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Title: **Small Portable Drones for Visual Iinspection Specification**

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## REVISION CONTROL

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## TABLE OF CONTENTS

**PAGE**

## 1. INTRODUCTION

Eskom, like many other utilities, conducts a routine inspection to identify defects that could lead to line failures, of which some could be catastrophic. The inspections are carried out by ground patrol inspectors and by means of a manned helicopter with inspectors on-board. The ground inspectors are trained to identify defects on lines using binoculars and cameras, and identified line defects are manually recorded in a logbook. The ground (conventional) inspections are not adequate because there is no aerial visual of structure, and climbing to view structure at the top could be unsafe and a time-consuming exercise. This inherently led to the adoption of manned helicopters fitted with enhanced camera systems, increasing the amount of transmission line inspections and proving to be more efficient and accurate than ground inspections; however they are still constrained due to aerial inspection resources limitations. The lack of adequate inspections could results in line failures that should have been avoided.

The Remotely Piloted Aircraft System (RPAS), known as drone has enabled many opportunities in power utilities to improve efficiency in performing daily tasks. The RPAS-based solution will increase situational awareness of Eskom assets, which will assist decision makers in their analysis and strategies, ultimately leading to better and informed decisions. The RPAS Should complement helicopters, by being utilized for all operations spanning up to 5km, where helicopter flights are prohibited and also for tasks such as tower assessments, tower fault investigations and constructions site evaluations where helicopters use will be costly. The use of RPAS can potentially decrease inspection operating costs.

## 2. SUPPORTING CLAUSES

### 2.1. Scope

This document contains the technical specifications required for a small portable drone with an accessory list to be supplied.

### 2.2. Purpose

The purpose of this document is to define the technical requirements as well as the technical evaluation criteria for a small portable drone used for visual inspections.

### 2.3. Definitions

| Definition | Description |
|---|---|
| Omnidirectional | receiving signals from or transmitting in all directions |
| Portable | able to be easily carried or moved |

### 2.4. Abbreviations

| Definition | Description |
|---|---|
| RPAS | Remote Piloted Aircraft System |
| kg | kilogram |
| cmos | Complementary metal-oxide semiconductor |
| MP | Megapixel |
| km | kilometer |
| m/s | meter per second |
| ˚C | Degrees Celsius |
| GPS | Global Positioning System |

## 3. TECHNICAL REQUIREMENTS

This section details the specific requirements for a small portable drone to be supplied with a list of standard accessories (supplied as standard with every drone) as well as additional accessories required for spares or additional functionality per drone.

### 3.1. Specifications

- Small portable drone weighing less than 1kg
- Camera capabilities:
    - Sensor 4/3 cmos
    - Single shot, burst shooting and timed modes with a 20MP photo capability
    - 4k video resolution
    - 4x zoom
- Omnidirectional obstacle avoidance technology
- A minimum transmission range of 10km
- GPS tracking system

- A minimum flight time of 40 minutes
- Capable of resisting a wind speed of 12 m/s
- Operating temperature of -10 ˚C to 40 ˚C

### 3.2. List of standard accessories

- Smart Controller
- Set of batteries for monitor, flying unit and controller
- Battery charger
- Power cable
- Set of propellers
- If required for the the controller a remote control cable with lightning, micro-USB as well as Type-C connector
- Communication Cable with USB 3.0 Type-C Connector
- USB Adapter
- Large RC Cable Slider
- Small RC Cable Slider

### 3.3. Additional accessories

- 6x Intelligent Flight Battery
- Multi-battery charger (at least 4 charge ports)
- A set of spare control sticks
- USB adapter
- 4x set of propellers
- 2x 128GB microSD card
- Protection and carry case

## 4. TECHNICAL EVAULATION CRITERIA

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. A minimum total of **80%** is required to pass the technical requirements.

| | Criteria | Score Weight | Score |
|---|---|---|---|
| 1 | Proof of Brochure that include the following specification: | | |
| | Small portable drone (Weight of less 1kg) | 10 | |
| | Camera: 4/3 CMOS, Effective pixels: 20 MP | 10 | |
| | Video resolution of 4k, Digital zoom of 4x | 10 | |
| | Minimum flight time of 40 min | 5 | |
| | Minimum wind resistance of 12 m/s | 5 | |
| | Obstacle avoidance technology | 5 | |
| | Minimum transmission range of 10 km | 5 | |
| | GPS Tracking device which can be mounted on the drone | 10 | |
| 2 | Proof of after sale support (signed letter from accredited supplier) | 20 | |
| 3 | Proof that all accessories will be supplied as requested | 20 | |