

through PG-13 of section I of the ASME Boiler and Pressure Vessel Code (incorporated by reference; see 46 CFR 52.01-1) except as noted otherwise in this section.

(b) Material not fully identified with an ASME Boiler and Pressure Vessel Code-approved specification may be accepted as meeting Coast Guard requirements providing it satisfies the conditions indicated in paragraph PG-10 of section I of the ASME Boiler and Pressure Vessel Code.

(c) (*Modifies PG-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 tables 1A and 1B of section II of the ASME Boiler and Pressure Vessel Code (incorporated by reference; see 46 CFR 52.01-1).

(d) (*Modifies PG-8.2.*) The use of cast iron is prohibited for mountings, fittings, valves, or cocks attached directly to boilers operating at pressures exceeding 15 pounds per square inch.

[USCG-2003-16630, 73 FR 65161, Oct. 31, 2008]

§ 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 section I of the ASME Boiler and Pressure Vessel Code (incorporated by reference; see 46 CFR 52.01-1) 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 section I of the ASME Boiler and Pressure Vessel Code except that

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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; USCG-2003-16630, 73 FR 65161, Oct. 31, 2008]

§ 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 section I of the ASME Boiler and Pressure Vessel Code (incorporated by reference; see 46 CFR 52.01-1) 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 of section I of the ASME Boiler and Pressure Vessel Code except that threaded connections shall not be used under any of the following conditions:

(1) Pressures greater than 4,137 kPa (600 psig);

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

(3) Nominal diameters greater than 19 mm (0.75 in.) and pressures above 1,034 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, as amended by USCG-2003-16630, 73 FR 65161, Oct. 31, 2008]

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

(a) Boiler external piping within the jurisdiction of the ASME Boiler and Pressure Vessel Code must be as indicated in PG-58 and PG-59 of section I of the ASME Boiler and Pressure Vessel Code (incorporated by reference; see 46 CFR 52.01-1) except as noted otherwise in this section. Piping outside the jurisdiction of the ASME Boiler and Pressure Vessel 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 section I of the ASME Boiler and Pressure Vessel Code, boiler external piping must:

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(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 § 56.35-1 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