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Government of India
Ministry of Commerce and Industry
Department of Industrial Policy and Promotion
(Central Boilers Board)

New Delhi, the 9th April, 2002.

Notification

G.S.R. ._____.- Whereas certain draft regulations further to amend the Indian Boiler Regulations, 1950 were published, as required by sub-section (1) of section 31 of the Indian Boilers Act, 1923 (5 of 1923), at pages 2482 to 2490 in Part II, Section 3, Sub-section (i) of the Gazette of India, dated the 28th July, 2001, vide notification of the Government of India in the Ministry of Commerce and Industry (Department of Industrial Policy and Promotion) (Central Boilers Board) number G.S.R. 393, dated the 17th July, 2001 for inviting objections and suggestions from all persons likely to be affected thereby till the expiry of forty-five days from the date on which copies of the Gazette containing the said notification were made available to the public;

And whereas the copies of the said Gazette were made available to the public on the 30th July, 2001;

And whereas no objections or suggestions have been received within the specified period in respect of the amendments contained in this notification;

Now, therefore, in exercise of the powers conferred by section 28 of the Indian Boilers Act, 1923, the Central Boilers Board hereby makes the following regulations further to amend the Indian Boiler Regulations, 1950, namely:-

1. (1) These regulations may be called the Indian Boiler (Amendment) Regulations, 2002.
(2) They shall come into force on the date of their publication in the Official Gazette.

2. In the Indian Boiler Regulations, 1950 (hereinafter referred to as the principal regulations),
(a) in regulation 151, after clause (h), the following clause shall be inserted, namely:-

"(i) All butt welded joints shall be subjected to non-destructive examination by radiographic, radioscopy or other approved methods such as ultrasonic testing, magnetic particle inspection or liquid dye penetrant inspection. When radioscopic examination is to be performed in lieu of radiography on welded components, the following requirements shall be met, namely:-

(1) A written procedure shall be submitted for approval to the Inspecting Authority which shall contain the following:
    (i) material and the thickness range;
    (ii) equipment qualifications;
    (iii) test object scan plan;
    (iv) radioscopic parameters;
    (v) image processing parameters;

(vi) image display parameters;
(vii) image archiving requirements;
(viii) accept-reject criteria (Code reference);
(ix) performance evaluation;
(x) Operator identification.

(2) The system shall be aided with an image processor to enhance the quality of the radioscopic images and system performance quality shall exhibit-
(i) a thin section contrast sensitivity of 3%;
(ii) a thick section contrast sensitivity of 2%;
(iii) a spatial resolution of 3 line pairs per mm;.
(iv) IQI sensitivity - 2% of the joint thickness when wire IQI's are to be used, the wire diameter axis shall be oriented along the axis of the least sensitivity of the system.

(3) Radioscopes are to be properly marked to co-relate with particular part of joint represented.

(4) The radioscopic examination data shall be recorded and stored on videotape, magnetic disk or optical disk at the maker's plant for a sufficient period after the date of radioscopic examination as specified by the Inspecting Authority, efficient radioscopic examination record recall shall be made available at any time over the record retention period and shall be traceable to the test objects.

(5) When repair has been performed as a result of radioscopic examination, the repaired areas shall be re-examined using the same radioscopic technique to evaluate the effectiveness of the repair.

(6) To aid in proper interpretation of the radioscopic examination data, the details of the technique used shall accompany the data. As a minimum, the information shall include the approved procedure requirements and system performance test data.";

(b) For regulation 243 of the principal regulations, the following regulation shall be substituted, namely:-

"243. Forging**.-** The forging shall be made from a solid cast ingot, punched, bored or trepanned, or alternatively, hollow, cast ingots may be used. The resultant wall in the case of the solid cast ingot, or the wall of hollow ingot as cast shall be reduced in thickness by at least one-half in the process of forging.";

(c) Regulation 256 of the principal regulations shall be numbered as clause (a) thereof and after clause (a) as so numbered, the following clause shall be inserted, namely:-

"(b) Tolerance – (i) The deviation from circularity in any section shall, in the case of normalised drums, not exceed 2% and in case of stress relieved drum 1%. The deviation from a straight line shall not exceed 0.3% of the cylindrical length.

(ii) In order to determine the deviation from circularity of the drums the maximum and minimum internal diameter at one cross section shall be measured. From these measured values the percentage deviation from circularity shall be calculated according to the following formula:-

$$C = \frac{2(d_{max} - d_{min})}{(d_{max} + d_{min})} \times 100$$

where, C = percentage deviation from circularity of the drums.
d = internal diameter at one cross section.

In order to determine the deviation from a straight line, a stretched line should be placed longitudinally against the sides and its largest distance from the shell line concerned shall be measured. From this distance, and from the cylindrical shell, the deviation from the straight line shall be calculated.";

(d) In regulation 259 of the principal regulations, -
(A) in clause (a), -
(i) for the word and figures "fig. 18", the word, figures and letter "figure 18A" shall be substituted;
(ii) for the word and figures "figure 18", the word, figures and letter "figure 18B" shall be substituted;
(B) in Fig. 18A, after the dimension "30mm MAX.", the following shall be inserted, namely:-
"Thickness of the plate.";

(e) In regulation 265 of the principal regulations, after clause (d), the following clause shall be inserted, namely:-

"(e) All butt welded joints shall be subjected to non-destructive examination by radiographic, radioscopy or other approved methods such as ultrasonic testing, magnetic particle inspection or liquid dye penetrant inspection. When radioscopic examination is to be performed in lieu of radiography on welded components, the following requirements shall be met, namely:-

(1) A written procedure shall be submitted for approval to the Inspecting Authority which shall contain the following:
(i) material and the thickness range;
(ii) equipment qualifications;
(iii) test object scan plan;
(iv) radioscopic parameters;
(v) image processing parameters;
(vi) image display parameters;
(vii) image archiving requirements;
(viii) accept-reject criteria (Code reference);
(ix) performance evaluation;
(x) Operator identification.

(2) The system shall be aided with an image processor to enhance the quality of the radioscopic images and system performance quality shall exhibit-

(i) a thin section contrast sensitivity of 3%;

(ii) a thick section contrast sensitivity of 2%;

(iii) a spatial resolution of 3 line pairs per mm;

(iv) IQI sensitivity - 2% of the joint thickness when wire IQI's are to be used, the wire diameter axis shall be oriented along the axis of the least sensitivity of the system.

(3) Radioscopes are to be properly marked to co-relate with particular part of joint represented.

(4) The radioscopic examination data shall be recorded and stored on videotape, magnetic disk or optical disk at the maker's plant for a sufficient period after the date of radioscopic examination as specified by the Inspecting Authority, Efficient radioscopic examination record recall shall be made available at any time over the record retention period and shall be traceable to the test objects.

(5) When repair has been performed as a result of radioscopic examination, the repaired areas shall be re-examined using the same radioscopic technique to evaluate the effectiveness of the repair.

(6) To aid in proper interpretation of the radioscopic examination data, the details of the technique used shall accompany the data. As a minimum, the information shall include the approved procedure requirements and system performance test data.";

(f) In regulation 343 of the principal regulations, for sub-regulation (3), the following sub-regulation shall be substituted, namely:-

"(3) Notwithstanding anything contained in Chapter VIII, the hydraulic test for pipes in maker's premises may be dispensed with by the Inspecting Authority:

Provided that these pipes have been fully tested by approved radiographic or ultrasonic techniques:

Provided further that in the case of pipes having internal diameter 600mm and more, the plates used for the manufacture of pipes and the long seam welds of pipes are fully tested by approved non-destructive test; for example, ultrasonic or radiographic testing and the soundness of pipes both in the parent material and in the weld is established in the maker's premises; and the whole component of the pipes, after completion of any further fabrication and erection at site, are hydraulically tested at a pressure not less than 1.5 times the design pressure of the piping system:

Provided also that in the event of detection of any defect after conducting hydraulic test of these pipes at site, it shall be the responsibility of the manufacturer to repair or replace the defective pipes, as may be deemed necessary by the Inspecting Authority.";

(g) In regulation 350 of the principal regulations,-

(i) for the portion beginning with "f = Allowable stress determined on the following basis" and ending with "lowest stress to produce rupture at the temperature", the following shall be substituted, namely:-

"f = Allowable stress as provided under regulation 271;

(ii) Table 3 shall be omitted.";

(h) In regulation 360 of the principal regulations, after clause (e), the following clause shall be inserted, namely:-

"(f) All butt welded joints shall be subjected to non-destructive examination by radiographic, radioscopy or other approved methods such as ultrasonic testing, magnetic particle inspection or liquid dye penetrant inspection. When radioscopic examination is to be performed in lieu of radiography on welded components, the following requirements shall be met:

(1) A written procedure shall be submitted for approval to the Inspecting Authority which shall contain the following:-
- (i) material and the thickness range;
- (ii) equipment qualifications;
- (iii) test object scan plan;
- (iv) radioscopic parameters;
- (v) image processing parameters;
- (vi) image display parameters;
- (vii) image archiving requirements;
- (viii) accept-reject criteria (Code reference);
- (ix) performance evaluation;
- (x) Operator identification.

(2) The system shall be aided with an image processor to enhance the quality of the radioscopic images and system performance quality shall exhibit-
- (i) a thin section contrast sensitivity of 3%;
- (ii) a thick section contrast sensitivity of 2%;
- (iii) a spatial resolution of 3 line pairs per mm;.
- (iv) IQI sensitivity - 2% of the joint thickness when wire IQI's are to be used, the wire diameter axis shall be oriented along the axis of the least sensitivity of the system.

(3) Radioscopes are to be properly marked to co-relate with particular part of joint represented.

(4) The radioscopic examination data shall be recorded and stored on videotape, magnetic disk or optical disk at the maker's plant for a sufficient period after the date of radioscopic examination as specified by the Inspecting Authority, Efficient radioscopic examination record recall shall be made available at any time over the record retention period and shall be traceable to the test objects.

(5) When repair has been performed as a result of radioscopic examination, the repaired areas shall be re-examined using the same radioscopic technique to evaluate the effectiveness of the repair.

(6) To aid in proper interpretation of the radioscopic examination data, the details of the technique used shall accompany the data. As a minimum, the information shall include the approved procedure requirements and system performance test data.";

(i) In regulation 367 of the principal regulations, after the table, for the portion beginning with the words "Where tapered threads" and ending with "limits of 31.6 kg/cm^2 (450 lbs./sq. in)", the following shall be substituted, namely:-

"Screwed joints are permitted at temperatures exceeding 260^{o}C and size or pressure limits in excess of those given the table provided that the following conditions are satisfied, namely:-

(1) All threads are tapered unless pressure tightness depends on a seal weld or a seating surface other than the threads and experience or test demonstrates the suitability of the joint.

(2) Pressure or temperature rating in appropriate component standard like BS, ASME, DIN etc. or as calculated under relevant regulation of these regulations are not exceeded.

(3) Minimum specified tensile strength of screwed pipes is greater than 330 N/mm^2.

(4) The minimum thickness of screwed pipes is not to be less than that given in Table No.1.

(5) The design temperature does not exceed 495^{o}C.

(6) The pressure limits given in Table No.2 are not exceeded.

Screwed joints are permitted for temperatures in excess of 495^{o}C and pressure in excess of those given in Table No.2 for instrument insertion and tapping and for plug for access opening for radiographic inspection provided following conditions are satisfied:

(a) They do not exceed 50mm nominal bore size or one quarter of nominal pipe size, which ever is the smaller.

(b) The minimum thread engagement is not less than –
6 for up to and including 20mm nominal bore;
7 for over 20 mm up to and including 40mm nominal bore;
8 for 40 mm up to and including 50mm nominal bore.

(c) The connection is seal welded.

(d) The design of instrument insertion withstands the fluid characteristics, fluid flow and any vibrations.

Screwed joints are permitted for pressure in excess of those given in Table No.2 up to 345 bar for dead end instrument lines at the outlet end and downstream of shut off valves and instruments, control apparatus or discharge of a sample cooler provided that the nominal bore size of the pipe does not exceed 12mm.

Table No.1

MINIMUM THICKNESS OF SCREWED PIPES		
Nominal Pipe size	Minimum thickness	
	17.5 bar or less for steam 7 bar and less for water over 105°C	Over 17.5 bar for steam Over 7 bar for water over 105°C
mm	mm	Mm
8	2.24	3.02
10	2.31	3.20
15	2.77	3.75
20	2.87	3.91
25	3.38	4.55
32	3.56	4.85
40	3.68	5.08
50	3.91	5.54
65	5.16	7.01
80	5.49	7.62

Table No.2

MAXIMUM PRESSURE FOR SCREWED PIPES	
Nominal pipe size	Maximum pressure
mm	Bar
Over 50 up to and including 80	27.5
Over 25 up to and including 50	41.5
Over 20 up to and including 25	83
Up to and including 20	103.5.";

(j) In regulation 374 of the principal regulations, in clause (c), the following shall be inserted at the end, namely:-

"Notwithstanding anything contained in this clause, for boiler external piping and non-boiler external piping which are open to atmosphere such as vent and drain pipes, the hydraulic test for the portions of such pipes located beyond the last isolation valve may be dispensed with provided the weld joints in the pipe under reference are tested 100% by approved non-destructive examination and found satisfactory.";

(k) In regulation 382 of the principal regulations, after "Bihar" and the entry relating there to, the following shall be inserted, namely:-

"Chhattisgarh……..CG";

(l) In Form III of the principal regulations relating to *Constructor's Certificate of Manufacture and Test*, under the heading, "1. Description", the following entry shall be inserted at the end, namely:-

"Evaporation capacity …….
(for calculation of relieving capacity of safety valves)";

(m) After Form III-E of the principal regulations, the following Form shall be inserted, namely:-

"**FORM III-F**

Certificate of Manufacture and test of castings and forgings
(Regulations 73 to 80 or 81 to 85 as applicable)

Certificate No. ……..
Name of part……..
Maker's name and address…….
……...
Main dimensions……
Drawing Nos. …...……..
Identification Marks……
Chemical composition…….
Physical test results…….

(v) Tensile strength……
(vi) Transverse bend test…….
(vii) Elongation……

Certified that the particulars entered herein by us are correct. This satisfies the requirements of Indian Boiler Regulations, 1950.

Maker's Representative (Name and signature) MONOGRAM/ SEAL MAKERS_____";

(n) In Form XIII of the principal regulations, for the heading "Qualified Boiler Welder's Certificate issued under Indian Boiler Regulation 1960", the following heading shall be substituted, namely:-

"Qualified Boiler Welder's Certificate issued under Indian Boiler Regulation, 1950.".

[File No. 6(3)/2001-Boilers]

(V. K. GOEL)
Secretary, Central Boilers Board

Note:- The principal regulations were published in the Gazette of India vide S.O. 600, dated the 15th September, 1950 and subsequently amended vide notifications –

(i) G.S.R. 178, dated the 24th March, 1990;
(ii) G.S.R. 179, dated the 24th March, 1990;
(iii) G.S.R. 488, dated the 9th October, 1993;
(iv) G.S.R. 516 dated the 23rd October, 1993;

(v) G.S.R. 634 dated the 25th December, 1993;
(vi) G.S.R. 107 dated the 26th February, 1994;
Errata G.S.R. 223 dated the 14th May, 1994;
(vii) G.S.R. 250 dated the 4th June, 1994;
(ii) G.S.R. 402 dated the13th August, 1994;
(iii) G.S.R. 427 dated the 20th August, 1994;
(iv) G.S.R. 562 dated the12th November, 1994;
(v) G.S.R. 607 dated the10th December, 1994;
(vi) G.S.R. 83 dated the 25th February, 1995;
(vii) G.S.R. 93 dated the 4th March, 1995;
(viii) G.S.R. 488 dated the 9th November, 1996;
(ix) G.S.R. 582 dated the 28th December, 1996;
(x) G.S.R. 59 dated the 25th January, 1997;
(xi) G.S.R. 117 dated the 1st March, 1997;
(xii) G.S.R. 172 dated the 29th March, 1997.
(xiii) G.S.R. 221 dated the 21st November, 1998.
(xiv) G.S.R. 131 dated 1st May, 1999.
(xv) G.S.R. 139 dated 8th May, 1999.
Errata G.S.R. 201 dated 7th April, 2001.
(xvi) G.S.R. 237 dated 31st July, 1999.
(xvii) G.S.R. 345 dated 23rd October, 1999.
(xviii) G.S.R. 397 dated 14th October, 2000
(xix) G.S.R. 219 dated 14th April, 2001.
(xx) G.S.R. 496 dated 8th September, 2001
(xxi) G.S.R. 672 dated 15th December, 2001.

To

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