

11.01.2019. Nr. 2.5/2019/116
Uz Nr.

Sarunu procedūras pretendentiem

Par sarunu procedūru Nr. AST2018/111 "Apakšstacijas Nr. 30 "Daugavpils" 110 kV sadalnes pārbūve"

Nosūtām atbildi uz saņemto jautājumu par sarunu procedūru Nr. AST2018/111 "Apakšstacijas Nr. 30 "Daugavpils" 110 kV sadalnes pārbūve".

Jautājums: Iepirkuma procedūras "Apakšstacijas Nr. 30 "Daugavpils" 110 kV sadalnes pārbūve" (ID Nr. AST2018/111) prasībām atbilstoša / alternatīva 110 kV kabeļu izvēlei un finanšu piedāvājuma sagatavošanai, lūdzam izsniegt 110 kV kabeļu tehnisko specifikāciju un līnijas īsslēguma strāvu lielumus.

Atbilde: Paziņojam, ka sarunu procedūras Nr. AST2018/111 "Apakšstacijas Nr. 30 "Daugavpils" 110 kV sadalnes pārbūve" Tehniskajam uzdevumam tiek pievienots pielikums Nr. 5 "110 kV kabeļu tehniskā specifikācija autotransformatoru saitēm", kas pievienota pielikumā. Aizpildītu 110 kV kabeļu tehnisko specifikāciju autotransformatoru saitēm lūdzam pievienot sarunu procedūras piedāvājumam.

Lūdzam apstiprināt šīs vēstules saņemšanu.

Pielikumā:

1. Tehniskā uzdevuma pielikums Nr. 5 "110 kV kabeļu tehniskā specifikācija autotransformatoru saitēm" (*MS Word* datne) – 5 lpp.

Valdes loceklis

Mārcis Kauliņš

Velbergs 67725234

Tehniskā uzdevuma pielikums Nr. 5

110 KV KABEĻU TEHNISKĀ SPECIFIKĀCIJA AUTOTRANSFORMATORA SAITEI TECHNICAL SPECIFICATION

110 kV cable for autotransformers

General

Proposed Goods shall comply with the standards specified herein. However other standards may be used that are demonstrated to the Purchaser's satisfaction that they promise to confer equal or better quality and/or performance.

Description:	Requested:	Offered:
All offered goods shall be type tested and shall pass routine and special tests before delivery	yes	
The tests shall comply with the IEC standards for each type of the goods	yes	
The cables shall be longitudinally and radial water tight, the cable sheathing shall be of material that will protect the main insulation from dangerous water-trees	yes	
Low temperature testing. Sheaths shall be tested at -35°C	yes	
The Tenderer shall include in the tender: <ul style="list-style-type: none"> • copies of type test reports • appropriate test reports of water tightness and durability against water-trees for similar construction cables shall be included in offer • calculations of conductor current carrying capacity for cables laid in ground • calculations of permissible short time currents in conductors • calculations of permissible short time currents in metallic screens of cables 	please attach to the tender in electronical .pdf format	

Short-circuit parameters on 110 kV busbars	See below
Max single-phase short-circuit current	21.6 kA
Max double-phase short-circuit current to earth on phase	21.2 kA, $3I_0=23.7$ kA
Max three-phase short-circuit current	19.7 kA
Peak current	44.8 kA

Alternatives: Aluminium or Copper conductor

Description:	Requested:	Offered:
The Tenderer may propose as alternatives the cables with aluminium or copper conductor	please choose alternative: Al or Cu	
The Technical Specification Form and Price Schedule shall be clearly separated and filled-in for each alternative	please prepare Tender forms separately for each alternative	
Technical data (standards, cable lengths, temperatures, electrical and mechanical data) of alternatives shall be as specified in the Technical Specification Form	noted	

1.1. 110 kV cables

Description:	Requested:	Offered:
Manufacturer	please indicate	
Type No.	please specify	
Reference standards (where applicable)	<u>IEC60840, IEC60287,</u> <u>IEC60228, IEC60229,</u> <u>EN60071-1,</u> <u>EN60071-2</u>	
Power network system earthing	directly earthed	
Total quantity of the 110 kV cables	See below	
110 kV cables connection	according to technical design	
Electrical data	See below	
Operating voltage U_0/U	64 / 110 kV	
Rated voltage	123 kV	
Impulse withstand voltage	550 kV	
Rated frequency	50 Hz	
Current carrying capacity, when cables are installed in free air, formation – flat, distance between neighbour cable centers – according to technical design, load factor = 1, ambient temperature +25°C, conductor temperature 65°C	at least 700 A	
Current carrying capacity, when three single phase cables installed according to technical design, in separate unfilled PE pipes, soil temperature +15°C, thermal resistivity of soil 1.0 K-m/W, cable metallic screens and metallic foils are single point bonded, load factor = 1, nearby is laid parallel similar cable at 2 m distance. Consider other external heat sources in cable route, e.g. heat pipes, other cables etc.	at least 700 A, conductor temperature 65°C conductor temperature 90°C	
Permissible short time current in conductor (initial temperature before short circuit 65°C, final temperature after short circuit 250°C)	kA (0,6 s)	
Permissible short time current in Cu metallic screen (initial temperature before short circuit 65°C, final temperature after short circuit 250°C)	kA (0,6 s)	
Max. conductor DC-resistance at +25°C	Ω/km	
Max. conductor 700 A AC-resistance at +25°C	Ω/km	
Metallic screen DC-resistance at +25°C	Ω/km	
Metallic screen 700 A AC-resistance at +25°C	Ω/km	
Capacitance	$\mu\text{F}/\text{km}$	
Inductance	mH/km	
Three-phase load losses in the conductor at current 700 A	W/m	
Three-phase load losses in the metallic screens at current 700 A	W/m	
Total three-phase load losses at current 700 A	W/m	
Estimated service life endurance of the cable	years	
Max. conductor operating temperature	$\geq 65^\circ\text{C}$	
Max permissible conductor temperature at short-circuit current for 0,6 s	250°C	
Max permissible metallic screen temperature at short-circuit current for 0,6 s	250°C	
Construction	See below	
Type of manufacturing	please specify the type of manufacturing in full words	
Single core cable	yes	
The cable shall be longitudinally and radial watertight	yes	
Conductor	See below	
Round, segmental stranded and compacted longitudinally watertight conductor. Watertightening by swellable material in the wire interstices and semi-conducting water-swellable tape over conductor.	yes	
Nominal cross-sectional area	mm^2	
Number of segments	please specify the type of manufacturing in full words	

Description:	Requested:	Offered:
Approximate diameter over conductor	mm	
Material of the conductor	please choose version: aluminium or copper	
Conductor screen	See below	
Semi-conducting copolymer compound	yes	
Nominal thickness of conductor screen	mm	
Main insulation	See below	
Superclean extruded cross-linked polyethylene compound	yes	
Nominal thickness of main insulation	≥15.0 mm	
Minimum point thickness	≥13.5 mm	
Approximate outer diameter over main insulation	mm	
The cable sheathing shall be of material that will protect the main insulation from dangerous water-trees	yes	
Insulation screen	See below	
Semi-conducting copolymer compound	yes	
Nominal thickness of insulation screen	mm	
Bedding	See below	
Semi-conducting water swellable tape	yes	
Metallic screen of copper	See below	
A layer of copper wire helix and a copper contact tape counter helix	yes	
Cross-sectional area of metallic screen	mm ²	
Binder tape	See below	
Semi-conducting water-swellable foam tape	yes	
Metallic foil	See below	
Longitudinal aluminium tape tightly bonded to sheath	yes	
Nominal thickness of metallic foil	mm	
Outer sheath	See below	
Extruded high density polyethylene compound, graphite coated	yes	
Nominal thickness of the outer sheath	≥4.0 mm	
Each separate cable ends are prepared for installation	See below	
Pulling eye	yes	
Water tight end sheathing	yes	
Data of complete cable	See below	
Approximate diameter of complete cable with possible deviation	mm (± %)	
Approximate weight of complete cable	t/km	
Weight of used copper per km of cable	t/km	
Weight of used aluminium per km of cable	t/km	
Marking	See below	
Embossed on the outer sheath: manufacturer, year, identification No. of manufacturing	yes	
Printed on the outer sheath: manufacturer, cable type, year of manufacturing, length marking in meters	yes	
Mechanical data	See below	
Bending radius at installation	m	
Bending radius after final installation	m	
Maximum pulling tension with pulling eye	kN	
Max sidewall pressure	kN/m	
Delivery	See below	
Delivery on cable drums	yes	
Material of cable drum	please indicate	
Weight of cable drum	kg	

1.2. Equipment for the earthing of metallic screen

Description:	Requested:	Offered:
Equipment for earthing of metallic screen at end-terminations	See below	
All equipment needed for earthing of metallic screen through surge arresters	yes	
All the cables between end-terminations and surge arresters-earthing boxes	yes	
Conductor cross-section of cables between end-terminations and	yes	

Description:	Requested:	Offered:
earthing boxes shall be at least as the cross-section of metallic screen		
Number of earthing through surge arresters sets	pc.	
Degree of protection	≥IP-54	
Earthing boxes will be installed on the end-terminations supports	yes	
Earthing boxes design from non-corroding cast aluminium or stainless steel	yes	
Earthing cable	See below	
Nearby the main power cables shall be installed earthing cable for single-point earthing of the main power cable	yes	
Earthing cable (length – according to technical design) with appropriate insulation shall be included in the scope of supply	yes	
Nominal cross-sectional area of the earthing cable	mm ²	
Material of the conductor	copper	
Technical description of the all earthing equipment shall be attached to the Tender	please attach to the tender	

1.3. Outdoor end-terminations in substations and towers

Description:	Requested:	Offered:
Manufacturer	please indicate	
Type No.	please specify	
Number of units	12 units	
The electrical data are the same as for the cable or better	yes	
The current carrying capacity	at least 700 A, but not less than for the cable	
Applicable standards	IEC 60840	
The complete end-termination diameter	mm	
The complete end-termination length	mm	
The complete end-termination weight	kg	
Composite insulator – requested solution or better	HTV (high temperature vulcanizing)	
The creepage distance (phase – ground voltage)	≥43.3 mm/kV	
Flash-over distance	mm	
Intended for outdoor installation	yes	
Ambient air temperature range	-40°C up to +40°C	
All metal components are of corrosion-resistant materials or effectively protected against corrosion	yes	

1.4. Services and technical documentation to be submitted by the Supplier

Description:	Requested:	Offered:
Installation of cable joints shall be made by the Supplier	yes	
Installation of end-terminations shall be made by the Supplier	yes	
The Supplier is responsible for the performed cable joints and end-terminations installation until entire cable line has passed tests and commissioning successfully	yes	
Supervision of installation of the cables shall be made by the Supplier	yes	
Installed cable line should be entirely commissioned by the Supplier, the tests and commissioning are included in the Contract Price	yes	
In the case of any discrepancies between planned and actual time of installation and commissioning, the Supplier is no way released from the obligation to perform entire commissioning without the Contract Price exchanges	yes	
Within 5 days after commissioning the Supplier shall submit to the Customer the protocols of performed tests and commissioning. The protocols should be written in the Latvian. Note: The take-over deed about the performed tests and commissioning will be signed by the Customer only after receipt of the protocols.	yes	
List of recommendable test procedures to be performed during operation of cable line according to applicable IEC standards	please attach to the Tender	
Below mentioned routine, sample and electrical tests according to IEC	See below	

Description:	Requested:	Offered:
60840, IEC 60228, IEC 60229 issuing the test report		
Electrical resistance determining of cable conductor by DC acc. IEC 60840, clause 10.5	yes	
Electrical resistance determining of cable metal screen by DC (outer sheath check) acc. IEC 60840, clause 10.5	yes	
Capacitance of cable conductor acc. IEC 60840, clause 10.10	yes	
Dielectric dissipation factor $\tan \Delta$ in accordance with IEC 60840, clause 12.4.5	yes	
Heating cycle voltage test in accordance with IEC 60840, clause 12.4.6	yes	
Outer sheath check acc. IEC60840, clause 9.4, referring to IEC60229, clause 3: 25 kV DC, 1 minute	yes	
Voltage test with 2.5 U _o , 50 Hz, 30 minutes acc. IEC 60840, clause 9.3	yes	
Repeat electrical resistance of cable conductor (main insulation 2500-10000V DC) if test failed	yes	
Partial discharge test acc. IEC 60840, clause 9.2 and acc. IEC 60840, clause 10.6; 10.7; 10.8; 10.13 <ul style="list-style-type: none"> - Measurement of thickness of insulation and oversheath - Measurement of diameters. - Measurement of thickness of metallic sheath. 	yes	
Other tests:	please indicate if any	
Below mentioned cable tests after installation issuing the test report	See below	
DC voltage test of outer sheath acc. IEC 60229, Clause 5.	yes	
AC voltage test for main insulation (IEC 60840, Clause 16.3)	U _o , 24 h, 50 Hz	
Contact tightness/resistance determining between metallic screen at cable end-terminations and connected earthing circuit	yes	
Other tests:	please indicate if any	