
**Vodilo za nabavljanje opreme elektrarn – 2-8. del: Električna oprema –
Elektroenergetski kabli**

Guide for procurement of power station equipment – Part 2-8: Electrical equipment –
Power cables

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**Guide for procurement of power station equipment
Part 2-8: Electrical equipment –
Power cables**

Guide pour l'acquisition d'équipements
destinés aux centrales de production
d'électricité
Partie 2-8: Equipements électriques –
Câbles de puissance

Leitfaden für die Beschaffung von
Ausrüstungen für Kraftwerke
Teil 2-8: Elektrische Ausrüstung –
Starkstromkabel

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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 45510-2-8 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) 2005-03-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2007-03-01

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

- [SIST EN 45510-2-8:2004](https://standards.sist/16434d0d-d629-4c77-ad65-800000000000/standards/sist/16434d0d-d629-4c77-ad65-800000000000/en-45510-2-8-2004)
- Part 2-1: Electrical equipment - Power transformers
 - Part 2-2: Electrical equipment - Uninterruptible power supplies
 - Part 2-3: Electrical equipment - Stationary batteries and chargers
 - Part 2-4: Electrical equipment - High power static convertors
 - Part 2-5: Electrical equipment - Motors
 - Part 2-6: Electrical equipment - Generators
 - Part 2-7: Electrical equipment - Switchgear and controlgear
 - Part 2-8: Electrical equipment - Power cables
 - Part 2-9: Electrical equipment - Cabling systems

- Part 3-1: Boilers - Water tube boilers
- Part 3-2: Boilers - Shell boilers
- Part 3-3: Boilers - Boilers with fluidized bed firing

- Part 4-1: Boiler auxiliaries - Equipment for reduction of dust emissions
- Part 4-2: Boiler auxiliaries - Gas-air, steam-air and gas-gas heaters
- Part 4-3: Boiler auxiliaries - Draught plant
- Part 4-4: Boiler auxiliaries - Fuel preparation equipment
- Part 4-5: Boiler auxiliaries - Coal handling and bulk storage plant
- Part 4-6: Boiler auxiliaries - Flue gas desulphurization (De-SO_x) plant
- Part 4-7: Boiler auxiliaries - Ash handling plant
- Part 4-8: Boiler auxiliaries - Dust handling plant
- Part 4-9: Boiler auxiliaries - Sootblowers
- Part 4-10: Boiler auxiliaries - Flue gas denitrification (De-NO_x) plant

- Part 5-1: Turbines - Steam turbines
- Part 5-2: Turbines - Gas turbines
- Part 5-3: Turbines - Wind turbines
- 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
Part 6-5: Turbine auxiliaries - Dry cooling systems
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**.*

Where parts of the "common clauses" are omitted, this is indicated by the symbol *****.

Where minor changes have been made to sentences in the "common clauses" these are marked by a vertical line in the left margin.

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.

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1 Scope

This standard gives guidance on writing the technical **specification** for the procurement of low voltage (LV) and medium voltage (MV) power cables 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 power cables only for voltages up to and including $U_m = 41,5$ kV. This Guide does not cover cables for public distribution systems, control and instrumentation systems or communications systems.

For guidance on the technical **specification** of cables, including their installation and termination, refer to EN 45510-2-6

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

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

European Standards

EN ISO 9001	Quality management systems - Requirements
EN 50265	Common test methods for cables under fire conditions. Test for resistance to vertical flame propagation for a single-insulated conductor or cable Part 1: Apparatus Part 2-1: Procedures - 1kW pre-mixed flame Part 2-2: Procedures - Diffusion flame
EN 50266	Common test methods for cables under fire conditions. Tests for vertical flame spread of vertically-mounted bunched wire or cables Part 1: Apparatus Part 2: Procedures

EN 50268 Common test methods for cables under fire conditions. Measurement of smoke density of cables burning under defined conditions
Part 1: Apparatus
Part 2: Procedure

International standards

IEC 60050 (191) International electrotechnical vocabulary
Chapter 191: Dependability and Quality of Services

IEC 60050 (461) International electrotechnical vocabulary
Chapter 461: Electric cables.

IEC 60183 Guide to the selection of high-voltage cables.

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

Most technical terms applicable to the design, description, construction and performance of cables are defined in IEC 60050 International Electrotechnical Vocabulary, Chapter 461 or the normative references given in Clause 2.

The **specification** should define any additional technical terms not included in IEC 60050 (461) or the normative references.

For reasons of simplification, the general term 'cables' is used in this guide for those power cables, flexible cables and insulated wires intended to transmit electrical energy.

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** *****

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3.3.6 **design life** *****

3.3.7 **acceptability**

*compliance with criteria defined by the **purchaser** for assessing the suitability of **equipment**.*

3.3.8 **equipment margin** *****

3.3.9 **proven equipment** *****

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, either the **purchaser** should define the cable type, cross-section and length or, if the **supplier** is asked to select the cable, the **specification** should give the **supplier** all necessary information to allow the correct cable type and cross-section to be selected. Such information may be as given in Annex B and/or IEC 60183.

The **purchaser** may need to define the length of cable to be supplied on each drum or, alternatively, a minimum drum length.