SLOVENSKI STANDARD
SIST CR 12952-17:2002

01-november-2002

Vodocevni kotli in pomožne napeljave - 17. del: Smernica za vključevanje kontrolnega organa, neodvisnega od proizvajalca

Water boilers and auxiliary installations - Part 17: Guideline for the involvement of an inspection body independent of the manufacturer

Wasserrohrkessel und Anlagenkomponenten - Teil 17: Leitfaden für die Einbeziehung einer herstellerunabhängigen Prüforganisation

Chaudieres a tubes d'eau et installations auxiliaires - Partie 17: Guide pour l'implication d'un organisme d'inspection indépendant du fabricant

Ta slovenski standard je istoveten z: **CR 12952-17:2002**

ICS:

27.040	Plinske in parne turbine. Parni stroji	Gas and steam turbines. Steam engines

SIST CR 12952-17:2002 **en**

CEN REPORT

RAPPORT CEN

CEN BERICHT

CR 12952-17

May 2002

ICS

English version

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This CEN Report was approved by CEN on 27 March 2002. It has been drawn up by the Technical Committee CEN/TC 269.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Ref. No. CR 12952-17:2002 E

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Foreword

This document (CR 12952-17:2002) has been prepared by Technical Committee CEN /TC 269, "Shell and water-tube boilers" the secretariat of which is held by DIN.

The European Standard EN 12952 concerning water-tube boilers and auxiliary installations consists of the following Parts:

— *Part 1: General.*
— *Part 2: Materials for pressure parts of boilers and accessories.*
— *Part 3: Design and calculation for pressure parts.*
— *Part 4: In-service boiler life expectancy calculations.*
— *Part 5: Workmanship and construction of pressure parts of the boiler.*
— *Part 6: Inspection during construction, documentation and marking of pressure parts of the boiler.*
— *Part 7: Requirements for equipment for the boiler.*
— *Part 8: Requirements for firing systems for liquid and gaseous fuels for the boiler.*
— *Part 9: Requirements for firing systems for pulverized solid fuels for the boiler.*
— *Part 10: Requirements for safeguards against excessive pressure.*
— *Part 11: Requirements for limiting devices of the boiler and accessories.*
— *Part 12: Requirements for boiler feedwater and boiler water quality.*
— *Part 13: Requirements for flue gas cleaning systems.*
— *Part 14: Requirements for flue gas DENOX-systems.*
— *Part 15: Acceptance tests.*
— *Part 16: Requirements for grate and fluidized bed firing systems for solid fuels for the boiler.*

CR 12952 Part 17: Guideline for the involvement of an inspection body independent of the manufacturer.

Although these Parts can be obtained separately, it should be recognized that the Parts are inter-dependent. As such, the design and manufacture of water-tube boilers requires the application of more than one Part in order for the requirements of the standard to be satisfactorily fulfilled.

1 Scope

This Technical report gives guidance for the involvement of an inspection body independent of the manufacturer of shell boilers as defined in EN 12952-1.

2 Normative references

This CEN Report incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this CEN Report only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies (including amendments).

EN 10204, *Metallic products — Types of inspection documents.*

EN 12952-1, *Water-tube boilers and auxiliary installations — Part 1: General.*

EN 12952-2, *Water-tube boilers and auxiliary installations — Part 2: Materials for pressure parts of boilers and accessories.*

EN 12952-6, *Water-tube boilers and auxiliary installations — Part 6: Inspection during construction; documentation and marking of pressure parts of the boiler.*

3 Guidance

3.1 General

Depending upon the conformance assessment module chosen by the manufacturer for the design and manufacture of each boiler component and the boiler assembly, the inspection activities will involve, to a greater or lesser extent, organisations which are independent of the manufacturer. For the guidance of the manufacturer, the specific involvement of such organisations, known as Responsible Authorities (RA), is described in this CEN report.

For the purpose of this standard, these organizations have been collectively termed RA. A definition of Responsible Authorities is given in EN 12952-1:2002, 3.6.

The involvement of responsible authorities is recognized by this standard as indicated below:

a) in connection with conformity assessment requirements;

b) arising from the complexity of the technical requirements.

3.2 Modules

Reference to EN 12952-1:2002, Annex A – Guidance in the use of conformity assessment procedures – indicates that the modules normally applicable to water-tube boilers are B + D or B + F or G or H1. A digest showing the key requirements of these modules is also given in EN 12952-1.

3.3 Technical complexity

Where the technical requirements are complex and no clearly defined procedure is given in this EN 12952, it is the convention within the boiler industry for the manufacturer to prepare procedures based on his own experience proposing how the design/manufacture should proceed. In such cases the proposals are normally submitted to the RA for appraisal. Such appraisal will normally be completed at the initial design stage, but it is recognized that

similar proposals may be needed to introduce design modifications and/or to accommodate concessions (deviations) during the manufacturing stage. These latter proposals also form part of the design/type appraisal procedure.

4 Conformity assessment activities

The extent of RA involvement will depend upon the conformity assessment procedure adopted by the manufacturer. The assumed involvement of the RA for each appropriate conformance assessment module, in accordance with Table 4-1 for category IV steam boilers. For category III steam boilers appropriate modules may be chosen. For the guidance of the manufacturer, examples of the form that the following certificates may take are given in clause 7 – Manufacturer's Declaration of Conformity, Responsible Authority's Certificate of Conformity, Responsible Authority's Surveillance and Inspection Report, Design Examination Certificate and Type Examination Certificate.

Considering the pressures and volumes applicable to water-tube boiler components, Tables 1 to 9 in annex II of the Pressure Equipment Directive (PED) should be consulted to determine the hazard category. The modules permitted for these hazard categories are included in annex III of the PED.

NOTE A manufacturer can choose to adopt a higher category than indicated by annex II.

The inspection activities given in EN 12952-6:2002, Table 4.5-1are reproduced and supplemented in Table 4-1 with respect to those activities considered to involve the RA. This indicates where the involvement of the responsible authority should be additional to that of the manufacturer as a function of the selected conformity assessment module. It should be noted that for the modules subject to the Type Examination procedure (B + D and B + F), with the issue of the Type Examination certificate, no further design examination is required for the subsequently manufactured components. However, surveillance or inspection is required during the manufacturing stage as indicated in Table 4-1.

Table 4-1 — Conformity assessment activities showing the involvement of Responsible Authorities

Number	Area of activity	Inspection operation	RA involvement by module				
			B	D	F	G	H1
1	**Quality system/product type examination**						
1.1	Quality system to H1	Assessment of quality system documentation including all modifications	–	–	–	–	RA
		Audit of quality system in operation including all modifications	–	–	–	–	RA
		On going surveillance including all modifications	–	–	–	–	RA
1.2	Quality system to D	Assessment of quality system documentation including all modifications	RA	RA	–	–	–
		Audit of quality system in operation including all modifications	RA	RA	–	–	–
		On going surveillance [a]	RA	RA	–	–	–
1.3	Product type examination	Assessment of product type	RA	–	RA	–	–
1.4	Type examination certificate	Issue type examination certificate – see Figure 7-5	RA	–	RA	–	–
2	**Design and general documentation** [b]						
2.1	Design data/calculations	Check that the design data/calculations conform to: – technical specifications if applicable – the requirements of this standard	RA	–	–	RA	RA
2.2	Manufacturing drawings	Check that drawing information conform to: – design data and calculations – technical specifications if applicable – the requirements of this standard	RA	–	–	RA	RA
2.3	Design examination certificate	Issue design examination certificate – see Figure 7-2	–	–	–	–	RA
2.4	Specification for subcontracted parts	Check that the specification for subcontracted parts conforms to: – technical specifications if applicable – manufacturing drawings – the requirements of this standard – applicable regulatory requirements	RA	–	RA	RA	–
3	**Materials**						
3.1	Material certificates	Check that the material can be used	RA	–	RA	RA	–
		Verify that the information on the certificate and results conform to the design specification	RA	–	RA	RA	–

Number	Area of activity	Inspection operation	RA involvement by module				
			B	D	F	G	H1
3.2	Welding consumables	Verify that the consumables to be used are in accordance with the design specification	RA	–	RA	RA	–
3.3	Material identification	Identify the material with the material certificates and check the marking at the boiler manufacturer's works	RA	–	RA [c]	RA [c]	–
3.4	Transfer of identification marks	Examination of procedure drawn up by the boiler manufacturer for the transfer of marks	RA [d]	–	RA	RA	RA [d]
		Transfer the identification marks	–	–	RA [c]	RA [c]	–
3.5	Acceptance of sub-contracted parts	Verify that sub-contracted parts conform to the boiler manufacturer's specification at the sub-contractor's works	RA	–	RA	RA	–
4	**Fabrication and welding**						
4.1	Welding procedure specifications	Verify that appropriate welding procedure specifications are available and that their contents are compatible with the welding procedure approvals	RA	RA	RA	RA	RA
4.2	Welding procedure approvals	Verify that the welding procedures are appropriate for the materials and the field of welding application, and that they have been approved by a RA	RA	RA	RA	RA	RA
4.3	Welder approval	Verify that the welder approvals have been approved by a RA and that they are available and valid	RA	RA	RA	RA	RA
4.4	Forming procedures	Verify that forming procedures are available, where applicable, and their contents are appropriate to the product to be formed	RA	RA	RA	RA	RA
4.5	Formed parts	Verify that formed parts are in accordance with the requirements of the forming procedures	RA	–	RA	RA	–
4.6	Production control test plates, if any	Witness removal and marking of production test plates	RA	–	RA	RA	–
		Verify that any PWHT on production test plates independent of the component complies with the specific heat treatment applied to the component	RA	–	RA	RA	–
		Examine NDE reports on production test plates	RA	–	RA	RA	–
		Confirm identification and marking of test specimens taken from production test plates for mechanical tests	RA	–	RA	RA	–
		Witness mechanical tests	RA	RA	RA	RA	RA

Number	Area of activity	Inspection operation	RA involvement by module				
			B	D	F	G	H1
4.6	Production control test plates, if any	Verify that the test information and results contained in the manufacturer's report conform to the requirements of EN 12952	RA	RA	RA	RA	RA
5	**Non-destructive examination of welds**						
5.1	Non-destructive examination procedures	Verify that appropriate non-destructive examination procedures are available and check the qualification of the originator	RA	RA	RA	RA	RA
5.2	Non-destructive examination operator qualifications	Verify the validity of the non-destructive examination operator's qualifications	RA	RA	RA	RA	RA
5.3	Non-destructive examination operation	Scrutinise any radiographs and check conformance to the acceptance criteria	RA	–	RA [e]	RA [e]	–
		Re-check the ultrasonic examination of at least 5% of the examined drum and header longitudinal and circumferential seams after scrutiny of manufacturer's ultrasonic examination reports	RA	–	RA	RA	–
5.4	Non-destructive examination reports	Verify that the information and results conform to the acceptance criteria	RA	RA	RA	RA	RA
6	**Post-weld heat treatment**						
6.1	PWHT procedures	Verify that the post-weld heat treatment procedures conform to EN 12952	RA	RA	–	RA	RA
6.2	PWHT records	Verify that temperature/time recordings conform to the requirements of this standard	RA	RA	RA	RA	RA
7	**Final inspection and marking**						
7.1	Pre-hydrostatic pressure test inspection	Dimensional checking, visual examination and identification of accessible parts after component completion, prior to hydrostatic pressure test and application of any covering at the manufacturer's works, or on site, as appropriate	RA	RA	RA	RA	RA
7.2	Hydrostatic pressure test	Witness final hydrostatic test at the manufacturer's works, or on site, as appropriate	RA	RA	RA	RA	RA
7.3	Post-hydrostatic pressure test inspection	Carry out visual examination on completion of hydrostatic pressure test	RA	RA	RA	RA	RA
		Check marking on nameplate	RA	RA	RA	RA	RA

Number	Area of activity	Inspection operation	RA involvement by module				
			B	D	F	G	H1
7.4	Safety devices	Check provision of safety equipment	RA	RA	RA	RA	RA
7.5	Responsible Authority's identification number	Affix or cause to be affixed identification number	RA [f]	RA	RA	RA	RA [f]
7.6	Responsible Authority's certificate of conformity	Issue certificate of conformity – see Figure 7-4	RA	–	RA	RA	–
7.7	Responsible Authority's report of surveillance and inspection	Issue report of surveillance and inspection – see Figure 7-5	RA	RA	–	–	RA
7.8	Manufacturer's data dossier	Review data dossier for completeness	RA	RA	RA	RA	RA

[a] The RA involvement in module D is carried out during periodic, unexpected audits and test.

[b] These requirements apply equally to the initial design stage and to the manufacturing stage when design modifications/manufacturing concessions are required to be introduced.

[c] This may be delegated to the manufacturer by the RA for materials conforming to certificate 3.1.B of EN 10204.

[d] This assessment is included in the formal assessment of the manufacturer's quality system.

[e] The extent of radiograph scrutiny will be determined by the RA.

[f] The identification number of the responsible authority who assesses the manufactuer's quality system and, if different, that of the RA involved during the design, fabrication and final inspection stages concerned with the component/boiler.

5 Type examination – Modules B + D and B + F

5.1 General

The manufacturer should submit an application for type examination to the responsible authority and enclose the design and manufacturing schedules in accordance with 5.2. Additionally, a sample of the product should be made available for examination.

The criteria for type approval should be theedition of EN 12952-6 current on the date when the type approval was requested or when any subsequent modifications are proposed.

5.2 Information for the product type approval schedule

For each water-tube boiler component, the design and manufacturing schedule should contain:

a) the name of the boiler component manufacturer;

b) technical documentation giving a general description of the type including:

1) the boiler component, giving a clear understanding of its design basis including design calculations. A general arrangement drawing showing its parts, connection points, any safety equipment such as safety valves, pressure gauges, thermocouples;