

	<b>Standard</b>	<b>Technology</b>
---	-----------------	-------------------

Title: **TECHNICAL EVALUATION  
CRITERIA FOR HV XLPE CABLE  
SYSTEM AND HV OIL-FILLED  
CABLE SYSTEM  
CONTRACTORS**

Unique Identifier: **240-151205323**

Alternative Reference Number: **<n/a>**

Area of Applicability: **Engineering**



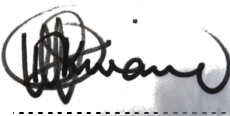
Documentation Type: **Standard**

Revision: **1**

Total Pages: **12**

Next Review Date: **January 2025**

Disclosure Classification: **Controlled  
Disclosure**

Compiled by	Approved by	Authorized by
		
<b>Sandisiwe Mtshaulana</b> Engineer (SI GOU)	<b>Kagiso Senosi</b> Snr Technologist (SI NWOU)	<b>Stephen Nkwane</b> Manager (SI GOU)
Date: 25/02/2020	Date: 25/02/2020	Date: 25/02/2020
		<b>Supported by SCOT/SC</b>
		<b>&lt;First Name and Surname&gt;</b> <b>SCOT/SC Chairperson</b>
		Date:

PCM Reference: **<xxxxxx>**

SCOT Study Committee Number/Name: **<Number or name>**

## Content

	Page
1. Introduction.....	3
2. Supporting clauses.....	3
2.1 Scope.....	3
2.1.1 Purpose.....	3
2.1.2 Applicability.....	3
2.2 Normative/informative references.....	3
2.2.1 Normative.....	3
2.2.2 Informative.....	3
2.3 Definitions.....	4
2.3.1 General.....	4
2.3.2 Disclosure classification.....	4
2.4 Abbreviations.....	4
2.5 Roles and responsibilities.....	4
2.6 Process for monitoring.....	4
2.7 Related/supporting documents.....	4
3. Requirements.....	5
3.1 Premises evaluation.....	5
3.2 Evaluation criteria.....	5
3.2.1 Table 1: Technical Evaluation Criteria for HV cable systems Contractors: Mandatory Requirements.....	5
3.2.2 Table 2: Technical Evaluation Criteria for HV Contractors: Scoring.....	6
4. Authorization.....	7
5. Revisions.....	7
6. Development team.....	7
7. Acknowledgements.....	8
Annexure A – Tools and Equipment list.....	9
Annexure B – Vehicles list.....	11
Annexure C – POE Checklist.....	12

## **1. Introduction**

This document has been developed to set the standard technical evaluation criteria to be used when evaluating tender submissions by civil and electrical contractors for the maintenance of HV XLPE cable system and HV oil-filled cable system in the Gauteng Operating Unit (GOU). The civil scope includes but is not limited to: River crossing, road crossing, HV cable joint bays, HV cable installation; and the electrical scope includes but is not limited to: HV cable fault locating and tracing, river crossing, road crossing, HV cable jointing (joint bays and bonding leads), HV cable termination, pilot cable, oil works, sheath repair. This document provides technical evaluation criteria developed in line with the Eskom HV cable system standards.

## **2. Supporting clauses**

### **2.1 Scope**

These technical evaluation criteria covers the minimum requirements for civil work and electrical work conducted on the HV XLPE cable system and HV oil-filled HV cable system with nominal voltages from 44 kV up to and including 132 kV for maintenance purposes.

#### **2.1.1 Purpose**

This document was compiled to provide technical evaluation criteria for civil and electrical scope of work for HV XLPE cable system and HV oil-filled HV cables system to ensure contractor compliance to standard within Eskom Holdings SOC (Ltd). It is applicable only for the purpose of performing contractor tender evaluations for the maintenance of HV cable systems in GOU.

#### **2.1.2 Applicability**

This document shall apply for Eskom Holdings Limited (Dx GOU).

### **2.2 Normative/informative references**

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

#### **2.2.1 Normative**

- [1] ISO 9001, Quality Management Systems
- [2] 240-56030640, General Information and Requirements for High Voltage Cable Systems
- [3] 240-56030625, Specification for XLPE-insulated Power Cables and Accessories for Systems with Nominal Voltages of 44kV to 132kV
- [4] 240-56030399, Specification for Oil-filled Power Cables and Accessories for Systems With Nominal Voltages of 44kV to 132kV
- [5] 240-45683927, Compaction Testing on Cable System Installations

#### **2.2.2 Informative**

- [6] 32-9: Definition of Eskom documents.
- [7] 32-644: Eskom documentation management standard.
- [8] 474-65: Operating manual of the Steering Committee of Technologies (SCOT).

## 2.3 Definitions

### 2.3.1 General

None

### 2.3.2 Disclosure classification

**Controlled disclosure:** controlled disclosure to external parties (either enforced by law, or discretionary).

## 2.4 Abbreviations

Abbreviation	Description
Dx	Distribution
GOU	Gauteng Operating Unit
HV	High voltage
JRA	Johannesburg Road Agency
NHBRC	National Home Builders Registration Council
OEM	Original Equipment Manufacturer
OFC	Optical fibre cable
ORHVS	Operating regulations for high voltage system
PDE	Power Delivery Engineering
PPE	Personal protective equipment
PVC	Polyvinyl chloride
SI	Standards Implementation
XLPE	Cross-linked poly ethylene

## 2.5 Roles and responsibilities

All Eskom employees and/or appointed bodies involved in the qualification process of contractors to perform the maintenance of HV cable systems shall ensure that the contractors being evaluated meet the requirements of this standard. Any deviation from these requirements shall constitute non-conformance, unless it was in advance agreed to by a delegated cable specialist and is based on sound engineering judgement.

All HV cable systems maintenance contractors shall ensure that they obtain clarity where required and obtain all supporting information or documents necessary to comply with this document.

## 2.6 Process for monitoring

Acceptance of bidding contractors for the maintenance of HV cable systems shall be based on fully compliant submissions of documents and proving capability of providing the required service during equipment/tools and premises evaluations.

## 2.7 Related/supporting documents

Refer to clause 2.2.

### **3. Requirements**

This document contains the technical evaluation criteria for the oil-filled and XLPE HV cable systems maintenance contractors in Eskom GOU. The evaluation methodology consists of two stages namely 1) the submitted documentation evaluation and 2) premises evaluation where equipment and tools are checked.

The technical evaluation exercise is performed by the Eskom evaluating representatives. The initial part of the evaluation starts when submissions are opened and assessed for the first time. The submitted documents will be evaluated against the mandatory and scoring technical evaluation criteria as stated in clauses 3.2.1 and 3.2.2 respectively. Should a tenderer fail to meet any one of the mandatory requirements, they will automatically be disqualified. The documentation evaluations are meant for establishing if all the key tender deliverables are met with regard to the maintenance of oil-filled and XLPE HV cable systems.

The second part of the evaluation is the verification of tender documentation submissions that takes place at the tenderer's premises as per clause 3.1. Each contractor has to pass mandatory evaluation as well as achieve a minimum score of 85% in the scoring phase of documentation evaluation on 3.2.2 in order to qualify for premises evaluation, any score below 85% will result in immediate disqualification.

At the end of the premises evaluation, the Eskom evaluating representative(s) will list all the deviations and identified risks, if any. The representatives will conduct a formal discussion of the deviations and risks in line with Eskom's requirements of clause 3.2.2. The tenderer that fails to demonstrate the 85% compliance to tables 1 and 2 at the premises evaluation will be disqualified.

#### **3.1 Premises evaluation**

The following will be checked at the contractor's premises:

- Owned vehicles and their documents
- Owned tools
- Owned equipment
- List of hired tools and equipment and their hiring letters
- Proof of employment for personnel with submitted certificates (e.g. employment contracts etc.)
- General housekeeping (e.g. how tools and equipment are kept)

#### **3.2 Evaluation criteria**

The technical evaluation criteria comprise mandatory and scoring phases.

##### **3.2.1 Table 1: Technical Evaluation Criteria for HV cable systems Contractors: Mandatory Requirements**

<b>TASK / MEASURE</b>	
<b>Criteria</b>	<b>Acceptance: Yes/No</b>
Submit all technical requirements on a separate Technical file.	
Provide proof of company's registration for Eskom PDE website access.	
Submit a signed copy of the provided tools and equipment list in annexure A used for maintenance of HV cable systems, indicating if the tools and equipment are owned or hired.	
Provide a copy of a signed procedure on how you measure soil compaction.	
Provide valid certified copies of your training records for your cable jointers, i.e. a minimum of two certificates with the following training:	

**TECHNICAL EVALUATION CRITERIA FOR HV XLPE  
CABLE SYSTEM AND HV OIL-FILLED CABLE SYSTEM  
CONTRACTORS**
Unique Identifier: **240-151205323**Revision: **1**Page: **6 of 12**

TASK / MEASURE	
Criteria	Acceptance: Yes/No
<ul style="list-style-type: none"> <li>Oil-filled cable jointing and termination certificates</li> <li>XLPE cable jointing and termination certificate</li> <li>Indoor switchgear termination (SF6 insulated)</li> </ul> <b>NB:</b> Training should be conducted by an OEM or company approved by an OEM	
Provide valid certified copies of ORHVS certificates or GOU HV authorisation for responsible person.	
Provide valid certified copies of construction regulation training certificates.	
Provide an affidavit per employee, completed by the resources named on the certificates and certified by a Commissioner of Oaths. This affidavit will be used as confirmation of employment by the tendered company.	

**3.2.2 Table 2: Technical Evaluation Criteria for HV Contractors: Scoring**

TASK / MEASURE		
Criteria	Source of evidence	Weighting
<p>Complete the template on annexure D, which is confirmation and proof of the history of at least five maintenance/breakdown projects that were performed by your company's qualified personnel, related to the following scope:</p> <p>The <b>civil scope</b> includes but is not limited to: River crossing, road crossing, HV cable joint bays, HV cable installation; and the <b>electrical scope</b> includes but is not limited to: River crossing, road crossing, HV cable jointing (joint bays and bonding leads), HV cable termination, pilot cable, oil works, sheath repair</p> <p>The above required project references shall indicate and provide the project name, customer name, customer contact details, the operating voltage, conductor size, year of execution, quantity (total length of cable and number of accessories). Contact details of the utility/customer representatives, their titles, addresses, emails and telephone numbers.</p> <p><b>NB:</b> Experience should cover both oil-filled- and XLPE-insulated cable system projects.</p>	Appointment letter/task orders and completion certificates	20
Method statement for soil compaction and testing.	Clearly written technique used when doing soil compaction and compaction results	5
HV oil-filled and XLPE-insulated cable jointing and terminating valid certified certificates and indoor switchgear termination valid certified certificates.	Submitted certificates	20
<p>ORHVS certificates and authorization (as per POE)</p> <ul style="list-style-type: none"> <li>For currently authorised person, provide Eskom GOU</li> </ul>	Submitted certificates; Print and complete the	5

**ESKOM COPYRIGHT PROTECTED**

TASK / MEASURE		
Criteria	Source of evidence	Weighting
Authorised certificates <ul style="list-style-type: none"> <li>For previously authorised persons with expired authorization, provide certified copies of those expired authorisation certificates</li> <li>For unauthorised persons ready to be authorised, provide a completed copy of POE checklist and submit all certificates as per POE table as per Annexure C.</li> </ul>	provided POE checklist on annexure C and sign	
Equipment and tools list NB: There will be penalties if <b>all</b> tools and equipment are hired	Print and complete the provided tool/equipment list on annexure A and sign, or hiring letter	25
Vehicles, proof of ownership (10 Ton crane truck, LDV, Transporter)	Print and complete the vehicle list on annexure B <b>and</b> sign Vehicle documents	16
Suitable PPE for all staff (registers signed by each employee) and PPE Matrix.	Signed PPE register	2
Company premises (office and storage).	Proof of physical address (e.g. municipality statements, etc.)	2
In what manner do you deal with external authority'/utility's services (e.g. JRA, Rand Water etc.)?	Internal procedure	5
TOTAL		/100

#### 4. Authorization

This document has been seen and accepted by:

Name and surname	Designation
Stephen Nkwane	Manager: Standards Implementation (GOU)
Mphathutshedzeni Mudau	Manager: Technical Support (GOU)

#### 5. Revisions

Date	Rev	Compiler	Remarks
December 2019	Draft 0.1	S. Mtshaulana & K. Senosi	New document.

#### 6. Development team

The following people were involved in the development of this document:

- Sandisiwe Mtshaulana: Engineer (SI)
- Kagiso Senosi: Snr Technologist (SI)
- Phenny Bopape: Principal Engineering Assistant (PPM)

**ESKOM COPYRIGHT PROTECTED**

## **7. Acknowledgements**

Not applicable.



**Annexure A – Tools and Equipment list**

Tools/Equipment	QTY	Owned/Hired
Equipment and consumables to pump oil into oil-filled cable		
Equipment and consumables to perform gaseous vaporisation fluid tagging		
Steel Barricading, concrete barricading and steel guard rails for trenches as per construction regulations. Minimum of 50 meters.		
Shoring equipment (timber, steel supports, struts) as per construction regulations. Minimum of 50 meters.		
Road crossing steel plates (with hoisting equipment) – Heavy vehicular traffic.		
Trench crossing walkways for pedestrians / light vehicular traffic (driveways etc.)		
Road traffic signage (road works/construction ahead, lane closed/road narrowing, detour, no through road, road closed, chevrons, stops signs, flag men, Stop/go, etc.)		
Cable winch, dynamometer (pulling strain), jack stands and steel rope.		
Cable bond pulling and nose pulling (pulling eye / pulling socks) equipment.		
Cable corner/guide rollers (5, sufficient for at least 5 corners).		
Cable rollers and skids (50, sufficient for every 2m of cable installed).		
Hand excavation tools (picks, beaded spades, etc.) 2 beaded minimum.		
Mechanical excavator (machine) (TLB).		
Rock drills (for boulder busting / chemical rock breaking).		
Pipe jacking equipment, rock blasting		
Directional drilling machines		
Compressors.		
Jackhammers.		
Tar (asphalt) / concrete road surface cutter (angle grinder).		
Bulleting machine (110mm and 160mm diameter).		
Hand compacting tools (stampers).		
Mechanical compacting machinery ('rammer'/'wacker').		

**ESKOM COPYRIGHT PROTECTED**

**TECHNICAL EVALUATION CRITERIA FOR HV XLPE  
CABLE SYSTEM AND HV OIL-FILLED CABLE SYSTEM  
CONTRACTORS**

Unique Identifier: **240-151205323**

Revision: **1**

Page: **10 of 12**

Mechanical compacting roller (e.g. 'Bomag').		
Soil compaction testing equipment (DCPs).		
Soil sieve of 12mm mesh size		
A.C. (230V) generators (for lighting, bentonite mixing equipment, portable test equipment, etc.), min of 2.		
Lighting equipment (for joint bays etc.), min 2 sets.		
Submersible water pump.		
Equipment for punching labels onto Al/Cu plates, Stencils.		
Equipment for cutting cables, electric saws, hacksaw etc.		
Tools for jointing/terminating HV cables (XLPE); (specify tools and electrical equipment)		
Tools for jointing/terminating HV cables (oil-filled); (specify tools and electrical equipment)		
Hexagonal die crimping tools and suitable dies for compression fittings.		
CAD and MIG welding equipment (HV cables only).		
Gas flame/torch equipment (e.g. for heat shrink application).		
Lead wiping/plumbing equipment (HV cables only).		
Cylindrical brushes / close fitting mandrels (110 mm and 160 mm) to clean pipes before pulling cable.		
Bellmouths for pulling cable into PVC pipes.		
Bentonite equipment (mixer and pump etc.) for pipes		
Cast-on-site concrete mixing equipment (mixer)		
Containers for hazardous / waste material - for disposal (HV OFC only)		
Oil degasifying plant (HV OFC only).		
Oil-filled cable freezing equipment (Liquid nitrogen, sleeve, manometer x2) (HV OFC only).		
Hand held radios, 3 sets min.		
HV joint bay protective weather cover (e.g. waterproof tent)		

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**ESKOM COPYRIGHT PROTECTED**

---

**Annexure B – Vehicles list**

Vehicles	QTY	Registration number	Owned
10 ton crane truck			
LDVs			
Transport for personnel			

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

---

### Annexure C – POE Checklist

Mandatory Requirements: Portfolio of Evidence			
No	Minimum Valid certificates required	Valid	
		Yes	No
1	First Aid Level 2		
2	Basic Fire fighting		
3	Supervision		
4	Occupational Medical certificate		
5	Risk Assessment		
6	Equipotential Earthing		
7	ORHVS HVO2		
8	Understanding the fundamentals of Electricity or N2 in Electrical Engineering		
9	High Voltage environment and regulations awareness		
10	Working From Heights and rescue		
11	Environmental awareness		

**ESKOM COPYRIGHT PROTECTED**

**Annexure D – Previous Related Experience**

Start and end dates							Date: _____
Rank value of project							
Customer contact details							
Customer name							
Brief scope of work							
Project name							
							Signature: _____

**ESKOM COPYRIGHT PROTECTED**