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Department	Security Services
Specifications and Scope of Work	Necsa Remote Piloted Aircraft System (RPAS)
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APPROVAL & DISTRIBUTION

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ABBREVIATIONS

SACAA	South Africa Civil Aviation Authority
NECSA	Nuclear Energy Cooperation of South Africa
RPAS	Remote Piloted Aircraft System
HD	High Definition
SABS	South African Bereu of Standards
OHSA	Occupational Health and Safety
NEA	Nuclear Energy Act
PPS	Physical Protection System
SSD	Security Services department
EXCO	Executive Committee
SAS	Secondary Station Alarm
CAS	Central Alarm Station
GBIC	Giga Bit Interface Convertor
IP	Internet Protocol
SHEQ	Safety Health and Quality
KM	Kilometer
M/S	Meters per Second
RPM	Revs per Minute
GHZ	Giga Hertz
HDD	Hard Drive
RAM	Random Access Memory
QYT	Quality
ITT	Invitation To Tender
ROC	Remote Operating Certificate
RPL	Remote Piloted License
ASL	Air Service License
RLA	RPAS letter of Approval
ROM	SACAA Approved RPAS operating Manual
SSA	State Security Agency

1. INTRODUCTION

Necsa is a state owned company and its mandate under the Nuclear Energy Act (NEA) includes undertaking and promoting research and development in the field of nuclear energy and radiation sciences and technology and, subject to the Safeguards Agreement, to make these generally available. **In line with section29 of NEA, the act provides that the** installations, sites, premises and land belonging to or under the control of Necsa are restricted areas. Therefore Necsa may make any arrangements it considers reasonably necessary for the proper protection of the site.

2. PURPOSE AND BACKGROUND

NECSA EXCO has mandated Necsa Security Services Department (SSD) to oversee the implementation of the RPAS at Necsa Pelindaba site. These security upgrades are aimed at aligning the Necsa Physical Protection System (PPS) with international standards and norms pertaining to nuclear facilities. The upgrades shall reinforce the aerial view surveillance security at the Necsa site. Necsa airspace is a no fly zone and it is paramount that the airspace is protected, and any unauthorized aircrafts on the Necsa airspace should be detected and reported to the Civil Aviation Authority (CAA). The Contractor shall commit to works specified herein for the RPAS implementation. These works shall include the supply, installation and commissioning as per Necsa requirements, manufacturer's guidelines, statutory requirements (e.g. OHSA/SABS 0142) and best practises. This specification stipulates all the requirements that the Contractor shall meet in order to provide a fit for purpose turnkey solution. This shall include the specification of equipment to be supplied, installation practices and adherence to the design, system commissioning and Sit Acceptance Test.

3. CURRENT INFRASTRUCTURE

Necsa has two alarm stations, Central Alarm Station (CAS) and Secondary Alarm Station (SAS) where all intrusion alarms and camera videos are monitored. Necsa security system runs on two platforms, the surveillance platform **(Dvtel Latitude version 7.0/Plugin Version 3.2.1.1 System)** and intrusion detection system **(Gallagher version 7.40).** Network communication is through fibre mode. Where more clarification is sought by the contractor in terms of the existing infrastructure, the contractor shall notify the Security System Manager. The Contractor shall not be permitted to upgrade any software or hardware out of

this scope on the current infrastructure without written permission from the Security System Manager.

4. SUPPLY, INSTALLATION REQUIREMENTS AND SCOPE OF WORK

4.1 Backbone requirements

The Contractor shall supply and install communication data link able to transmit and receive video signals over a distance radius of 6 km, datalink shall be capable of streaming live or real time video images back to the security control room. The RPAS video signals shall be monitored through the existing Necsa Flir/Dvtel surveillance system or shall be monitored on the application able to generate alarms. The system shall have video analytics and all alarms shall be streamed to the existing Necsa alarm station (**cardax / Gallagher 7.40**) or on a separate system able to generate video analytics alarms, or similar integration. The fibre distribution network switch located in the main security server room is capable of streaming data at 10Gbps and can be used to integrate the RPAS base station, and stream RPAS video images back to the security control room, and monitored on the FLIR VMS or similar VMS supplied by the Contractor. The re-configuration of network switches and security server shall not be permitted unless authorised in writing by the technical competent authority (Security Systems Manager), Contractor shall only be allowed to add configuration of RPAS system on the existing setup. The Contractor shall supply all equipment and devices including interface devices (GBIC), computer desktop, monitors, and control units necessary to integrate the new infrastructure into the existing infrastructure

4.2 Surveillance Cameras

The RPAS shall be equipped with two cameras a HD day/night camera with zooming capabilities and thermal camera with video analytics. The performance of the camera in terms of frame rates , picture quality etc. are not specified in this document but the quality of the picture shall form part of the scoring during selection process (refer to selection criteria appendix in the ITT).The cameras shall be able to stream live or real-time videos the entire flight duration and thermal shall have analytics or something similar that shall be able to send alarms back to the control room once have detected objects or people in the unauthorized areas. All RPAS cameras shall be water proof and be able to operate under extreme weather conditions.

4.3 Remote Piloted Aircraft System (RPAS)

The RPAS must be a robust with high endurance and multi rotor system with fly time of sixty (40) minutes or more.

The RPAS shall be:

- Able to fly under extreme weather in the rain, heat over 30 °C and high wind speed
- Able to fly at minimum operational altitude of 120 m and more above ground
- Able to accomplish forward speed of 18 m/s vertical speed or more
- Able to detect any from obstacle during fly mode to avoid crashing (anti crash detection system) and activate land safe or return home same
- Battery operated (No liquid fuel operated RPAS shall be permitted)
- Able to fly autonomously which includes landing and take off
- Necsa has a weather stations at its premises which is able to detect wind speed and direction therefore weather advisory shall be given before mission is launched.

5. ADDITIONAL REQUIREMENTS

The Contractor shall include in a quote, Necsa induction and access card fee:

- Induction Cost R 450.00 per person
- Access card R 100.00 per person

	Description
SHEQ Induction	All Contractor staff that shall be performing works on site shall be SHEQ inducted. This shall be arranged with the project manager prior to the start of the project
Work Permit	The Contractor shall be granted a work permit by the facility manager or site engineer prior to the commencement of daily works
Safety File	The Contractor shall have a safety file approved by the Necsa SHEQ representative. In addition the Contractor shall have a safety officer.
INS 0800	The INS 0800 process shall be initiated and completed by the Necsa representative.
Company Screening	A positive company screening is required in order to perform any works. The security vetting office shall be furnished with all director/company owner identity documents and any other particulars they would require in order to do a company screening.
Individual	The Contractor shall undergo Necsa security. Failure to obtain

screening	positive security clearance the personnel shall not be permitted to work at Necsa site. Recent and valid foreign individuals' documentation shall be submitted as this process takes time.
Non-Disclosure Agreement	The Contractor shall complete and commit to non-disclosure of project information to any third party or any information about Necsa acquired during the project. Also the Contractor shall provide a signed letter with tender returnable stating that no parts with capability of transmitting information other than the NECSA transmit and receive data link. NECSA shall send the RPAS to the South African State Security Agency (SSA) for further wireless transmitting parts tests, only the specified wireless transmitting parts in the specification shall be accepted.

6. TRAINING AND HANDOVER

The contractor shall provide the following:

- Training for Necsa technical personnel on operation, troubleshooting, system set up and maintenance
- Training of eleven (8) RPAS Pilots for RPL accreditation
- Training of 4 safety officers and 2 quality managers as required by SACAA
- The handover document shall be one bound copy (hard copy) and one soft copy and shall compose of the as built one line drawings ,RPAS ,cameras specifications, warrantee , guarantee certificates , operating manuals and all other necessary information needed
- Signed declaration that supplier does not have any capabilities of connecting to the RPAS by other means out of from NECSA security control room. The devices shall be sent to the South African State Security Agency for further test of any unauthorized wireless remote connections able to grant access to the RPAS outside NECSA control room. Only specified wireless and radio devices shall be permitted
- The ROC certificates

7. OUT OF SCOPE

The contractor shall not be responsible for any electrical works.

The contractor shall not be responsible for the allocation of IP addresses and configuration of network switches. The contractor shall provide a table of devices requiring an IP address.

8. WARRANTY PERIOD

The contractor shall provide a three years warranty period on the RPAS. In addition all workmanship provided for by the contractor shall be for one year warranty. Any equipment that is found to be faulty or defective and not because of human error or any act of God shall be swapped out within five (5) business days.

9. MATERIAL SPECIFICATIONS AND BILL OF QUANTITY

Material	Qty	Specification
RPAS Physical Characteristics	2	▪ Malty Rotor System ▪ Minimum of 40 minutes or more fly time ▪ 18 m/s or more vertical speed ▪ With anti-crash detection avoidance module ▪ Drop Safe Parachute or go home safe parachute ▪ Go home automatic module in an event of data link loss, radio connection loss, low battery levels, technical fault etc. ▪ GPS ,Wi-Fi tracker or something similar to recover the RPAS when land safe in activated ▪ Telemetry modules Gimbal system ▪ Wind tolerance and radio Antennas ▪ 40 minutes or more flying time ▪ On-board Video Memory card slot capabilities ▪ Battery pack
Ground Station and Tablet Computer	1	▪ Tablet Computer integrated to the ground station for programing autonomous flight paths and wave points within given parameters ▪ HDMI and USB connection Ground Station capability ▪ Ground Station camera output shall be able to be integrated to FLIR VMS by an IP (able to be discovered by an IP address) so the video signals can be viewed from FLIR application ▪ Ground Station shall be able to be connected to any current network switch so the video images can be retained in the video storage archivers and also so they

		can be able to communicate with the application servers and client computer. ▪ Ground station shall integrate with computers and servers running Windows Server 2008 OS, Client Windows 2007 OS
Client Desktop (Pilot Remote Operator Machine)	1	▪ Processor Dual Core @ 2.4 GHZ (i5-i70 Intel processor ▪ RAM 8 Gb ▪ HDD 320 Gb ▪ 64bit / 5400 RPM ▪ Microsoft Windows 2007 (Necsa have multi licence agreement with Microsoft and shall provide the licence)
Monitor (Pilot Remote Operating Monitor)	2	▪ 17" Monitor ▪ Mounting control room desks brackets ▪ Splitter for two (2) monitors ▪ Key Board and mouse
Optical zoom camera	2	▪ IR Camera ▪ Ultra-Wide Angle HD camera ▪ High Resolution and Zooming Capabilities ▪ Capture images and/or videos ▪ Performance shall be tested during compulsory site demonstrations
Thermal imaging camera	2	▪ Full thermal support ▪ Capture images and/or videos ▪ With video analytics or something similar for detection of people in unauthorized areas whilst on mission ▪ Frame Rates and Pixel performance shall be tested during compulsory onsite demonstrations
Digital Data Link	1	▪ Able to transmit radio signals over radius of 6 km ▪ Antenna and antenna tracker ▪ NECSA has a radio communication licence with ICASA and the implementation of the RPAS shall be facilitated under the same licence agreement. The Contractor shall assist NECSA with all necessary licence applications
Blades – for spare parts	4	▪ RPAS blades

Landing gear – for spare parts	2	▪ RPAS landing gear
Batteries – for spare parts	4	▪ Battery pack
Pilots Training	8	▪ SACAA Licensed Pilot Certification Training (RPL), Training shall include safety management and quality system
Contractor Pilot		▪ Onsite Contractor Pilot (SACAA Accredited) with at least reasonable flying hours as per industry standards and must be able to fly the RPAS competently. The pilot shall be onsite for period of two (2) weeks after handover to shadow NECSA trained pilots. They will be helping them to operate RPAS efficiently and safely on their own without supervision. The pilot shall be onsite for at least 8 hours per day, on other days they shall be requested to work or shadow at night (after 9 pm). All scenarios shall be taught during this period.
Maintenance SLA	-	▪ One (1) year maintenance SLA once warrantee period has lapsed. This is for general RPAS onsite inspection and refresher maintenance training, second line servicing and crash repair. ▪ Initial onsite maintenance training is for four (4) security technicians , and shall be included in a quote
SACAA compliance	-	▪ Contractor shall assist Necsa with all SACAA compliance for RPAS i.e. ROC registration with department of transport, RPAS registration with SACAA, RPL (RPAS Licence of Approval) , ROM (SACAA Approved RPAS Operating Manual for by-annual audits and other binding compliance requirements ▪ And all applicable regulations
Project Management	-	▪ Project management for successful RPAS implementation and operation ▪ System Operation Procedure (SOP) ▪ Maintenance procedures ▪ All this info must be included in the Level 5 Microsoft schedule as stipulated in the selection criteria appendix in the ITT

NB: Contractor shall price according to the line items stipulated in the above table, if anything/any line is omitted from the above table, then total price shall be dimmed incomplete and the bid shall not be meeting the hurdle requirements to go on to second round of evaluation. Therefore the bid shall be disqualified.

10. CONCLUSION

Any further questions shall be addressed in writing to the SCM Department, Buyani Nsibande 012 305 6072. All questions shall be send before three (3) days of tender close and questions received after then shall be deemed late and not be answered. The response for all questions shall be to all Contractors regardless who posed the question.