Eskom	Technical Specification	Apollo and Centralised Service

Title: **Technical Specification for Conductive Clothing used for Transmission Live Line work**

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Compiled by	Functional Responsibility	Authorized by
.....	.....	.....
Madoda Fihla	**Eric Marshall**	**Russel Shabangu**
Senior Advisor – Live Line	**Chief Engineer: Live Work**	**Manager: WP&CS Live Line**
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FIGURES

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TABLES

FOREWORD

Revision History

Date	Rev.	Remarks
May 2016.	0	New Doc
Dec 2021	1	Revised TET members, remove all N/A Sections and updated the document

Authorization

This document has been seen and accepted by:

Name	Designation
Eric Marshall	Chief Engineer: Live Work
Madoda Fihla	Chair - Tx LWSC
Russel Shabangu	Middle Manager: A & CS

Applicability

This document shall apply throughout Transmission Live Line Maintenance Teams.

Development Team

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

- Tx Live Work Steering Committee

1. SCOPE

This specification covers conductive clothing that are utilized during bare hand live working activities on installations operating at voltages from 132 kV, up to and including 765 kV (including 533 kV DC).

2. NORMATIVE REFERENCES

Parties using this document shall use the most recent edition(s) of the document(s) listed in this section.

[1] **240-60725816**: Standard for High Voltage Live Working
[2] **IEC 60895**: Live working - Conductive clothing for use at nominal voltage up to 800 kV A.C and +/- 600 kV D.C.

2.1.1 Informative references

[1] **IEC 61477:2009:** Live working - Minimum requirements for the utilization of tools, devices and equipment

[2] **240-114967625:** Eskom Operating Regulations for High Voltage System (ORHVS)

[3] **240-60725817**: Standard for Aerial Live Working

[4] **240-60725057**: Guide for the planning of live-line maintenance work

[5] **240-105015449**: Live line risk assessment and fall protection plan

3. DEFINITIONS AND ABBREVIATIONS

3.1 DEFINITIONS

[1] **Conductive material:** material composed of metallic threads or non-metallic conductive substances and natural or synthetic threads closely woven, knitted, or layered.
[2] **Hood (head cover):** part of the clothing, either as a separate item or integrated into a complete garment, which covers the head.
[3] **Garment:** main body of the clothing consisting of jacket and trousers

3.1.1 Classification

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

3.2 ABBREVIATIONS

Abbreviation	Description
ASTM	American Society for Testing and Materials
IEC	International Electro technical Commission
Tx	Transmission
A & CS	Apollo and Centralised Services

4. REQUIREMENTS

Live working conductive clothing and the material used to manufacture such clothing shall conform to **IEC 60895** and shall not exceed maximum resistance of 50 ohms.

4.1 CONDUCTIVE CLOTHING

[1] Conductive garment, trousers and jacket with hood with securing strap.

[2] Conductive gloves

[3] Conductive socks

[4] Conductive boots

[5] Protective patches/reinforcing in areas of high wear and tear.

5. TESTS

The following minimum test as specified by **IEC 60895** shall be conducted as part of the routine testing and the manufacturer shall issue certificates indicating compliance to the relevant standards.

5.1 ACCEPTANCE TEST

An acceptance test certificate shall be required for each conductive suit purchased indicating compliance with **IEC 60895**.

Suppliers shall ensure that such acceptance tests were done before delivery to Eskom.

6. MARKING, LABELLING AND PACKAGING

[1] All conductive suits to be used for live working shall be marked in a manner which does not interfere with the electrical performance of the suit.
[2] All conductive suits shall be clearly marked with the manufacturers name and/or trade mark, and unique identification code.
[3] All markings shall be as per **IEC 60895**.

7. IN-SERVICE MAINTENANCE AND CARE

[1] A complete chronological record of the conductive clothing used, its condition and test results should be retained so that the user can establish their own replacement parameters based on the specific tasks, use of the conductive clothing and care given to the garment and component parts.
[2] It is the responsibility of the worker to exercise extreme care while wearing and handling the conductive clothing. Tears, holes and other deformities should be repaired according to accepted practice.
[3] Conductive clothing and component parts should be stored in a dustproof breathable container, such as a canvas or vinyl bag or briefcase.
[4] The manufacturer's cleaning instructions should be followed.

ANNEXURE A: TENDER TECHNCIAL EVALAUTION CRITERIA

A.1 TECHNICAL EVALUATION THRESHOLD

The minimum weighted final score (threshold) required for a tender to be considered from a technical perspective is 70%.

A.2 MANADATORY TECHNICAL EVALUATION CRITERIA

Table A.1: Mandatory Technical Evaluation Criteria

	Mandatory Technical Criteria Description	Reference to Technical Specification / Tender Returnable	Motivation for use of Criteria
1.	Resistance BELOW 50 ohms	**Compliance Certificate as per IEC 60895**	International criteria used to evaluate electrical performance of conductive clothing
2.	Flame retardant properties.	**Compliance Certificate as per IEC 60895**	International criteria used to evaluate electrical performance of conductive clothing

A.3 QUALITATIVE TECHNICAL EVALUATION CRITERIA

Table A.2: Qualitative Technical Evaluation Criteria

	Qualitative Technical Criteria Description		Reference to Technical Specification / Tender Returnable	Criteria Weighting (%)	Criteria Sub Weighting (%)
1.	**Material**		**IEC 60895**	**40**	
	1.1	Conductive			50
	1.2	Interwoven			50
2.	**Care and Maintenance Instructions**		**IEC 60895**	**30**	
	2.1	Care	**IEC 60895**		50
	2.2	Repairs			50
3.	**Markings and Labelling**		**IEC 60895**	**30**	

A.4 TET MEMBERS

Table A.3: TET Members

TET number	TET Member Name	Designation
TET 1	Dave Bedeman	Tx Live Line Trainer
TET 2	Livhuwani Tshivhase	Senior Supervisor Live Line
TET 3	Madoda Fihla	Senior Advisor Technical Support

A.5 TET MEMBER RESPONSIBILITIES

Table A.1: TET Member Responsibilities

Mandatory Criteria Number	TET 1	TET 2	TET 3
1.	X	X	X
2.	X	X	X
Qualitative Criteria Number	**TET 1**	**TET 2**	**TET 3**
1.	X	X	X
2.	X	X	X
3.	X	X	X

Table A.4.1 Technical evaluation outcomes

Requirement as per IEC/EN 60895					
Company	**Item:**	**IEC/EN 60895 compliance test certificate class 1**	**Material**	**Care and Maintenance Instruction**	**Markings and Labelling**

Technical evaluation done by: TET Members