An overview of South African RPAS regulations

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Abstract

The purpose of this paper is to introduce the reader to the newly promulgated RPAS regulations which came into effect on 1 July 2015 by giving a broad overview of the regulations, the type of operations, restrictions and the application process to be followed.

Keywords

RPAS, drone, regulations, application process, SACAA, licensing

Introduction

Remotely piloted aircraft systems (RPAS) also popularly referred to as “drones” were flown in South African skies as early as 1994 during the country’s first democratic elections when it was used by the South African military for peace keeping missions and surveillance of areas where potential violent uprisings were expected.

In recent years, due to its military deployment in for instance Afghanistan, the term “drone” conjures up images of deadly air strikes and as such this fledgling industry refers the term RPAS. The term was also adopted internationally by the International Civil Aviation Organization (ICAO) and henceforth this term shall be used by all contracting states, which includes South Africa.

Civil applications of RPAS focus on the three “Ds” – dull, dirty or dangerous missions across industries such as mining, construction, agriculture, land management, security and law enforcement. Dull missions would include repetitive aerial data acquisition or repetitive inspections of an asset. Dirty missions refer to the inspection of radioactive areas or areas where hazardous material has been spilled. Dangerous missions refer to disaster response, security surveillance or law enforcement missions.

In South Africa, as is the case in most other parts of the world, the RPAS industry attracted a lot of interest and further uses for the systems were identified taking into account the country’s unique socio-economic challenges. Due to this increased interest in RPAS technology there was an urgent need for legislation that would regulate the industry and ensure safe RPAS operations in order to take advantage of this booming industry on a national level.

The South African Civil Aviation Authority (SACAA) has a mandate to regulate civil aviation activities in order to ensure acceptable levels of aviation safety and security within South Africa and among operators, this mandate includes the safety of persons and property on the ground. From September 2014 the SACAA consulted with various industry stakeholders to draft the country’s RPAS regulations. Numerous meetings at committee and technical workgroup levels were held which led to the drafting of the proposed regulations written with South Africa’s unique operating conditions and requirements in mind which were published for public comment in the Government Gazette in December 2014. Numerous comments were received and considered during further technical workgroup meetings and minor changes were adopted whereafter the final draft was forwarded to the Minister of Transport for approval.

On 17 May 2015, the Director of Civil Aviation, Poppy Khoza made a statement confirming that the draft RPAS regulations had been signed and that the regulations would come into effect on 1 July 2015.

Overview of RPAS regulations

With the promulgation of SA-CAR Part 101, potential RPAS operators are expected to operate safely and responsibly and through their company specific operations manual and related documents will need to convince the SACAA that they are able to do so. The RPA pilot as a new entrant to aviation will undergo thorough training to be familiarised with existing aviation rules and regulations in addition to RPAS specific theory and practical training.
Types of operations

Restricted visual line of sight (R-VLOS)

Restricted visual line of sight (R-VLOS) means an operation within 500 m of the RPA pilot and below the height of the highest obstacle within 300 m of the RPA, in which the remote pilot maintains direct unaided visual contact with the remotely piloted aircraft to manage its flight and meet separation and collision avoidance responsibilities;

Visual line of sight (VLOS)

Visual line of sight (VLOS) means an operation below 400 ft (120 m) above ground level in which the remote pilot maintains direct and unaided visual contact with the remotely piloted aircraft at a distance not exceeding 500 m from the pilot.

Extended visual line of sight (E-VLOS)

Extended visual line of sight (E-VLOS) means an operation below 400 ft (120 m) above ground level in which an observer maintains direct and unaided visual contact with the remotely piloted aircraft at a distance not exceeding 1000 m from the pilot.

Beyond visual line of sight (B-VLOS)

Beyond visual line of sight (B-VLOS) means an operation in which the remote pilot cannot maintain direct unaided visual contact with the remotely piloted aircraft to manage its flight and to meet separation and collision avoidance responsibilities visually.

Operations in controlled airspace

Controlled airspace means airspace of defined dimensions within which an air traffic control service is provided to pilots (including RPA pilots) in accordance with the airspace classification as prescribed in civil aviation regulations.

Operations at night

Night operations means the period from 15 minutes after sunset to 15 minutes before sunrise, sunset and sunrise being as given in the publication *Times of sunrise, sunset and local apparent noon of the South African Astronomical Observatory* or a similar publication issued by a recognised astronomical observatory.

Selected sections from the RPAS regulations

General provisions

- The draft regulations apply to commercial, corporate, non-profit and private operations.
- The current draft applies to remotely piloted aircraft that weigh less than 20 kg (Phase 1).
- Third Party Insurance - an ROC holder shall at all times be insured adequately for third party liability.

RPA approval and registration

- Each RPA to be operated will require an RPA Letter of Approval as well as a Certificate of Registration issued by the Director of Civil Aviation.
- Each RPA will be issued with a unique registration mark which shall be affixed to the particular RPA.

Personnel licensing

No person shall operate an RPA unless such person is in possession of a valid Remote Pilot License (RPL). A Remote Pilot License may be issued for the following categories:

- **RPL (A):** Aeroplane Remote Pilot Licence.
- **RPL (H):** Helicopter Remote Pilot Licence.
- **RPL (MR):** Multirotor Remote Pilot Licence.
The following ratings may be endorsed on the licence:
- *VLOS*: Visual line of sight operations.
- *E-VLOS*: Extended visual line of sight operations.
- *B-VLOS*: Beyond visual line of sight operations.

The candidate RPA pilot need to meet the following requirements for the issue of an RPL:
- Not be less than 18 years of age.
- Submit a self-declared medical assessment report or Class 4 medical certificate for B-VLOS operations.
- Hold a restricted Certificate of Proficiency in radiotelephony (restricted radio licence).
- Pass an English proficiency test (Level 4).
- Have completed flight training.
- Passed the theoretical knowledge examination.
- Passed the skill test (practical flying test).

An RPL is valid to the last day of the 24th month from the date of issue. Thereafter, a revalidation check will be required to renew the RPL.

**RPAS operator certificate (ROC)**

- No person shall operate an RPAS unless such person is the holder of a valid ROC including the operations specifications attached to it.
- For commercial operations, there is an additional requirement to hold an Air Services Licence issued in terms of the Air Services Licensing Act, 1990 (Act No. 115 of 1990).
- Each ROC applicant shall develop for approval by the SACAA, an operations manual containing all information required to demonstrate how such operator will ensure compliance with the regulations and how safety standards will be applied and achieved during such operations.
- The ROC holder shall take specified security steps to safeguard the RPA from acts of unlawful interference and shall also conduct background checks on all personnel recruited for RPAS operations.

**RPAS operations**

- *Weather conditions*: RPAS shall be operated in weather conditions that allow unobstructed visual contact to be maintained with the RPA by other airspace users and the operator unless in B-VLOS and Night operations specifically approved by the SACAA.
- *Landing on roads*: A public road may not be used for landing or taking-off of an RPA except when involved in civil defence and law-enforcement operations approved by the SACAA.
- *Controlled airspace*: No operations in controlled airspace except as specifically approved by the SACAA subject to compliance with specified conditions.

**General restrictions**

No person shall operate an RPA unless they have in their possession:
- A valid RPA pilot license.
- Copy of the ROC and associated OpSpec.
- Certificate of Registration for each RPA in operations.
- Copy of the RPA Letter of Approval.
- User manual for the RPA and remote pilot station.

No RPA shall:
- Be flown in formation or swarm
- Be flown adjacent to or above a nuclear power plant, prison, police station, crime scene, court of law, national key point or strategic installation

Unless specifically approved by the SACAA, no RPA shall be operated:
- Above 400 ft above the surface.
- Within a radius of 10 km from an aerodrome.
- Within restricted or prohibited airspace.
Beyond visual line of sight: Specific approval may be obtained from SACAA for B-VLOS operations but only in visual meteorological conditions and for operations below 400 ft above ground level unless otherwise approved.

Night operations: Specific approval may be obtained from SACAA for night operations.

Operations in the vicinity of people: No RPAS operations directly overhead any person or group of people or within a lateral distance of 50 m from any person unless specifically by the SACAA or unless such person is under the direction of the RPAS operator or forms part of the operations of the RPA.

Operations in the vicinity of property, structures and buildings: No RPA shall be flown within a lateral distance of 50 m from any structure or building unless:
- Specifically approved by the SACAA.
- Permission is obtained from the owner.
- The safety of all persons on the ground accessing such building or in the vicinity of such structure have been ensured.

Operations in the vicinity of public roads: No RPA may be operated over a public road, along the length of such road or at a distance of less than 50 m from a public road unless:
- Specifically approved by the SACAA.
- For operations over a public road, such road has been closed for public use.
- Reasonable care has been taken to ensure the safety of road users and pedestrians in the event of loss of control of the RPA.

Radio communication procedures: No RPA shall be operated unless the RPA pilot has a functioning air-band radio in his possession, tuned to the frequency applicable to the air traffic unit controlling such area or airspace or to aircraft in such area or airspace:
- The RPA pilot shall make the required radio calls indicating the altitude, location and intended operation of the RPA in that area and at such intervals as are required in order to ensure adequate separation from other aircraft is maintained.
- For approved operations in controlled airspace, the RPA pilot shall maintain radio contact with the relevant air traffic unit and acknowledge and execute such instructions as the air traffic unit may give at any time during operation of the RPA.

Flight operations: The RPAS shall be operated in such a way that appropriate separation from other aircraft is maintained and that adequate obstacle clearance is ensured during all phases of flight. With regard to the type of operation, the size of the RPA, the RPA’s performance and external factors, the RPA pilot shall ensure that:
- The take-off and landing area is safe and of the appropriate dimensions.
- Free from obstacles.
- Has adequate surface conditions.

Right of way – an RPA shall give way to manned aircraft.

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<th>Certificate</th>
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<tr>
<td>Air Service License (ASL)</td>
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<td>RPAS Operator Certificate (ROC)</td>
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<td>RPA Letter of Approval (RLA)</td>
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<td>RPA Certificate of Registration (CoR)</td>
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<td>Remote Pilot License (RPL)</td>
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*Table 1: Summary of required certificates and licences for RPAS operations.*
Maintenance

Continued system maintenance: An RPAS shall be compliant with the manufacturer’s instructions for continued equipment maintenance through actions or inspections.

RPAS maintenance: Maintenance on an RPA or any component thereof shall be carried out by the following persons:

- RPA classified Class 2 or lower (RPA weighing less than 20 kg, operated below 400 ft) – maintenance performed by the ROC holder provided the holder can demonstrate its ability to perform the required maintenance.
- RPA classified as Class 3 and higher (RPA weighing less than 150 kg, operated above 400 ft) – maintenance performed by the holder of a valid RPAS Maintenance Technician authorisation.

SACAA application process

The regulations draw a distinction between commercial, corporate and non-profit RPAS operations. Please refer to Table 1.

A commercial operation is defined as an operation conducted for business purposes (mapping, security surveillance, anti-poaching, aerial application etc.) for remuneration or hire.

A corporate operation is defined as a non-commercial operation or use of RPAS by an entity for professional or aerial work as an aid to the conduct of their business.

Application process

A commercial RPAS operator will follow a dual application process by submitting applications to the South African Civil Aviation Authority (SACAA) as well as the Air Services Licensing Council (ASLC) respectively. The application to the Air Services Licensing Council focuses on the financial capacity of the applicant and the applicant’s ability to ensure a safe and reliable air service.

On the SACAA website at www.caa.co.za/Pages/RPAS/RPAS%20operators%20certificate.aspx [1] the following five phase application process is described:

Phase 1

The applicant submits a “Letter of Intent” to the SACAA (FOD) Flight Operations Department. An inspector will then be allocated to the applicant, and will guide the applicant on the following steps:

- The applicant will have to have a meeting with the SACAA where the applicant will be guided on the whole Five Phase Process and the applicant will be given the “Application for RPAS Operations Approval” form. Depending on the application, this meeting may, at the discretion of the inspector, be conducted via telephone and/or email correspondence.
- The applicant will be guided on the next phase which is applying at the Air Services Licensing Council.
- The applicant will have to approach the Air Services Licensing Council, which resides at the Department of Transport, for the application of the Air Service License.
- The applicant needs a Class III license, Category A4 and type of operations approved for G16, G4 or as applicable to the operation.

Phase 2

- Once the applicant has received the applicable license from the Air Service Licensing Council, the applicant needs to submit a formal application, including the “Application for RPAS Operations Approval” form.
- Once received and reviewed by the SACAA, the applicant will be invited to attend a formal application meeting with the relevant personnel at SACAA. Depending on the application, the formal meeting may, at the discretion of the inspector, be conducted via telephone and/or email correspondence.
- The purpose of this meeting is to discuss the application process and resolve any omissions and/or discrepancies and to answer any questions from either party. This meeting shall encourage open communication and an effective working relationship between both parties.
- The applicant will be notified in writing whether the formal application has been rejected or accepted. If the formal application is rejected, a full explanation will be provided to the applicant.

Phase 3

- Once the formal application has been accepted, the applicant will need to submit all the required manuals to the CAA for approval.
The CAA will complete a thorough review of the manuals.
If a manual is incomplete or deficient, or if non-compliance with the regulation or safe operating procedures is detected, the manual will be returned for corrective action.
If the manuals are satisfactory, they will be approved or accepted as required by the regulations.
A fully completed Statement of Compliance must be included within the manuals submitted.

**Phase 4**

After approval or acceptance has been given to all the required documentation, the applicant will enter the “Demonstration and inspection phase”. In this phase, the applicant will need to demonstrate their ability to comply with regulations, the company operations manual and safe operating practices. The demonstration and inspection phase includes onsite evaluations of all policies, procedures, methods and instructions as described by the regulation and operations manual.

**Phase 5**

After the document compliance and demonstration and inspection phase has been completed satisfactorily, the application will be issued with an RPAS Operating Certificate (ROC) as well as the Operational Specifications (Ops Spec).

- The Ops Spec will contain authorisations, limitations and provisions applicable to the operation.
- The certificate holder is responsible for continued compliance with the regulations, authorisations, limitations and provisions of its certificate and operational specifications.
- The CAA is responsible for conducting periodic inspections of the operator’s operation to ensure continued compliance with the regulations and safe operating procedures.

As part of the application made to SACAA, the proposed RPAS operator shall also apply for the following:

- Certificate of Registration for each remotely piloted aircraft to be operated.
- RPAS Letter of Approval (RLA) for each remotely piloted aircraft to be operated.
- Each remote pilot shall apply for the approval of a Remote Pilot License once the required theoretical examination and practical skill test have been passed.

**Advantages of having a regulated industry**

The approval of RPAS legislation comes at a time when our country is facing serious social and economic challenges which could be addressed by the RPAS industry if it is allowed to operate as soon as possible.

Rhino poaching lies close to all of our hearts – how many rhinos will be saved in the future by allowing RPAS surveillance flights to protect our natural heritage? How many human lives could potentially be saved by giving anti-poaching units the information they need to arrest poachers without putting their own lives at danger?

For mining operations, surveyors performing GPS ground surveys can be removed from the hazardous open pit environment and can measure stockpiles from a safe distance.

RPAS is a very effective tool for security surveillance – the “eye in the sky” can now curb cable theft which has a crippling effect on our economy.

In an age where the population is exploding and farm lands are decreasing, food security is vital for our survival. Farmers are required to farm intensively and more productively and RPAS technology can now easily assist them with this important task.

In other parts of the world, RPAS technology has been welcomed with open arms and the RPAS industry is set to become the next multi-billion dollar industry. Governments across the globe have realised the economic growth and employment opportunities that the RPAS industry hold and we can now proudly add South Africa to that growing list. In light of the economic growth opportunities already acknowledged by these states, our own country should soon be able to reap the rewards offered by the RPAS industry.

**References**


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