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Guide for procurement of power station equipment - Part 4-9: Boilers auxiliaries - Sootblowers

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Leitfaden für die Beschaffung von Ausrüstungen für Kraftwerke -- Teil 4-9: Nebenanlagen - Rußbläser

Guide pour l'acquisition d'équipements destinés aux centrales de production d'électricité -- Partie 4-9: Auxiliaires de chaudière - Système de ramonage

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN/CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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Foreword

This European Standard has been prepared by Technical Committee CEN/CLC JTFPE "Joint Task Force Power Engineering", the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2000, and conflicting national standards shall be withdrawn at the latest by April 2000.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

This standard takes the form of a recommendation and is therefore entitled a "Guide".

This Guide for procurement has been prepared under mandates given to CEN and CENELEC by the European Commission and the European Free Trade Association.

*This Guide for procurement is a part of a series of Guides mandated to cover the procurement of power station plant and **equipment** in conformity with European Procurement Directives. The Guides are:*

*EN 45510 Guide for procurement of power station **equipment***

Part 1: Common Clauses

Part 2-1: Electrical equipment - Power transformers
Part 2-2: Electrical equipment - Uninterruptible power supplies
Part 2-3: Electrical equipment - Stationary batteries and chargers
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Part 5-1: Turbines - Steam turbines
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Part 5-4: Turbines - Hydraulic turbines, storage pumps and pump-turbines

Part 6-1: Turbine auxiliaries - Deaerators
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Part 6-4: Turbine auxiliaries - Pumps
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Part 6-7: Turbine auxiliaries - Moisture separator reheaters
Part 6-8: Turbine auxiliaries - Cranes
Part 6-9: Turbine auxiliaries - Cooling water systems

Part 7-1: Pipework and valves - High pressure piping systems
Part 7-2: Pipework and valves - Boiler and high pressure piping valves

Part 8-1: Control and instrumentation

EN 45510 part 1 contains those clauses common to all the above Guides giving the provisions of a non ***equipment*** *specific nature for use in the procurement of power station plants. EN 45510 is the responsibility of JTFPE. The so called "common clauses", as appropriate, also appear in italics in the documents specific to particular* ***equipment****.*

In this Guide, words in bold type indicate that they have the meaning given in the definitions, clause 3.

In this Guide, words and sentences not in italics are specific to this Guide and refer to the particular **equipment** covered.

1 Scope

*This standard gives guidance on writing the technical **specification** for the procurement of* **sootblower equipment** associated with steam generating plant *for use in electricity generating stations (power stations). This Guide for procurement is not applicable to **equipment** for use in the nuclear reactor plant area of nuclear power stations. Other possible applications of such **equipment** have not been considered in the preparation of this Guide.*

This Guide covers mechanical (steam or air) and **acoustic sootblowers** for the following applications:

- furnace wall **sootblowers** and **water lances**;
- **long retractable** and **semi-retractable sootblowers**;
- **rotating element sootblowers** including **rake sootblowers**;
- airheater **sootblowers**.

*The **equipment** covered by this Guide is defined by its function rather than design type. Therefore, the guidance to the **specification** is stated in performance terms rather than being specified by a detailed description of the **equipment** to be supplied.*
*This Guide indicates to potential **purchasers** how their **specification** should be prepared so that:*

- *the **equipment** type and capacity interfaces correctly with other elements of the systems ;*
- *predicted **performance** is achieved;*
- *ancillary equipment is properly sized;*
- ***reliability, availability** and safety requirements are achieved;*
- *proper consideration is given to the evaluation process and the quality measures to be applied.*

*This Guide does not determine the type of **specification** (e.g. detailed, performance, functional) or the extent of supply for any given contract which is normally decided on the basis of the **purchaser's** project strategy. It does not cover:*

- *any commercial, contractual or legal issues which are normally in separate parts of an **enquiry**;*
- *any allocation of responsibilities which are determined by the contract.*

*This Guide does not prescribe the arrangement of the documents in the **enquiry**.*

> *NOTE: As a comprehensive European environmental policy is still under preparation, this Guide does not address the environmental implications of the **equipment**.*

2 Normative references

This Guide for procurement incorporates by dated or undated reference, provisions from other publications. These normative references are cited in 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 Guide only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

EN ISO 9001	*Quality systems - Model for quality assurance in design, development, production, installation and servicing (ISO 9001:1994).*
EN ISO 9002	*Quality systems - Model for quality assurance in production, installation and servicing (ISO 9002:1994).*
IEC 60050-191	*International electrotechnical vocabulary – Chapter 191 : Dependability and quality of service.*

3 Definitions

For the purposes of this Guide, the following definitions apply:

3.1 Organisational terms

***3.1.1** **purchaser**: Recipient of a product and/or a service provided by a **supplier**.*

3.1.2 ***supplier****: Person or organisation that provides a product and/or a service to the* ***purchaser****.*

3.1.3 ***specification:*** *Document stating technical requirements of the* ***purchaser****. It may form part of an* ***enquiry*** *issued by a* ***purchaser****.*

3.1.4 ***enquiry:*** *Invitation to* ***tender*** *issued by a* ***purchaser****. It will normally include a* ***specification*** *together with the necessary contractual and commercial conditions.*

3.1.5 ***tender:*** *Offer made by a* ***tenderer*** *in response to an* ***enquiry****.*

3.1.6 ***tenderer:*** *Person or organisation submitting a* ***tender*** *for the* ***equipment*** *in response to the* ***enquiry****.*

3.1.7 ***site:*** *Place to which the* ***equipment*** *is to be delivered or where work is to be done by the* ***supplier****, together with so much of the area surrounding as the* ***supplier*** *may, with the consent of the* ***purchaser****, use for the purposes of the contract.*

NOTE: Further definitions of useful organisational terms may be found in EN ISO 8402 (see Bibliography).

3.2 Technical terms

3.2.1 sootblower: Device which uses the impact of a jet of, steam, air or water, or sound energy (**acoustic sootblower**) to dislodge **deposits** from the internal surfaces of the boiler.

3.2.2 long retractable sootblower: sootblower which may be fully retracted from the boiler gas path when not in use. Rotation or part rotation is applied to give maximum tube coverage.

3.2.3 semi-retractable sootblower: Retractable **sootblower** part of which may remain in the gas stream when in the rest position without the need for cooling air. This device is also known as a helical or part retractable **sootblower**.

3.2.4 rake sootblower: Sootblower with multiple arms and nozzles which normally remains in the flue gas path without the need for cooling air when in the rest position. This device is also known as a traversing multi-jet **sootblower**.

3.2.5 wall sootblower: Short retractable **sootblower** with backward facing nozzles to clean the tubewall through which the device is retracted. This device is also known as a short retractable or deslagger **sootblower**.

3.2.6 rotating element sootblower: Non-retractable rotating **sootblower** with multiple nozzles which remains in the flue gas path without the need for cooling air.

3.2.7 water lance: Device for spraying water on to boiler tube work, usually in the furnace, to remove **deposits**. This device is also known as a water blower.

3.2.8 acoustic sootblower: Device which dislodges **deposits** from tubes by issuing noise at a predefined frequencies.

3.2.9 wall box: Sealing device attached to the boiler wall where the **sootblower** enters the gas stream which may be pressurised with air to minimise leakage.

3.2.10 sootblower coverage: Ratio of the effective area cleaned by **sootblowers** to the total area.

3.2.11 media utilisation diagram: Plot of utilisation of sootblowing media against time or position in the sootblowing sequence.

3.2.12 section valve: An isolation valve in the sootblowing media supply pipework which isolates a group(s) of **sootblowers**.

3.2.13 deposits: Solid residues of combustion which adhere to internal surfaces within the boiler. These can be in the form of slagging deposits on the furnace or fouling deposits along the flue gas path.

3.2.14 continuous maximum operating condition: Maximum condition at which the boiler (or plant to be cleaned) may be operated for a period not exceeding the specified **design life**. This is the operating condition under which the **performance** of the **sootblowers** are usually demonstrated.

3.3 General terms

3.3.1 ***equipment:*** *Plant, component, system and/or associated service to be provided in response to the* ***enquiry****.*

3.3.2 ***conformity:*** *Fulfilment of specified requirements by a product, process or service.*

3.3.3 ***performance:*** *Obligations verified by specified tests.*

3.3.4 ***operating period:*** *Time between planned outages or maintenance periods during which the* ***equipment*** *is in operation and/or does not restrict operational requirements of the power station.*

3.3.5 ***life expectancy:*** *Time period over which the* ***equipment*** *might be expected to operate with planned maintenance but without replacement of a significant component*, for example, a sootblower carriage, is a major component.

3.3.6 ***design life:*** *Operating hours of the* ***equipment*** *on which design calculations are based.*

3.3.7 ***acceptability:*** *Compliance with criteria defined by the* ***purchaser*** *for assessing the suitability of* ***equipment****.*

3.3.8 ***equipment margins:*** *Allowance for design, fabrication or operating contingency defined in the* ***specification****. These are separate to those normally included by the* ***supplier*** *for his own purposes.*

3.3.9 ***proven equipment:*** ***Equipment*** *which may be demonstrated to be similar to that offered and has operated for a sufficient time to have demonstrated performance and availability.*

3.3.10 ***availability:*** *As defined in IEC 60050-191.*

3.3.11 ***reliability:*** *As defined in IEC 60050-191.*

3.3.12 ***maintainability:*** *As defined in IEC 60050-191.*

4 Brief overall project description

4.1 Role and organisation of purchaser

The ***enquiry*** *should define the* ***purchaser's*** *role in the project, including whether the* ***purchaser*** *will assume responsibility for the planning and technical coordination of the project, or whether other organisations will be appointed to carry out all or part of this function. The* ***enquiry*** *should define all organisational interfaces and the procedures to be employed for managing the contract and the* ***site****.*

4.2 Site location

The ***specification*** *should describe the geographical location of the* ***site*** *which may include surveying points, the previous use of the* ***site*** *and any local features such as impact of industrial or military activities and planning restrictions.*

Where applicable, the ***specification*** *should indicate* ***site*** *datum on* ***specification*** *drawings and specify* ***site*** *and drawing orientation and define co-ordinate axes (x, y, z) and numbering order to ensure consistency between suppliers of connected equipment.*

Where appropriate, the ***specification*** *should define the permitted ground loading, dimensional and time restrictions on access routes up to but not including public roads or railways.*

The ***specification*** *should identify, where appropriate, the environment of the* ***site*** *in which the* ***equipment*** *will operate. The following factors may normally be included if appropriate:*

- *climatic e.g. atmospheric pressure, annual variation of air and cooling water temperature, relative humidity, rain fall, icing, snow, wind velocity (normal and maximum), lightning;*
- *geological e.g. seismic conditions and characteristics of subsoil (e.g. caverns, gliding stratifications, load bearing capability of subsoils);*
- *geographic e.g. elevation, influence of local topography and structures;*
- *hydrological e.g. flooding and tides.*

4.3 Equipment task

*The **specification** should describe in general terms the function, task or role of the **equipment** to be purchased, e.g. whether it is part of a new power generating plant, a modification to an existing power generating plant, or replacement **equipment**.*

*Where appropriate, the **specification** should define the function and the known limitations, if any, in the **equipment** connected to that which is being supplied so that the **equipment** may avoid imposing adverse conditions or the **supplier** may suggest modifications to connected equipment which would ensure satisfactory operation.*

4.4 Equipment to be purchased

*The **specification** may define the **equipment** type or arrangement to be purchased*, for example:

- the sootblowing medium (i.e. steam, water or air);
- the number of **sootblowers** or the **sootblower coverage**;
- the **sootblower** type (i.e. **retractable**, **semi-retractable**, **rake**, **acoustic sootblower**).

*The **specification** may also define preferences for **equipment** types (or give information) regarding compatibility with existing equipment, if required.*

The **specification** may define any preferences with regard to the grouping of systems, for example include the steam, water or air supply system with the **sootblowers** so as to ensure system completness.

*The **specification** should define the intended methods or local practice for maintenance, inspection and operation.*

*The **specification** should define requirements with regard to the general appearance of the **equipment** (e.g. dimensions, shape or colour) to meet local planning requirements or specific criteria, where such requirements exist.*

NOTE: Attention is drawn to European, national and/or local legislation which may place restrictions in this area.

4.5 Control and instrumentation

*The **specification** should define the general requirements for the control and instrumentation system, the level of operator intervention allowed or required, integration with other control systems, localised control loops, commonality and redundancy.*

NOTE: Guidance on the procurement of control and instrumentation systems for power stations, including advice on interfaces can be found in EN 45510-8-1.

4.6 Electrical supplies and other services

*The **specification** should define the electrical supplies available for the operation of the **equipment**, their voltages and frequencies, with their range of variation, phases available and, where appropriate, the acceptable values of maximum load (kW) and short circuit level at each voltage level and the harmonic content. Requirements for terminals and terminal boxes should be stated; these should be to a recognised European or international standard.*

The **specification** should define the type and capacity of other services for the operation of the **equipment** such as auxiliary steam, water or compressed air. For the latter the **specification** may state a preference for either a dedicated or integrated compressed air supply system.

4.7 Other interfaces

*The **specification** should define the interfaces with existing ancillary or new ancillary equipment to be supplied under separate contracts which interact directly with the **equipment***, for example, steam supply system, supports systems and walkways.

4.8 Project programme

*The **specification** should describe the overall programme and timescale in which the project is to be carried out. This may include the principal dates associated with tendering, placement of orders, access to **site**, start and completion of installation, commissioning, take-over and final acceptance.*