Eskom National Transmission Company South Africa ™	**Scope of Work**	**NTCSA**

Title: **Supply and Delivery of Insulator Bird Shields Scope of Work**

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		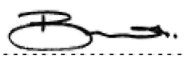
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1. Introduction

Due to the high number of bird faults experienced on the Transmission Network within Central Grid, additional mitigation is required to reduce the number of bird related faults. The rationale behind the installation of the Insulator Bird Shields is to protect the Transmission network from bird streamer faults. This will be achieved by way of reducing the amount of bird pollution that might cover the insulators. To be used in conjunction with the Insulator Bird Shields Pilot programme.

2. Supporting Clauses

2.1 Scope

The scope of work will cover the requirements for the supply and delivery of insulator bird shields for Central Grid.

2.1.1 Purpose

The purpose of this scope of work is to detail the minimum requirements for the supply and delivery of insulator bird shields. The Insulator Bird Shields are required to reduce the number of bird related faults within Central Grid.

2.1.2 Applicability

This document shall apply to National Transmission Company South Africa (NTCSA) SOC Ltd Reg No 2021/539129/30 Central Grid.

2.1.3 Effective date

The effective date shall be upon all completed signatures.

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] 32-846, Eskom Operating Regulations for High Voltage System (ORHVS)

[2] 240-47172520 TRMSCAAC6, The Standard for The Construction of Overhead Powerlines

2.2.2 Informative

[1] Electricity Regulation Act of 2006

[2] Environment Conservation Act of 1989

[3] ISO 14001 Environmental management systems

[4] ISO 45001 Occupational Health & Safety Management System

[5] ISO 9001 Quality Management Systems

[6] National Environmental Management Act of 1998

[7] Occupational Health and Safety Act of 1993

2.3 Definitions

Term	Definition
Insulator	A substance or device which does not readily conduct electricity
Tracking Resistance	The ability of an insulating material to resist the formation of conductive pathways (tracks) on its surface due to electrical stress, moisture, and contamination
Thermal Endurance	A material's ability to withstand degradation from high temperatures over time
UV-Resistant	The ability of a material that can withstand damage from ultraviolet (UV) light, primarily from the sun

2.4 Abbreviations

Abbreviation	Explanation
ASTM	American Society for Testing and Materials
hrs	hours
kV	Kilovolt
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineer
mm	millimetre
NTCSA	National Transmission Company South Africa
OEM	Original Equipment Manufacturer
XLPE	Crosslinked Polyethylene

2.5 Roles and Responsibilities

- It is the responsibility of the compiler to ensure that this document is authorised.

2.6 Process for Monitoring

Accountability for compliance with this document shall be the responsibility of NTCSA – Central Grid.

2.7 Related/Supporting Documents

N/A

3. Scope of Work

The scope of work is to supply and deliver 950 Insulator Bird Shields, with the following quantities:

- 750 Insulator Bird Shields for glass insulators, 350 for 120kn, 350 for 210kn, 25 for 300kn and 25 for 400kn.
- 200 Insulator Bird Shields for composite insulators, 100 for 16mm pin and 100 for 20mm pin.

4. Background

The performance of NTCSA's transmission line network has for many years been closely monitored and analysed, particularly with regards to the identification of the causes of power line faults in the network. For over two decades, considerable effort has been expended on reducing the number of flashovers caused by fires and bird related faults, these factors being two of the major causes. Birds predominantly cause flashovers on power lines in three ways:

- Bridging of the conductors-to-tower air-gap by the wings and body of the bird (applies mainly to lines of 132 kV and below).
- Pollution flashover caused by the pre-deposit of excrement on suspension insulators.
- Bridging of the tower-to-conductor air-gap by a streamer of excreta. The streamer is generally electrically conductive.

5. Motivation

Insulator Bird Shield devices have been installed, as part of an initial pilot study on the Hydra Ruigtevallei 275kV line. They have been installed on approximately 3-4 towers to understand their performance. The Insulator Bird Shield device when applied to suspension I-string insulators will allow for a reduction in pollution accumulation on the insulators and will also possibly lead to a reduction of streamer induced faults. Thus far the application on these devices on Hydra Ruightevallei 275kV line has shown some success in reducing faults on the identified towers.

6. Benefits to NTCSA

The Insulator Bird Shield is applied at the dead/grounded end of the insulators on a transmission line. They serve the purpose to prevent the bird excrement from bridging the gap between the tower and the live conductor and prevent the build-up of excrement accumulation on the insulator surfaces. Given that the majority of faults on transmission lines are attributed to birds, it is anticipated that the application of these Insulator Bird Shields will serve to reduce the number of faults caused by birds streamers and excrement build-up on the insulators.

7. Technical Specification

The required specification for the required Insulator Bird Shields is as indicated in Table 1, below:

Table 1: Specification for Insulator Bird Shields

Material type	Superior high-voltage outdoor materials to be used in shield Design – High temperature Crosslinked Polyethylene (XLPE) Robust
Size of shield	Diameter: 600mm Minimum Thickness: 2.5mm Height: 100mm
Arc and Flashover Withstand	Compliant to IEEE 1656-2010
Installation	Must be possible while insulators are in-service. Needs to be a fast and versatile installation.
Fit	Both glass & composite (polymeric) insulators
Thermal endurance	Product life prediction - Thermal index IEC 60216 / IEEE-98 Minimum 105°C for 20,000 hours Accelerated Ageing – ASTM-D2671 Minimum 150°C for 168hours
Component design	Two-piece shield design around the top of the insulator string, attached with plastic fasteners and nuts or press-studs.
Accelerated aging (168hours)	Tensile strength- minimum 17pa Elongation- minimum 25%
UV-resistant	Last 5000hrs (Compliant to ASTM G154)
Tracking and erosion resistance :	No tracking erosion to top surface or flame Compliant to ASTM-2303

KEY FEATURES:

- Easy to install on insulator and bushings
- Bolted or press-stud design for excellent mechanical hold and wind resistance
- Excellent insulator, prevent phase-to-ground flashovers
- Excellent tracking and erosion resistance - ability of a material to defend itself against contamination and leakage current, that combined with moisture, compromise its insulating properties over time
- Rugged, UV and chemical resistant polymer

8. Technical Evaluation Criteria - Insulator Bird Shield

The technical tenders received will be evaluated via a document evaluation (desktop assessment) process. The evaluation exercise will be performed by the appointed NTCSA technical team.

This initial part of the evaluation starts when submissions are opened and assessed for the first time. The submitted documents will be evaluated against the evaluation criteria as stated in this document. The evaluations are done to establish whether all the key tender deliverables are met.

An initial minimum total of 80% is required to pass the technical requirements for the technical evaluation criteria for insulator bird shields. Should the tenders received not reach the 80% threshold, the minimum threshold may be adjusted downwards to a minimum of 65%.

	Criteria	Scoring weight		Score
1	Provide Technical Brochure or Data Sheet of Insulator Bird Shield confirming the following: • Size of shield 600x2.5x100mm • Material type: High temperature XLPE • Component design: Two-piece shield design around the top of the insulator string, attached with plastic fasteners and nuts or press-studs. • Arc and Flashover Withstand: Compliant to IEEE 1656-2010 • UV-resistant: Last 5000hrs (Compliant to ASTM G154) • Tracking and erosion resistance: No tracking erosion to top surface or flame - Compliant to ASTM-2303	Technical information provided – not compatible with user specification	0	
		Technical information provided – partially compatible with user specification	25	
		Technical information provided – fully compatible with user specification	50	
2	Provide signed letter of commitment from original equipment manufacturer (OEM) to supply the quantities as requested in tender.	No letter provided	0	
		Letter of commitment provided from OEM but does not indicate OEM's commitment to manufacture require quantities.	10	

		Letter of commitment provided from OEM indicating commitment to manufacture require quantities.	25	
3	Provide a minimum of 1 year warrantee for insulator bird shields.	No warrantee provided	0	
		Warrantee provided (Minimum of 1year)	25	
Total score				

Pricing Schedule

Item	Description	Quantity	Unit Price	Total Price
1	Supply and delivery of insulator Bird Shield for 120kn glass insulators	350		
2	Supply and delivery of insulator Bird Shield for 210kn glass insulators	350		
3	Supply and delivery of insulator Bird Shield for 300kn glass insulators	25		
4	Supply and delivery of insulator Bird Shield for 400kn glass insulators	25		
5	Supply and delivery of insulator Bird Shield for 16mm pin composite insulators	100		
9	Supply and delivery of insulator Bird Shield for 20mm pin composite insulators	100		
Total (excluding vat)				

9. Acceptance

This document has been seen and accepted by:

Name	Designation
Mbali Nyalunga	Lines & Servitudes Manager
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10. Revisions

Date	Rev.	Compiler	Remarks
July 2025	01	A. Hassen	Document creation

11. Development Team

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

- Abduraghman Hassen

12. Acknowledgements

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