875—92.3(89) Maximum allowable working pressure for steel boilers. This rule applies to power boilers installed prior to July 1, 1983. A boiler constructed with fusion-welded seams and not radiographed and stress relieved during construction shall not be operated at a pressure in excess of 15 pounds per square inch. Boilers with fusion-welded seams that are radiographed and stress relieved and constructed to ASME Code requirements in effect when the boiler was constructed may be operated at a pressure as established in subrules 92.4(1) and 92.4(2).

92.3(1) *Calculation.* The maximum allowable working pressure on the shell of a boiler is to be determined by the strength of the weakest course computed from the thickness of the plate, the tensile strength of the plate, the efficiency of the longitudinal joint, the inside diameter of the course, and the factor of safety allowed by these rules. The formula for determining the maximum allowable working pressure is:

$$\frac{TStE}{RFS} = \text{Maximum allowable working pressure, psig.}$$

Where:

TS = Ultimate tensile strength of shell plate(s), psig. When the tensile strength of a steel plate(s) is unknown, it shall be taken as 55,000 psig for temperatures not exceeding 650 degrees F.

t = Minimum thickness of shell plates of the weakest course, in inches.

E = Efficiency of longitudinal joint calculated pursuant to construction or installation code.

R = Inside radius of the weakest course of the shell or drum, in inches.

FS = Factor of safety specified in subrule 92.4(2).

92.3(2) *Factor of safety requirements.*

a. The lowest factor of safety on boilers is four, except for horizontal tubular boilers having continuous lap seams more than 12 feet in length where the factor of safety is eight.

b. Boilers that are reinstalled and have lap riveted construction or seams of butt and double strap riveted construction use ASME Code, Section I (1971).

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