Guide for procurement of power station equipment - Part 2-7: Electrical equipment; Switchgear and controlgear

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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 45510-2-7:2002 sisaldab Euroopa standardi EN 45510-2-7:2002 ingliskeelset teksti.

Käesolev dokument on jõustatud 13.12.2002 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.

Standard on kättesaadav Eesti standardiorganisatsioonist.

This Estonian standard EVS-EN 45510-2-7:2002 consists of the English text of the European standard EN 45510-2-7:2002.

This document is endorsed on 13.12.2002 with the notification being published in the official publication of the Estonian national standardisation organisation.

The standard is available from Estonian standardisation organisation.

Käsitlusala:

This Standard gives guidance on writing the technical specification for the procurement of switchgear and controlgear 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.

Scope:

This Standard gives guidance on writing the technical specification for the procurement of switchgear and controlgear 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.

ICS 27.100, 29.130.10

Võtmesõnad: definitions, design, efficiency, electric power stations, equipment, guide books, guidelines, management, performance in service, policy, procurements, specification (approval), specifications, switchgears

EUROPEAN STANDARD

EN 45510-2-7

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2002

ICS 27.100; 29.160.30

English version

Guide for procurement of power station equipment Part 2-7: Electrical equipment – Switchgear and controlgear

Guide pour l'acquisition d'équipements destinés aux centrales de production d'électricité Partie 2-7: Equipements électriques – Appareillage

Leitfaden für die Beschaffung von Ausrüstungen für Kraftwerke Teil 2-7: Elektrische Ausrüstung -Schaltanlagen

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

CEN and CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CENELEC Central Secretariat or to any CEN or CENELEC member.

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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CEN Management Centre: rue de Stassart, 36 B-1050 Brussels CENELEC Central Secretariat: rue de Stassart. 35 B-1050 Brussels

Contents

Forew	/ord	4
1	Scope	6
2	Normative references	6
3	Definitions	8
3.1	Organisational terms	8
3.2	Technical terms	9
3.3	General terms	
4	Brief overal! project description	10
4.1	Role and organisation of purchaser	10
4.2	Site location	
4.3	Equipment task	
4.4	Equipment to be purchased	
4.5	Control and instrumentation	
4.6	Electrical supplies and other services	
4.7	Other interfaces	
4.8	Project programme	
4.9	Equipment identification systems	
5	Extent of supply	12
6	Terminal points	13
7	Operational requirements	13
7.1	Operating environment	13
7.2	Manning levels	13
7.3	Normal operation	
7.4	Operating hours	
7.5	Start-up and shut-down	
7.6	Abnormal conditions	
7.7	Further operational requirements	14
8	Life expectancy	15
8.1	Design life	15
8.2	Components requiring periodic maintenance	
9	Performance requirements	15
9.1	Duty	
9.2	Performance	
9.3	Equipment margins	
9.4	Availability	
9.5	Levels of component redundancy	
9.6	Further performance requirements	
40	Design and fabrication	40
10	Design and fabrication	16
10.1	Specific equipment features	
10.2	Design justification	
10.3	Material selection	
10.4	Safety	
10.5	Interchangeability	
10.6	Fabrication methods	21

11	Maintenance requirements	21
11.1	Planned maintenance	
11.2	Personnel safety	
11.3	Requirements for access	
11.4	Lifting requirements	
11.5	Special tools	
11.6	Test equipment	
-		
11.7	Spare parts strategy	
11.8	Special precautions	22
12	Technical documentation requirements	22
12.1	Tender documentation	
12.2	Contract documentation	22
40	Annilo alda la dalatian na mulatiana atan danda and funthan na mulana and f	00
13	Applicable legislation, regulations, standards and further requirements	
13.1	Legislation and regulations	
13.2	Standards	
13.3	Further requirements	23
14	Evaluation criteria	23
14.1	General	
14.2	Technical criteria	23
	O'	•
15	Quality measures	
15.1	General	
15.2	Approvals procedure	
15.3	Inspection requirements	
15.4	Non-conformity	
40	Site factors	25
16	Site factors	25
16.1	Access	
16.2	Facilities	
16.3	Site specific requirements	
17	Verification of specified performance	26
17.1	General	26
17.2	Works tests	
17.3	Tests during installation and commissioning	
17.4	Technical conditions for trial run	
17.5	Functional and performance tests	27
Annov	ς Α (informative) Bibliography	20
Annex	(A (Informative) bibliography	20
	A (informative) Bibliography	

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 45510-2-7 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

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) 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_) 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 paragraphs of "common clauses" are omitted, each paragraph omitted is indicated by the symbol *****.

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

tr.
Lics are s, 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 **switchgear** and **controlgear** 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 **switchgear** and **controlgear** within installations primarily concerned with the generation of electrical power and, where appropriate, their interconnection with the transmission and/or distribution system. It also includes main connections (**busbars**) associated with generator circuits and the ancillary plant forming part of switchboards and/or switching circuits.

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 60044-1		Instrument transformers - Current transformers (IEC 60044-1, mod.)
EN 60071	series	Insulation co-ordination (IEC 60071 series)
EN 60129		Alternating current disconnectors and earthing switches (IEC 60129)
EN 60265-1		High-voltage switches for rated voltages above 1 kV and less than 52 kV (IEC 60265-1)
EN 60265-2		High-voltage switches - Part 2: High-voltage switches for rated voltages of 52 kV and above (IEC 60265-2)

EN 60282-1		High-voltage fuses - Part 1: Current-limiting fuses (IEC 60282-1)
EN 60298		AC metal-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV (IEC 60298)
EN 60420		High-voltage alternating current switch-fuse combinations (IEC 60420)
EN 60439-1		Low-voltage switchgear and controlgear assemblies - Part 1: Type-tested and partially type-tested assemblies (IEC 60439-1)
EN 60439-3	0	Low-voltage switchgear and controlgear assemblies - Part 3: Particular requirements for low-voltage switchgear and controlgear assemblies intended to be installed in places where unskilled persons have access for their use - Distribution boards (IEC 60439-3, mod.)
EN 60439-4		Low-voltage switchgear and controlgear assemblies - Part 4: Particular requirements for assemblies for construction sites (ACS) (IEC 60439-4)
EN 60470		High-voltage alternating current contactors and contactor-based motor starters (IEC 60470)
EN 60517		Gas-insulated metal-enclosed switchgear for rated voltages of 72,5 kV and above (IEC 60517)
EN 60622		Sealed-nickel-cadmium prismatic-rechargeable single cells (IEC 60622)
EN 60623		Vented nickel-cadmium prismatic rechargeable single cells (IEC 60623)
EN 60644		Specification for high-voltage fuse-links for motor circuit applications (IEC 60644)
EN 60694		Common clauses for high-voltage switchgear and controlgear standards (IEC 60694)
EN 60865	series	Short-circuit currents - Calculation of effects (IEC 60865 series)
EN 60865 EN 60896	series series	Short-circuit currents - Calculation of effects (IEC 60865 series) Stationary lead-acid batteries - General requirements and methods of tests (IEC 60896 series)
		Stationary lead-acid batteries - General requirements and methods of tests
EN 60896		Stationary lead-acid batteries - General requirements and methods of tests (IEC 60896 series)
EN 60896 EN 60947-1		Stationary lead-acid batteries - General requirements and methods of tests (IEC 60896 series) Low-voltage switchgear and controlgear - Part 1: General rules (IEC 60947-1, mod.)
EN 60896 EN 60947-1 EN 60947-2		Stationary lead-acid batteries - General requirements and methods of tests (IEC 60896 series) Low-voltage switchgear and controlgear - Part 1: General rules (IEC 60947-1, mod.) Low-voltage switchgear and controlgear - Part 2: Circuit-breakers (IEC 60947-2) Low-voltage switchgear and controlgear - Part 3: Switches, disconnectors, switch-
EN 60896 EN 60947-1 EN 60947-2 EN 60947-3		Stationary lead-acid batteries - General requirements and methods of tests (IEC 60896 series) Low-voltage switchgear and controlgear - Part 1: General rules (IEC 60947-1, mod.) Low-voltage switchgear and controlgear - Part 2: Circuit-breakers (IEC 60947-2) Low-voltage switchgear and controlgear - Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units (IEC 60947-3) Low-voltage switchgear and controlgear - Part 4-1: Contactors and motor-starters
EN 60896 EN 60947-1 EN 60947-2 EN 60947-3 EN 60947-4-1		Stationary lead-acid batteries - General requirements and methods of tests (IEC 60896 series) Low-voltage switchgear and controlgear - Part 1: General rules (IEC 60947-1, mod.) Low-voltage switchgear and controlgear - Part 2: Circuit-breakers (IEC 60947-2) Low-voltage switchgear and controlgear - Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units (IEC 60947-3) Low-voltage switchgear and controlgear - Part 4-1: Contactors and motor-starters - Electromechanical contactors and motor-starters (IEC 60947-4-1) Low-voltage switchgear and controlgear - Part 5-1: Control circuit devices and
EN 60896 EN 60947-1 EN 60947-2 EN 60947-3 EN 60947-4-1 EN 60947-5-1 + A12		Stationary lead-acid batteries - General requirements and methods of tests (IEC 60896 series) Low-voltage switchgear and controlgear - Part 1: General rules (IEC 60947-1, mod.) Low-voltage switchgear and controlgear - Part 2: Circuit-breakers (IEC 60947-2) Low-voltage switchgear and controlgear - Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units (IEC 60947-3) Low-voltage switchgear and controlgear - Part 4-1: Contactors and motor-starters - Electromechanical contactors and motor-starters (IEC 60947-4-1) Low-voltage switchgear and controlgear - Part 5-1: Control circuit devices and switching elements - Electromechanical control circuit devices (IEC 60947-5-1) Low-voltage switchgear and controlgear - Part 6-1: Multiple function equipment -
EN 60896 EN 60947-1 EN 60947-2 EN 60947-3 EN 60947-4-1 EN 60947-5-1 + A12 EN 60947-6-1		Stationary lead-acid batteries - General requirements and methods of tests (IEC 60896 series) Low-voltage switchgear and controlgear - Part 1: General rules (IEC 60947-1, mod.) Low-voltage switchgear and controlgear - Part 2: Circuit-breakers (IEC 60947-2) Low-voltage switchgear and controlgear - Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units (IEC 60947-3) Low-voltage switchgear and controlgear - Part 4-1: Contactors and motor-starters - Electromechanical contactors and motor-starters (IEC 60947-4-1) Low-voltage switchgear and controlgear - Part 5-1: Control circuit devices and switching elements - Electromechanical control circuit devices (IEC 60947-5-1) Low-voltage switchgear and controlgear - Part 6-1: Multiple function equipment - Automatic transfer switching equipment (IEC 60947-6-1) Low-voltage switchgear and controlgear - Part 7-1: Ancillary equipment - Terminal

Harmonization Documents (HD)

HD 554 Voltage transformers (IEC 60186, mod.)

HD 578 Characteristics of indoor and outdoor post insulators for systems with nominal

voltages greater than 1 kV (IEC 60273)

HD 637 Power installations exceeding a.c. 1 kV

International Standards

IEC 60050-191 International electrotechnical vocabulary - Chapter 191: Dependability and Quality

of Services

IEC 60050-441 International electrotechnical vocabulary - Chapter 441: Switchgear, controlgear and

fuses

IEC 60466 AC insulation-enclosed switchgear and controlgear for rated voltages above 1 kV

and up to and including 38 kV

IEC 60478 Stabilized power-supplies, DC output

IEC 60815 Guide for the selection of insulators in respect of polluted conditions

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