2 replaced by	52.15–5(b)
PWT–11 modified by	52.15–5
PWT–11.3 replaced by	52.15–5(b)
PFT–1 through PFT–49 modified by	52.20–1
PFT–44 modified by	52.20–17
PFT–46. modified by	52.20–25
PFH–1 modified by	52.25–3
PMB–1 through PMB–21 modified by	52.25–5
PEB–1 through PEB–19 modified by	52.25–7
PVG–1 through PVG–12 modified by	52.25–10
A–19 through A–21 modified by	52.01–50

[1] The references to specific provisions in the ASME Code are coded. The first letter "P" refers to section I, while the letter "A" refers to the appendix to section I. The letter or letters following "P" refer to a specific subsection of section I. The number following the letter or letters refers to the paragraph so numbered in the text.

(b) References to the ASME Code, such as paragraph PG–1, indicate:

P=Section I, Power Boilers ASME Code.
G=Subsection—General.
1=Paragraph 1.

(c) When a section or paragraph of the regulations in this part relates to material in section I of the ASME Code, the relationship with the code will be shown immediately following the heading of the section or at the beginning of the paragraph as follows:

(1) (Modifies P _____.) This indicates that the material in P _____ is generally applicable but is being altered, amplified or augmented.

(2) (Replaces P _____.) This indicates that P _____ does not apply.

(3) (Reproduces P _____.) This indicates that P _____ is being identically reproduced for convenience, not for emphasis.

[CGFR 68–82, 33 FR 18815, Dec. 18, 1968, as amended by CGFR 69–127, 35 FR 9975, June 17, 1970; CGD 81–79, 50 FR 9431, Mar. 8, 1985. Redesignated and amended by CGD 88–032, 56 FR 35821, July 29, 1991]

§ 52.01–3 Definitions of terms used in this part.

(a) *Types of boilers*—(1) *Main power boiler.* A main power boiler is a steam boiler used for generating steam for main propulsion.

(2) *Auxiliary or donkey boiler.* An auxiliary or donkey boiler is a steam boiler used for all purposes, including emergency propulsion, for which steam may be required other than main propulsion.

(3) *Watertube boiler.* A watertube boiler is a steam boiler in which the boiler tubes contain water and steam. The heat is applied to the outside surface of the tubes.

(4) *Internally fired firetube boiler (scotch boiler).* An internally fired firetube boiler is a steam boiler containing furnaces, one or more combustion chambers and tubes or flues, which are surrounded by water and through which the products of combustion pass from the furnace to the uptake. In such boilers no part of the shell is in contact with the fire or products of combustion.

(5) *Externally fired firetube or flue boiler (horizontal return tubular*). An externally fired firetube or flue boiler is a steam boiler, part of the outer shell of which is exposed to fire or to the products of combustion, and containing flues through which such products pass from the furnace to the uptake.

(6) *High temperature water boiler.* A high temperature water boiler is a boiler containing water at a temperature exceeding 250 °F.

(7) *Packaged boiler.* A packaged boiler is a steam boiler equipped, and shipped complete with fuel burning equipment, mechanical draft equipment, feed water apparatus and all necessary controls for manual or automatic operation, all completely mounted on a common base and requiring only to be connected to fuel, water and electric supplies to be ready for use.

(8) *Fired steam boiler.* A pressure vessel in which steam is generated by the application of heat resulting from the combustion of fuel is classed as a fired steam boiler.

(9) *Unfired steam boiler.* A pressure vessel in which steam is generated by means other than fuel combustion is classed as an unfired steam boiler. (See § 54.01–10 of this subchapter.)

(10) *Hybrid boiler.* A hybrid boiler is a steam boiler whose design employs features from both watertube and firetube boilers.

(b) *Parts of boilers*—(1) *Shell.* The shell is the structure forming the outer envelope of a boiler drum, or pressure vessel consisting of one or more plates properly joined (or of seamless construction) as specified in this part. This does not include tube sheets or heads.

(2) *Heads.* The heads are the ends of a boiler or pressure vessel. They may be flat or dished, stayed or unstayed.

(i) *Dished heads.* Dished heads are heads formed to a segment of a sphere or to a hemispherical or elliptical section and may be attached to the shell so that the pressure will be either on the concave or on the convex side.

(ii) *Stayed heads.* Stayed heads are heads supported in whole or in part by stays, furnaces, flues, tubes, etc.

(3) *Water wall.* A water wall is a series of tubes or elements spaced along or integral with a wall of a furnace to protect the wall and provide additional heating surface.

(4) *Header.* A header is a hollow forging, pipe, or welded plate of cylindrical, square, or rectangular cross section, serving as a manifold to which tubes are connected.

(5) *Superheater.* A superheater is an appliance for the purpose of increasing the temperature of steam.

(6) *Economizer.* An economizer is a feed-water heater usually located in the uptake or casing of a boiler to absorb heat from the waste gases.

(7) *Domes.* Domes are superstructures of shells, attached by riveting, bolting, or welding. They generally consist of a cylindrical shell with one end flanged for attachment to the main shell and the other end closed by a head which may be integral with, riveted, or welded to the shell.

(8) *Steam chimneys.* Steam chimneys are superstructures of steam boilers which are fitted with a lining inside of which the products of combustion pass to the smokestack. They may be constructed in the form of a dome integral with the boiler or as independent steam vessels connected by piping to the boiler.

(9) *Furnace.* A furnace is a firebox or a large flue in which the fuel is burned.

(i) *Corrugated furnace.* A corrugated furnace is a cylindrical shell wherein corrugations are formed circumferentially for additional strength and to provide for expansion.

(ii) *Plain furnace.* A plain furnace is a cylindrical shell usually made in sections joined by means of riveting or welding.

(10) *Combustion chamber.* A combustion chamber is that part of an internally fired boiler in which combustible gases may be burned after leaving the furnace.

(i) *Separate combustion chamber.* A separate combustion chamber is a combustion chamber which is connected to one furnace only.

(ii) *Common combustion chamber.* A common combustion chamber is a combustion chamber connected to two or more furnaces in a bolier.

(iii) *Crown or top plate.* A crown or top plate is the top of a combustion chamber and is usually supported by girder stays or by sling stays or braces.

(iv) *Curved bottom plate.* A curved bottom plate is the bottom of a separate combustion chamber formed to an arc of a circle and usually designed to be self-supporting.

(v) *Combustion chamber tube sheet.* A combustion chamber tube sheet is the plate forming the end of a combustion chamber in which the tubes are secured.

(vi) *Combustion chamber back sheet.* A combustion chamber back sheet is the plate opposite the tube sheet forming the back of the combustion chamber. It is usually stayed to the back head of the boiler by means of screw staybolts, or, in the case of double-ended boilers, to the back of the combustion chamber of the other end of the boiler.

(11) *Flues.* Flues are cylindrical shells made of seamless or welded tubing, or with a riveted longitudinal joint, the ends being attached by riveting or welding. Their purpose is to provide additional heating surface and to form a path for the products of combustion.

(12) *Tubes.* Tubes are cylindrical shells of comparatively small diameter constituting the main part of the heating surface of a boiler or superheater.

(i) *Seamless tube.* A seamless tube is a tube without any longitudinal joint.

(ii) *Electric-resistance-welded tube.* An electric-resistance-welded tube is a tube the longitudinal joint of which is made by the electric-resistance butt welding process.

(iii) *Stay tube.* A stay tube is a thickwalled tube, the end of which is usually thickened by upsetting to compensate for threading. Such tubes are used for staying tube sheets into which they are screwed and expanded.

(13) *Tube sheet.* A tube sheet is a portion of a boiler drum, or header perforated for the insertion of tubes.

(14) *Ligament.* The ligament is the section of metal between the holes in a tube sheet.

(i) *Longitudinal ligament.* A longitudinal ligament is the minimum section of metal between two tube holes on a line parallel with the axis of the drum.

(ii) *Circumferential ligament.* A circumferential ligament is the minimum section of metal between two tube holes on a line around the circumference of the drum.

(iii) *Diagonal ligament.* A diagonal ligament is the minimum section of metal between two tube holes in adjacent rows, measured diagonally from one row to the other.

(c) *Stays and supports.* (1) *Surfaces to be stayed.* Surfaces to be stayed or reinforced include flat plates, heads, or

areas thereof, such as segments of heads, wrapper sheets, furnace plates, side sheets, combustion chamber tops, etc., which are not self-supporting; and curved plates, constituting the whole or parts of a cylinder subject to external pressure, which are not entirely self-supporting.

(2) *Through stay.* A through stay is a solid bar extending through both heads of a boiler and threaded at the ends for attachment by means of nuts. With this type of stay the ends are usually upset to compensate for the threading. (See Figure 52.01–3(a).)

(3) *Solid screw staybolt.* A solid screw staybolt is a threaded bar screwed through the plates, the ends being riveted over or fitted with nuts or welded collars. (See Figure 52.01–3(b).)

(4) *Welded collar.* A welded collar is a beveled ring formed around the end of a screw stay by means of arc- or gas-welding. It is used in lieu of a nut. (See Figure 52.01–3(1).)

(5) *Hollow screw staybolt.* A hollow screw staybolt is a hollow threaded bar screwed through the plate, the ends being riveted over or fitted with nuts or welded collars. (See Figure 52.01–3(c).)

(6) *Flexible staybolt.* A flexible staybolt is a bar made with ball-and-socket joint on one end, the cup of the socket being screwed into the outside sheet and covered with a removable cap, the plain end of the staybolt being threaded, screwed through the inside sheet and riveted over. (See Figure 52.01–3(d).)

(7) *Sling stay.* A sling stay is a flexible stay consisting of a solid bar having one or both ends forged for a pin connection to a crowfoot or other structural fitting secured to the stayed plate. (See Figure 52.01–3(e).)

(8) *Crowfoot.* A crowfoot is a forged fitting with palms or lugs secured to the head to form a proper connection with a sling stay. (See Figure 52.01–3(f).)

(9) *Crowfoot stay.* A crowfoot stay is a solid bar stay terminating in a forged fork with palms or lugs for attachment to the plate. (See Figure 52.01–3(g).)

(10) *Diagonal stay.* A diagonal stay is a bar or formed plate forged with palms or lugs for staying the head of the boiler to the shell diagonally. (See Figure 52.01–3(h).)

(11) *Gusset stay.* A gusset stay is a triangular plate used for the same purpose as a diagonal stay and attached to the head and the shell by angles, flanges, or other suitable means of attachment. (See Figure 52.01–3(i).)

(12) *Dog stay.* A dog stay is a staybolt, one end of which extends through a girder, dog, or bridge, and is secured by a nut, the other end being screwed through the plate which it is supporting and riveted over or fitted with a nut or welded collar. (See Figure 52.01–3(j).)

(13) *Girder.* A girder is a bridge, built up of plates of structural shapes separated by distance pieces, a forging, or a formed plate, which spans an area requiring support, abutting thereon and supporting the girder stays or staybolts. (See Figure 52.01–3(k).)

(14) *Structural stiffeners.* Structural stiffeners are rolled shapes or flanged plates which are used to stiffen a surface which is not entirely self-supporting.

(15) *Reinforcement.* A reinforcement is a doubling plate, washer, structural shape, or other form for stiffening or strengthing a plate.

(d) *Pressure relief devices.* For boilers, pressure vessels, and pressure piping, a pressure relief device is designed to open to prevent a rise of internal fluid pressure in excess of a specified value due to exposure to emergency or abnormal conditions. It may also be designed to prevent excessive internal vacuum. It may be a pressure relief valve, a nonreclosing pressure relief device or a vacuum relief valve.

(1) *Pressure relief valve.* A pressure relief valve is a pressure relief device which is designed to reclose and prevent the further flow of fluid after normal conditions have been restored.

(i) *Safety valve.* A safety valve is a pressure relief valve actuated by inlet static pressure and characterized by rapid opening or pop action. Examples of types used on boilers include:

(A) *Spring-loaded safety valve.* A spring-loaded safety valve is a safety valve fitted with a spring which normally holds the valve disk in a closed position against the seat and allows it

to open or close at predetermined pressures. Spring-loaded safety valves are characterized by pop action.

(B) *Pressure loaded pilot actuated safety valve.* A pressure loaded pilot actuated safety valve is one which is held in a closed position by steam pressure and controlled in operation by a pilot actuator valve.

(C) *Spring loaded pilot actuated safety valve.* A spring loaded, pilot actuated safety valve is one in which a spring is used in the conventional way to hold the disk against the seat, but which has a piston attached to the spindle and enclosed within a cylinder, which when subjected to a limiting or set pressure, unbalances the spring load thereby opening the valve.

(D) *Spring loaded pilot valve.* A spring loaded pilot valve is a conventional safety valve designed to actuate another spring loaded safety valve through a pressure transmitting line led from the body of the pilot valve.

(ii) *Relief valve.* A relief valve is a pressure relief valve actuated by inlet static pressure which opens in proportion to the increase in pressure over the opening pressure.

(iii) *Safety relief valve.* A safety relief valve is a pressure relief valve characterized by rapid opening or pop action, or by opening in proportion to the increase in pressure over the opening pressure, depending on application.

(A) *Conventional safety relief valve.* A conventional safety relief valve has its spring housing vented to the discharge side of the valve. The performance characteristics (opening pressure, closing pressure, lift and relieving capacity) are directly affected by changes of the back pressure on the valve.

(B) *Balanced safety relief valve.* A balanced safety relief valve incorporates means of minimizing the effect of back pressure on the operational characteristics (opening pressure, closing pressure, lift and relieving capacity).

(C) *Internal spring safety relief valve.* An internal spring safety relief valve incorporates the spring and all or part of the operating mechanism within the pressure vessel.

(iv) *Pilot operated pressure relief valve.* A pilot operated pressure relief valve is a pressure relief valve in which the major relieving device is combined with and is controlled by a self-actuated auxiliary pressure relief valve.

(v) *Power actuated relief valve.* A power actuated pressure relief valve is a pressure relief valve in which the major relieving device is combined with and controlled by a device requiring an external source of energy.

(vi) *Temperature actuated pressure relief valve.* A temperature actuated pressure relief valve is a pressure relief valve. A spring loaded, pilot actuated internal temperature.

(2) *Nonreclosing pressure relief device.* A nonreclosing pressure relief device is a pressure relief device not designed to reclose after operation.

(i) *Rupture disk device.* A rupture disk device is a device actuated by inlet static pressure and designed to function by the bursting of a pressure retaining disk.

(ii) *Explosion rupture disk device.* An explosion rupture disk device is a rupture disk device designed for use at high rates of pressure rise.

(iii) *Breaking pin device.* A breaking pin device is a device actuated by inlet static pressure and designed to function by the breakage of a load carrying section of a pin which supports a pressure retaining member.

(iv) *Shear pin device.* A shear pin device is a device actuated by inlet static pressure and designed to function by the shearing of a load carrying pin which supports the pressure retaining member.

(v) *Fusible plug device.* A fusible plug device is a device designed to function by the yielding or melting of a plug of suitable melting temperature.

(vi) *Frangible disk device.* A frangible disk device is the same as a rupture disk device.

(vii) *Bursting disk device.* A bursting disk device is the same as a rupture disk device.

(3) *Vacuum relief valve.* A vacuum relief valve is a valve designed to admit fluid to prevent an excessive internal vacuum.

(e) *Other boiler attachments.* (1) *Mountings.* Mountings are nozzle connections, distance pieces, valves, or fittings attached directly to the boiler.

(2) *Main steam stop valve.* A main steam stop valve is a valve usually connected directly to the boiler for the

purpose of shutting off the steam from the main steam line.

(3) *Auxiliary steam stop valve.* An auxiliary steam stop valve is a valve usually connected directly to the boiler for the purpose of shutting off the steam from the auxiliary lines (including the whistle lines).

(4) *Manifold.* A manifold is a fitting with two or more branches having valves either attached by bolting or integral with the fitting.

(5) *Feed valve.* A feed valve is a valve in the feed-water line which controls the boiler feed.

(6) *Blowoff valve.* A blowoff valve is a valve connected directly to the boiler for the purpose of blowing out water, scum or sediment.

(7) *Dry pipe.* A dry pipe is a perforated or slotted pipe placed in the highest part of the steam space of a boiler to prevent priming.

(8) *Water column.* A water column is a fitting or tube equipped with a water glass attached to a boiler for the purpose of indicating the water level.

(9) *Test cocks.* Test cocks are small cocks on a boiler for indicating the water level.

(10) *Salinometer cocks.* Salinometer cocks are cocks attached to a boiler for the purpose of drawing off a sample of water for salinity tests.

(11) *Fusible plugs.* Fusible plugs are plugs made with a bronze casing and a tin filling which melts at a temperature of 445° to 450 °F. They are intended to melt in the event of low water and thus warn the engineer on watch.

(f) *Boiler fabrication.* (1) *Repair.* Repair is the restoration of any damaged or impaired part to an effective and safe condition.

(2) *Alteration.* Alteration is a structural modification to or departure from an approved design or existing construction.

(3) *Expanding.* Expanding is the process of enlarging the end of a tube to make it fit tightly in the tube sheet.

(4) *Beading.* Beading is the process of turning over the protruding end of a tube after expanding to form a supporting collar for the tube sheet.

(5) *Bell-mouthing.* Bell-mouthing is the process of flaring the end of a tube beyond where it is expanded in the tube sheet.

(6) *Telltale hole.* A telltale hole is a small hole having a diameter not less than three-sixteenths inch drilled in the center of a solid stay, and extending to at least one-half inch beyond the inside surface of the sheet.

(7) *Access or inspection openings.* Access or inspection openings are holes cut in the shells or heads of boilers or boiler pressure part for the purpose of inspection and cleaning.

(8) *Openings.* Openings are holes cut in shells or heads of boilers or boiler pressure parts for the purpose of connecting nozzles, domes, steam chimneys, or mountings.

(g) *Pressure.* The term pressure is an abbreviation of the more explicit expression ''difference in pressure intensity.'' It is measured in terms such as pounds per square inch (p.s.i.).

(1) *Gage (or gauge) pressure.* Gage pressure is the difference between the pressure at the point being measured and the ambient pressure for the gage. It is measured in units such as pounds per square inch gage (p.s.i.g.).

(2) *Absolute pressure.* Absolute pressure is the difference between the pressure at the point being measured and that of a perfect vacuum. It is measured in units such as pounds per square inch absolute (p.s.i.a.).

(3) *Internal pressure.* Internal pressure refers to a situation where the pressure inside exceeds that outside the volume being described.

(4) *External pressure.* External pressure refers to a situation where the pressure outside exceeds that inside the volume being described.

(5) *Maximum allowable working pressure.* For a definition of maximum allowable working pressure, see § 54.10–5 of this subchapter.

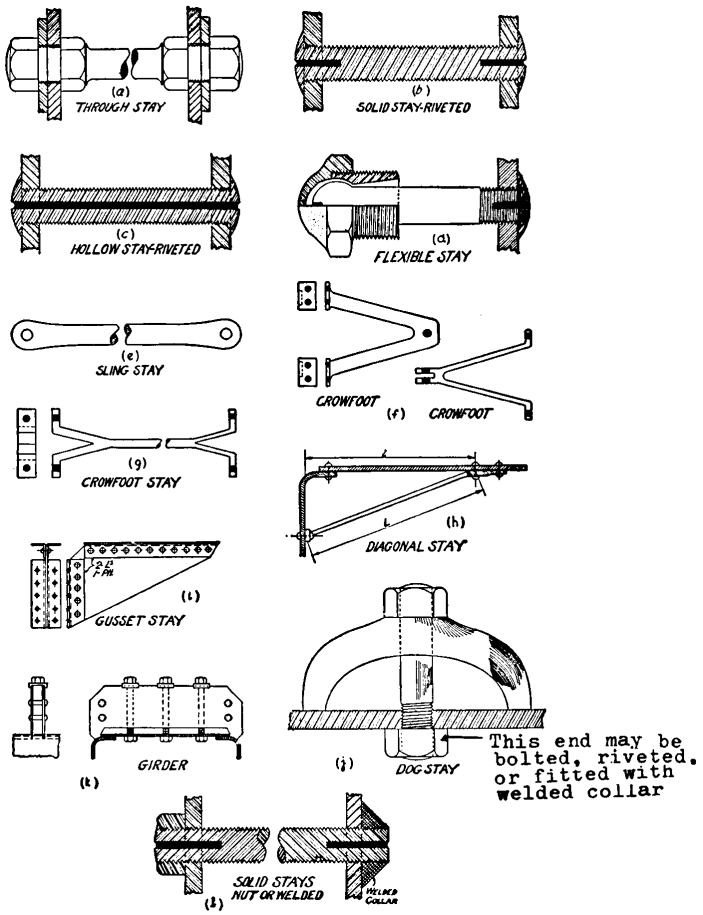

FIGURE 52.01–3—Acceptable Types of Boiler Stays.

[CGFR 68–82, 33 FR 18815, Dec. 18, 1968, as amended by CGFR 69–127, 35 FR 9976, June 17, 1970; CGD 81–79, 50 FR 9431, Mar. 8, 1985; CGD 83–043, 60 FR 24772, May 10, 1995]

§52.01–5 Plans.

(a) Manufacturers intending to fabricate boilers to be installed on vessels shall submit detailed plans as required by subpart 50.20 of this subchapter. The plans, including design calculations, must be certified by a registered professional engineer as meeting the design requirements in this part and in section I of the ASME Code.

(b) The following information must be included:

(1) Calculations for all pressure containment components including the maximum allowable working pressure and temperature, the hydrostatic or pneumatic test pressure, the maximum steam generating capacity and the intended safety valve settings.

(2) Joint design and methods of attachment of all pressure containment components.

(3) A bill of material meeting the requirements of section I of the ASME Code, as modified by this subpart.

(4) A diagrammatic arrangement drawing of the assembled unit indicating the location of internal and external components including any interconnecting piping.

(Approved by the Office of Management and Budget under control number 2115–0142)

[CGD 81–79, 50 FR 9432, Mar. 8, 1985]

§ 52.01–10 Automatic controls.

(a) Each main boiler must meet the special requirements for automatic safety controls in § 62.35–20(a)(1) of this chapter.

(b) Each automatically controlled auxiliary boiler having a heat input rating of less than 12,500,000 Btu/hr. (3.66 megawatts) must meet the requirements of part 63 of this chapter.

(c) Each automatically controlled auxiliary boiler with a heat input rating of 12,500,000 Btu/hr. (3.66 megawatts) or above, must meet the requirements for automatic safety controls in part 62 of this chapter.

[CGFR 68–82, 33 FR 18815, Dec. 18, 1968, as amended by CGD 81–030, 53 FR 17837, May 18, 1988; CGD 88–057, 55 FR 24236, June 15, 1990]

§ 52.01–35 Auxiliary, donkey, fired thermal fluid heater, and heating boilers.

(a) To determine the appropriate part of the regulations where requirements for miscellaneous boiler types, such as donkey, fired thermal fluid heater, heating boiler, etc., may be found, refer to Table 54.01–5(a) of this subchapter.

(b) Fired vessels in which steam is generated at pressures exceeding 103 kPa gage (15 psig) shall meet the requirements of this part.

[CGFR 68–82, 33 FR 18815, Dec. 18, 1968, as amended by CGD 81–79, 50 FR 9432, Mar. 8, 1985]

§ 52.01–40 Materials and workmanship.

All materials to be used in any of the work specified in the various sections of this part shall be free from injurious defects and shall have a workmanlike finish. The construction work shall be executed in a workmanlike manner with proper tools or equipment and shall be free from defects which would impair strength or durability.

§ 52.01–50 Fusible plugs (modifies A–19 through A–21).

(a) All boilers, except watertube boilers, with a maximum allowable working pressure in excess of 206 kPa gage (30 psig), if fired with solid fuel not in suspension, or if not equipped for unattended waterbed operation, must be fitted with fusible plugs. Fusible plugs must comply with only the requirements of A19 and A20 of the ASME Code and be stamped on the casing with the name of the manufacturer, and on the water end of the fusible metal ''ASME Std.''. Fusible plugs are not permitted where the maximum steam temperature to which they are exposed exceeds 218 °C (425 °F).

(b) Vertical boilers shall be fitted with one fusible plug located in a tube not more than 2 inches below the lowest gage cock.

(c) Externally fired cylindrical boilers with flues shall have one plug fitted to the shell immediately below the fire line not less than 4 feet from the front end.

(d) Firebox, Scotch, and other types of shell boilers not specifically provided for, having a combustion chamber common to all furnaces, shall have one plug fitted at or near the center of the crown sheet of the combustion chamber.

(e) Double-ended boilers, having individual combustion chambers for each end, in which combustion chambers are common to all the furnaces in one end of the boiler, shall have one plug fitted at or near the center of the crown sheet of each combustion chamber.

(f) Boilers constructed with a separate combustion chamber for each individual furnace shall be fitted with a fusible plug in the center of the crown sheet of each combustion chamber.

(g) Boilers of types not provided for in this section shall be fitted with at least one fusible plug of such dimensions and located in a part of the boiler as will best meet the purposes for which it is intended.

(h) Fusible plugs shall be so fitted that the smaller end of the filling is in direct contact with the radiant heat of the fire, and shall be at least 1 inch higher on the water side than the plate or flue in which they are fitted, and in

no case more than 1 inch below the lowest permissible water level.

(i) The lowest permissible water level shall be determined as follows:

(1) Vertical firetube boilers, one-half of the length of the tubes above the lower tube sheets.

(2) Vertical submerged tube boilers 1 inch above the upper tube sheet.

(3) Internally fired firetube boilers with combustion chambers integral with the boiler, 2 inches above the highest part of the combustion chamber.

(4) Horizontal-return tubular and dry back Scotch boilers, 2 inches above the top row of tubes.

(j) [Reserved]

(k)(1) Fusible plugs shall be cleaned and will be examined by the marine inspector at each inspection for certification, and oftener if necessary. If in the marine inspector's opinion the condition of any plug is satisfactory, it may be continued in use.

(2) When fusible plugs are renewed at other than the inspection for certification and no marine inspector is in attendance, the Chief Engineer shall submit a written report to the Officer in Charge, Marine Inspection, who issued the certificate of inspection informing him of the renewal. This letter report shall contain the following information:

(i) Name and official number of vessel.

(ii) Date of renewal of fusible plugs.

(iii) Number and location of fusible plugs renewed in each boiler.

(iv) Manufacturer and heat number of each plug.

(v) Reason for renewal.

[CGFR 68–82, 33 FR 18815, Dec. 18, 1968, as amended by CGD 81–79, 50 FR 9432, Mar. 8, 1985]

§52.01–55 Increase in maximum allowable working pressure.

(a) When the maximum allowable working pressure of a boiler has been established, an increase in the pressure settings of its safety valves shall not be granted unless the boiler design meets the requirements of this subchapter in effect at the time the boiler was contracted for or built; but in no case will a pressure increase be authorized for boilers constructed prior to the effective date of the regulations dated November 19, 1952, if the minimum thickness found by measurement shows that the boiler will have a factor of safety of less than 4½. The piping system, machinery, and appurtenances shall meet the present requirements of this subchapter for the maximum allowable working pressure requested. An increase in pressure shall be granted only by the Commandant upon presentation of data or plans proving that the requested increase in pressure is justified.

(b) When an existing boiler is replaced by a new boiler designed to operate at pressures in excess of the pressure indicated on the certificate of inspection for the previous boiler, an analysis of the complete system shall be made, including machinery and piping, to insure its compatibility with the increased steam pressure. The maximum allowable working pressure on the certificate of inspection shall be based on the results of this analysis.

§52.01–90 Materials (modifies PG–5 through PG–13).

(a) Materials subject to stress due to pressure shall conform to specifications as indicated in paragraph PG–5 through PG–13 of the ASME Code except as noted otherwise in this section.

(b) Material not fully identified with an ASME Code approved specification may be accepted as meeting Coast Guard requirements provided it satisfies the conditions indicated in paragraph PG–10 of the ASME Code.

(c) (Modifies PG–5.5) When the maximum allowable working pressure (See PG–21) exceeds 15 pounds per square inch, cross pipes connecting the steam and water drums of water tube boilers, headers, cross boxes and all pressure parts of the boiler proper shall be made of a wrought or cast steel listed in Table PG–23.1 of the ASME Code.

(d) (Modifies PG–8.2.2.) The use of cast iron for mountings, fittings, valves, or cocks attached directly to boilers operating at pressures exceeding 15 pounds per square inch is prohibited.

(e) (Modifies PG–11.1.1.) The material, design, construction and workmanship of pumps shall be at least equivalent to the standards established

by the American Bureau of Shipping or other recognized classification society. See part 58 of this subchapter.

[CGFR 68–82, 33 FR 18815, Dec. 18, 1968, as amended by CGD 73–254, 40 FR 40163, Sept. 2, 1975; CGD 81–79, 50 FR 9432, Mar. 8, 1985]

§ 52.01–95 Design (modifies PG–16 through PG–31 and PG–100).

(a) *Requirements.* Boilers required to be designed to this part shall meet the requirements of PG–16 through PG–31 of the ASME Code except as noted otherwise in this section.

(b) *Superheater.* (1) The design pressure of a superheater integral with the boiler shall not be less than the lowest setting of the drum safety valve.

(2) Controls shall be provided to insure that the maximum temperature at the superheater outlets does not exceed the allowable temperature limit of the material used in the superheater outlet, in the steam piping, and in the associated machinery under all operating conditions including boiler overload. Controls need not be provided if the operating superheater characteristic is demonstrated to be such that the temperature limits of the material will not be exceeded. Visible and audible alarms indicating excessive superheat shall be provided in any installation in which the superheater outlet temperature exceeds 454 °C (850 °F). The setting of the excessive superheat alarms must not exceed the maximum allowable temperature of the superheater outlet, which may be limited by the boiler design, the main steam piping design, or the temperature limits of other equipment subjected to the temperature of the steam.

(3) Arrangement shall be made for venting and draining the superheater in order to permit steam circulation through the superheater when starting the boiler.

(c) *Economizer.* The design pressure of an economizer integral with the boiler and connected to the boiler drum without intervening stop valves shall be at least equal to 110 percent of the highest setting of the safety valves on the drum.

(d) *Brazed boiler steam air heaters.* Boiler steam air heaters utilizing brazed construction are permitted at temperature not exceeding 525 °F. Refer to § 56.30–30(b)(1) of this subchapter for applicable requirements.

(e) *Stresses. (Modifies PG–22).* The stresses due to hydrostatic head shall be taken into account in determining the minimum thickness of the shell or head of any boiler pressure part unless noted otherwise. Additional stresses, imposed by effects other than internal pressure or static head, which increase the average stress over substantial sections of the shell or head by more than 10 percent of the allowable stress shall be taken into account. These effects include the weight of the vessel and its contents, method of support, impact loads, superimposed loads, localized stresses due to the reactions of supports, stresses due to temperature gradients and dynamic effects.

(f) *Cylindrical components under internal pressure. (Modifies PG–27.)* The minimum required thickness and maximum allowable working pressure of boiler piping, tubes, drums and headers shall be as required by the formula in PG–27 of the ASME Code except that threaded boiler tubes are not permitted.

[CGFR 68–82, 33 FR 18815, Dec. 18, 1968, as amended by CGD 81–79, 50 FR 9432, Mar. 8, 1985]

§ 52.01–100 Openings and compensation (modifies PG–32 through PG–39, PG–42 through PG–55).

(a) The rules for openings and compensation shall be as indicated in PG–32 through PG–55 of the ASME Code except as noted otherwise in this section.

(b) (Modifies PG–39.) Pipe and nozzle necks shall be attached to vessel walls as indicated in PG–39 except that threaded connections shall not be used under any of the following conditions:

(1) Pressures greater than 4137 kPa (600 psig);

(2) Nominal diameters greater than 51mm (2 in.); or

(3) Nominal diameters greater than 19mm (0.75 in.) and pressures above 1034 kPa (150 psig).

(c) *(Modifies PG–42).* Butt welding flanges and fittings must be used when full radiography is required by § 56.95–10.

[CGD 81–79, 50 FR 9432, Mar. 8, 1985]

§52.01–105 Piping, valves and fittings (modifies PG–58 and PG–59).

(a) Boiler external piping within the jurisdiction of the ASME Code must be as indicated in PG–58 and PG–59 of the ASME Code except as noted otherwise in this section. Piping outside the jurisdiction of the ASME Code must meet the appropriate requirements of part 56 of this subchapter.

(b) In addition to the requirements in PG–58 and PG–59 of the ASME Code, boiler external piping must:

(1) Meet the design conditions and criteria in §56.07–10 of this subchapter, except §56.07–10(b);

(2) Be included in the pipe stress calculations required by §56.31–1 of this subchapter;

(3) Meet the nondestructive examination requirements in §56.95–10 of this subchapter;

(4) Have butt welding flanges and fittings when full radiography is required; and

(5) Meet the requirements for threaded joints in §56.30–20 of this subchapter.

(c) Steam stop valves, in sizes exceeding 152mm (6 inch) NPS, must be fitted with bypasses for heating the line and equalizing the pressure before the valve is opened.

(d) *Feed connections.* (1) Feed water shall not be discharged into a boiler against surfaces exposed to hot gases or radiant heat of the fire.

(2) Feed water nozzles of boilers designed for pressures of 2758 kPa (400 psi), or over, shall be fitted with sleeves or other suitable means employed to reduce the effects of metal temperature differentials.

(e) *Blowoff connections.* (1) Firetube and drum type boilers shall be fitted with a surface and a bottom blowoff valve or cock attached directly to the boiler or to a short distance piece. The surface blowoff valve shall be located within the permissible range of the water level, or fitted with a scum pan or pipe at this level. The bottom blowoff valve shall be attached to the lowest part of the boiler or fitted with an internal pipe leading to the lowest point inside the boiler. Watertube boilers designed for pressures of 2413 kPa (350 psig) or over are not required to be fitted with a surface blowoff valve. Boilers equipped with a continuous blowdown valve on the steam drum are not required to be fitted with an additional surface blowoff connection.

(2) Where blowoff pipes are exposed to radiant heat of the fire, they must be protected by fire brick or other suitable heat-resisting material.

(f) *Dry pipes.* Internal dry pipes may be fitted to the steam drum outlet provided the dry pipes have a diameter equal to the steam drum outlet and a wall thickness at least equal to standard commercial pipe of the same diameter. Openings in dry pipes must be as near as practicable to the drum outlet and must be slotted or drilled. The width of the slots must not be less than 6mm (0.25 in.). The diameter of the holes must not be less than 10mm (0.375 in.). Where dry pipes are used, they must be provided with drains at each end to prevent an accumulation of water.

[CGD 81–79, 50 FR 9432, Mar. 8, 1985]

§52.01–110 Water-level indicators, water columns, gauge-glass connections, gauge cocks, and pressure gauges (modifies PG–60).

(a) *Boiler water level devices.* Boiler water level devices shall be as indicated in PG–60 of the ASME Code except as noted otherwise in this section.

(b) *Water level indicators (modifies PG–60.1).* (1) Each boiler, except those of the forced circulation type with no fixed water line and steam line, shall have two independent means of indicating the water level in the boiler connected directly to the head or shell. One shall be a gage lighted by the emergency electrical system (See Subpart 112.15 of Subchapter J (Electrical Engineering) of this chapter) which will insure illumination of the gages under all normal and emergency conditions. The secondary indicator may consist of a gage glass, or other acceptable device. Where the allowance pressure exceeds 1724 kPa (250 psi), the gage glasses shall be of the flat type instead of the common tubular type.

(2) Gage glasses shall be in continuous operation while the boiler is steaming.

(3) Double-ended firetube boilers shall be equipped as specified in this paragraph and paragraph (e) of this section except that the required water

level indicators shall be installed on each end of the boiler.

(4) Externally fired flue boilers, such as are used on central western river vessels, shall be equipped as specified in paragraphs (b) (1) through (3) of this section except that float gages may be substituted for gage glasses.

(c) *Water columns (modifies PG–60.2).* The use of water columns is generally limited to firetube boilers. Water column installations shall be close hauled to minimize the effect of ship motion on water level indication. When water columns are provided they shall be fitted directly to the heads or shells of boilers or drums by 1 inch minimum size pipes with shutoff valves attached directly to the boiler or drums, or if necessary, connected thereto by a distance piece both at the top and bottom of the water columns. Shutoff valves used in the pipe connections between the boiler and water column or between the boiler and the shutoff valves required by PG–60.6 of the ASME Code for gage glasses, shall be locked or sealed open. Water column piping shall not be fitted inside the uptake, the smoke box, or the casing. Water columns shall be fitted with suitable drains. Cast iron fittings are not permitted.

(d) *Gage glass connections (modifies PG–60.3).* Gage glasses and gage cocks shall be connected directly to the head or shell of a boiler as indicated in paragraph (b)(1) of this section. When water columns are authorized, connections to the columns may be made provided a close hauled arrangement is utilized so that the effect of ship roll on the water level indication is minimized.

(e) *Gage cocks (modifies PG–60.4).* (1) When the steam pressure does not exceed 250 pounds per square inch, three test cocks attached directly to the head or shell of a boiler may serve as the secondary water level indicator.

(2) See paragraph (d) of this section for restrictions on cock connections.

(f) *Pressure gages (modifies PG–60.6).* Each double-ended boiler shall be fitted with two steam gages, one on either end on the boiler.

(g) *Salinometer cocks.* In vessels operating in salt water, each boiler shall be equipped with a salinometer cock or valve which shall be fitted directly to the boiler in a convenient position. They shall not be attached to the water gage or water column.

(h) *High-water-level alarm.* Each watertube boiler for propulsion must have an audible and a visible high-water-level alarm. The alarm indicators must be located where the boiler is controlled.

[CG FR 68–82, 33 FR 18815, Dec. 18, 1968, as amended by CGD 81–79, 50 FR 9433, Mar. 8, 1985; CGD 83–043, 60 FR 24772, May 10, 1995]

§ 52.01–115 Feedwater supply (modifies PG–61).

Boiler feedwater supply must meet the requirements of PG–61 of the ASME Code and § 56.50–30 of this subchapter.

[CGD 81–79, 50 FR 9433, Mar. 8, 1985]

§ 52.01–120 Safety valves and safety relief valves (modifies PG–67 through PG–73).

(a)(1) Boiler safety valves and safety relief valves must be as indicated in PG–67 through PG–73 of the ASME Code except as noted otherwise in this section.

(2) A safety valve must:

(i) Be stamped in accordance with PG–110 of the ASME Code;

(ii) Have its capacity certified by the National Board of Boiler and Pressure Vessel Inspectors;

(iii) Have a drain opening tapped for not less than 6mm (¼ in.) NPS; and

(iv) Not have threaded inlets for valves larger than 51mm (2 in.) NPS.

(3) On river steam vessels whose boilers are connected in batteries without means of isolating one boiler from another, each battery of boilers shall be treated as a single boiler and equipped with not less than two safety valves of equal size.

(4) (Modifies PG–70.) The total rated relieving capacity of drum and superheater safety valves as certified by the valve manufacturer shall not be less than the maximum generating capacity of the boiler which shall be determined and certified by the boiler manufacturer. This capacity shall be in compliance with PG–70 of the ASME Code.

(5) In the event the maximum steam generating capacity of the boiler is increased by any means, the relieving capacity of the safety valves shall be

checked by an inspector, and, if determined to be necessary, valves of increased relieving capacity shall be installed.

(6) (Modifies PG–67). Drum safety valves shall be set to relieve at a pressure not in excess of that allowed by the Certificate of Inspection. Where for any reason this is lower than the pressure for which the boiler was orginially designed and the revised safety valve capacity cannot be recomputed and certified by the valve manufacturer, one of the tests described in PG–70(3) of the ASME Code shall be conducted in the presence of the Inspector to insure that the relieving capacity is sufficient at the lower pressure.

(7) On new installations the safety valve nominal size for propulsion boilers and superheaters must not be less than 38mm (1½ in.) nor more than 102mm (4 in.). Safety valves 38mm (1½ in.) to 114mm (4½ in.) may be used for replacements on existing boilers. The safety valve size for auxiliary boilers must be between 19mm (¾ in.) and 102mm (4 in.) NPS. The nominal size of a safety valve is the nominal diameter (as defined in 56.07–5(b)) of the inlet opening.

(8) Lever or weighted safety valves now installed may be continued in use and may be repaired, but when renewals are necessary, lever or weighted safety valves shall not be used. All such replacements shall conform to the requirements of this section.

(9) Gags or clamps for holding the safety valve disk on its seat shall be carried on board the vessel at all times.

(10) *(Modifies PG–73.2).* Cast iron may be used only for caps and lifting bars. When used for these parts, the elongation must be at least 5 percent in 51mm (2 inch) gage length. Nonmetallic material may be used only for gaskets and packing.

(b)(1) (Modifies PG–68.) Superheater safety valves shall be as indicated in PG–68 of the ASME Code except as noted otherwise in this paragraph.

(2) The setting of the superheater safety valve shall not exceed the design pressure of the superheater outlet flange or the main steam piping beyond the superheater. To prevent damage to the superheater, the drum safety valve shall be set at a pressure not less than that of the superheater safety valve setting plus 5 pounds minimum plus approximately the normal load pressure drop through the superheater and associated piping, including the controlled desuperheater if fitted. See also §52.01–95(b) (1).

(3) Drum pilot actuated superheater safety valves are permitted provided the setting of the pilot valve and superheater safety valve is such that the superheater safety valve will open before the drum safety valve.

(c)(1) (Modifies PG–71.) Safety valves shall be installed as indicated in PG–71 of the ASME Code except as noted otherwise in this paragraph.

(2) The final setting of boiler safety valves shall be checked and adjusted under steam pressure and, if possible, while the boiler is on the line and the steam is at operating temperatures, in the presence of and to the satisfaction of a marine inspector who, upon acceptance, shall seal the valves. This regulation applies to both drum and superheater safety valves of all boilers.

(3) The safety valve body drains required by PG–71 of the ASME Code shall be run as directly as possible from the body of each boiler safety valve, or the drain from each boiler safety valve may be led to an independent header common only to boiler safety valve drains. No valves of any type shall be installed in the leakoff from drains or drain headers and they shall be led to suitable locations to avoid hazard to personnel.

(d)(1) (Modifies PG–72.) The operation of safety valves shall be as indicated in PG–72 of the ASME Code except as noted in paragraph (d)(2) of this section.

(2) (Modifies PG–73). The lifting device required by PG–73.1.3 of the ASME Code shall be fitted with suitable relieving gear so arranged that the controls may be operated from the fireroom or engineroom floor.

[CGFR 68–82, 33 FR 18815, Dec. 18, 1968, as amended by CGD 81–79, 50 FR 9433, Mar. 8, 1985]

§52.01–130 Installation.

(a) *Foundations.* (1) Plans showing details of proposed foundations and support for boilers and the proposed means of bracing boilers in the vessel shall be

submitted for approval to the Officer in Charge, Marine Inspection, in the district where the installation is being made.

(2) Provision shall be made in foundations for expansion of the boilers when heated.

(3) Boilers shall be provided with chocks to prevent movement in the event of collision unless a bolted or riveted construction satisfactorily provides for this contingency.

(b) *Protection of adjacent structure.* (1) Boilers shall be so placed that all parts are readily accessible for inspection and repair.

(2) In vessels having a double bottom or other extensive surfaces directly below the boiler, the distance between such surface and a boiler shall in no case be less than 18 inches at the lowest part.

(3) In certain types of vessels where the boiler foundation forms the ashpit, such foundations shall be efficiently ventilated, except in cases where the ashpit is partially filled with water at all times.

(4) The pans of oil-burning, watertube boilers shall be arranged to prevent oil from leaking into the bilges and shall be lined with firebrick or other heat resisting material.

(5) The distance between a boiler and a compartment containing fuel oil shall not be less than 24 inches at the back end of a boiler and 18 inches elsewhere, except that for a cylindrical part of a boiler or a knuckle in the casing of a water-tube boiler, these distances may be reduced to 18 inches, provided all parts are readily accessible for inspection and repair.

(6) All oil-burning boilers shall be provided with oiltight drip pans under the burners and elsewhere as necessary to prevent oil draining into the bilges.

(c) *Boiler uptakes.* (1) Where dampers are installed in the uptakes or funnels, the arrangement shall be such that it will not be possible to shut off the gas passages from the operating boilers.

(2) Each main power boiler and auxiliary boiler shall be fitted with a separate gas passage.

§ 52.01–135 Inspection and tests (modifies PG–90 through PG–100).

(a) *Requirements.* Inspection and test of boilers and boiler pressure parts shall be as indicated in PG–90 through PG–100 of the ASME Code except as noted otherwise in this section.

(b) The inspections required by PG–90 through PG–100 of the ASME Code shall be performed by the ''Authorized Inspector'' as defined in PG–91 of the ASME Code. The Authorized Inspector shall hold a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors. After installation, boilers will be inspected for compliance with this part by the ''Marine Inspector'' as defined in § 50.10–15 of this subchapter.

(c) *Hydrostatic test (modifies PG–99).* Each new boiler shall be hydrostatically tested after installation to 1½ times the maximum allowable working pressure as indicated in PG–99 of the ASME Code. Before the boilers are insulated, accessible parts of the boiler shall be emptied, opened up and all interior surfaces shall be examined by the marine inspector to ascertain that no defects have occurred due to the hydrostatic test.

(d) *Operating tests.* In addition to hydrostatic tests prescribed in paragraph (c) of this section, automatically controlled auxiliary boilers must be subjected to operating tests as specified in §§ 61.30–20, 61.35–1, 61.35–3, 62.30–10, 63.15–9, 63.25–3, and 63.25–5 of this chapter, as appropriate, or as directed by the Officer in Charge, Marine Inspection, for propulsion boilers, These tests are to be performed after final installation.

[CGFR 68–82, 33 FR 18815, Dec. 18, 1968, as amended by CGFR 69–127, 35 FR 9976, June 17, 1970; CGD 81–79, 50 FR 9433, Mar. 8, 1985; CGD 88–057, 55 FR 24236, June 15, 1990]

§ 52.01–140 Certification by stamping (modifies PG–104 through PG–113).

(a) All boilers built in accordance with this part must be stamped with the appropriate ASME Code symbol as required by PG–104 through PG–113 of the ASME Code.

(b)(1) Upon satisfactory completion of the tests and Coast Guard inspections, boilers must be stamped with the following:

(i) Manufacturer's name and serial number;

(ii) ASME Code Symbol;

(iii) Coast Guard symbol, which is affixed only by marine inspector (see §50.10–15 of this subchapter);

(iv) Maximum allowable working pressure _____ at _____ °C (°F): and

(v) Boiler rated steaming capacity in kilograms (pounds) per hour (rated joules (B.T.U.) per hour output for high temperature water boilers).

(2) The information required in paragraph (b)(1) of this section must be located on:

(i) The front head or shell near the normal waterline and within 610 mm (24 inches) of the front of firetube boilers; and

(ii) The drum head of water tube boilers.

(3) Those heating boilers which are built to section I of the ASME Code, as permitted by §53.01–10(e) of this subchapter, do not require Coast Guard stamping and must receive full ASME stamping including the appropriate code symbol.

(c) The data shall be legibly stamped and shall not be obliterated during the life of the boiler. In the event that the portion of the boiler upon which the data is stamped is to be insulated or otherwise covered, a metal nameplate as described in PG–106.6 of the ASME Code shall be furnished and mounted. The nameplate is to be maintained in a legible condition so that the data may be easily read.

(d) Safety valves shall be stamped as indicated in PG–110 of the ASME Code.

[CGD 81–79, 50 FR 9433, Mar. 8, 1985]

§52.01–145 Manufacturers' data report forms (modifies PG–112 and PG–113).

The manufacturers' data report forms required by PG–112 and PG–113 of the ASME Code must be made available to the marine inspector for review. The Authorized Inspector's National Board commission number must be included on the manufacturers's data report forms.

[CGD 81–79, 50 FR 9434, Mar. 8, 1985]

Subpart 52.05—Requirements for Boilers Fabricated by Welding

§52.05–1 General (modifies PW–1 through PW–54).

(a) Boilers and component parts, including piping, that are fabricated by welding shall be as indicated in PW–1 through PW–54 of the ASME Code except as noted otherwise in this subpart.

§52.05–15 Heat treatment (modifies PW–10).

(a) Vessels and vessel parts shall be preheated and postweld heat treated in accordance with PW–38 and PW–39 of the ASME Code (reproduces PW–10). This includes boiler parts made of pipe material even though they may be nondestructively examined under §52.05–20.

§52.05–20 Radiographic and ultrasonic examination (modifies PW–11 and PW–41.1).

Radiographic and ultrasonic examination of welded joints shall be as described in PW–11 of the ASME Code except that parts of boilers fabricated of pipe material, such as drums, shells, downcomers. risers, cross pipes, headers and tubes containing only circumferentially welded butt joints, shall be nondestructively examined as required by §56.95–10 of this subchapter even though they may be exempted by the size limitations specified in PW–11.1.2 and PW–41.1 of the ASME Code.

[CGD 81–79, 50 FR 9434, Mar. 8, 1985]

§52.05–30 Minimum requirements for attachment welds (modifies PW–16).

(a) The location and minimum size of attachment welds for nozzles and other connections shall be as required by PW–16 of the ASME Code except as noted otherwise in this section.

(b) When nozzles or couplings are attached to boilers, as shown in Figure PW–16 (a) and (c) of the ASME Code and are welded from one side only, backing strips shall be used unless it can be determined visually or by acceptable nondestructive test methods that complete penetration has been obtained.

(c) When attachments as shown in Figure PW–16 (y) and (z) of the ASME

Code are employed they shall be limited to 2-inch pipe size for pressure exceeding 150 pounds per square inch.

§ 52.05–45 Circumferential joints in pipes, tubes and headers (modifies PW–41).

(a) Circumferential welded joints of pipes, tubes and headers shall be as required by PW–41 of the ASME Code except as noted otherwise in this section.

(b) (Modifies PW–41.1) Circumferential welded joints in pipes, tubes, and headers of pipe material must be nondestructively examined as required by § 56.95–10 of this subchapter and PW–41 of the ASME Code.

(c) (Modifies PW–41.5) Butt welded connections shall be provided whenever radiography is required by § 56.95–10 of this subchapter for the piping system in which the connection is to be made. When radiography is not required, welded socket or sleeve type joints meeting the requirements of PW–41.5 of the ASME Code may be provided.

[CGFR 68–82, 33 FR 18815, Dec. 18, 1968, as amended by CGD 81–79, 50 FR 9434, Mar. 8, 1985]

Subpart 52.15—Requirements for Watertube Boilers

§ 52.15–1 General (modifies PWT–1 through PWT–15).

Watertube boilers and parts thereof shall be as indicated in PWT–1 through PWT–15 of the ASME Code except as noted otherwise in this subpart.

[CGD 81–79, 50 FR 9434, Mar. 8, 1985]

§ 52.15–5 Tube connections (modifies PWT–9 and PWT–11).

(a) Tubes, pipe and nipples shall be attached to sheets, heads, headers, and fittings as indicated in PWT–11 of the ASME Code except as noted otherwise in this section.

(b) (Replaces PWT–9.2 and PWT–11.3.) Threaded boiler tubes shall not be permitted as described by PWT–9.2 and PWT–11.3 of the ASME Code.

(c) In welded wall construction employing stub and welded wall panels which are field welded, approximately 10 percent of the field welds shall be checked using any acceptable nondestructive test method.

(d) Nondestructive testing of the butt welded joints shall meet the requirements of § 56.95–10 of this subchapter.

[CGFR 68–82, 33 FR 18815, Dec. 18, 1968, as amended by CGFR 69–127, 35 FR 9976, June 17, 1970; CGD 81–79, 50 FR 9434, Mar. 8, 1985]

Subpart 52.20—Requirements for Firetube Boilers

§ 52.20–1 General (modifies PFT–1 through PFT–49).

(a) Firetube boilers and parts thereof shall be as indicated in PFT–1 through PFT–49 of the ASME Code except as noted otherwise in this subpart.

§ 52.20–17 Opening between boiler and safety valve (modifies PFT–44).

When a discharge pipe is used, it must be installed in accordance with the requirements of § 52.01–105.

[CGD 81–79, 50 FR 9434, Mar. 8, 1985]

§ 52.20–25 Setting (modifies PFT–46).

(a) The method of supporting firetube boilers shall be as indicated in PFT–46 of the ASME Code except as noted otherwise in this section.

(b) The foundations shall meet the requirements of § 52.01–130.

Subpart 52.25—Other Boiler Types

SOURCE: CGD 81–79, 50 FR 9434, Mar. 8, 1985, unless otherwise noted.

§ 52.25–1 General.

Requirements for fired boilers of various sizes and uses are referenced in Table 54.01–5(a) of this subchapter.

§ 52.25–3 Feedwater heaters (modifies PFH–1).

In addition to the requirements in PFH–1 of the ASME Code, feedwater heaters must meet the requirements in this part or the requirements in part 54.

§ 52.25–5 Miniature boilers (modifies PMB–1 through PMB–21).

Miniature boilers must meet the applicable provisions in this part for the boiler type involved and the mandatory requirements in PMB–1 through PMB–21 of the ASME Code.

§ 52.25–7 Electric boilers (modifies PEB–1 through PEB–19).

Electric boilers required to comply with this part must meet the applicable provisions in this part and the mandatory requirements in PEB–1 through PEB–19 except PEB–3 of the ASME Code.

§ 52.25–10 Organic fluid vaporizer generators (modifies PVG–1 through PVG–12).

(a) Organic fluid vaporizer generators and parts thereof shall meet the requirements of PVG–1 through PVG–12 of the ASME Code except as noted otherwise in this section.

(b) The application and end use of organic fluid vaporizer generators shall be approved by the Commandant.

§ 52.25–15 Fired thermal fluid heaters.

(a) Fired thermal fluid heaters shall be designed, constructed, inspected, tested, and stamped in accordance with the applicable provisions in this part.

(b) Each fired thermal fluid heater must be fitted with a control which prevents the heat transfer fluid from being heated above its flash point.

(c) The heat transfer fluid must be chemically compatible with any cargo carried in the cargo tanks serviced by the heat transfer system.

(d) Each fired thermal fluid heater must be tested and inspected in accordance with the requirements of subpart 61.30 of this chapter.

[CGFR 68–82, 33 FR 18815, Dec. 18, 1968, as amended by CGD 88–057, 55 FR 24236, June 15, 1990]

§ 52.25–20 Exhaust gas boilers.

Exhaust gas boilers with a maximum allowable working pressure greater than 103 kPa gage (15 psig) or an operating temperature greater than 454 °C. (850 °F.) must be designed, constructed, inspected, tested and stamped in accordance with the applicable provisions in this part. The design temperature of parts exposed to the exhaust gas must be the maximum temperature that could normally be produced by the source of the exhaust gas. This temperature must be verified by testing or by the manufacturer of the engine or other equipment producing the exhaust. Automatic exhaust gas boiler control systems must be designed, constructed, tested, and inspected in accordance with § 63.25–7 of this chapter.

[CGD 88–057, 55 FR 24236, June 15, 1990]

PART 53—HEATING BOILERS

Subpart 53.01—General Requirements

Sec.

53.01–1 Incorporation by reference.
53.01–3 Adoption of section IV of the ASME Code.
53.01–5 Scope (modifies HG–100).
53.01–10 Service restrictions and exceptions (replaces HG–101).

Subpart 53.05—Pressure Relieving Devices (Article 4)

53.05–1 Safety valve requirements for steam boilers (modifies HG–400 and HG–401).
53.05–2 Relief valve requirements for hot water boilers (modifies HG–400.2).
53.05–3 Materials (modifies HG–401.2).
53.05–5 Discharge capacities and valve markings.

Subpart 53.10—Tests, Inspection, Stamping, and Reporting (Article 5)

53.10–1 General.
53.10–3 Inspection and tests (modifies HG–500 through HG–540).
53.10–10 Certification by stamping.
53.10–15 Manufacturers' data report forms.

Subpart 53.12—Instruments, Fittings, and Controls

53.12–1 General (modifies HG–600 through HG–640).

AUTHORITY: 46 U.S.C. 3306, 3703; E.O. 12234, 45 FR 58801, 3 CFR, 1980 Comp., p. 277; 49 CFR 1.46.

SOURCE: CGFR 68–82, 33 FR 18826, Dec. 18, 1968, unless otherwise noted.

Subpart 53.01—General Requirements

§ 53.01–1 Incorporation by reference.

(a) Certain material is incorporated by reference into this part with the approval of the Director of the Federal Register in accordance with 5 U.S.C. 552(a). To enforce any edition other than that specified in paragraph (b) of this section, the Coast Guard must publish notice of change in the FEDERAL REGISTER and make the material available to the public. All approved