ORGANISATION: Remove Before Flight Club

MANUAL TITLE: REMOTELY PILOTED AIRCRAFT SYSTEM OPERATIONS MANUAL

REVISION: Original

EFFECTIVE DATE: 01 August 2014
PART 1: GENERAL

1. ADMINISTRATION AND CONTROL

Company Information

REMOVE BEFORE FLIGHT CLUB

Registration Number:

VAT Number:

P.O. Box

Hanger No:

Airport

Tel:
Positions, Duties and Contact Details:

Chief Executive Officer (CEO):
Telephone:  
Email:  

Managing Director (MD),
Telephone:  
Email:  

Aviation Safety and Security
Telephone:  
Email:  

Operations and Training
Telephone:  
Email:  

Responsible Aircrafts and Search and Rescue:
Telephone:  
Email:  


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Commitment of Accountable Manager

This Operations Manual describes the organisation, aircraft systems, personnel, flight operations and procedures by which Remove Before Flight Club carries out its RPAS operations.

It is accepted that the contents of this document do not override the necessity of reviewing and complying appropriately with any new or amended regulation published from time to time by the Director SACAA.

Signed

Date: 01 August 2014

Chief Executive Officer
(Remove Before Flight Club, Operations, Legislation, Quality and Safety)

All personnel employed or contracted by this organization must sign this sheet manually or digitally as evidence of having read, understood and agreed to apply the procedures and data contained in this Operations Manual.

If this Manual is reissued or revised they must re-sign, acknowledging review of the revision.

Remove Before Flight Club will be responsible for the revisions and changes to the Operations Manual. This will be done electronically. One hard copy will be kept with the Company and one with the SACAA. The rest will be emailed to all personnel.

Once certified by the SACAA, all personnel will receive updated revisions from the Company via PDF format. These revisions will be fully incorporated throughout the entire OM.

All crew are to delete the previous revision and immediately download the new revision. Once this has been done a reply stating “Revision 01 OM deleted and Revision 02 OM now current” must be sent. This will be electronically accepted by Remove Before Flight Club as a signature that the revision has been received and updated by the specific personnel. This will be kept on hard copy and electronic record by Remove Before Flight Club.

If Remove Before Flight Club does not receive the above reply within 7 days, the personnel concerned will be phoned to confirm that the revision has been incorporated. If not it will be done by the last working day of the same week that the phone call was made. Disciplinary action will be taken will be taken if two phone calls to the same person are made for the same revision.
A list of effective pages will present each page of the OM and reveal the revision and effective date of the revision. The contents of the revisions will be printed in BLUE font throughout the OM to highlight the new changes. When the next revision is released the blue font will revert to black.

The header of each revised OM will show the latest revision and release date on each page.

The distribution list below will be kept updated at all times by Remove Before Flight Club.

B. Definitions and Acronyms

Definitions:

This chapter provides an alphabetical reference to many of the definitions and abbreviations that are used throughout the Operations Manual.

Throughout the Operations Manual the following definitions apply:

- Shall or Must means that application of the criteria is mandatory
- Should means that application of the criteria is recommended
- May means that application of the criteria is optional

Abnormal

Operations under conditions which are neither Normal nor Emergency operations.

Accident

An occurrence associated with the operation of an RPAS, which takes place between the time any person signs for the RPAS with the intention of flight until such time as such persons have returned it in which:

- A person is fatally or seriously injured as a result of direct contact with any part of the RPAS, including parts which have become detached from the RPAS, or
- The RPAS sustains damage or structural failure which adversely affects the structural strength, performance or flight characteristics of the RPAS and would normally require major repair or replacement of the affected component.

Autonomous Unmanned Aircraft

An unmanned aircraft that does not allow intervention in the management of the flight.

Autonomous Operation

An operation during which an unmanned aircraft is operating without intervention in the management of the flight.

Approach
A manoeuvre to position the RPAS at a designated safety altitude at a point above the intended landing area.

**Background Check**

The checking of a person’s identity and previous experience, including any criminal history as part of the assessment of an individual’s suitability to implement a security control and/or for unescorted access to a security restricted area.

**Base Turn**

A turn executed by the RPAS during the initial approach between the end of the outbound track and the beginning of the intermediate or final approach track. The tracks are not reciprocal. The turns may be designated as being made in level flight or while descending.

**Beyond Visual Line-of-sight**

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.

**Bomb Threat or Hoax**

Is a warning given by an anonymous informant pretending knowledge that a dangerous device, such as a bomb, has been or is about to be placed on or near an RPAS.

**Ceiling**

The height above the ground or water of the base of the lowest layer of cloud below 6 000 metres (20 000 feet) covering more than half the sky.

**Civil Aircraft**

Any aircraft registered in an ICAO Contracting State.

**Clearance Limit**

The point and altitude to which an RPAS has received an ATC clearance.

**Command and Control Link**

The data link between the remotely-Piloted aircraft and the remote Pilot station for the purposes of managing the flight.

**Communication link**

A digital or analogue data link to transfer voice or data between the remote crew, air traffic control, airspace users and other data users.

**Contamination**

Anything that adheres to the RPAS surfaces.
Co Pilot

The Co Pilot is responsible for assisting the Pilot in all duties, specifically safety related duties. Remove Before Flight Club does not employ observers. Fully trained Pilots will assume the observer duties as Co Pilot.

Corporate Operation

A non-commercial operation or use of RPAS by an entity for professional or aerial work as an aid to the conduct of business of that entity.

Critical Phases of Flight

This is defined as from engine start to above Safety Altitude for take off and Safety Altitude to engine shut down after landing. Communications and surrounding activities and noises should be kept to a minimum to allow maximum focus and concentration by all crew.

Damage

Substantial damage is defined as damage or failure which adversely affects the structural strength, performance, or flight characteristics of the RPAS, and which would normally require major repair or replacement of the affected component.

Designated Operator

Is a qualified Remove Before Flight Club Pilot who has completed the required Remove Before Flight Club training and qualifications and has been assigned to fly as the Pilot.

Down-link

The direct or indirect communication link from the RPAS.

Emergency

It is a condition which affects safety in such a way that continuation of a flight is seriously endangered. Emergencies shall be handled according to the policies and procedures in this manual, subject to the demands of the situation.

Emergency Operations

Operations under conditions which represent a serious and imminent threat to the safety of the RPAS, people and property in close proximity.

Error

Slip - an error in which a correct intent is inadvertently carried out incorrectly.
Lapse - an error in which the correct action is inadvertently not carried out.
Mistake - an error in which the judgement process is deficient.
Extended Visual Line-of-sight

An operation below 400 ft AGL in which an Co Pilot maintains direct and unaided visual contact with the remotely Piloted aircraft at a distance not exceeding 1 000 m from the Pilot.

Extended Visual Line-of-sight Operation

An operation below 400 ft AGL, in which an RPAS Co Pilot assists in the direct unaided visual contact with the RPAS, in order to facilitate separation and collision avoidance requirements.

Height

RPAS height measured above ground level immediately below it.

Incident

An occurrence, other than an accident, associated with the operation of an RPAS, which affects or could affect the safety of operation.

Injury – Fatal

Any injury that results in death within 30 days of the accident.

Injury – Serious

Serious injury is defined as any injury that is sustained by a person in an accident and which:

- requires hospitalisation for more than 48 hours, commencing within 7 days from the date the injury was received, or results in a fracture of any bone, (except simple fracture of fingers, toes, or nose), or
- causes severe haemorrhages, nerve, muscle, or tendon damage, or
- involves any internal organ, or
- involves second or third degree burns, or any burns affecting more than 5% of the body surface.

Malfunction

Is a condition which might create or contribute to an irregular operation of a flight not directly endangering flight safety? Typical malfunctions are covered by regulations in the relevant Company instructions.

Observer

A trained and competent person designated by the operator who, by visual observation of the remotely Piloted aircraft, assists the remote Pilot in the safe conduct of the flight.
Remove before Flight Club an Observer role will be carried out by a fully qualified Pilot which will be named the Co Pilot.

**Operator**

A person, organisation or enterprise engaged in or offering to engage in RPAS operation.

**Operations Manual**

Is the Remotely Piloted Aircraft System operations manual as prescribed in the Part 101 CATs and CARs.

**Payload**

Includes all elements of an RPAS that are not necessary for flight but that are carried for the purpose of fulfilling specific mission objectives.

**Pilot**

The Pilot designated by the operator as being in command and charged with the safe conduct of a flight. However all sorties will be flown in a shared manner by all qualified Pilots on site. Pilot / Co Pilot flying duties should be alternated between the crew throughout the mission.

**Pilot In Command**

In the case of 2 pilots Remove before Flight Club will usually nominate the more senior pilot who will assume overall responsibility of the operation as a whole.

**Radio Line-of-sight**

Means a direct electronic point-to-point contact between a transmitter and receiver.

**Remote Pilot**

Means the person who manipulates the flight controls or manages the flight command instructions of a remotely-piloted aircraft during flight time.

**Remote Pilot Station**

The station at which the remote Pilot manages the flight of the remotely Piloted aircraft.

**Remotely Piloted Aircraft**

An unmanned aircraft which is piloted from a remote Pilot station, excluding model aircraft and toy aircraft.

**Remotely Piloted Aircraft System**
A set of configurable elements consisting of a remotely Piloted aircraft, its associated remote Pilot station(s), the required command and control links and any other system elements as may be required at any point during flight operation.

**Restricted Visual Line-of-sight**

An operation within 500m of the RPAS Pilot and below the height of the highest obstacle within 300m of the RPAS, 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.

**RPAS Category**

RPAS classification according to maximum take-off mass.

**Sabotage**

- Is an act or deliberate omission, intended to cause malicious or wanton destruction of property, endangering or resulting in unlawful interference with civil aviation and its facilities.

**Safety Altitude**

Maintaining a prescribed minimum terrain clearance and to avoid wind turbulence in mountainous areas.

**Security**

Is the term used in conjunction with legislation, regulations, programmes, staff, equipment, devices, measures and procedures required to safeguard the assets of an organisation. It is used in reference to all aspects of protecting international civil aviation against unlawful acts and interference.

**Sterile Environment**

The area 50m from the take off or landing location must be cleared of people, animals and objects or any other item which could distract the crew from their duties during the take off and landing phase of flight (Critical Phase of Flight).

**Training Flights**

Are flights under the jurisdiction of the Flight Training Manager and are required for:

- qualifying/re-qualifying RPAS Pilots.
- supervising the abilities of Pilots under normal and abnormal conditions (Site Checks).
- Pilot Proficiency Checks.

**Visibility**
It is the ability as determined by atmospheric conditions, and expressed in units of distance, to see and identify prominent unlighted objects by day and prominent lighted objects by night.

**Ground visibility**
The visibility at an aerodrome as reported by an accredited observer.

**Visual Line-of-sight**
An operation below 400ft AGL in which the remote Pilot maintains direct and unaided visual contact with the remotely Piloted aircraft at a distance not exceeding 500 m.

**Acronyms:**

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<td>RFM</td>
<td>RPAS Flight Manual</td>
</tr>
<tr>
<td>METAR</td>
<td>Meteorological Aerodrome Report</td>
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<td>MR</td>
<td>Mission Report</td>
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<tr>
<td>NAA</td>
<td>Notification of Authorised Amendment</td>
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<td>NFCR</td>
<td>Non Fatal Crash</td>
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<td>NOTOC</td>
<td>Notice to Crew</td>
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<td>NOTAM</td>
<td>Notice to Airmen</td>
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<td>NPA</td>
<td>Notification of Proposed Amendment</td>
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<td>MTOM</td>
<td>Maximum Take-off Mass</td>
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<td>OAT</td>
<td>Outside Air Temperature</td>
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<td>OEC</td>
<td>Operational Emergency Clearance</td>
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<td>OM</td>
<td>Operations Manual</td>
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<td>PTO</td>
<td>Permission To Operate</td>
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<td>PED</td>
<td>Portable Electronic Device</td>
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<td>PF</td>
<td>Pilot Flying</td>
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<td>PIC</td>
<td>Pilot In Command</td>
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<td>PNF</td>
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<td>Pilot Proficiency Check</td>
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<td>PTL</td>
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<td>RLOS</td>
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<td>RMT</td>
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<td>RPAS Co Pilot</td>
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<td>RPAS</td>
<td>Remotely Piloted Aircraft</td>
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<td>Remotely Piloted Aircraft System</td>
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<td>Remote Viewing Terminal</td>
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<td>RWY</td>
<td>Runway</td>
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<td>SACAA</td>
<td>South African Aviation Authority</td>
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<td>TQC2</td>
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<td>UAS</td>
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<td>VTOL</td>
<td>Vertical Take-off and Landing</td>
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C. Compliance

It is the Pilot’s responsibility to ensure that the RPAS under his command is operated within the law of the country he is operating in. Remove Before Flight Club RPAS’ shall be operated according to the laws of the Republic of South Africa.

When Remove Before Flight Club RPAS’ are operated in countries other than the Republic of South Africa, Pilots must comply with the laws regulations and procedures of those States. It is Remove Before Flight Club’s policy that the more restrictive of either State Law or Operations Manual policy shall be adhered to.

No person shall operate an RPAS in a careless or reckless manner so as to endanger the life or property of another. Careless or reckless operation may result in enforcement or other legal action against the person committing the act.

The Remove Before Flight Club Operations Manual is to be read and understood by all personnel. All rules, procedures and statements must be strictly followed by all personnel. All amendments received must be immediately read and understood and receipt thereof acknowledged through signature or e-signature.

2. ORGANIZATION AND OPERATIONAL CONTROL

a. Organizational Structure and Organogram

```
Chief Executive Officer

Operations and Training  Aviation Safety and Security  Aircraft and Search and Rescue  Business Development

Aerial Survey  Aerial Photography  Oil and Gas  Mining  Agriculture  Security & Surveillance Manager  Search & Rescue Manager

Chief Pilot

Team 1
```
b. Organizational Responsibilities

Responsibilities and Duties of the Managing Director (MD)

The Managing Director is responsible for the safe, efficient operation of Remove Before Flight Club RPAS within the regulatory requirements. He will be accountable for all Remove Before Flight Club Operations.

This is achieved by:

- establishing a departmental strategy to meet current and future growth.
- the selection of suitable and properly qualified personnel to be recruited for RPAS Operators and other specialised duties within the Remove Before Flight Club.
- the setting of career development paths for employees.
- the calculation, submission, and control of the Remove Before Flight Club budget.
- ensuring that there are sufficient RPAS Operators to fly the planned schedule, in the most effective and efficient manner.
- the development, implementation, and maintenance of appropriate systems within Remove Before Flight Club departments to ensure:
  * efficient use of the Company resources.
  * adequate operations planning and briefing.
  * provision of site information and performance data to RPAS Operators.
- effective management of RPAS Operators to promote corporate needs and objectives, and for development of a well-briefed and highly motivated workforce.
- the dissemination of information concerning safety, security and operational matters.
- the administration and discipline of all Remove Before Flight Club personnel.
- representing the Company in all matters pertaining to Operations with legal authorities within and outside the RSA, with other companies and with RPAS manufacturers.
- liaison with other partner Companies.
- monitoring the investigation of accidents, incidents and occurrences and the development of recommendations arising there from.

Responsibilities and Duties of the Chief Executive Officer (CEO)

The Chief Executive Officer is responsible for leading the development and execution of the Company’s long-term strategy with a view to creating shareholder value. The CEO’s
leadership role also entails being ultimately responsible for all day-to-day management decisions and for implementing the Company’s long and short term plans.

The CEO acts as a direct liaison between the Board and management of the Company and communicates to the Board on behalf of management. The CEO also communicates on behalf of the Company to shareholders, employees, Government authorities, other stakeholders and the public.

More specifically, the duties and responsibilities of the CEO include the following:

- to lead, in conjunction with the Board, the development of the Company’s strategy.
- to lead and oversee the implementation of the Company’s long and short term plans in accordance with its strategy.
- to ensure the Company is appropriately organized and staffed and to have the authority to hire and terminate staff as necessary to enable it to achieve the approved strategy.
- to ensure that expenditures of the Company are within the authorized annual budget of the Company.
- to assess the principal risks of the Company and to ensure that these risks are being monitored and managed.
- to ensure effective internal controls and management information systems are in place.
- to ensure that the Company has appropriate systems to enable it to conduct its activities both lawfully and ethically.
- to ensure that the Company maintains high standards of corporate citizenship and social responsibility wherever it does business.
- to act as a liaison between management and the Board.
- to communicate effectively with shareholders, employees, Government authorities, other stakeholders and the public.
- to keep abreast of all material undertakings and activities of the Company and all material external factors affecting the Company and to ensure that processes and systems are in place and to ensure that the CEO and management of the Company are adequately informed.
- to ensure that the Directors are properly informed and that sufficient information is provided to the Board to enable the Directors to form appropriate judgments
- to ensure the integrity of all public disclosure by the Company.
- in concert with the Chairman, to develop Board agendas to request that special meetings of the Board be called when appropriate.
- in concert with the Chairman, to determine the date, time and location of the annual meeting of shareholders and to develop the agenda for the meeting.
- to sit on committees of the Board where appropriate as determined by the Board; and
- to abide by specific internally established control systems and authorities, to lead by personal example and encourage all employees to conduct their activities in accordance with all applicable laws and the Company’s standards and policies, including its environmental, safety and health policies.

Duties and Responsibilities of Flight Operations Manager (FOM)

The FOM will report to the MD and CEO.
The Flight Operations Manager (FOM) shall, in addition to other specified duties, shall be responsible:

- to nominate, and delegate authority to a deputy in his absence, and brief as appropriate.
- to ensure that best industry practices are implemented in his section.
- to ensure that all RPAS Operators holding positions described in this manual shall remain current with RPAS operations.
- to be responsible for the documentation and upkeep of the procedures under his control.
- to carry out any other duties, as required by the Managing Director or CEO.
- to manage and ensure effective use of all resources under his control.
- to manage and ensure efficient use of all team members.
- to maintain close working relationships with clients, other alliance businesses.
- to ensure the career development and progression of his staff.
- to ensure efficient operation of Remove Before Flight Club RPAS’s within the regulatory requirements.
- to ensure that the development and maintenance of Operations policy to achieve high standards of Flight Safety, RPAS Operator Training, Technical Support, RPAS Operations, Quality, and Regulatory Compliance.
- to establish a strategy to meet current and future growth.
- for the selection of suitable personnel to be recruited for RPAS flight crew and other specialised duties within the department.
- for ensuring that there are sufficient RPAS Operators to fly the planned missions, in the most effective and efficient manner.
- for the development, implementation, and maintenance of appropriate systems to ensure:
  * efficient use of the Company resources allocated to him.
  * adequate operations planning and briefing.
  * provision of site information, meteorology and airspace data to crew.
- for effective management of RPAS Operators to promote Company needs and objectives, and for development of a well-briefed and highly motivated workforce.
- for the dissemination of information concerning safety, security and operational matters.
- for the administration and discipline of all Company personnel.
- for representing the Company in all matters pertaining to Operations with legal authorities within and outside South Africa, with other companies and with aircraft manufacturers.
- for monitoring the investigation of accidents, incidents and occurrences and the development of recommendations arising there from.
- for the provision of specialist technical expertise and information for the development of Standard Operating Procedures and Operations Policy.
- for all technical matters such as RPAS maintenance inspections, servicing and carriage of sufficient spare parts.
- for the management of the requirements of current and future RPAS’s and systems.
- for maintenance of Flight Operations Electronic manuals and documentation.
- to be responsible for all related Quality Assurance matters
- to conduct risk assessment of new and ongoing operations as appropriate.
to be responsible for all Safety matters and conduct any Flight Safety Investigations should they be required.

Duties and Responsibilities of the RPAS Training Manager (RTM)

The RTM is responsible for RPAS Operator Training. The RTM reports to the MD and CEO.

The duties and responsibilities of this position include, to:

- set and advise on Training Policy.
- plan the Flight Training budget to ensure the provision of cost effective training.
- set and appraise Training Standards.
- produce the training plan in collaboration with the MD.
- provide the required training resources.
- select and train the required training staff.
- manage the required training facilities and resources.
- provide technical and flight training to the specified standard.
- provide non-technical and development programmes for RPAS Operators.
- provide third-party training to external customers.
- give advice on RPAS Operator qualification and experience requirements.
- manage training records.
- manage courses and Pilot currencies.
- manage pilot medicals.
- provide Pilot performance feedback.
- liaise with the SACAA on training issues.
- follow the procedure of keeping all company manuals updated and to ensure all relevant staff possess updated manuals.
- to make sure the Company data base is constantly updated
- lead safety investigations and boards of enquiry.

Duties and Responsibilities of the Quality Assurance and Safety Manager

The function of the Quality Manager is to monitor compliance with, and the adequacy of procedures required to ensure airworthy RPAS and safe operational practices.

Remove Before Flight Club has nominated one Quality Manager for Maintenance and for Operations.

The primary role of Quality Assurance and Safety Manager is to verify, by monitoring activities in Flight Operations and Crew Training, that the standards required by the SACAA and any additional requirements of Remove Before Flight Club are being maintained under the supervision of the CEO and MD.
Quality Assurance and Safety Manager is responsible for ensuring that the Flight Operations Quality Assurance Programme is properly established, implemented and maintained.

Duties and Responsibilities of Chief RPAS Pilot (CRP)

The Chief RPAS Operator reports to the FOM.

The duties and responsibilities of this position include, to:

- ensure the safe and efficient operation of the fleet.
- be responsible for the well being and safety of all RPAS Aircraft.
- monitor and report on all aspects of flight and ground safety related to RPAS operating within Remove Before Flight Club.
- always be current on all duties as an RPAS Operator.
- plan Pilot career development.
- conduct field investigations if required.
- ensure Operator discipline, and conduct disciplinary activities.
- ensure and encourage good communication with all Operators.
- provide feedback to Operators.
- be responsible for Operator welfare.
- manage the seniority list.
- have SOPs approved by FOM
- monitor and ensure Operator performance.
- monitor and ensure Operator standards.
- produce Operator rosters on a weekly basis a week in advance.
- ensure roster workload is evenly and fairly distributed amongst Operators.
- monitor and manage leave allocation.
- conduct regular meetings with Operators to provide suggested updates for Operational policies and give feedback.
- analyse returned Field reports and to update the Site and Airspace Information Guide.
- establish and maintain operational contingency plans to cover irregular operations.
- work in close liaison with the FOM on all matters.
- assist in safety investigations and boards of enquiry.

Duties and Responsibilities of the RPAS Pilot in Command (PIC)

For each operation a PIC will be designated, this person will be directly responsible for the operation of the UAS and the safety of the operation. It will be the responsibility of the PIC to ensure the operation complies with applicable regulations and/or ensures professional “best practice” to all applicable regulations. The PIC is expected to carry out all Co Pilot duties when required. In normal circumstances the PIC, in addition shall be responsible for:
supervising the operation of the day.

- ensuring that the Co Pilot is aware of his responsibilities by giving a concise briefing.
- ensuring that all required paperwork is completed such as Pilot, Co Pilot and RPAS flying hours, battery log etc.
- ensuring that the On-Site Assessment form is completed correctly.
- ensuring that the aircraft is only operated within the stated limitations for that particular aircraft and airspace.
- ensuring all commercial work is completed within the limitations stated on the permission for aerial work document.
- ensuring that the aircraft used is airworthy.
- strictly utilizing the specific RPAS checklist for all operations.
- ensuring that the welfare of the crew or others are not compromised by any of the planned operations.
- ensuring that all crew are of sound body and mind to operate the aircraft.
- ensuring the camera is operational. (Fully charged, empty memory card fitted, lens clean).
- ensuring that the camera is securely mounted.
- ensuring that the camera is switched on and operating correctly before activation of the aircraft.
- ensuring that the camera is switched off and images saved after the aircraft is made safe.
- ensure that the camera is rotated to the stored position for take-off and landing procedures.
- ensuring operational safety. It is every crew member’s responsibility to alert the Pilot or Co Pilot to any changing situation which may cause threat to any aircraft, property or person present.
- communication with the client to establish and reconfirm the required task.
- all safety related matters pertaining to the operation.

Both Pilots are to support each other in which ever way to share the workload

**Duties and Responsibilities of RPAS Co Pilot**

The Co Pilot will be trained as a fully qualified RPAS pilot. He will assume all flying duties as a Pilot. In addition the Co Pilot is responsible to visually maintain contact with the RPAS and scan the area for undetected aircraft or obstacles. The Co Pilot will also handle the communications between the PIC, external crew, air safety officer and the platform safety officer. The Co Pilot also being a certified and a current RPAS operator and will assume control of the UAS should the PIC become incapacitated. In addition the CP shall:

- ensure the RPAS Pilot is aware of all relevant developing situations.
- maintain constant visual look out for public, animal and aircraft encroachments.
- inform the Pilot of any weather changes seen or expected.
- ensure the position of the UAS is known at all times.
• keep the Pilot updated with battery status.
• complete all required admin related duties on site.
• carry out any other duties delegated to him by management or the RPAS PIC

Both Pilots are to support each other in which ever way to share the workload

c. Responsibilities of Support Personnel

Support Personnel (if utilized) will be compliant in all rules and regulation pertaining to the Remove Before Flight Club Operations Manual and SACAA regulations. They will be familiar with Pilot Operations, use of medical aid kits, handheld fire extinguishers and offer their full support at all times.

They will be utilized in the “Cordon Procedure” which will entail securing the flying area in a densely populated area. They will cordon off the flying area plus 100 meters outside the flying area.

d. RPAS Technical Description and Intended Use

The contents of this Operations Manual are to provide generic policies and procedures to cover all RPAS types without being specific. For Specific technical information refer to the specific RPAS type Flight Manual (RFM).

Remove Before Flight Club will not be utilizing helicopters for any of its operations.

A general overview of Remove Before Flight Club RPAS types and intended uses are as follows:

• **Aeryon Sky Ranger:**

  A Quad-rotor battery powered RPAS with a VTOL capability. It is fitted with a HD camera and has a zoom capability. Intended uses will be to take high definition photographs and videos for surveillance, surveying and inspection purposes. It is semi autonomous and has an endurance of approximately 50 minutes.

  It will be utilized at Oil and Gas infrastructures, agricultural land, forests, search and rescue purposes, rhino poaching, wind turbine structures, land surveying, building and structural inspections, electric pylon inspections, pipeline inspections, mine surveys and air pollution analysis.

• **DJI Inspire 1:**

  A Quad-rotor battery powered RPAS with a VTOL capability. It is fitted with a HD camera and no zoom capability. Intended uses will be to take high
definition photographs and videos for surveillance, surveying and inspection purposes. It is manually flown and has an endurance of 50 minutes.

It will be utilized at Oil and Gas infrastructures, agricultural land, forests, search and rescue purposes, rhino poaching, wind turbine structures, land surveying, building and structural inspections, electric pylon inspections, pipeline inspections, mine surveys and air pollution analysis.

e. **Scope Of Operation**

The RPAS owned by Remove Before Flight Club will generally cover the following operations:

- inspections of Oil and Gas flare stacks and pipelines
- Agricultural Land assessments
- Forest fire monitoring and damage assessment
- Search and Rescue operations over land or water masses
- Anti-rhinoceros, and other endangered animal, poaching operations
- Wind Turbine structure evaluations
- Land Surveys
- Building and Concrete Structure inspections
- Electric Pylon inspections
- Mine surveys
- Air Pollution analysis

f. **Operating Limitations and SACAA Regulatory Considerations**

Remove Before Flight Club will not allow any Pilot or Co Pilot to operate any RPAS unless the SACAR part 101 or SACATS 101 regulations for RVLOS operations are fully complied with. Remove Before Flight Club will operate RVLOS only until BVLOS and EVLOS certifications are granted by the Director SACAA. All RPAS’ will be operated within the limitations set out in their respective RFM’s.

The following VLOS and EVLOS operation limitations will be complied with. All RPAS’ must be operated:

- below 400 feet above ground level.
- only in VMC.
- only during daylight hours (30 minutes after sunrise and 30 minutes before sunset).
- further than 10km from any airfield.
- in uncontrolled airspace only unless otherwise certified by the SACAA.
- not in danger areas, restricted or prohibited airspace.
- not adjacent to or above a nuclear power plant, prison, police station, crime scene, court of law, national key point or strategic installation.
• at least 50 meters lateral distance away from any person or group of people, structure or building, or public roads.
• within the weather limitations documented in the relevant RFM.
• within any limitations set out in NOTAMs, NOTOCs and AICs’.

g. Supervision of Operation

The Operations Manager will ultimately manage and make all the necessary decisions with regard to global RPAS operations. The Chief Pilot will delegate each operation to a Pilot, Co Pilot and RPAS. He will be responsible for the operational crew currency and the RPAS certification. He will manage the security of the RPAS and will personally sign over each RPAS to the crew for each mission or missions. Once signed for, the Pilot in Command assumes full responsibility for the RPAS and the operation.

At any time the Pilot or Co Pilot are in doubt of any part of the operation assigned to them, they are to contact the Chief Pilot or any management for advice.

The Co Pilot is to assist the Pilot in all his duties. Remove Before Flight Club will only use qualified and current Pilots for Pilot and Observer duties. Remove Before Flight Club refers to the observer as a Co Pilot due to the qualification status.

In each operation with two pilots, the senior Pilot will be assigned as the overall pilot responsible and in charge.

The Pilot and Co Pilot will fly the RPAS mission for mission, flights must be alternated between the two. In this way currencies can be maintained. Who ever is the Pilot flying assumes full authority of the flight and all decisions relating to that flight. The Co Pilot (even if it is the Pilot in command at the time) will always assume an assistant role and will offer advice when necessary. Only in times of incapacitation of whatever sort will the pilot not flying take over control.

When the mission has been completed the Pilot will sign the RPAS back to the Chief Pilot and the Chief pilot will ensure the RPAS and all the accessories received are clean and free from any damage whatsoever before signing acceptance and storing it in the secure storage facility.

h. Accident Prevention and Flight Safety Programme

Persons responsible for Flight Safety will consist of the Managing Director, Head of Flight Operations, Training Manager, Chief Pilot and all Pilots.

Responsibilities:

a. Act as a source of expertise and advice.

b. Review the progress of incidents/accidents reported in the ASRs, and the actions taken.

c. Review the status of hazard/risk reports, and review the actions taken.
d. Make safety recommendations to address hazards.

e. Review internal/external audit reports.

f. Review and approve audit response and actions taken.

g. Encourage lateral thinking and creative solutions.

h. Help identify hazards and defences.

i. Prepare and submit reports to the MD for review

Purpose

The purpose of this section is to detail the items to be covered for the safe operation of RPAS by Remove Before Flight Club personnel. Reference should be made to the Remove Before Flight Club Safety Management System (SMS) which outlines the company safety goals and methods for achieving the safety vision.

Safety Policy and National Perspective:

Remove Before Flight Club adopts best industry practice to ensure that all of its flight operations using RPAS as previously detailed are carried out as safely as possible.

Within Remove Before Flight Club safety is our number one priority. This priority will shape the way business is performed, constantly striving to ensure every flight is operated safely and in a professional manner.

In support of Remove Before Flight Club commitment to make Safety the number one priority, we have adopted a Safety Management System (SMS), which will provide a formal process for safety management, from the front line employee to the CEO.

In order to achieve our goals we will set the standard as follows:

- **Safety**: improve safety by identifying, eliminating or mitigating any deficiencies in our operations.
- **Professionalism**: be professional and safe in our dealings with clients, customers, associates, staff and local communities.
- **Efficiency**: be efficient in achieving our tasks but not to the detriment of the safety of our clients, customers, associates, staff and local communities.

The safety management program aims to continually improve the safety of Remove Before Flight Club flight operations by identifying, eliminating or mitigating any deficiencies in conditions, policies and procedures, and by ensuring that all staff consider at all times the safety implications of their own actions, and those of their colleagues.

Remove Before Flight Club addresses operations worldwide and covers regulations, procedures and specific details concerning individual countries.
Safety Goals

It is the goal of Remove Before Flight Club to operate aircraft without harm, injury or damage to any persons or property. The Remove Before Flight Club Pilots will comply with all of the safety requirements and limitations of the Permission / Exemption for Aerial Work issued by the Director SACAA to Remove Before Flight Club.

Safety Objectives

The strategic safety goal of the company Safety Management System is to reduce the safety-risks to as low a level as reasonably practicable. In order to achieve this strategic goal the Remove Before Flight Club Safety Management System must be proactive, ongoing and fully integrated throughout the Company and all of its activities.

To achieve this, the following initiatives are important:

a. All Remove Before Flight Club employees will be involved in the company safety management system;
b. Employee awareness, compliance, inspection, investigation and education programs will be incorporated into all aspects of the operation;
c. All employees will endeavour to identify, report and eliminate hazardous conditions;
d. All reported hazardous events will be investigated to determine root cause;
e. All proposed new equipment acquisitions, facilities, operations and procedures will be reviewed with safety in mind; and
f. All employees will ensure that all applicable laws and regulations are complied with.

Safety Assurance

Remove Before Flight Club is committed to maintaining the highest standards of flight safety and aims to minimise harm to any persons or property by undertaking thorough risk assessment, site surveys, crew briefings and ensuring aircraft are in operational condition through regular inspection and maintenance regimes. By these processes Remove Before Flight Club assures safety at all times whilst carrying out flight operations. Safety and Quality Assurance audits will be carried out by the Safety and Quality Assurance officer on a quarterly basis.

Organisational and Safety Training

All Remove Before Flight Club crew members will undertake an organisational training course and must follow specific procedures set out in this Operations Manual. The training course will include a brief technical overview of the aircraft currently in service, limitations to be considered for operating, organisational procedures and emergency procedures. Any Remove Before Flight Club Pilot will hold the relevant, current qualification as stated in the qualification requirements section in order to operate the specific aircraft. Crew performance will be monitored, assessed and refresher training may be given if required. All incidents will be recorded, analysed and any findings will be fed back to the crew as training to form a basis of Continual Professional Development.
Refer to Operating Procedures Part 2 Section 1.c - Risk Management.

i. **Flight Crew Composition**

Refer to Duties and Responsibilities of the RPAS Pilot (RP) and Duties and Responsibilities of RPAS Co Pilot (CP) in Part 1 Section 2.b. "Organizational Responsibilities" of the OM.

It is Remove Before Flight Club’s policy not to employ or train observers. It is deemed far safer utilising two fully qualified pilots to carry out all mission operations. Observer related duties will be part of the Pilot training syllabus and all pilots will be trained in these duties.

Remove Before Flight Club will endeavour to use two pilots as a crew for all operations. If there is a shortage of Pilots for whatever reason, a mission will be analysed to determine the scope and hours required to carry out the mission. The Chief Pilot in liaison with the Operations Manager will decide whether the mission is suited to a one pilot operation, and the mission will be authorized by the Chief Pilot as such.

j. **Operation of Multiple RPAS**

Remove Before Flight Club Pilots are limited to fly a maximum of two different types of RPAS of either fixed wing or Multirotor. Remove Before Flight Club will not utilize Helicopters in any of its operations. A fixed wing Pilot may fly a Multirotor RPAS, however a Multirotor RPAS pilot may not fly a fixed wing RPAS unless he/she has completed the fixed wing Pilot course and passed the flight test. Remove Before Flight Club is currently only operating Multirotor RPAS’.

k. **Qualification Requirements**

**Initial requirements:**
- Be not less than 18 years of age.
- Must be a holder of a Restricted Radio Licence (minimum).
- Be medically fit in line with the Class requirement.
- Completed RPAS ground school.
- Successfully passed the SACAA theory examination.
- Undergo the required Flight Training through a SACAA certified RPAS Flight School.
- Successfully pass the SACAA flight test.
- Be a holder of a RPAS Pilot licence.

**Recencies:**

All Pilots will undergo an Annual Recurrent Training Programme a minimum of once a year.

Annual Recurrent Training Programme will consist of:

- Technical refresher course for each RPAS type rated on.
- Technical exam.
• Safety and Security.
• RPAS Accident / Incident Scenario Workshop.
• Crew Resources Management.
• Flight Training.
• Flight Test (SACAA conducted flight test every 2nd Year).

Currencies on multiple types:

Other than the annual currency training and flight tests which will be conducted on any of the Pilot RPAS types, the Pilots are required to fly each type of RPAS they are type rated on for at least 2 hours in any 3 consecutive months. If this requirement is not met and three months pass by without meeting these criteria, a recurrent course and flight test on that type must be carried out.

Annual Flight Tests on multiple types:
Remove Before Flight Club will endeavour to conduct annual flight tests on type rotational basis. This means if a pilot is rated on two types of RPAS he will have completed a flight test on each type over a period of two years.

I. Flight Crew Health and Safety

All Crew must take good care of themselves through fitness, quality sleep and a healthy eating regime. It is the responsibility of the individual to determine if they are in a physically and mentally fit condition to operate as part of the Flight Crew for Remove Before Flight Club.

Flight Crew must follow Remove Before Flight Club’s Health and Safety guidance programme, and:

- maintain their work area in a clean and tidy condition and free from any unnecessary risks.
- check before use that tools, equipment, safety devices and protective clothing are in good condition as specified, suitable for the task and purpose and are used in accordance with instructions and legal requirements.
- immediately report hazards to the Chief Pilot or senior member of staff, whilst taking appropriate steps to minimise the risk associated with the hazard.
- assist with undertaking risk assessments, including prior to undertaking a new mission or following a change to an existing area of work.
- to observe standards of dress consistent with safety and/or hygiene (this could preclude for example unsuitable footwear, items considered dangerous).
- to observe all the safety rules of the establishment and in particular the instructions of staff given in an emergency.
- to use and not wilfully misuse, neglect or interfere with items provided for their safety.

The person responsible for an establishment or work area is responsible for all health and safety matters relating to that establishment and work area, and for the initial investigation of all accidents and incidents occurring in the establishment or work area.
Site specific risk assessments will be carried out prior to work being carried out in the work area. When Crew enter their place of work they must observe the house rules of those premises to ensure not only their own health and safety, but that of others who may be affected by their actions.

The “Health and Safety Law Poster” must be displayed in all premises or leaflets distributed telling employees what they need to know about health and safety.

Young workers, trainees and students on work experience will be properly instructed, monitored and supervised. A specific risk assessment must be carried out for young people at work or on work experience. Information, instruction, training and supervision must be provided for all employees.

If an employee’s health deteriorates so that the standard of work required cannot be maintained the employee must refrain from duties and report to his/her immediate manager.

New employees, including any temporary or casual staff must be given induction training before they start work. Induction training will include emergency procedures (e.g. fire safety) and access to first aid. Managers will identify health and safety training needs for all employees and ensure they are adequately trained and have sufficient knowledge and skills to fulfil the duties allocated to them. Training records must be kept and monitored on a regular basis to identify training needs.

The person responsible for the establishment at the time of the accident or incident must ensure that all accidents, incidents, injuries (no matter how minor), near misses that occur to Crew will be reported using the Air Safety Report form (ASR). Each Crew will carry an ASR. Any Fatality, Major Injury or Reportable Dangerous Occurrences must be reported immediately to the Chief Pilot of Remove Before Flight Club. Any contractors or visitors on the premises or work site must be informed that if any accident/incident occurs on the premise or work site, it must be reported to Remove Before Flight Club’s management immediately.

Any incident which has the potential for injury, near miss or hazardous condition of the grounds, buildings, plant or equipment must be reported to Remove Before Flight Club’s management via the ASR.

All accident records must be kept for a minimum of 5 years.

Sufficient numbers of first aid boxes must be provided and a qualified First Aider or Appointed Person will take charge of the first aid requirements. One First Aid box will be supplied to each Crew.

All managers are responsible for monitoring the health and safety of activities under their control.

m. Documents and Record Keeping

Remove Before Flight Club Administration shall be responsible for maintaining a system to index, file and store all papers, documents, correspondence and information which may
be required for record purposes. The records organisation shall retain custody of all such material and shall release it to authorised persons under controlled conditions.

Material retained in Flight Operations records files comes from all flight operational activities as well as inputs from the SACAA, Remove Before Flight Club personnel and other organisations.

The maintenance of operational and crew records is the joint responsibility of Chief Pilot and Remove Before Flight Club Administration.

**Operational and Personnel Records:**

Remove Before Flight Club shall keep at its principal business office or at other places approved by the SACAA, and shall make available for inspection by the SACAA the following:

- Remove Before Flight Club Operating Certificate or authorization.
- Operations Specifications.
- A current list of the RPAS used or available for use in operations and the operations for which each is equipped.
- An individual record of each Pilot used in operations including the following information:
  - The full name of the Pilot.
  - The Pilot licence (by type and number) and ratings that the Pilot holds.
  - The Pilot’s aeronautical experience in sufficient detail to determine the Pilot’s qualifications to Pilot RPAS in operations under this Part.
  - The Pilot’s current duties and the date of the Pilot’s assignment to those duties.
  - The effective date and class of the medical certificate that the Pilot holds
  - The date and result of each of the initial and recurrent competency tests and proficiency and site checks required by this part and the type of RPAS flown during that test or check.
  - The crew member’s flight time, flight duty periods and rest periods in sufficient detail to determine compliance with the flight time limitations of this Part.
  - Any action taken concerning the Pilot’s release from employment for physical or professional disqualification.
  - The date of the completion of the initial phase and each recurrent phase of the training required by this section.

**Crew Qualification Change:** Any qualification changes affecting crew members must be internally notified to Administration by email, fax or other electronic means that may evolve. Upon notification of changes, Administration will amend the crew records database to ensure the system maintains a legal operation at all times.

**Retention of Records**

Remove Before Flight Club shall keep each record required by the above paragraphs for at least 5 years in a manner that ensures protection from damage, alteration and theft.
Approval Process for New Procedures

Flight Operations will have responsibility for managing, defining and changing Standard Operating Procedures. The Managing Director will have overall responsibility for the SOPs.

Changes to the SOPs will primarily be conducted through and co-ordinated by the Pilots and Chief Pilot. These will be presented to Training and Operations management who will have them signed off by the Managing Director. They will be certified by the SACAA before implementation.

In general, the manufacturer’s Operating Procedures will be adopted as the primary standard. These will be modified as necessary to reflect overall Company philosophy, with due consideration given to the SA Civil Aviation Regulations.

The manufacturer will be consulted when deemed necessary for proposed changes.

RFM revisions from the manufacturer are received by Remove Before Flight Club and have to be incorporated into company standard manuals within a two month period. Within this period they must be presented to the SACAA for prior approval.

Reports, Records & Forms General

There are many types of reports and forms used by the Company to cover various eventualities that may occur before, during or after flight (See Appendices section of the OM). Copies of pertinent forms and reports are stored in each RPAS Tablet. Hard copies will also be available to the operating crew in the form of a flight folder. These can be filled in manually but preferably electronically and sent to Remove Before Flight Club via email.

Those reports and forms that are relevant for all types of Company aircraft are described in this Section. The only one that will always be filled in on completion of the last flight of each day is the Mission Report.

The others are designed to explain various additional operational incidents or a divergence from normal procedures.

Completion and Filing of Reports & Forms – Responsibility

The Pilot in command is responsible for ensuring that all flight documents are completed according to the relevant instructions. Where his signature is required, he is accepting that the information is correct. If documentation is submitted to the company via email it will be considered that the Pilot in command has signed the form/report.

Reports and forms are to be kept in a place accessible to authorised persons only. All forms are to be kept confidential in the trip folder and handed to Remove Before Flight Club admin on return from site.

Flight documents must be kept on file at Remove Before Flight Club Admin for a period of not less than 5 years.
Pilot logbook

The holder of a RPL and Co Pilot must maintain in a Pilot logbook a record of all his/her flight time, simulation time and instruction time. Where electronic logbooks are used, the electronic data must be printed on paper at least every 90 days and the printed pages filed sequentially in a binder.

Remove Before Flight Club utilizes electronic logbooks. These must be kept up to date on a daily basis. On the first Monday of every month an up to date copy of the Pilot/Co Pilot logbook must be emailed to the Managing Director.

The Pilot and Co Pilot must retain all Pilot logbooks for at least 60 months from the date that person no longer holds a valid Pilot licence. The holder of an RPL must make the logbook available for inspection upon a reasonable request by an authorised officer, inspector or authorised person.

Mission Report (MR)

The Mission Report is to be filled in on a daily basis at the end of the last flight of the day by the RPAS Pilot. This report will include items such as:

- Flying times, day and night.
- Weather at launch.
- Battery usage.

In the feedback section items below should always be considered:

- Delays in arrival or departure from site.
- Any special duties performed by the crew.
- Training flight validation.
- Any new observations of the site operated on irregularities or anomalies which could adversely effect the Company’s operation or reputation.
- Comments or recommendations to improve the Company’s operation or reputation.
- Any other matter the Pilot feels warrants a formal report.

Air Safety Report (ASR)

Flight Crew are expected to submit an Air Safety Report in an expeditious manner after any relevant event.

Air safety incidents (operational or non-operational) must be reported to the Managing Director, using the ASR forms provided in each flight folder.

Detailed instructions for filing an ASR are shown on the ASR form itself, and should be followed by all relevant members of staff.
The ASR shall include as much relevant and useful information as possible, including:

- Flight description.
- Mission number.
- Date.
- Time.
- Pilot’s name.
- Number of people involved.
- Site location.
- Type of RPAS and registration.
- RPAS component malfunction.
- Weather conditions.
- Closest Airport.
- Take off / Landing area conditions.
- Runway conditions if applicable.
- A description of the occurrence.
- Emergency equipment used.
- Personal injury.

When it is relevant, the comments and details of bystanders should be included on the ASR.

Any member of staff may submit an ASR at any time, if they believe that air safety has been compromised or if they have information which may enhance air safety.

- However, **Pilots must submit an ASR** when:
  * A system defect occurs, which adversely affects the handling characteristics of the RPAS or renders it unfit to fly
  * Loss of communication between base station and RPAS
  * When there is fire or smoke
  * Any emergency situation arises
  * Safety equipment or procedures are defective or inadequate
  * Deficiencies occur in any operating procedures or manuals
  * Batteries are not charged normally
  * Incorrect configuration where the RPAS has to return to base
  * Ground damage occurs
  * Ground incident occurs; involving a vehicle (the registration/ID number of the vehicle is to be included)
  * Significant handling difficulties are experienced
  * A navigation error occurs, involving a significant deviation from the intended track
  * A height control error of more than 10ft occurs
  * Communications fail or are impaired
  * Whenever the requirements for a stabilised approach are not met
  * A heavy landing
  * Significant turbulence or wind shear or other severe weather is encountered (including lightning strikes)
  * Visual contact with RPAS is lost
* Crew are seriously ill, injured or become incapacitated.
* There is difficulty in controlling violent armed or intoxicated bystanders
* Bomb threat or Hi Jack
* Security procedures are breached
* A bird strike or other foreign object damage occurs
* The RPAS does not land at the programmed original destination for any reason

**Accident and Incident Record**

The Accident and Incident Record is primarily for Remove Before Flight Club to monitor the safety of its operation. Information from this record will also be presented to the SACAA periodically.

The information will be derived from the ASR throughout the month. This record will be updated on a monthly basis.

**RPAS Pilot Competency Record**

All Pilot information such as hours, currency dates and logbook checks are documented on this form. This form will be filed in Remove Before Flight Club’s personal files and used for monitoring and planning recency checks.
PART: 2

OPERATING PROCEDURES

STANDARD OPERATING PROCEDURES (SOPs):

This OM is based on a universal RPAS type operation. Reference is based on general SOPs and not type specific. Type specific SOPs will be found in the RFM of the specific type of RPAS.

SOP’s are to be adhered to at all times during all normal operations, only in Abnormal or Emergency situations with rational decision making may a Pilot divert from adhering to SOP’s.

1: FLIGHT PLANNING

a. Task Feasibility

- Identify the task as it is set out in the mission. Determine if there is enough time to complete the task. Factors such as sunset, weather or other planned operations in the area that could affect the mission.
- Only continue with the task if after all possible evaluations it is clear that the task will be feasible.
- Initial customer enquiries should be captured using the “Permission to Operate Form” and the “Pre Survey Form” found in the Appendix Section of the OM.
- Details that should be captured on the form from the customer such as:-
  a. Contact Details.
  b. Work Required.
  c. Date and Time Constraints.
  d. Location of Work (Latitude and Longitude if possible).
  e. Landowner Details.
  f. Other Nearby Air Users (if known).
  g. Price Expectations.
  h. Any Other Relevant Information.
b. Site Location and Assessment

- **Airspace type:**

By utilizing Jeppersen area charts the site location must be identified and it must be confirmed that this location is in an airspace that is suitable for the category of operation authorized for this mission. Ensure that the RPAS is certified for the intended airspace to be operated in. No operations are to be carried out in or near Prohibited airspace or Danger areas. Restricted airspace may be operated in if all permissions and protocols for that specific Airspace have been fulfilled.

- **Other Airborne Operations**

Identify any other operating sites or local aerodromes and assess the expected air traffic movement during the time of the operation. Ensure that aerodromes are more than 10 km from the intended operational site.

- **Hazards**

Hazards are not always obvious. A Pilot identifying Hazards must survey the area not only focusing on the obvious but also look for the subtle hazards in the vicinity. Below are examples:

  a. Industrial sites which may expel heavy smoke and cause visibility problems. Tall chimneys or stacks which would form an obstacle.
  b. Shooting Ranges/Military Ranges with live firing close by.
  c. Towers and Radio dishes which may emit high intensity radio transmissions and interfere with the RPAS link.
  d. Gas venting common in industrial areas.

- **Local Bye-Laws**

Every municipality has local by-laws which could restrict RPAS Operations. It is the Pilot’s duty to contact the local municipality to explain the scope of the mission and enquire if the operation will infringe in any of their bye-laws. Note the Municipality, date, time and person spoken to on the MR.

- **Obstructions**

These can present themselves in many forms. Below is a list as a guide only. Pilots must use their discretion and scan for ANY obstructions. The Pilot will assess each obstruction and safely plan the operation around each obstruction. If safety is in doubt, the mission must be aborted.

  a. Tall Structures (Buildings, Bridges, Towers etc).
  b. Tall Trees.
  c. Rocks.
  d. High ground including mine dumps.
  e. Flocks of Birds in the vicinity.
f. Free roaming animals.
g. People.

- **Establishment Restrictions**

  The site establishment could have its own restrictions. Check with the owner or manager whether any site establishment restrictions exist.

- **Habitation and Recreational Activities**

  a. If the site is in a rural area, check with the local chief or population if RPAS operation in their area is sanctioned.
  
b. Be aware and respect sensitive areas such as hospitals, churches and schools. If possible carry out operations out of their hours of work. If this is not possible then meet with the leaders, explain the operation and request their go ahead.

- **Public Access**

  Avoid crowded areas such as paths and meeting places. Crowd control is difficult most circumstances; especially if there are only 2 crew of which one is flying.

  People are not allowed within 50 meters of the operation. Utilize any spare crew or members of the public to restrict public access whilst flying if possible.

- **Landowner Permission**

  The “Permission to Operate Form” is to be filled in and signed by the landowner. No flight operations will commence without permission from the relevant land owners.

- **Operating Site and Alternates**

  The Field Operations Guide and the use of the Pre-site Survey Form must be utilized to assess the suitability of the Operating Site.

  In VLOS and EVLOS operations a minimum of one alternate landing site must be nominated. This site is to be utilized in cases of emergencies or any unexpected situations which will require an immediate landing. An alternate site must comply with normal site checks; it must be situated in the furthest sector of the operating area and in line of sight of the Pilot or Co Pilot observing.

- **Weather Conditions**

  In the week leading up to any flight operation Unmanned Tech will obtain long range weather forecasts. Twenty four hours before the proposed flight operations a further weather forecast will be obtained. The information from this weather forecast will either be printed and stapled to or written in the Pre-Site Survey Form. The Pilot will then review the weather forecast and based on the aircraft limitations make a decision about the validity of the planned flight operations. The client must
be informed at least twenty four hours in advance if flight operations are to be postponed.

c. Risk Management

Introduction

The ideal goal of any organisation is to achieve a completely risk free environment. However, risks and hazards are an integral part of the aviation industry. ICAO rightly points out that both failure and operational errors will, and do, occur in aviation despite best attempts to prevent them from happening. As an aviation company committed to the provision of a safe environment in which to work, Remove Before Flight Club has introduced a Safety Management procedure that includes the identification of hazards through a system of Safety Assessments and Surveys.

Safety assessments provide a proactive mechanism for identifying potential hazards and finding ways to control the risks associated with them. Remove Before Flight Club should ensure that safety assessments are undertaken prior to the implementation of any changes to either procedures or equipment. By doing so, this will demonstrate that any change meets an acceptable level of safety.

A safety assessment / review may, for example, be carried out for proposals of any airspace reorganization or for changes in the provision of procedures applicable to an aerodrome. They should also be conducted for the introduction of:

a. New equipment.

b. Systems.

c. Facilities.

d. Operations.

e. Equipment (hardware and software).

f. Personnel (training-staffing-etc.).

g. Environment.

h. relations with users; or

i. Company culture.

Safety Surveys are not audits and are not to be perceived as such by either Remove Before Flight Club Management or staff alike. They are not to be used as a tool in order to apportion blame on any individual or group, but should be used to assure current practices, and identify areas that will enhance safety in existing systems or procedures.
Objective

The objective of this document is to ensure that Remove Before Flight Club fulfills the requirements set by ICAO and SACAA and that all current, new or modified procedures are assessed for their safety significance. This document outlines the method to be used in order to facilitate the identification of hazards and their associated risks. Surveys and assessments will identify areas of risk and enable staffs to produce associated mitigations. They will also be used to quantify the level of risk being held and identify the risk owner. Through this process, Remove Before Flight Club will be able to reduce any risks to a tolerable and acceptable level.

Remove Before Flight Club should ensure that all staff are encouraged to identify hazards and to propose solutions. All staff, regardless of status, must be permitted to suggest changes to procedures if they believe that these will lead to improvements in safety. Remove Before Flight Club management must make this document available to all members of staff and actively encourage them to participate in the safety management process.

Scope

This document applies to all locations at which Remove Before Flight Club operates.

Process

For all new or amended procedures, the Remove Before Flight Club Hazard Assessment Pro-forma should be used to document the process. This should also be used where a safety survey is deemed necessary for existing procedures.

Responsibilities

Managers should ensure that safety assessments are conducted, documented, and accepted by the Remove Before Flight Club safety department.

Where appointed, safety staffs should be responsible for the content of assessments and/or surveys. These should be reasonable, well-constructed, justified and compliant with the requirements of this document, including the involvement of relevant stakeholders. Unit Management should also verify that all mitigations have been accepted for action by Accountable Personnel.

Assessment and/or Surveys should be facilitated by the appropriate member of the Remove Before Flight Club.

A safety assessment or safety survey proposal can be instigated by any member of staff. Where an idea for a change or improvement is raised, these should be suggested to management who will begin the process.
Hazards

In order to identify a hazard, one must understand what a hazard is. ICAO defines a hazard as: “as a condition or an object with the potential to cause injuries to personnel, damage to equipment or structures, loss of material, or reduction of ability to perform a prescribed function”. A hazard could be something completely harmless in its everyday state, but influenced by an external factor, may become harmful.

An example of a hazard might, on an airfield, be a flock of birds. On their own they present an object that is neither harmful nor dangerous. Add the external factor of an aircraft in flight then they become extremely dangerous as was the case with the US Airways aircraft’s bird-strike and subsequent landing in the Hudson River, New York.

The following list illustrates additional generic hazards. This list is not exhaustive but may be used as a means for starting any brainstorming exercise.

For flying operations pre-existing hazards may include the following:

a. a situation in which the intended trajectories of two or more aircraft would lead to a mid-air collision.

b. controlled flight towards terrain or obstacle.

c. penetration of restricted airspace – this category is quite distinct from military danger areas where the end effect could be being shot down.

d. wake vortex encounters (WVE); or

e. encounters with adverse weather.

For Runway / Taxiway operations pre-existing hazards may include the following:

a. a situation in which the intended trajectories of aircraft would lead to a mid-air collision.

b. controlled flight towards terrain or obstacle.

c. another aircraft or vehicle inside the obstacle free zone during aircraft approaches.

d. another aircraft or vehicle inside landing-aid protection area during aircraft approach.

e. wake vortex encounters (WVE).

f. violent wind/weather effects (thunderstorm, wind shear, and sandstorm).

g. tailwind or severe crosswind on landing / take-off.

h. birds close to / in path of aircraft.

i. FOD (within runway or lift off protected area).
Following any proposal, and prior to the introduction or change to a procedure, a Hazard Identification (Hazid) must be conducted. A Hazid shall take place in a structured manner and will include a range of experienced operational and technical personnel. Once a hazard has been identified, it will be assigned a reference and be recorded in the Mission Report. This information will then be recorded in the Site and Airspace Information Guide. The report should contain a description of each hazard, its consequences, the assessed likelihood and severity of the safety risks of the consequences, and required safety risk controls, and, most usually, mitigation measures. The Site and Airspace Information should be updated as new hazards are identified and proposals for further safety risk controls (i.e. further mitigation measures) are introduced. For each item on the report, a Hazard Analysis (HA) shall then be undertaken and the results recorded.

Risk

The assessment of risk is: “the combination of, the probability or frequency of occurrence of a defined hazard and the magnitude of the consequences of the occurrence”... Risk, therefore, is the assessed potential for adverse consequences resulting from hazard if its potential to cause harm is realised. A hazard has the potential to cause harm, while risk is the likelihood of that harm being realised within a specific time-scale.

Following the identification of a hazard a further step is required to assess its potential for harm or damage. This involves two considerations:

a. probability of the hazard causing adverse consequences, and

b. severity of the potential adverse consequences.

Risk assessment and mitigation processes analyse and eliminate, or mitigate to an acceptable level, risks that could threaten the capabilities of an organisation.

When assessing risk, consideration should be given to the appropriate use of incident data from previous occurrences and, from similar operations around the world. This will support, where possible, the estimation of frequencies and/or probabilities in the risk analysis.

Hazards and their associated causal factors should each be assessed, where possible, in a group discussion. Initial analysis of hazards and risks at units may be conducted by the Flight Operations team in conjunction with management and subject matter experts.

The following diagram is taken from ICAO Doc 9859 and illustrates a generic Safety Risk Management process. Safety risks assessed as initially falling in the intolerable region are unacceptable under any circumstances. The probability and/or severity of the consequences of the hazards are of such a magnitude, and the damaging potential of the hazard poses such a threat to the viability of the organization, that immediate mitigation action is required. Generally speaking, two alternatives are available to Remove Before Flight Club to bring the safety risks to the tolerable or acceptable regions:

Allocate resources to reduce the exposure to, and/or the magnitude of, the damaging potential of the consequences of the hazards; or if mitigation is not possible, reject the procedure and/or proposal.
METHOD

Firstly consider and document the range of possible causes of the hazard.

The pre-mitigation hazard frequency (probability) shall then be assigned using the most appropriate category from the table below. Any supporting rationale for the choice of probability should be recorded on the appropriate form.

<table>
<thead>
<tr>
<th>Probability</th>
<th>Description</th>
<th>Typical occurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequent</td>
<td>Likely to occur many times</td>
<td>Typically occur at least</td>
</tr>
<tr>
<td></td>
<td></td>
<td>daily</td>
</tr>
<tr>
<td>Likely</td>
<td>May reasonably be expected to occur</td>
<td>Typically occur at least</td>
</tr>
<tr>
<td></td>
<td></td>
<td>once a week</td>
</tr>
<tr>
<td>Conceivable</td>
<td>Might occur</td>
<td>Typically occur at least</td>
</tr>
<tr>
<td></td>
<td></td>
<td>once a month</td>
</tr>
<tr>
<td>Unlikely</td>
<td>Unlikely to occur</td>
<td>Typically occur at least</td>
</tr>
<tr>
<td></td>
<td></td>
<td>once a year</td>
</tr>
<tr>
<td>Extremely Unlikely</td>
<td>Almost inconceivable that the event will</td>
<td>Typically occur at least</td>
</tr>
<tr>
<td></td>
<td>occur</td>
<td>once for every 3 years</td>
</tr>
</tbody>
</table>
All of the above are as a guideline only. Probability may vary dependent on aircraft sorties.

A Safety assessment or survey shall be subject to review. This will include the acceptance of either the assessment or survey in accordance with this procedure and subsequent acceptance and endorsement of any residual risks where necessary. The “acceptance and endorsement” of any residual risks shall be in accordance with the following:

<table>
<thead>
<tr>
<th>Risk Index</th>
<th>Tolerability</th>
<th>Action required</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Extreme risk</td>
<td>Stop operation or process immediately. Unacceptable under the existing circumstances. Do not permit any operation until sufficient control measures have been implemented to reduce the risk to an acceptable level.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Top management approval required.</td>
</tr>
<tr>
<td>B</td>
<td>High risk</td>
<td>Caution. Ensure that risk assessment has been satisfactorily completed and declared preventive controls are in place. Senior management approval of risk assessment before commencement of the operation or process.</td>
</tr>
<tr>
<td>C</td>
<td>Moderate risk</td>
<td>Perform or review risk mitigation as necessary. Departmental approval of risk assessment.</td>
</tr>
<tr>
<td>D</td>
<td>Low risk</td>
<td>Acceptable – Requires regular review.</td>
</tr>
<tr>
<td>E</td>
<td>Negligible risk</td>
<td>Acceptable</td>
</tr>
</tbody>
</table>

Before a procedure is implemented, the appropriate notification requirements of the relevant safety regulatory authority shall be complied with.

Retention of Safety Assessments/Reviews

The completed safety assessment will be held by the safety team and unit management. Recommendations from the assessments will be managed within the company as required.
Safety Performance Monitoring

Each new assessment should be reviewed after a minimum period of not more than three (3) months in order to establish whether or not the risk/hazard analysis has been effective. The review will establish that the safety performance and/or benefits are as predicted during the assessment process. Safety reviews/surveys should be conducted at least once a year.

Surveys and assessments shall be made available on request to any member of the company or any external or internal assurance teams. In any event, company management are recommended to review all surveys at least annually. Records of reviews are to be retained at company headquarters.

Should it be found that any new procedure or system is not providing a safety improvement as expected; either the procedure should be immediately withdrawn or, following a further assessment, amended. Management, in conjunction with operational staff and engineers, are responsible for monitoring and reviewing safety assessments.

**Remove Before Flight Club** staff will use the Risk Assessment form to record Hazards which affect normal flight operations. Potential mitigating factors should also be recorded. Below is a Risk Matrix which should help to determine if a proposed Flight Operation has acceptable risks:

<table>
<thead>
<tr>
<th>Probability of Hazard</th>
<th>Severity of Potential Incident or Fatality</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 to 5 = Low Risk</td>
</tr>
<tr>
<td></td>
<td>6 to 10 = Moderate Risk</td>
</tr>
<tr>
<td></td>
<td>12 to 15 = High Risk</td>
</tr>
<tr>
<td></td>
<td>16 to 20 = Unacceptable Risk</td>
</tr>
<tr>
<td>Almost Certain 5</td>
<td>Insignificant No Incident 1</td>
</tr>
<tr>
<td>Will Probably Occur 4</td>
<td>Non Reportable Incident 2</td>
</tr>
<tr>
<td>Will Possibly Occur 3</td>
<td>Reportable Incident 3</td>
</tr>
<tr>
<td>Remote Possibility 2</td>
<td>Major Injury or Fatalities 4</td>
</tr>
<tr>
<td>Extremely Unlikely 1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>8</th>
<th>12</th>
<th>16</th>
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<tbody>
<tr>
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<td></td>
<td></td>
<td>2</td>
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<td>4</td>
<td>6</td>
<td>8</td>
</tr>
</tbody>
</table>

- Risk factors between 1 and 10 are acceptable and the operation can be cleared.
- Risk factors between 12 and 15 are unacceptable but mitigating factors may reduce the risk.
- Risk factors between 16 and 20 are unacceptable and the operation can’t be cleared.

Surveys and assessments shall be made available on request to any member of the company or any external or internal assurance teams. In any event, company management are recommended to review all surveys at least annually. Records of reviews are to be retained at company headquarters.
Should it be found that any new procedure or system is not providing a safety improvement as expected; either the procedure should be immediately withdrawn or, following a further assessment, amended. Management, in conjunction with operational staff and engineers, are responsible for monitoring and reviewing safety assessments.

Refer to the Appendices Section of the OM for Risk Assessment forms.

d. Communications

RPAS and base station: Ensure all communication systems are serviceable. Establish a maximum safe communication operating range for the system. (Refer to the RFM)

VHF Radios and Intercom: Ensure the correct operating frequencies are set. Test both the radio and intercom for serviceability. Ensure there is no radio interference. Refer to the FOG for local frequencies, airspaces and radio procedures for that area. A radio information call of the operational intentions must be made on the appropriate frequency before take off.

Pilot / Co Pilot Communication: The Pilot flying will always communicate with ATC or other air traffic via VHF Radio. The radio volume must be turned high enough for clarity. If a Co Pilot is assisting, the radio volume must be turned loud enough for the Co Pilot to hear. The Co Pilot is responsible to listen out for other traffic or ATC and brief the Pilot if the radio call was missed.

If headsets are used for EVLOS operations, the Pilot and Co Pilot will use the intercom for communications. For VLOS operations with 2 pilots standing together normal conversation will be preferred.

Frequencies, any special radio procedures and necessary contact detail of other operators will be detailed in the Field Operations Manual.

e. Pre-Notifications

If the flight is to be performed within an Aerodrome Traffic Zone, or near to any aerodrome or aircraft operating site, then their contact details should be obtained and notification of the intended operation should be provided prior to take-off. It may be necessary to inform the local police of the intended operation to avoid interruption or concerns from the public

f. Site Permission

This is a very important procedure due to the legal implications of operating on private land especially if there is an accident or incident. The Permission to Operate Form in the Appendix Section of the OM must always be fully completed before any operation may begin.
g. Weather

Weather forecasts will be obtained using the following resources:

- Met Office for TAFS and METARS if required
- Met Office for local weather report
- Accuweather

For planning purposes the weather forecasts (1 hour before first planned take off time to 1 hour after final planned landing time) must not exceed the following limitations:

1. Visibility must be good.
2. Operation must be in VFR conditions.
3. Cloud base must be a minimum of 500 feet.
4. Wind speed must be less than 20 kts for multi-rotor and not more than 10 kts crosswind for fixed wing RPAS’ (includes gusts).
5. No operations should take place in rain.
6. There must be no cumulonimbus activity forecast.

h. RPAS and Equipment Serviceability

RPAS serviceability checks will be unique to type. Refer to the RPAS type RFM, SOP’s and checklists to conduct these checks.

2. PREFLIGHT

a. On-Site Assessment Survey

Upon arrival at the operating site location, the Pilot and Co Pilot will carry out an On-Site Assessment Survey to familiarise themselves with the local geography and topography of the site. This is completed by physically walking around the site to assess any hazards marked on the ON Site Survey Form in the Appendices Section of the FOM. It is advisable for the Pilot to carry out this procedure with the Co Pilot so that all issues can be discussed as they are found. All findings should be recorded using the On-Site Survey Form.

The mobile application GPS Test will be used to ascertain satellite coverage, a minimum of seven satellites over a good spread will be required for all flight operations.

If the Pilot-In-Command feels confident that the proposed flight operations can be safely carried out, then the operation can progress to the next stage.

b. Selection of Operating Area and Alternates

The Pilot should select an Operating or Take-Off area based on the following criteria. An alternative or emergency landing zone should also be discussed with the Co Pilot and
selected, this area should be available to land in if the first location becomes inaccessible or an immediate landing is required:

- Full visual coverage of the operating site.
- Position in relation to the sun to avoid visual impairment.
- Physical obstacles such as overhanging trees, rocks, buildings, power lines etc.
- Terrain topography, avoid steep slopes or uneven ground. Select a firm level surface. If this is not available use the Remove Before Flight Club launch pad for multirotors.
- Consider effects such as wind shear from nearby trees, buildings etc.
- All buildings and persons not under the control of the Pilot must remain 50 metres away from the RPAS for Take-Off and 50 metres in flight.

c. Crew Briefing

The Pilot will give the Crew Briefing. This briefing must be carried out before any flight operations take place. A Pre-Operation crew briefing should be given on the day before a flight operation is to take place so that all crew members can be prepared on the day. If this is not possible an email should be sent to each flight crew team member at least twenty four hours before the planned flight operation advising on location and arrival time.

All Unmanned Flight Crew Team Members must be present at the crew briefing on-site, if any members miss the briefing they must complete a one to one briefing with the Pilot. The Pilot must cover the criteria listed below. If any crew members feel unable to complete their assigned tasks or have reservations about the flight operation then they must make their concerns known at this briefing:

- Check that all relevant and required crew members are present.
- Brief on Security issues
- Issue identification badges and fluorescent vests
- Advise crew of Take-Off, Landing, Emergency and Operating areas.
- Confirm flight plan with the crew.
- Advise the crew on timescales. (expected flight times, durations and quantities)
- Ensure all crew members are aware of their individual responsibilities.
- Brief on the Critical Phases of flight
- Ensure crew are familiar with the Emergency Procedures and have emergency contact numbers.
- Brief on any non-normal expectations as far as the operation or any other external factors are concerned. A plan of action on each of the non-normal expectations must be covered.
- Ensure Co Pilot is familiar with the failsafe function.
- Check that the crew are happy to proceed and have no questions.
- Issue Two Way radio communication devices if required and state frequency to use

d. Cordon Procedure
The Pre-Site Assessment should have identified if a cordon is required but the Pilot will decide if a cordon is required. If large numbers of the public are expected then a cordon should be established fifty metres around the planned flight area. This cordon should be set out using cones and safety tape. Signs should be placed every ten metres advising members of the public that UAS flight operations are in progress.

Extra support personnel may be required to be positioned at gates or on public footpaths to advise members of the public about the dangers of entering the area. Gates may be closed, access may be restricted but spotters may not detain any members of the public or prevent them from accessing public rights of way. The spotters are there to advise on the dangers of entering restricted areas and to advise the Co Pilot about public encroachments.

If the location is set in a more rural area then a local cordon around the take-off and landing area may be utilised, this can be as little as four cones set out into a five metre square.

It is the responsibility of the Spotter to ensure that the Co Pilot is aware of any encroachment from a member of the public. The Co Pilot in turn will advise the Pilot of any encroachments. This process will ensure that the Pilot remains focused on operating the aircraft.

e. Communications

Crew communications will be as described in Section D of Chapter 1 Flight Planning. Communication of Pilot and Co Pilot for EVLOS operations will be via radio contact but not on the same frequency as Area or ATC frequency. Mobile telephones will be used as a backup. A back up radio will be carried by all Pilots.

When in Controlled Airspace the Pilot will be in constant contact with the ATSU controller, whereas in Uncontrolled Airspace the Pilot will give position reports every 10 minutes and keep a constant listening watch for nearby Aircraft or RPAS’.

Pilot / Co Pilot role change:

If for any reason the Pilot flying needs to relinquish his flying role as Pilot flying to the Co Pilot, he will brief the Co Pilot on the altitude direction and speed of the RPAS, the battery status and the intended RPAS operation to follow. When the Co Pilot is satisfied that he is in the loop he will say “I have control” The pilot relinquishing control will reply “You have control”

f. Weather Checks

The Pilot for the operation must assess the local weather conditions. Wind speed in knots and outside air temperature in degrees Celsius will be obtained by using a hand held anemometer. The wind direction can be obtained using the compass feature of the GPS Test mobile application. The on-site weather information must be recorded on the MR. RPAS weather limitations must be considered.
The Co Pilot must constantly assess the present weather conditions throughout the operation. If he sees the weather criteria deteriorate he must inform the Pilot. The Pilot will assess the situation and decide whether to continue with the operation or land the RPAS. Awareness of adverse weather conditions and prediction is vital for safe operations.

g. Charging and Fitting of Batteries

The Pilot is responsible for charging and fitting flight battery packs to the RPAS’. All battery packs should be charged and checked as part of the embarkation checklist. All Unmanned Tech UK battery packs will be identified by a unique specific identification number applied to the battery pack. Battery identification codes can be found in the front of the Battery Charge Logbook.

All battery information will be recorded in the Battery Charge Log.

The procedure for flight battery charging is:

- Measure the battery residual charge % and enter the value in the corresponding charge logbook box.
- Connect the battery to the charger charge lead and balance lead.
- Select the appropriate settings on the charger for the battery.
- Place the battery pack into the Lipo-Safe bag and start the charge cycle.
- Stay in the area of the charging battery, never leave unattended.
- When battery is charged log the mAh charge input in the charge logbook.
- Switch off the charger and disconnect the battery pack.
- Fit the “Charged” peg to the battery lead to confirm this battery is ready for use.

Batteries must be charged in “Lipo-Safe” protective bags using the correct specific battery charger in line with the manufacturer’s guidelines. Batteries must never be left unattended whilst charging. A fire extinguisher must be present when charging battery packs. All batteries will be stored in the large storage box marked “Batteries”. Any battery packs showing anomalies will not be used and must be disposed of through the recognised battery disposal area at the council refuse site.

Before any battery is to be used the voltage must be checked using the fusion battery checker and the % reading should be logged in the charge logbook in the appropriate box. Any battery under 90% charge will not be fitted. The charged peg must be removed from the battery to identify that this battery is no longer fully charged and requires charging before being refitted.

If a battery pack is not used in any three month period it must be checked and charged if required. If there is any charge abnormality of a battery the battery must be discarded by soaking it in a bucket of salt water for a minimum of 24 hours to de charge. It will then be taken to a recycling facility. The same procedure will follow when the battery has reached its expiry date.

Great care must be taken when inserting a battery into an RPAS. Dropping the battery could severely damage it. There are also vulnerable metal connectors on the battery and in the RPAS battery compartment that can be easily damaged.
h. **Loading of Equipment**

The Pilot is responsible for ensuring that the payload is ready to use. If the payload is a camera the memory card should be empty and the battery should be fully charged. The Pilot is also responsible for ensuring that the payload is securely fitted to the airframe. All payloads require two mechanical fixings such as a retaining bolt and safety lanyard before flight operations can commence.

The Pilot should ensure that the aircraft balances correctly with the selected payload fitted; adjustments to position should be made to ensure this is the case and under no circumstances should the aircraft fly if the balance is not within limitations. The Pilot is responsible for ensuring that the aircraft does not operate in excess of the stated maximum take-off mass.

i. **Preparation and Assembly of the RPAS**

The Pilot and Co Pilot will work together in assembling the RPAS for its intended operation according to the RPAS type RFM.

All crew are to secure the area where RPAS assembly is to take place before preparation and assembly for security purposes.

j. **Preflight and Post Flight Checks**

If the Co Pilot is available then he/she will read off the checklists for the Pilot. The Pilot will answer “Check” for all items completed. If it is a single Crew operation then the Pilot on the day must complete the following checklists:

- **The Embarkation Checklist** must be completed before the equipment is loaded and brought to site ideally twenty four hours in advance.

- **The Site Arrival Checklist** must be completed as soon as the Pilot reaches the intended flight operation location.

- **The Pre-flight Checklist** must be completed immediately prior to any flight operation.

- **The Post-flight Checklist** must be completed immediately after landing.

If any fault or problem is found which can’t be remedied then the intended flight operations must be postponed until a solution is found. All findings must be documented in the relevant logbook. Any interrupted checklist procedure must be restarted from the beginning. The checklists can be found in the Appendices Section of the OM.
3. INFLIGHT PROCEDURE

a. Start

The following procedure is to be completed by the Pilot:

- Check Camera Lens is free from obstructions or dirt and properly secured.
- Check Flight Battery Pack Level with Battery Checker *(Must be at least 90%)*.
- Record Battery Pack identification code and power level details in the Battery Logbook.
- Fit the Flight Battery to the aircraft and place the aircraft on the calibration platform facing into wind.
- Ensure all switches on the Aircraft Control Transmitter are set correctly.
- Switch on the Aircraft Control Transmitter and ensure battery level is over 80%.
- Call *"Clear Props"* and connect the flight battery pack *(The propellers/rotors may turn momentarily)*.
- Let the aircraft run the system diagnostics program.
- Calibrate Gyro *(as per RFM Procedure)*.
- Test camera gimbal operation and move to take-off position *(camera lens parallel with ground level)*.
- Switch on Ground Station and load software.
- Monitor satellite capture on screen and confirm GPS operation.
- Confirm GPS / GNSS position fix.
- Load waypoint flight plan if required.

b. Take Off

The following procedure is to be completed by the Pilot:

- Make a 360° visual sweep of the area *(Pay particular attention to airspace and public encroachments)*.
- Pilot will confirm with Co Pilot *"Confirm clear for take off?"*.
- Co Pilot will answer *"Clear for take off"* or *"Standby"* if there is a problem to be resolved.
- Check and note the time of take off.
- Call *"Take Off"* and start the motors.
- Take a final look above the aircraft and around the airspace to confirm no other air traffic in the vicinity. Climb to altitude recommended in the RFM or to nominated Safety Altitude.
- Test yaw and cyclic controls *(Use small gentle movements and ensure aircraft reacts correctly)*.
- Ensure the RPAS holds position and altitude.
- Check battery status.
- Confirm with Co Pilot that the planned flight operation is still good to go ahead.
c. In Flight

The following procedure is to be carried out by the Pilot and Co Pilot:

- Pilot to keep aircraft within the 500/1000 metre wide and 400 feet height bubble.
- Pilot to maintain primary focus on the aircraft and immediate surroundings.
- Pilot to monitor basic telemetry from aircraft when safe and appropriate.
- Pilot to maintain communications with the Co Pilot at all times.
- Co Pilot to monitor telemetry, flight battery voltage, satellites tracked, altitude etc..
- Co Pilot to give Pilot-In-Command continuous feedback of flight battery voltage.
- Co Pilot to maintain a constant scan for public encroachments and airspace incursions.

d. Landing

The following procedure is to be completed by the Pilot-In-Command, observer and payload operator:

- Pilot to advise Co Pilot of intention to land.
- Pilot and Co Pilot are to visually check landing area and surrounds to ensure it is safe to land.
- Pilot to fly directly to landing site and hover at nominated Safety Altitude facing into wind.
- Pilot is to take a final look below the aircraft and call “Landing”.
- Pilot to reduce power and land the aircraft (Be aware of gusts and ground effect).

e. Shut Down

The following procedure is to be completed by the Pilot:

- Upon touchdown stop the motors.
- Approach the aircraft, disconnect the flight battery pack and call “Aircraft Safe”.
- Check and note the time.
- Switch off the Aircraft Control Transmitter.
- Check Flight Battery Pack Level with Battery Checker.
- Fill in Pilot / Aircraft Hours and Battery Logbooks.

4. EMERGENCY PROCEDURES

Below is a list of Emergency Procedures for various scenarios which should be adhered to by the Crew. Nothing inhibits the pilot to operate out of these procedures if it is deemed that safety would be compromised. Pilots and Co Pilots will need to utilise two way radios to ensure that their calls can be heard by the rest of the crew if any. Any emergency situation should be recorded in the ASR.
Note these Emergency Procedures are generic. For more type specific Emergency Procedures refer to RFM for that specific type.

**FAIL SAFE PROCEDURE**: Upon activation of the ‘fail safe’ function the Multi-rotor RPAS with hold position and altitude for three seconds, the aircraft will then climb to 20 metres or remain at current altitude if higher than 20 metres. The aircraft will then head directly to the position at which it attained GPS / GNSS original position lock after power up. Once in position the aircraft will hold position for a further three seconds before slowly descending to land. Once the aircraft has landed the motors will shut-down automatically.

a. **RPAS and Control System**

Loss of Propulsion Motor or Propeller Failure Aircraft Battery Failure:

Call “**Dead Stick**” and assess if the aircraft is controllable, if sufficient control is maintained head directly to either the landing site or alternate landing site whichever is closest. If control is compromised try to execute a controlled descent.

**Pilot Incapacitation:**

If the Pilot feels as though incapacitation is imminent he should try to activate the fail safe function and call “**Fail Safe**”. If possible he should indicate his condition to the Co Pilot and announce “**You have Control**”. In response the Co Pilot will announce “**I have Control**” and immediately control the situation.

If the CO Pilot notices the Pilot has become incapacitated he must activate the return to home fail safe function and call “**Fail Safe – I have Control**”. Ensure that the Pilot is not in any imminent danger from a returning aircraft and then ensure that the now landing site is clear of all persons as the aircraft will be returning to its initial ‘power up’ coordinates. Call for the emergency services if required. Once the aircraft lands and shuts down disconnect the flight battery and switch all the controllers off.

**Public Encroachment:**

The Pilot or Co Pilot are to call “**Public**” The Co Pilot will approach the member of the public asking them to follow you to safety as they are currently in an extremely dangerous situation. Upon identifying an encroachment from a member of the public or hearing the call “**Public**” advise the Pilot by using the relevant phrase (“**Public Below**”, “**Public Left**”, “**Public Right**” or “**Public Behind**”). Identify the nearest available landing site away from the encroachment and advise the Pilot.

If there is no Co Pilot present the Pilot will confirm they understand dealing with the situation, approach the member of the public asking them to follow the Pilot to safety as they are currently in an extremely dangerous situation.

Upon being advised by the Co Pilot of a public encroachment immediately hold position and wait for further instruction. The Co Pilot will advise the Pilot which the safest area to land is and confirmation should be given that the instruction has been understood. Immediately proceed to the advised landing site.
Aircraft Incursions:

The Co Pilot will upon identifying an imminent aircraft incursion within the 400ft, 500 metre bubble call the relevant phrase ("Aircraft Ahead", "Aircraft Behind", "Aircraft Left" or "Aircraft Right") and maintain visual contact with the approaching aircraft. Identify the approaching aircraft. Advise the Pilot to take avoiding action by using the phrase "Aircraft, Descend". Once the aircraft has passed by then advise the Pilot by using the phrase "Aircraft Clear".

The Pilot upon being advised by the Co Pilot of an aircraft incursion immediately hold position and look beneath the aircraft to identify hazards. Descend the aircraft to around 10ft above the ground or any structure. Once the Observer advises the incursion no longer exists the planned operation may resume.

Uncontrolled Fly Away Actions:

The Pilot will call "Fly Away" so that the crew understand the situation. Activate the return to home fail safe function in case communication is re-established and maintain direct visual contact with the aircraft for as long as possible. If visual contact is lost make a note of estimated altitude, speed, remaining battery endurance and heading estimated from the compass rose on the calibration platform.

Once the Co Pilot confirms actual information contact the local air traffic control by radio (if possible) and local police using the contact numbers found on the on-site assessment form to advise them of the situation.

If the RPAS is seen to make contact with the ground or a structure, execute the shutdown procedure and walk over to the crash site taking a fire extinguisher, camera and evidence bag.

b. Fire

On Ground:

The fire extinguisher must always be on site and readily available to the crew. If any of the Crew upon noticing fire, must call "Ground Fire". If the fire is a Lithium Polymer battery fire do not try to extinguish, allow the battery to burn out and then extinguish any additional fires. If it is not a Lithium Polymer battery, attempt to extinguish the fire utilizing the appropriate fire extinguisher. If the fire cannot easily be extinguished and increases in size, vacate the area and call the emergency services.

Airborne:

Any Crew noticing an RPAS fire call must call "RPAS Fire" and wait for instruction from the Pilot. The Pilot will proceed directly to the original take off position or as instructed by the Co Pilot observing to the nearest safest available landing point to the RPAS. Upon landing shut down the motors and extinguish the fire using the appropriate fire extinguisher. If the fire is a Lithium Polymer battery fire do not try to extinguish, allow the battery to burn out and then extinguish any additional fires. If the fire cannot easily be extinguished and increases in size, vacate the area and call the emergency services.
c. Accidents

Initial Actions:

If any person or public member was injured, the Crew must assess the nature and severity of the injuries. Minor injuries may be attended to utilizing the company issued First Aid Kit. If the injuries are deemed too serious to treat with the First Aid Kit, stabilize the person involved and call an Ambulance immediately. If possible attempt to record the injured person’s personal details and note them on the ASR.

If any property was damaged, contact the owner of the property and advise him/her of the damage and offer Remove Before Flight Club contact details. Take photographs of the crash site, the damaged property and the RPAS. Take contact details and statements from anyone present.

All RPAS wreckage and debris must be collected and inserted in the evidence bag with the camera and all other operating equipment. The evidence bag must then be sealed with the provided seal and returned to Remove Before Flight Club for further processing.

Final Actions:

- Any accidents and incidents are required to be notified to the SACAA and the nearest police station within 24 hours and by the most expeditious means available.
- Remove Before Flight Club management must immediately be notified.
- If outside the Republic of SA notify the relevant authority of the country concerned and the SACAA.
- The RPAS Pilot shall ensure that all affected crewmembers make a written report. This should include the facts, conditions and circumstances that relate to the accident or incident, as they appeared to the crewmember, and should be written at the earliest convenient opportunity.
- The Pilot shall immediately notify the Managing Director, who will in turn contact the Operations Manager to arrange notification to the relevant Company personnel.
- Complete the Air Safety Report in detail (ASR).

d. Loss of Control Link

Control Link Failure or Frequency Interference:

The Pilot is to call “Fail Safe” so that the crew understand the situation and observe the aircrafts flight path. Upon Control Link failure or frequency interference the aircraft will enter the ‘Fail Safe’ mode as described above.

Loss of GPS / GNSS Signal:

The Pilot will call “Dead Stick” and switch the aircraft in manual or ‘attitude’ control, head directly to either the landing site or alternate landing site whichever is closest. If control is compromised try to execute a controlled descent.
The Co Pilot will upon hearing the call “Dead Stick” identify the closest safe landing position to the aircraft and advise the Pilot. The Co Pilot will also immediately clear any persons directly underneath or in the path of the aircraft to either the landing site or alternate landing site whichever is closest. Maintain visual contact with the aircraft once the area is clear.

**Ground Control Station Failure:**

Call “Landing” and carry out the standard or manual landing procedure. The aircraft is not in immediate danger but the ground station monitors crucial systems and therefore it is not advisable to fly without telemetry information.
PART: 3

TRAINING

The purpose of this Chapter is to give a brief outline of the Remove Before Flight Club check and training system. Detailed instructions, procedures and guidelines are laid down in the Remove Before Flight Club RPAS Training Manual.

1. Training Objectives

The objective and extent of all training will be determined by the Managing Director in accordance with national, international, and Company regulations. Each Flight Crewmember must be trained and able to perform their duties and responsibilities as detailed Part A General Section B.2. Organizational Responsibilities.

   □ The training for each crew member, including SOP’s, normal, abnormal or emergency procedures, ensures that all flight crew members know the functions for which they are responsible and the relation of these functions to the functions of other crew members.

2. Checks and Grading General

The Standards of Performance and Gradings for Pilot/Co Pilot are contained in the Training Manual.

Checks serve the following purposes:

   • To show the Pilot/Co Pilot the quality of his work in relation to the required standard, with special emphasis on points that should be improved.
   • To record the performance of a Pilot/Co Pilot during:
      * a particular course.
      * a particular period.
      * a check.

If a Pilot/Co Pilot receives an “unacceptable” or lower grading, the Pilot/Co Pilot may not serve as a Pilot on any sortie until he/she has satisfactorily completed the required competency check. A Pilot/Co Pilot receiving an “unacceptable” or lower grading must be given an explanation.

If desired by the candidate such an explanation can be discussed further in the presence of the Managing Director.
Since Pilot/Observers must be in good physical and mental condition for flight duty, there can be no subsequent claim of indisposition as an excuse for an “unacceptable”. Results of Flight Crew checks shall be treated confidentially.

The responsible trainer in accordance with current forms and instructions shall complete initial proficiency and site checks for transition training, route, and proficiency checks in written or computerised form.

3. Renewals

Remove Before Flight Club Pilots will undergo a proficiency check annually to demonstrate competence in carrying out normal, abnormal, and emergency procedures and handling. Every 2 years the flight test will be conducted by the SACAA.

4. Site Checks

Remove Before Flight Club Pilots undergo an on site check to demonstrate competence in carrying out normal site operations. The check is conducted by an Remove Before Flight Club Examiner. The period of validity of a line check is 12 calendar months in addition to the remainder of the month of issue.

If the line check is conducted within the last 2 months of validity of a previous site check, the period of validity will extend from the expiry of the previous check.

Flying site checks must alternate between types. Each site check revalidates the site check for the other type. Site checks completed at site are a test of a Pilot’s ability to perform a complete site operation satisfactorily.

The site check includes pre-flight and post-flight procedures, and use of the equipment provided. It is an overall assessment of a Pilot’s ability to perform the duties required. The site chosen is such as to give adequate representation of the scope of a Pilot’s normal operation.

5. Crew Resource Management Training

a. Philosophy

It is Remove Before Flight Club philosophy that the application of the principles and concepts of Crew Resource Management (CRM) enhances safety through better operating efficiency and higher crew morale.

CRM is a dynamic and critical part of the safety culture in unmanned operations. As such, it lies at the interface between the systems of Flight Training, Flight Operations, and Flight Safety.

Successful CRM training requires commitment to the principles of CRM both from Remove Before Flight Club management and from each and every Pilot. Ongoing and continual reinforcement of the principles and concepts of CRM will result in a safer and more efficient operation.
b. Policy

The design and application of CRM training used by crews during operations is the responsibility of Flight Training.

c. Indoctrination Training

Remove Before Flight Club will provide indoctrination/awareness CRM training for every Pilot/Co Pilot joining Remove Before Flight Club. This training will be conducted during the initial transition course.

6. Security Training

Annual recurrent training will be conducted on RPAS security. RPAS security issues of a general nature will be covered.

7. Air Safety Training

Annual recurrent training will be conducted on RPAS safety.

Accident Investigations will be studied and workshops on specific cases will be conducted.

8. Recurrent Training

A CRM component will be included during the recurrent training period conducted for Pilots/observers. The subject matter and focus of the training will be directed by the Training Manager.

The CRM qualifications will be recorded.

9. Qualification Requirements

No person shall act as Pilot of an RPAS, except when undergoing a skill test or receiving flight instruction, unless he or she is in possession of a valid Remote Pilot Licence (RPL) in the relevant category.

A Remote Pilot Licence may be issued for the following categories:

- RPL (A): Aeroplane Remote Pilot Licence;
- RPL (H): Helicopter 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;

Requirements for the issue of an RPL:

• An applicant for an RPL shall –

  * not be less than 18 years of age.
  * hold at least a valid Class 4 medical certificate for B-VLOS operations or operations involving RPAS classified as class 3 or higher.
  * for all other classes or types of operation, submit a self-declared medical assessment report for operations involving RPAS classified as class 2 or lower: provided that an applicant who cannot meet the requirements of the medical assessment shall submit a Class 4 medical certificate.
  * hold a restricted Certificate of Proficiency in Radiotelephony (Aeronautical).
  * provide proof of the ability to speak the English language at proficiency level 4 or higher.
  * have completed the flight training.
  * have passed the theoretical knowledge examination.
  * have passed the skill test.

• an application for an RPL must be made to the SACAA on the appropriate form within 30 days of completing the practical skill test.

10. Theoretical knowledge examination

The theoretical knowledge examination applicable to the category of licence sought must be passed within 90 days preceding the skill test. The theoretical knowledge examination shall be conducted at an SACAA accredited test centre.

Approval shall be obtained from the Director SACAA before any foreign theoretical training or theoretical knowledge examination is undertaken if such training or knowledge is to be accredited towards a South African RPL.

11. Flight Training

The flight training syllabi for the different categories of licence shall be as prescribed in Document SA CATS 101.

The organisation conducting the training shall issue a certificate stating that flight training has been successfully completed.

All flight training shall be conducted with an aircraft of the same category for which the licence is sought.

Approval shall be obtained from the Director before any foreign flight training is undertaken if such training is to be accredited towards a South African RPL.

a. Skill test

The skill test for an RPL shall be conducted within 60 days of completing the flight training by an examiner accredited by the SACAA.
The skill test shall be conducted with an aircraft of the same category for which the licence is sought.

The skill test shall include the applicable sections for the E-VLOS and B-VLOS ratings if one or more of these ratings are sought.

b. **Revalidation check**

An RPL is valid to the last day of the 12th month from the date of issue.

A revalidation check shall be conducted by an examiner accredited by the SACAA in the 90-day period before the expiry date of the 24 month validity period. The revalidation shall be valid from the expiry date for a period of 12 months.

The revalidation check shall be conducted with an aircraft of the same category for which the licence is held.
PART: 4

SAFETY AND SECURITY

1. PREFACE: SAFETY & SECURITY

a) This chapter contains Remove Before Flight Club security processes and procedures, as required under the South African Civil Aviation Regulations, Part 101, applicable to remotely piloted aircraft systems (RPAS) within civil aviation operations. The measures contained in this chapter are approved security measures to be followed by Remove Before Flight Club.

b) The security coordinator (SC) responsible for the implementation, application and supervision of the applicable security controls (DO), as the competent official of Remove Before Flight Club, shall ensure that this chapter is continuously reviewed and updated.

c) This chapter is classified as a restricted document and shall only be made accessible to authorities and employees responsible for carrying out their duties relating to the security integrity of RPAS operations.

d) Security provisions contained within this chapter may be incorporated into operational procedures, SLA’s and other means of operational communications and training.

e) Information contained in this chapter will be shared on a “need to know” basis. Where employees are not required through the nature of their duties to have access to the full document, they will be restricted to parts of the document applicable to them through SOPs and job descriptions derived from requirements of this chapter.
2. OBJECTIVES & DEFINITIONS

The main objective of this chapter is to ensure that the RPAS and its operations are protected from unlawful interference through the application of security controls laid down in Part 101 of the South African Civil Aviation Regulations, 2011 as well as its associated Technical Standards (SA-CATS-101).

This chapter has been prepared by the official responsible for the implementation and maintenance of security controls, in consultation with all applicable operational role players, submitted to and signed and dated by Remove Before Flight Club Management. This chapter will be reviewed and updated as and when necessary.

APPLICABILITY

The provisions of this chapter apply to:

   a) All personnel employed by Remove Before Flight Club allocated with the deployment, handling and storage of RPAS.
   b) All contracted or third party service providers contracted to Remove Before Flight Club and allocated with the deployment, handling and storage of RPAS; and
   c) Any person seeking access to the restricted areas of Remove Before Flight Club RPAS facilities.

DEFINITIONS

Where terms used in this programme are defined in the South African Civil Aviation Regulations, they are used in accordance with meanings and usage given therein. A wide variety of terms are used throughout the world to describe facilities, procedures and concepts for air operations and planning. As far as possible the terms used in this document are those which have the widest international use.

3. SOURCES & REGULATIONS

SOURCES

   a) South African Civil Aviation Regulations, 2014.

OTHER ACTS & REGULATIONS

   a) Aviation Act No. 13 of 2009.
   b) ICAO Annexure 17.
   c) ICAO Document 8973.
4. ORGANISATIONAL STRUCTURE

4.1. Organisational Structure

The Organogram, depicting both the organizational structure as well as the security structure, depicting the relationship between the organizational structure and other structures within the organization will not be included at this time as the Company is still small. Remove Before Flight Club has seconded only one person to manage all safety and security areas.

4.2. Security Coordinator

The person whose name appears below has been appointed by the organization as the Security Coordinator (SC) responsible for the implementation, monitoring and supervision of the security controls prescribed by Part 101 of the South African Civil Aviation Regulations.

Communication relating to security related matters between the SACAA and Remove Before Flight Club should be directed to this official. This official is senior enough in the organization to affect any directives which might be necessary in the interest of aviation security.

He has the necessary experience and qualifications for this responsibility. The process followed in the selection of the Security Coordinator is available in our offices for the SACAA’s perusal.

Name: 
Title: Security Coordinator
ID Number: 
Cell: 
Email: hilma@Remove Before Flight Club.co.za

4.3. Duties of the Security Coordinator (SC)

a) The formulation and implementation of the overall RPAS security policy for the company.

b) The development and maintenance of RPAS security processes and procedures including amendments.

c) Ensuring the continuing effectiveness of the RPAS security policy by regular evaluation and inspections and by encouraging internal security audit processes.

d) Establishing and maintaining effective security liaison with the SACAA, airport authorities as well as other government and law enforcement agencies.

e) Ensuring that effective risk analysis, threat assessment is conducted regularly and that there is sufficient response capability.

f) Providing specialized advice to line management in all RPAS security functions regarding protection, intelligence, information and investigations.

g) Ensuring all staff dealing with RPAS are trained and proper control of training records are established and maintained.
h) Report all actual or suspected acts of unlawful interference with RPAS operations to the SACAA.

Signature:
Name: 
Position: Safety and Security Manager 
Date: 1\textsuperscript{st} August 2014

By his/her signature the incumbent accepts the duties and responsibilities mentioned above.

5. OPERATIONAL SECURITY PROCEDURES

Remove Before Flight Club will apply the under-mentioned security processes and procedures to prevent acts of unlawful interference and to ensure the security of remotely piloted aircraft systems (RPAS):

5.1 Acts of unlawful interference

These are acts or attempted acts such as to jeopardize the safety of civil aviation, including but not limited to:

- unlawful seizure of RPAS.
- destruction of an RPAS in service.
- introduction on an RPAS or at an airport of a weapon or hazardous device or material intended for criminal purposes.
- use of an RPAS in service for the purpose of causing death, serious bodily injury, or serious damage to property or the environment, and
- communication of false information such as to jeopardize the safety of an RPAS in flight or on the ground, of crew, ground personnel or the general public, at an airport or the operational site.

5.2 Prohibited Articles

The following shall be considered as prohibited articles on board an RPAS:

- Assembled explosive and incendiary devices that are not carried in accordance with the applicable safety rules.

5.3 Pre-Flight Security Checks & Searches

RPAS security check is defined as: An inspection of the interior and exterior of the RPAS, including the Remote Pilot Station, for the purposes of discovering sabotage, willful damage or suspicious objects, weapons, explosives or other dangerous devices, prohibited articles and substances.

A pre-flight security check shall be conducted prior to placing a remotely piloted aircraft into services.
To avoid duplication, the security check may be conducted in tandem with the pilot's pre-flight checks.

The pre-flight security check shall be conducted systematically by staff familiar with the RPAS type.

Subject to the size and complexity of the RPAS, a checklist or reference card may be useful to inspect assigned areas.

**RPAS security search is defined as:** A thorough inspection of the interior and exterior of the RPAS, including the Remote Pilot Station, for the purposes of discovering sabotage, damage or suspicious objects, weapons, explosives or other dangerous devices, prohibited articles and substances.

During heightened threat levels a pre-flight security check shall be elevated to a RPAS security search.

In the event of a security breach where the integrity of a Remote Pilot Station or RPAS cannot reasonably be confirmed, a RPAS security search shall be conducted.

### 5.4 Control of Access to RPAS and Remote Pilot Stations

The Remote Pilot Station is viewed as equivalent to the flight deck of a manned aircraft.

The main security concern remains the impact of an RPAS under duress and the overall impact on air navigation system safety and security.

Therefore considering the size and capability of the RPAS, security controls such as access control at Remote Pilot Stations should be commensurate with the size and capability of the RPAS.

The principal method of preventing the misuse of a RPAS or an RPAS under duress is to prevent unauthorized access to the Remote Pilot Station and to protect the pilot during operations.

In high-risk areas, additional precautions may be necessary, usually involving additional security measures to protect the RPAS pilot during operations and enhanced access control measures at Remote Pilot Stations.

**Premises, staff and access control and control of permits**

Considering the size and capability of the RPAS, adequate physical barriers, such as fences, security gates and doors shall be installed as to protect the RPAS and Remote Pilot Station from an act of unlawful interference.

Physical barriers shall be of such nature that unauthorised access will be detected and prevented. This will include the following:
a) All security installation doors shall be closed and locked or guarded when not in use.
b) All security installation doors shall be equipped with intrusion detection devices. Where intrusion detection devices are not installed other means of protection against intrusion shall be used.
c) Access to RPAS storage facility and Remote Pilot Stations areas shall be restricted to authorized persons with an operational need.
d) Access control shall be exercised at specific access control points, there being no other means of access into the premises other than through that point or points.
e) Each access control point shall be staffed, or effectively monitored or secured.
f) The outer perimeter shall be clearly defined through physical barriers.
g) The inner perimeter shall be clearly defined through physical barriers.
h) Staff authorized to have unescorted access to controlled areas shall be issued with passes/permits.
i) Visitors shall at all times be escorted if required to enter RPAS storage facilities and Remote Pilot Station areas.
j) A permit control process shall be implemented to approve and control the issuance, use and recovery of passes/permits.

Visitors

The identity of visitors shall be recorded and where visitors are required to enter areas such as RPAS storage facilities and Remote Pilot Stations, such visitor will remain under escort by an authorised representative.

Visitors requiring access to RPAS storage facilities and Remote Pilot Station areas shall commensurate with the level of threat, be subject to search as to prevent the introduction of explosives, incendiary devices or any other prohibited or harmful articles which may be used to commit acts of unlawful interference.

Parcels, bags or containers brought into security controlled areas by visitors shall either be prevented from taking such parcels, bags, containers into security controlled areas or such items shall be accounted for on exit.

Unauthorized Access

Where an unauthorised person where found having access to RPAS storage facilities and Remote Pilot Stations, such RPAS storage facilities and Remote Pilot Stations shall be viewed as unsecure. In such event such RPAS storage facilities and Remote Pilot Stations shall first be subjected to appropriate security controls including a security search prior to be deemed as secure.

In any such event of unauthorised access to RPAS storage facilities and Remote Pilot Stations, appropriate steps shall be taken without delay to prevent further breaches to the security system.

Where an unauthorised person is detected in RPAS storage facilities and Remote Pilot Station controlled areas the following actions shall be taken:
a) The person should be challenged. If it is regarded as not safe, the assistance of the security personnel and or police must be sought.
b) The identity of the person should be established.
c) The applicable area of RPAS storage facilities and Remote Pilot Stations shall be regarded as contaminated/unsecured.
d) The area, including all products/articles stored in the area shall be subjected to security controls (which may include a thorough search/inspection) as to confirm that the RPAS and Remote Pilot Station is secure.
e) The SACAA shall be notified of the incident within 48 hours.

Electronic Security Systems

Intruder detection systems shall be tested at least once every 30 days. Where Magnetic contacts, Glass-break detectors, Active Infrared beams and / or Passive/Microwave detectors are installed, such contacts and detectors should regularly be inspected for signs of tampering or damage. The inspection should further include verifying that the coverage areas of Active Infrared beams and / or Passive/Microwave detectors are not obstructed.

Where CCTV cameras are installed, such cameras should regularly be inspected for signs of tampering or damage. The inspection should further include verifying that the coverage areas of cameras are not obstructed.

Where security lights are installed, such lights should regularly be inspected for operation, signs of tampering or damage. The inspection should further include verifying that the coverage areas of security lights are not obstructed.

Where access control systems are deployed containing card/proximity readers, coded/magnetic locks, and such devises should regularly be inspected for signs of tampering, damage and effective operation. The inspection should further include verifying that the devices such as magnetic locks are not obstructed to render such devices inoperable.

5.5 C2 links & Software Protection

The C2 link provides functions as vital as traditional wiring, control cables and other essential systems. These links may utilize diverse hardware and software that may be provided and managed by third parties. Safety and security of these links and services are equally important as those for the RPAS and RPS. They must be free from hacking, spoofing and other forms of interference or malicious hijack.

RPS logon and logoff functions are critical security features to reduce unapproved access to the RPAS. The logon provides identified control over the RPAS and the logoff ends such control; failure in either process may enable an unauthorized individual to gain control over the RPAS. RPS logon should include identification and authentication of the remote pilot.

Handovers between non-collocated RPS may necessitate additional verifications and controls to assure the process is not interfered with by unauthorized individuals.
The following physical security measures shall be implemented:

a) RPAS hardware, particularly system control units/transmitters, are appropriately secured and located in areas to which access is controlled.

b) An authentication system verifying that only those authorized to have access are accessing the system, such as biometric log-on methods and/or passwords.

c) Persons with authorized access to control units/transmitters shall be limited.

d) Subject to the size and capability of the RPAS to require more than one person for approvals for passwords or system access.

e) Continuous monitoring and control of access to systems with specific reference to external suppliers.

f) Maintaining activity logs, which can be useful in auditing and evaluating, as well as providing alerts when there is activity outside of normal operating parameters.

g) Ensure that remote access to control units/transmitters is only permitted under prearranged and secure conditions, and that suppliers do not have unauthorized access to such systems after they have been procured and/or installed.

h) Remote access requires that suppliers have a means of accessing a system. The organisation shall ensure that this access route is known to them, and that the method and conditions of entry are agreed upon. For example, the supplier should be required to notify the SC whenever access to the system is needed. Alternatively, an automatic e-mail message should be generated to notify the SC each time access is sought.

i) Maintenance of the systems shall be performed by authorized personnel only, and at prearranged and approved times. The organisation shall request suppliers to limit the number of persons authorized to provide support and maintenance to the system. The SC shall require background checks be conducted on such persons, including criminal history checks.

j) Unofficial pieces of code within software, also referred to as “back doors”, may be used by suppliers and others to enter and use a system undetected. This vulnerability is almost impossible to mitigate against but certain measures may assist in detection. Implementing software behind a firewall not provided by the same supplier, and regular system audits, should identify any unusual activity in the system. The organisation shall request a certificate from suppliers stating that no such back door access exists and guaranteeing the integrity of the system.

5.6 Response Procedures

If a RPAS Operator receives intelligence indicating that a specific RPAS or Remote Pilot Station may be subject to an act of unlawful interference, the RPAS Operator shall notify the SACAA AVSEC Division, air traffic services and any adjacent airports where operations will be conducted so that they may implement additional security measures, or a crisis management response as appropriate.

If a suspect explosive device is found either on or in the immediate vicinity of an RPAS or Remote Pilot Station, the initial action should be to, land the RPAS safely and withdraw all personnel to a safe distance and await the arrival of police explosives disposal experts.
5.6.1 **Unlawful seizure of an RPAS during flight**

If there is an attempted or actual takeover of the RPAS, the crew should take the following measures:

a) Assess the situation to try to determine the intent of the attacker and modify the recommended response as appropriate;
b) Attempt to maintain control of the RPAS at all times and at all costs;
c) Activate the auto land/return to base or land the RPAS as soon as possible.
d) Declare an emergency and transmit appropriate information such as speed, high, endurance and direction in which the RPAS is moving;
e) Request assistance from manned aircraft in the vicinity.
f) After landing, disable batteries/fuel supply in an attempt to disable the RPAS and prevent its use by the offenders;
g) Evacuate to a secure area, if necessary;
h) Cooperate with local authorities, which may include providing statements and reports; and
i) Report the incident to the SACAA AVSEC Division.

5.6.2 **Unlawful seizure of a Remotely Piloted Station**

If there is an attempted or actual takeover of the RPAS, the crew should take the following measures:

a) Assess the situation to try to determine the intent of the attacker and modify the recommended response as appropriate.
b) Comply with initial demands without prejudicing safety.
c) Negotiate patiently and do not antagonize.
d) Avoid actions or movements that might appear hostile.
e) Before moving any control or switch, etc., explain the reason for the action.
f) Remain calm.
g) Consider passing information to controlling authorities.
h) Consider activating the auto land/return to base or landing the RPAS.
i) If forced by the attacker to continue flying the RPAS, consider actions to preserve life by remaining clear from other aircraft, incapacitate the RPAS safely or depleting battery charge/fuel.
j) After the situation is brought under control, cooperate with local authorities, which may include providing statements and reports, and
k) Report the incident to the SACAA AVSEC Division.

5.6.3 **Bomb threats**

On the receipt of a bomb threat the following actions shall be taken:

a) Stay calm.
b) Attract attention to co-worker.
c) Record details (use checklist).
d) Keep caller on the line as long as possible.
e) Ask questions.
g) Stay at your post.
h) Notify management or the SC.

The incident must be reported to the SC.

The SC and / Crisis Management Team must conduct an analysis / evaluation:

a) Review bomb threat information received.
b) Interview person receiving the call.
c) Consider current threat assessment.
d) Utilise PTI (Positive Target Identification).
e) Make a decision & classify threat, take action.

Take action based on the analyses of the SC and / or CMT.

  a) Notify local authorities.
  b) Safely land RPAS.
  c) Evacuate.
  d) Notify the CAA within 48 hours of the incident.

5.6.4 **Discovery of suspect or prohibited items**

If the security measures uncover a suspicious item, it is important that the:

  a) The suspect item is NOT touched.
  b) Notify your supervisor and police authorities immediately.
  c) The suspect item must not be moved.

The Security Coordinator in conjunction with the Evacuation Officer will determine which areas are at risk and order an immediate evacuation of these areas; and

The Police Explosives Unit will determine the status of the item based on their assessment.

Once the situation has been resolved, in cases where a prohibited item has been positively identified,

The authorities must be notified of the discovery and in addition in conjunction with the SACCAA, other operators operating from the same area should be notified.

5.7 **Special Procedures**

**Crop Spraying Operations**

Remove Before Flight Club does not participate in any crop spraying operations.

**Carrying of Weapons**

Remove Before Flight Club does not participate in any operations involving the carrying of any arms or ammunition.
Carrying Dangerous Goods

Remove Before Flight Club does not partake in any form of the carriage of cargo.

5.8 Crew Briefings

Crew shall be briefed in accordance with applicable response procedures and heightened security controls where a RPAS Operator receives intelligence indicating that a specific RPAS or Remote Pilot Station may be subject to an act of unlawful interference.

Crew shall receive initial and periodic briefings on the appropriate response procedures to take in the event of an act of unlawful interference.

5.9 Additional Security Measures During Heighted Threat Levels

When operating in high-risk areas or during heightened threat levels, additional precautions may be necessary, usually involving additional security measures to protect the RPAS pilot during operations and enhanced access control measures at Remote Pilot Stations.

The following additional security controls shall be implemented:

a) During storage and transportation, the RPAS shall be immobilized by storing the batteries and control unit separate from the RPAS.

b) During RPAS operations, a safety net shall be established around the RPAS pilot/Remote Pilot Station to give the RPAS pilot sufficient pre-warning to take evasive action in the event of a ground attack.

c) At least one person monitoring the safety net around the RPAS pilot shall be equipped with a panic button or pre-set speed dial function to make alarm and activate a suitable response. (The person or entity that will receive such alarms needs to be briefed of your exact location prior to taking the RPAS into service).

d) Local police authorities and ATNS contact numbers shall be confirmed and readily available to the RPAS pilot.

e) A system of reporting safe arrival and departure from a high-risk location shall be established with a responsible person not directly positioned at the location of operation.

5.10 Incident Reporting

Any breach of the security requirements of Part 101 shall be reported to the Security Coordinator, who in turn will report them to the SACAA AVSEC Division as soon as possible followed up with a written report within 48 hours. An ASR must be submitted.

5.11 Staff Recruitment & Training

All persons that have unescorted access to security restricted areas and that are involved in RPAS operations shall be subjected to background checks. Background checks shall be conducted prior to employment or prior to allowing persons unescorted access to security restricted areas.
Background checks will consist of:

a) Criminal records check
b) Qualifications verification
an interview is held, where the interviewer attempts to establish the reasons for

c) Any gaps in employment records, and reasons for leaving previous employments.
d) References shall be checked for a period of not less than 5 years prior to the recruitment process.

Records shall be maintained of all recruited staff that show a verification process was carried out, the result of the process and details of who made decisions on the candidate’s suitability to be allowed unescorted access within security restricted areas.

Criminal record checks shall be repeated every 24 months on all persons that have unescorted access to security restricted areas and that are involved in RPAS operations.

Records shall be maintained of such criminal record checks that show a verification process was carried out, the result of the process and details of who made decisions on the candidate’s suitability to be allowed unescorted access within security restricted areas and involved in RPAS operations.

All persons that have unescorted access to security restricted areas and that are involved in RPAS operations or having access to the contents of the Security Chapter shall be required to undersign an agreement to maintain confidentiality over sensitive RPAS security processes, procedures and systems.

The Security Coordinator and applicable staff with delegated responsibilities, responsible for the implementation, application and supervision of the security processes and procedures contained in this chapter will be trained or will receive appropriate security training and will be subjected to the required background checks including criminal record checks.

All persons that have unescorted access to security restricted areas and that are involved in RPAS operations shall receive security awareness training before commencing their duties and receive refresher training every 12 months thereafter.

All persons that are involved in RPAS operations shall receive training in accordance with the response procedures as contained in this chapter.

Regular updating of staff about security shall be conducted by the Security Coordinator or delegated to appropriate staff in the form of circulars and briefings.
PART: 5

QUALITY MANAGEMENT SYSTEM

(REFER TO REMOVE BEFORE FLIGHT CLUB QUALITY MANUAL)
APPENDICES

APPENDIX A:

PERMISSION TO OPERATE (PTO)

Date: __________________

To Whom It Concerns:

PERMISSION - Small Unmanned Aircraft, <7kg

1. I ___________________ (land owner’s name or Company) hereby permit Remove Before Flight Club (“the operator”) to conduct Aerial Photography and video filming on my privately owned property for:

☐ Agriculture
☐ Mining
☐ Wind Turbines
☐ Power line Inspections
☐ Conservation
☐ Industrial Inspections
☐ Utilities

Please provide the following Details:

Contact Details:

Physical Address and Coordinates: ____________________________________________

Telephone and Mobile Numbers: ____________________________________________

Email: ______________________________________

a. Flight Location – an exact postcode or map reference for the site of the operation so that we can do a pre-site assessment (PSA) using our online resources:

b. Operation Timing – are you looking to shoot on a particular day, or over a given period? It helps to know this so we can plan around the weather or other air traffic:

c. Type of media required – do you require video or still photographs? We can do both in one flight; it just needs to be planned correctly:

d. Other known air users in the vicinity:

e. Price expectation:

f. Any other information:
2. This Permission is granted subject to the following conditions, namely that the said aircraft shall not be flown:

(a) other than by pilots employed by or contracted to Remove Before Flight Club (Pty)Ltd

(b) in controlled airspace, except with the permission of the appropriate air traffic control unit;

(c) in any aerodrome traffic zone except with the permission either of the appropriate air traffic control unit or the person in charge of the aerodrome;

(d) at a height exceeding 400 feet above ground level;

(e) at a distance beyond the visual range of the operator(s) of the said aircraft, or a maximum range of 500 metres;

(f) within 50 metres of any person, vessel, vehicle or structure not under the control of the aircraft operator except that during the take-off or landing an aircraft to which this subparagraph applies shall not fly within 50 metres of any person other than the person in charge of the said aircraft or a person in charge of any other small aircraft or a person necessarily present in connection with the operation of such an aircraft;

(g) unless it is equipped with a mechanism that will cause the said aircraft to land in the event of disruption to or a failure of any of its control systems, including the radio link, and the person in charge of the said aircraft has satisfied himself that such mechanism is in working order before the aircraft commences its flight;

(h) unless the person in charge of the said aircraft has reasonably satisfied himself that any load carried by the aircraft is properly secured, that the said aircraft is in an airworthy condition and that the flight can safely be made taking into account the wind and other significant weather conditions;

(i) unless the operator maintains records of each flight made pursuant to this Permission and makes such records available to the Authority on request;

(j) at a speed exceeding 70 knots;

Land owner signature:

_____________________________ Date________________________ 2014

Pilot signature:

_____________________________ Date________________________ 2014

Operations Director Remove Before Flight Club Signature:

_____________________________ Date________________________ 2014
# APPENDIX B:

## PRE-SITE SURVEY

### OPERATING SITE LOCATION

<table>
<thead>
<tr>
<th>JOB NUMBER</th>
<th>DATE</th>
<th>SITE NAME:</th>
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<table>
<thead>
<tr>
<th>SITE LATITUDE:</th>
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<table>
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<tr>
<th>SITE LONGITUDE:</th>
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### FLIGHT TEAM COMPOSITION

<table>
<thead>
<tr>
<th>PILOT IN COMMAND:</th>
<th>DATE WORK REQUIRED:</th>
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<thead>
<tr>
<th>CO PILOT:</th>
<th>DowLOADED MAP TO GROUNDSTATION: (Tick)</th>
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<table>
<thead>
<tr>
<th>RPAS REGISTRATION:</th>
<th>IS THERE VEHICULAR ACCESS:</th>
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<tbody>
<tr>
<td></td>
<td>YES</td>
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</table>

### WORK REQUIRED:

<table>
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<tr>
<th>ITEM</th>
<th>ACTION TO COMPLETE</th>
<th>FINDINGS</th>
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<tr>
<td>AIRSPACE</td>
<td>Airspace - Manned/Unmanned, Prohibited, Restricted, Danger</td>
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</tr>
<tr>
<td>TERRAIN</td>
<td>Terrain - Flat, Mountainous, High Structures, Trees, Wires</td>
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</tr>
<tr>
<td>PROXIMITIES</td>
<td>Other Aircraft - Aerodromes, Helicopter Pads, SAAMA Sites, RPAS</td>
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</tr>
<tr>
<td>HAZARDS</td>
<td>Live Firing, High Intensity Radio Transmissions, Gas Venting</td>
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<tr>
<td>RESTRICTIONS</td>
<td>Nuclear Power Stations, Prisons, Police Stations, Military</td>
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<tr>
<td>SENSITIVITIES</td>
<td>Nature Reserves, Recreational Areas, Bye Laws</td>
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<tr>
<td>PEOPLE</td>
<td>Local Habitation, Hospitals, Churches, Education Establishments</td>
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<tr>
<td>LIVESTOCK</td>
<td>Local Farms, Hatcheries etc</td>
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<tr>
<td>PERMISSION</td>
<td>ATC, Local Authority, Land Owner, Military, Police</td>
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<tr>
<td>ACCESS</td>
<td>Public Right of Way, Gates &amp; Roads, Emergency Routes</td>
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<tr>
<td>CORDON</td>
<td>Cordon Required - a need for extra staff</td>
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<tr>
<td>FOOTPATHS</td>
<td>Public Footpaths, Bridal Paths</td>
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<tr>
<td>ALTERNATE</td>
<td>Alternative Take Off Sites / Landing Sites</td>
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<tr>
<td>RISK MITIGATION</td>
<td>Can the job be done at another time to avoid School times etc</td>
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<tr>
<td>WEATHER</td>
<td>24 hour forecast, Updated Forecast</td>
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<tr>
<td>NOTAMS</td>
<td>Anything that will impact on the operation</td>
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### COMPLETED PRE-NOTIFICATION (If Notified, Record Date, Time & Contact Name)

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<th>NOTOC:</th>
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</thead>
</table>
# APPENDIX C:

## EMBARKATION CHECKLIST

<table>
<thead>
<tr>
<th>ITEM</th>
<th>ACTION / CHECK</th>
<th>TICK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground Station &amp; Leads</td>
<td>Check Condition &amp; Functionality</td>
<td></td>
</tr>
<tr>
<td>Camera Monitor &amp; Leads</td>
<td>Check Condition &amp; Functionality</td>
<td></td>
</tr>
<tr>
<td>A / V Receiver &amp; Leads</td>
<td>Check Condition &amp; Functionality</td>
<td></td>
</tr>
<tr>
<td>Telemetry Receiver &amp; Leads</td>
<td>Check Condition &amp; Functionality</td>
<td></td>
</tr>
<tr>
<td>Laptop &amp; Leads</td>
<td>Check Condition &amp; Functionality</td>
<td></td>
</tr>
<tr>
<td>Mobile Phone &amp; Emergency No's</td>
<td>Check Condition &amp; Functionality</td>
<td></td>
</tr>
<tr>
<td>Anemometer</td>
<td>Check Condition &amp; Quantity</td>
<td></td>
</tr>
<tr>
<td>First Aid Kit &amp; Fire Extinguisher</td>
<td>Check Condition &amp; Contents</td>
<td></td>
</tr>
<tr>
<td>Food (Snacks &amp; Drink)</td>
<td>Check Condition &amp; Contents</td>
<td></td>
</tr>
<tr>
<td>Crew Identification</td>
<td>Check Requirements &amp; Quantity</td>
<td></td>
</tr>
<tr>
<td>Fluorescent Jacket(s) / Hard Hats</td>
<td>Check Condition &amp; Quantity</td>
<td></td>
</tr>
<tr>
<td>Two Way Radios</td>
<td>Check Condition, Charge &amp; Function</td>
<td></td>
</tr>
<tr>
<td>Clothing (Boots, Coat, Gloves)</td>
<td>Check Condition</td>
<td></td>
</tr>
<tr>
<td>Air Navigation Map</td>
<td>Check Condition</td>
<td></td>
</tr>
<tr>
<td>Checklists, Manuals &amp; Logbooks</td>
<td>Check Condition &amp; Current</td>
<td></td>
</tr>
<tr>
<td>Notepad &amp; Pens</td>
<td>Check Condition</td>
<td></td>
</tr>
<tr>
<td>Call Sheets (Emailed)</td>
<td>Check Status</td>
<td></td>
</tr>
<tr>
<td>Site Guide</td>
<td>Check Condition</td>
<td></td>
</tr>
<tr>
<td>Signs, Safety Tape, Cones</td>
<td>Check Condition &amp; Quantity</td>
<td></td>
</tr>
<tr>
<td>Flight Battery Packs</td>
<td>Charge &amp; Check Condition</td>
<td></td>
</tr>
<tr>
<td>Transmitter Battery Packs</td>
<td>Charge &amp; Check Condition</td>
<td></td>
</tr>
<tr>
<td>Camera Battery Packs</td>
<td>Charge &amp; Check Condition</td>
<td></td>
</tr>
<tr>
<td>Ground Station Battery</td>
<td>Charge &amp; Check Condition</td>
<td></td>
</tr>
<tr>
<td>Charger Battery Packs</td>
<td>Charge &amp; Check Condition</td>
<td></td>
</tr>
<tr>
<td>Mobile Phone Battery</td>
<td>Charge &amp; Check Condition</td>
<td></td>
</tr>
<tr>
<td>ITEM</td>
<td>ACTION / CHECK</td>
<td>TICK</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>---------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Airframe</td>
<td>Check Condition &amp; Airworthiness</td>
<td></td>
</tr>
<tr>
<td>Camera Mount</td>
<td>Check Condition &amp; Functionality</td>
<td></td>
</tr>
<tr>
<td>Flight Controller / Transmitter(s)</td>
<td>Check Functionality</td>
<td></td>
</tr>
<tr>
<td>Calibration Platform</td>
<td>Check Condition</td>
<td></td>
</tr>
<tr>
<td>Camera(s) &amp; Lens(s)</td>
<td>Check Condition &amp; Functionality</td>
<td></td>
</tr>
<tr>
<td>Camera Connection Leads</td>
<td>Check Condition</td>
<td></td>
</tr>
<tr>
<td>Camera Memory Cards</td>
<td>Check Condition &amp; Space</td>
<td></td>
</tr>
<tr>
<td>Camera to Airframe Lanyard</td>
<td>Check Condition &amp; Security</td>
<td></td>
</tr>
<tr>
<td>Camera Attachment Bolt</td>
<td>Check Condition</td>
<td></td>
</tr>
<tr>
<td>Multi Function Battery Charger</td>
<td>Check Condition &amp; Functionality</td>
<td></td>
</tr>
<tr>
<td>Required Charger Leads</td>
<td>Check Condition</td>
<td></td>
</tr>
<tr>
<td>Battery Checker</td>
<td>Check Functionality</td>
<td></td>
</tr>
<tr>
<td>Screwdrivers (Flat / Cross Drive)</td>
<td>Check Condition</td>
<td></td>
</tr>
<tr>
<td>Allen Keys</td>
<td>Check Condition</td>
<td></td>
</tr>
<tr>
<td>Pliers (Standard / Long Nose)</td>
<td>Check Condition</td>
<td></td>
</tr>
<tr>
<td>Cable Ties (Various Sizes)</td>
<td>Check Condition &amp; Quantity</td>
<td></td>
</tr>
<tr>
<td>Side Cutters</td>
<td>Check Condition</td>
<td></td>
</tr>
<tr>
<td>Nylock Propeller Nuts</td>
<td>Check Condition &amp; Quantity</td>
<td></td>
</tr>
<tr>
<td>Spare Props. (Tractor &amp; Pusher)</td>
<td>Check Condition &amp; Quantity</td>
<td></td>
</tr>
<tr>
<td>Small Socket Set</td>
<td>Check Condition</td>
<td></td>
</tr>
</tbody>
</table>

**NOTES:**
APPENDIX D: FIELD OPERATIONS GUIDE (FOG)

This guide is to be constructed as and when Remove Before Flight Club begin operations. It will contain all necessary detailed information pertaining to the operation at that specific site also covering all necessary radio communication frequencies and contact numbers etc.
## APPENDIX E:

### ON SITE SURVEY

<table>
<thead>
<tr>
<th>DATE:</th>
<th>PILOT:</th>
</tr>
</thead>
<tbody>
<tr>
<td>JOB NUMBER:</td>
<td>CO PILOT:</td>
</tr>
</tbody>
</table>

### WEATHER FORECAST

<table>
<thead>
<tr>
<th>Item</th>
<th>Action to Complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind Direction / Speed:</td>
<td>Knots</td>
</tr>
<tr>
<td>QNH:</td>
<td></td>
</tr>
<tr>
<td>Temperature:</td>
<td>°C</td>
</tr>
<tr>
<td>Humidity:</td>
<td>%</td>
</tr>
<tr>
<td>Chance of Rain:</td>
<td>%</td>
</tr>
<tr>
<td>Visibility:</td>
<td>Meters</td>
</tr>
<tr>
<td>Sunrise/Sunset:</td>
<td></td>
</tr>
</tbody>
</table>

### Item | Action to Complete
--- | ---
Obstructions | Masts, Power Lines, Buildings, Train Tracks, Trees, Lakes, Rivers, Canals or Industrial Hazards
Visual Limitations | Anything that May Impair Vision? (Up to 5KM)
Cordon | Is a Cordon Required? (Do we need extra staff?)
Livestock | Any Animals or Wildlife Present Nearby?
Terrain | Flat Surface, Rough, Sloped, Wet, Trees?
Permission | Do We Have the Land Owners Permission?
Public | Public Right of Way, Footpaths, Gates
Air Traffic | Do We Need & or Have Clearance?
Communication | Are Two Way Radios Required?
Proximity | Are We Far Enough Away from Buildings?
Take Off Area | Where is the Safest Convenient Position?
Landing Area | Where is the Safest Convenient Position?
Operational Zone | Are there Any Hazards or Obstructions?
Emergency Area | Where is the Safest Convenient Position?

### Contact

<table>
<thead>
<tr>
<th>Item</th>
<th>Names</th>
<th>Telephone Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pilot:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Co Pilot:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Client:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local Police:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local Hospital:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local Air Traffic Control:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Findings:
### APPENDIX F:

<table>
<thead>
<tr>
<th>ITEM</th>
<th>ACTION / CHECK</th>
<th>TICK</th>
</tr>
</thead>
<tbody>
<tr>
<td>SITE SURVEY CHECKLIST</td>
<td>CARRY OUT SITE SURVEY WITH CO PILOT</td>
<td></td>
</tr>
<tr>
<td>FLIGHT PLAN / BRIEF</td>
<td>CONFIRM FLIGHT PLAN &amp; BRIEF CREW &amp; CLIENT</td>
<td></td>
</tr>
<tr>
<td>CREW IDENTIFICATION BADGES</td>
<td>ISSUE AS REQUIRED</td>
<td></td>
</tr>
<tr>
<td>HARD HAT / FLOURESCENT JACKETS</td>
<td>ISSUE AS REQUIRED</td>
<td></td>
</tr>
<tr>
<td>TWO WAY RADIOS</td>
<td>ISSUE AS REQUIRED</td>
<td></td>
</tr>
<tr>
<td>CORDON, SIGNS AND SAFETY TAPE</td>
<td>SETUP IF SURVEY FINDS REQUIREMENT FOR CORDON PROCEDURE</td>
<td></td>
</tr>
<tr>
<td>CREW / HELPERS</td>
<td>POSITION AS REQUIRED TO MAINTAIN SAFE FLYING ZONE</td>
<td></td>
</tr>
<tr>
<td>FIRST AID KIT</td>
<td>POSITION TO BE EASILY ACCESSIBLE &amp; INFORM CREW OF LOCATION</td>
<td></td>
</tr>
<tr>
<td>FIRE EXTINGUISHER</td>
<td>POSITION TO BE EASILY ACCESSIBLE &amp; INFORM CREW OF LOCATION</td>
<td></td>
</tr>
<tr>
<td>AIRFRAME</td>
<td>UNLOAD &amp; CHECK AIRFRAME FOR ANY TRANSIT DAMAGE</td>
<td></td>
</tr>
<tr>
<td>PAYLOAD</td>
<td>CHECK SECURE</td>
<td></td>
</tr>
<tr>
<td>AUDIO VISUAL CONNECTION</td>
<td>INSERT A/V PLUG AND SECURE</td>
<td></td>
</tr>
<tr>
<td>PROPELLERS</td>
<td>CHECK CONDITION (Splits, chips or cracks - Replace if Required)</td>
<td></td>
</tr>
<tr>
<td>PROPELLER FIXINGS</td>
<td>CHECK SECURING NYLOCK NUTS FOR TIGHTNESS (Replace if Removed)</td>
<td></td>
</tr>
<tr>
<td>CALIBRATION PLATFORM</td>
<td>POSITION AS REQUIRED</td>
<td></td>
</tr>
<tr>
<td>GROUND STATION</td>
<td>SETUP, SWITCH ON AND TEST OPERATION</td>
<td></td>
</tr>
<tr>
<td>AUDIO VISUAL MONITOR</td>
<td>SETUP, SWITCH ON AND TEST OPERATION</td>
<td></td>
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</tbody>
</table>
# APPENDIX G:

## PRE FLIGHT CHECKLIST

<table>
<thead>
<tr>
<th>ITEM</th>
<th>ACTION / CHECK</th>
<th>TICK</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIRFRAME</td>
<td>CHECK FOR DAMAGE, WEAR, TIGHTNESS OF FITTINGS, CONDITION AND SECURE FITMENT OF PROPELLERS AND SECURE ATTACHMENT OF CAMERA</td>
<td></td>
</tr>
<tr>
<td>FLIGHT BATTERY</td>
<td>NOTE BATTERY NUMBER IN BATTERY LOGBOOK, RECORD PRE-FLIGHT BATTERY POWER % AND FIT INTO AIRFRAME (Flight Batteries Must Be No Lower than 90%)</td>
<td></td>
</tr>
<tr>
<td>TRANSMITTER</td>
<td>SWITCH ON, CHECK BATTERY POWER IS AT LEAST 80%, ENSURE TRIMS ARE NUETRAL AND ALL SWITCHES ARE IN THERE CORRECT POSITIONS</td>
<td></td>
</tr>
<tr>
<td>CAMERA</td>
<td>SWITCH ON AND CONFIRM CORRECT OPERATION</td>
<td></td>
</tr>
<tr>
<td>FLIGHT BATTERY</td>
<td>ENSURE AIRCRAFT IS LEVEL ON THE CALIBRATION PLATFORM</td>
<td></td>
</tr>
<tr>
<td>AIRFRAME</td>
<td>CALL &quot;CLEAR PROPS' AND CONNECT FLIGHT BATTERY</td>
<td></td>
</tr>
<tr>
<td>FLIGHT BATTERY</td>
<td>WAIT FOR DIAGNOSTIC TO FINISH</td>
<td></td>
</tr>
<tr>
<td>SELF DIAGNOSTIC</td>
<td>CHECK FUNCTION &amp; QUALITY OF AUDIO VISUAL LINK FROM CAMERA</td>
<td></td>
</tr>
<tr>
<td>CALIBRATION GYRO</td>
<td>CALIBRATE GYRO (Left transmitter stick to top left, Confirmed with a beep)</td>
<td></td>
</tr>
<tr>
<td>CALIBRATE ACCELEROMETER</td>
<td>WRITE ACCELEROMETER VALUES TO EEPROM (Left transmitter stick to top right, Confirmed with a beep)</td>
<td></td>
</tr>
<tr>
<td>CAMERA GIMBAL</td>
<td>SWITCH ON AND LOAD SOFTWARE (Once loaded select &quot;Connect to system&quot;)</td>
<td></td>
</tr>
<tr>
<td>GROUND STATION</td>
<td>ENSURE TELEMETRY FEED IS BEING RECEIVED AND DISPLAYS ARE CONNECTED</td>
<td></td>
</tr>
<tr>
<td>SATELLITE CAPTURE</td>
<td>MONITOR SATELLITE CAPTURE ON SCREEN UNTIL 7 SATELLITES ARE CAPTURED (3D Fix will be displayed)</td>
<td></td>
</tr>
<tr>
<td>GPS POSITION FIX</td>
<td>CONFIRM GPS POSITION FIX (Solid blue light on aircraft receiver)</td>
<td></td>
</tr>
<tr>
<td>FLIGHT PLAN</td>
<td>LOAD IN FLIGHT PLAN FROM GROUND STATION IF REQUIRED (Beep for Each Waypoint)</td>
<td></td>
</tr>
<tr>
<td>CAMERA</td>
<td>REPOSITION AIRCRAFT IN TAKE OFF AREA ON LEVEL GROUND FACING INTO WIND</td>
<td></td>
</tr>
<tr>
<td>CREW, PUBLIC &amp; CLIENT</td>
<td>ENSURE ALL CREW, PUBLIC AND CLIENT ARE IN CORRECT SAFE POSITIONS</td>
<td></td>
</tr>
<tr>
<td>CLEARANCE</td>
<td>DOES THIS FLIGHT OPERATION HAVE CLEARANCE FROM AIR TRAFFIC CONTROL IF REQUIRED?</td>
<td></td>
</tr>
<tr>
<td>POWER UP</td>
<td>CALL &quot;TAKING OFF&quot; AND START MOTORS (Left transmitter stick to bottom right corner)</td>
<td></td>
</tr>
<tr>
<td>TAKE OFF</td>
<td>TAKE ONE FINAL LOOK AROUND, CHECK WITH OBSERVER THAT THEY AGREE IT IS SAFE TO FLY, POWER UP AND TAKE OFF, CLIMB TO APPROXIMATELY 2 METERS</td>
<td></td>
</tr>
<tr>
<td>CONTROL TEST</td>
<td>TEST YAW AND CYCLIC CONTROLS (Use small gentle movements and ensure aircraft reacts correctly)</td>
<td></td>
</tr>
<tr>
<td>FUNCTION TEST</td>
<td>ENGAGE POSITION AND ALTITUDE HOLD TO TEST FUNCTION (Aircraft should hold position and altitude)</td>
<td></td>
</tr>
<tr>
<td>FLIGHT BATTERY CHECK</td>
<td>CHECK BATTERY STATUS AND SATELLITES BEING TRACKED</td>
<td></td>
</tr>
<tr>
<td>ACTIVATE PAYLOAD</td>
<td>CALL &quot;Camera Free&quot; TO ADVISE THE PAYLOAD OPERATOR THAT THE CAMERA MAY NOW BE MOVED</td>
<td></td>
</tr>
<tr>
<td>OPERATION</td>
<td>CONFIRM WITH THE OBSERVER THAT THE PLANNED FLIGHT OPERATION IS STILL GOOD TO GO AHEAD</td>
<td></td>
</tr>
</tbody>
</table>
### APPENDIX H:

#### POST FLIGHT CHECKLIST

<table>
<thead>
<tr>
<th>ITEM</th>
<th>ACTION / CHECK</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOUCHDOWN</td>
<td>UPON TOUCHDOWN STOP THE MOTORS</td>
</tr>
<tr>
<td>POWER DOWN</td>
<td>WALK TO AIRCRAFT, DISCONNECT FLIGHT BATTERY PACK AND CALL “Aircraft Safe”</td>
</tr>
<tr>
<td>REMOVAL</td>
<td>REMOVE THE AIRCRAFT FROM THE LANDING AREA</td>
</tr>
<tr>
<td>DATA RECORDING</td>
<td>RECORD PILOT, AIRCRAFT AND BATTERY DETAILS IN THE RELEVANT LOGBOOKS</td>
</tr>
<tr>
<td>TRANSMITTER</td>
<td>SWITCH OFF CONTROL TRANSMITTER</td>
</tr>
<tr>
<td>CAMERA</td>
<td>STOP RECORDING AND SWITCH OFF CAMERA</td>
</tr>
<tr>
<td>AIRFRAME</td>
<td>CHECK FOR DAMAGE, WEAR, TIGHTNESS OF FITTINGS, CONDITION AND SECURE FITMENT</td>
</tr>
<tr>
<td></td>
<td>OF PROPELLERS AND SECURE ATTACHMENT OF CAMERA</td>
</tr>
<tr>
<td>FLIGHT BATTERY</td>
<td>REMOVE FLIGHT BATTERY FROM AIRCRAFT, CHECK RESIDUAL BATTERY %, RECORD DETAILS</td>
</tr>
<tr>
<td></td>
<td>IN BATTERY LOGBOOK</td>
</tr>
<tr>
<td>MEMORY CARD</td>
<td>REMOVE MEMORY CARD FROM CAMERA AND BACKUP TO GROUND STATION PC</td>
</tr>
<tr>
<td>REVIEW</td>
<td>REVIEW IMAGES AND EVALUATE WITH CREW AND CLIENT IF REQUIRED</td>
</tr>
<tr>
<td>PAPERWORK</td>
<td>COMPLETE THE MISSION REPORT, ANY OTHER NECESSARY REPORTS, MAINTENANCE RECORD</td>
</tr>
<tr>
<td></td>
<td>AND PILOTS LOGBOOK</td>
</tr>
</tbody>
</table>

Revision: Original
Effective date: 01/08/2014
APPENDIX I:

MISSION REPORT (MR)

MISSION No: _______________________ DATE: _______________________

SITE: ___________________________

<table>
<thead>
<tr>
<th>PILOT</th>
<th>CO PILOT</th>
<th>Take Off Time</th>
<th>Landing Time</th>
<th>Flying Time</th>
<th>Day</th>
<th>Night</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

TOTAL FLYING TIME: ___________________________ Hours/ Minutes

WEATHER AT SITE:

<table>
<thead>
<tr>
<th>Cloud Base:</th>
<th>Wind:</th>
<th>QNH:</th>
<th>Temperature:</th>
<th>Adverse Weather:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NUMBER OF BATTERIES USED: _______________________

FEEDBACK: (Observations, changes, unusual conditions/requests etc)

ASR Raised Y / N

PILOT SIGNATURE: _____________________________

(Pilot signature not required if submitting by email)
# APPENDIX J:

## AIR SAFETY REPORT (ASR)

### page 1

<table>
<thead>
<tr>
<th>MISSION No:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE:</td>
<td></td>
</tr>
<tr>
<td>TIME:</td>
<td></td>
</tr>
<tr>
<td>PILOT:</td>
<td></td>
</tr>
<tr>
<td>CO PILOT:</td>
<td></td>
</tr>
<tr>
<td>RPAS TYPE:</td>
<td></td>
</tr>
<tr>
<td>RPAS REG:</td>
<td></td>
</tr>
<tr>
<td>SITE:</td>
<td></td>
</tr>
</tbody>
</table>

**WEATHER AT TIME OF OCCURRENCE:**

- Wind direction and speed:  
- Outside Air Temperature:  
- QNH:  
- Cloud Base:  
- Runway, T/O, Landing area conditions:  
- Visibility:  
- Dry / Wet conditions: 

**OTHER INFORMATION:**

- Number of people involved:  
- Personal injury:  
- RPAS component malfunction:  
- Base Station malfunction:  
- Closest airport:  
- Closest Police Station:  
- Emergency Equipment used:  

---

Revision: Original  
Effective date: 01/08/2014
FULL DETAILS OF OCCURRENCE: (Use sketches if necessary)

<table>
<thead>
<tr>
<th>WITNESS NAME:</th>
<th>CONTACT DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

PILOT SIGNATURE:
# APPENDIX K:

## ACCIDENT AND INCIDENT RECORD

<table>
<thead>
<tr>
<th>MONTH / YEAR</th>
<th>OCCURRENCES</th>
<th>TOTAL FLYING HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2014</td>
<td>0</td>
<td>0</td>
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</tbody>
</table>

**GRAND TOTAL AS OF 31st December 2014:**

<table>
<thead>
<tr>
<th>2014</th>
<th>OCCURRENCES</th>
<th>TOTAL FLYING HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>February</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>March</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>April</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>May</td>
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## Risk Assessment

**Assessor:** Safety Officer: Date: 

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### Exposure – Extent of Loss to the Company

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<th>Mitigation Reference</th>
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<td>Low</td>
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### Likelihood

**Operational Factors**

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**Technical Factors**

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**Human Factors**

- Flight crew qualifications
- Number of pilots / SO
- Experience
- Currency – aircraft
- Currency – routes
- Company culture
- Crew rest facilities

### Global Assessment of Likelihood

**Severity**

- 
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- 

**Global Assessment of Severity**
## Safety Risk Profile

<table>
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<tr>
<th>Assessor</th>
<th>Safety Officer</th>
<th>Date:</th>
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<td>Reason for update:</td>
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### Exposure – Extent of Loss to the Company

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<th>Risk</th>
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<th>Mitigation Reference</th>
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<td>Medium</td>
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<td>Low</td>
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### Likelihood

**Operational Factors**

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**Technical Factors**

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**Human Factors**

- Flight crew qualifications
- Number of pilots / SO
- Experience
- Currency – aircraft
- Currency – routes
- Company culture
- Crew rest facilities

**Global Assessment of Likelihood**

### Severity

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**Global Assessment of Severity**
## APPENDIX N:

<table>
<thead>
<tr>
<th>OPERATIONAL HAZARD IDENTIFICATION FORM</th>
<th>Report Date</th>
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<td>Resolution Date</td>
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<tr>
<td>Name</td>
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<tr>
<td>SAFETY CONCERN/HAZARD</td>
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<tr>
<td>RECOMMENDED SOLUTION/MITIGATION</td>
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<tr>
<td>ACTION TAKEN &amp; BY WHOM</td>
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APPENDIX O:

PILOT COMPETENCY RECORD

GENERAL INFORMATION

<table>
<thead>
<tr>
<th>Full Name(s):</th>
<th>Licence No:</th>
<th>Country of issue:</th>
<th>Expiry:</th>
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UAS EXPERIENCE

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<tr>
<th>RPAS Type</th>
<th>Pilot Time Day</th>
<th>Training Hours</th>
<th>Instructor Time</th>
<th>Total Time</th>
<th>Date of Last Recurrency</th>
<th>Date of Last Logbook Check</th>
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TOTALS

RPAS EMPLOYMENT RECORD

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<tr>
<th>From (M/Y)</th>
<th>To (M/Y)</th>
<th>Company</th>
<th>Country</th>
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<th>Position Held</th>
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COURSES AND QUALIFICATIONS

OPERATIONAL EXPERIENCE

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### APPENDIX P: RPAS CLASSIFICATIONS

<table>
<thead>
<tr>
<th>Class</th>
<th>Table 1: RPAS Classification</th>
<th>Kinetic energy ($E_{\text{max}}$) (kJ)</th>
<th>Height (ft)</th>
<th>MTOM (kg)</th>
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<tbody>
<tr>
<td></td>
<td>line-of-sight</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class 1A</td>
<td>R-VLOS/VLOS/E-VLOS/</td>
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<td>h &lt; 400</td>
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<td>m &lt; 7</td>
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<td>Class 1C</td>
<td>R-VLOS/VLOS/E-VLOS/</td>
<td>$E_k &lt; 34$</td>
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<td>Class 2A</td>
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<td>Class 2B</td>
<td>Experimental / Research</td>
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</table>

Reserved - means to be defined in the future

H - means height above the surface

$E_{\text{max}} = \frac{1}{2} \text{mass} \cdot (v_{\text{max}})^2$

Note: RLOS is a subset of B-VLOS