SLOVENSKI STANDARD
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Guide for procurement of power station equipment - Part 2-5: Electrical equipment - Motors

Guide for procurement of power station equipment -- Part 2-5: Electrical equipment - Motors

Leitfaden für die Beschaffung von Ausrüstungen für Kraftwerke -- Teil 2-5: Elektrische Ausrüstung - Motoren

Guide pour l'acquisition d'équipements destinés aux centrales de production d'électricité -- Partie 2-5: Equipements électriques - Moteurs

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Guide for procurement of power station equipment Part 2-5: Electrical equipment - Motors

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This European Standard was approved by CEN and CENELEC on 2001-03-06.

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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 or CENELEC member into its own language and notified to the CENELEC Central Secretariat has the same status as the official versions.

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Foreword

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

This Guide for procurement has been prepared by the CEN/CENELEC Joint Task Force Power Engineering (JTFPE) of which the secretariat is held by the British Standards Institution.

The text of the draft was submitted to the formal vote and was approved by CEN and CENELEC as EN 45510-2-5 on 2001-03-06.

The following dates were fixed:

- *latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement* *(dop)* *2003-03-01*

- *latest date by which the national standards conflicting with the EN have to be withdrawn* *(dow)* *2004-04-01*

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 2-5: Electrical equipment - Motors
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Part 5-4: Turbines - Hydraulic turbines, storage pumps and pump-turbines

Part 6-1: Turbine auxiliaries - Deaerators
Part 6-2: Turbine auxiliaries - Feedwater heaters
Part 6-3: Turbine auxiliaries - Condenser plant
Part 6-4: Turbine auxiliaries - Pumps
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Part 6-6: Turbine auxiliaries - Wet and wet/dry cooling towers
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 45510-1 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 plant. 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* motors *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 motors within installations primarily concerned with the generation of electrical power. However, as a complete electrical drive system is not defined in this Guide, attention is drawn to the possible additional electrical and mechanical stresses to which the motor may be subjected e.g. by a static AC converter/inverter. Reference should be made to IEC 60034-17.

*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.

European Standards

EN ISO 9001	*Quality systems - Model for quality assurance in design, development, production, installation and servicing*
EN ISO 9002	*Quality systems - Model for quality assurance in production, installation and servicing*
EN 45510-2-7	Guide for procurement of power station equipment – Part 2-7: Electrical equipment - Switchgear and controlgear
EN 45510-2-9[1)]	Guide for procurement of power station equipment – Part 2-9: Electrical equipment - Cabling systems

[1)] In preparation.

EN 50347	General purpose three-phase induction motors having standard dimensions and outputs - Frame numbers 56 to 315 and flange numbers 65 to 740
EN 60034-1	Rotating electrical machinery - Part 1: Rating and performances (IEC 60034-1, mod.)
EN 60034-2	Rotating electrical machines - Part 2: Methods for determining losses and efficiency of rotating electrical machinery from tests (IEC 60034-2 + IEC 60034-2A)
EN 60034-5	Rotating electrical machines - Part 5: Classification of degrees of protection provided by enclosures for rotating machines (IEC 60034-5, mod.)
EN 60034-6	Rotating electrical machines - Part 6: Methods of cooling rotating machinery IEC 60034-6)
EN 60034-9	Rotating electrical machines - Part 9: Noise limits (IEC 60034-9)
EN 60034-12	Rotating electrical machines - Part 12: Starting performances of single-speed three-phase cage induction motors for up to and including 660 V and 50 Hz (IEC 60034-12, mod.)
EN 60034-14	Rotating electrical machines - Part 14: Mechanical vibration of certain machines with shaft heights 56 mm and higher - Measurement, evaluation and limits of the vibration severity (IEC 60034-14)
EN 60034-15	Rotating electrical machines - Part 15: Impulse voltage withstand levels of rotating AC machines with form-wound stator coils (IEC 60034-15)
EN 60034-18 series	Rotating electrical machines - Part 18: Functional evaluations of insulation systems (IEC 60034-18 series)

Harmonization Documents (HD)

HD 53.8	Rotating electrical machines - Part 8: Terminal markings and direction of rotation of rotating machines (IEC 60034-8)
HD 566	Thermal evaluation and classification of electrical insulation (IEC 60085)
HD 637	Power installations exceeding a.c. 1 kV

International Standards

IEC 60034-17	Rotating electrical machines - Part 17: Guide for the application of cage induction motors fed from converters
IEC 60050-191	International electrotechnical vocabulary - Chapter 191: Dependability and Quality of Services
IEC 60050-411	International electrotechnical vocabulary - Chapter 411: Rotating machines

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 annex A).

3.2 Technical terms

The technical terms applicable to the design, description, construction and performance of electric motors are defined in IEC 60050-411 and the relevant component standards.

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 rotor is a significant 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 **purchaser** may specify:

– synchronous or asynchronous (induction) motor.

The **specification** may state any preferences with regard to the extent of the supply. For example, the **Purchaser** may wish to include an integral or separate bearing lubricating system.

The **specification** may state requirements for the type of enclosure selected, particularly if the motor is to be installed in a hazardous area.

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

*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.*