

# **Insulator Bird Shield**

**Date: 10 November 2023**

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### 1) Background

The performance of Eskom's transmission line network has for many years been closely monitored and analysed, particularly as regards 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 effects, these factors being two of the major causes. Birds 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.

### 2) Motivation

Bird shield devices have been installed, as part of an initial pilot study on the Hydra Ruigtevallei line. They have been installed on approximately 3-4 towers to understand their performance. The 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. Thusfar the application on the Hydra line has shown some success on the applied towers.

### 3) Benefits to Eskom

The 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 from excrement accumulation on the insulator surfaces. Given that that majority of faults on transmission lines are attributed to birds, it is anticipated that the application of these birds guards, as part of a pilot project, will serve to reduce the number of faults caused by birds streamers and excrement build up on the insulators.

### 4) Scope of work

- Supply and deliver of Insulator Bird Shield.

### 5) Technical Specification

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 ceramic (porcelain and ceramic) & 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

## 6) Technical Evaluation Criteria - Insulator Bird Shield

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

A minimum total of 80% is required to pass the technical requirements for the technical evaluation criteria for insulator bird shields.

	Criteria	Scoring weight		Score
1	Provide Technical Brochure or Data Sheet of Insulator Bird Shield confirming the following: <ul style="list-style-type: none"> <li>• Size of shield 600x2.5x100mm</li> <li>• Material type: High temperature XLPE</li> <li>• Component design: Two-piece shield design around the top of the insulator string, attached with plastic fasteners and nuts or press-studs.</li> <li>• Arc and Flashover Withstand: Compliant to IEEE 1656-2010</li> <li>• UV-resistant: Last 5000hrs (Compliant to ASTM G154)</li> <li>• Tracking and erosion resistance: No tracking erosion to top surface or flame - Compliant to ASTM-2303</li> </ul>	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 <b><i>does not</i></b> 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				

## Supply & Delivery Insulator Bird Shield

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### 7) Pricing Schedule

Item	Description	Quantity	Unit Price	Total Price
1	Supply and delivery of insulator Bird Shield.	1500		
Total (excluding vat)				

Complied by:



N Mahatho  
Snr Consultant

Date: 10/11/2023

Accepted by:



Bertram Jordaan  
Middle Manager – Test Facilities

Date: 14/11/2023