

## South Atlantic Environmental Research Institute (SAERI)



# OPERATIONS MANUAL

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## Part A – Introduction

### 1. *Introduction*

The purpose of the document is to detail the procedures to be followed for all South Atlantic Environmental Research Institute (hereinafter referred to as SAERI) commercial and research flight operations. It has been developed to satisfy requirements in two territories:

- The requirements of the United Kingdom Civil Aviation Authority (CAA) in compliance with CAP 393, The Air Navigation Order 2016, and the specific terms and conditions set out in any permissions or exemptions for Commercial Operations granted by the CAA.
- The requirements of the Falkland Islands Civil Aviation Department in compliance with the Air Navigation (Overseas Territories) Order 2013, and the specific terms and conditions set out in any permissions or exemptions for Aerial Work granted by the Falkland Islands Civil Aviation Department (FICAD).

Where any flight operation (commercial or research) deviates from the requirements set out in the above legislation, and within this documentation, permission in writing **MUST** be received from the relevant National Aviation Authority before the operation shall be allowed to proceed.

All personnel involved with SAERI aerial operations (commercial and research) will be familiar with this manual and will comply at all times with the operational instructions and procedures set out within it.

## 1.1. Definitions

The following abbreviations have been used in this document.

<b>ACRONYM</b>	<b>MEANING</b>
<b>AMSL</b>	Above Mean Sea Level
<b>ANO</b>	Air Navigation Order
<b>ATC</b>	Air Traffic Control
<b>ATZ</b>	Aerodrome Traffic Zone
<b>CAA</b>	UK Civil Aviation Authority
<b>CAP</b>	Civil Aviation Publication
<b>GPS</b>	Global Positioning System
<b>FICAD</b>	Falkland Islands Civil Aviation Department
<b>FIG</b>	Falkland Islands Government
<b>FIGAS</b>	Falkland Islands Government Air Service
<b>FISU</b>	Flight Information Service Unit
<b>FRZ</b>	Flight Restriction Zone
<b>MOR</b>	Mandatory Occurrence Reporting
<b>MTOM</b>	Maximum Take-Off Mass
<b>NOTAM</b>	Notice to Airmen
<b>PfCO</b>	Permission for Commercial Operations
<b>RTH</b>	Return to Home
<b>SAERI</b>	South Atlantic Environmental Research Institute
<b>SUA</b>	Small Unmanned Aircraft
<b>SUSA</b>	Small Unmanned Surveillance Aircraft
<b>SUAS</b>	Small Unmanned Aircraft System
<b>UAV</b>	Unmanned Aerial Vehicle
<b>VLOS</b>	Visual Line of Sight

## 1.2. Referenced Documents

Please see Appendix E

### 1.3. Document Control and Amendment Process

This operations manual is a controlled document. SAERI will maintain an amendment record which identifies the current version. It is the responsibility of all SAERI staff to ensure that they maintain a current version of this document to ensure that flight operations are compliant with current organisational, UK and Falkland Islands National Aviation Authority legislation.

For operations within the UK, SAERI subscribes to the 'Skywise' and NATS Aeronautical Information Service newsletter services to help ensure awareness of and thereby compliance with any updates from the UKs CAA. For operations within the Falkland Islands, SAERI liaises with FICAD.

Any amendments to this document must be approved by the accountable manager Dr Paul Brickle and these sections must be promptly distributed to the relevant SAERI staff.

Enquiries regarding the content of this document should be directed to:

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### 1.4. Amendment Record

This document is subject to regular changes and as such, any significant amendments are recorded below. All amendments must be brought to the attention of all personnel within the organisation.

Version Number	Amendment Date	Amendment Narrative	Incorporated By
1.0	07/06/18	First Edition	Neil Golding
1.1	09/07/18	Designated observers updated	Neil Golding
1.2	03/09/18	Inclusion of aerial operations for commercial/scientific research in the Falkland Islands	Neil Golding
1.3	18/12/18	Updated for South Georgia fieldwork	Neil Golding
1.4	03/06/19	Updated to reflect 2018 and 2019 amendments to the Air Navigation Order 2016 as set out in CAP 1763	Neil Golding

Version Number	Amendment Date	Amendment Narrative	Incorporated By
1.5	09/08/19	Updated CAP722 version & added contact information in relation to Falklands Helicopter Services	Neil Golding

### 1.5. Commitment of the Accountable Manager

This Operations Manual describes the organisation, aircraft systems, personnel, flight operations and procedures by which SAERI carries out its commercial and research unmanned flight 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 relevant National Aviation Authorities addressed by this document.

Signed:



Dr Paul Brickle  
Accountable Manager

Date: 03/06/19

For and on behalf of SAERI, a charity registered in England & Wales No: 1173105

## 2. Organisation

### 2.1. Organisation Details

Business Name:	South Atlantic Environmental Research Institute (SAERI)
Business Type:	Charity
Charity Registration No.	1173105
Registered in:	England & Wales
Accountable Manager:	Dr Paul Brickle
SUA Operator:	SAERI
Remote Pilot(s):	Listed in 2.3 below

### 2.2. Structure of Organisation and Management Lines

SAERI conducts flight operations using the personnel in the following roles:

- Accountable Manager
- Remote Pilot
- Visual Observer (potentially client or other SAERI crew)

The Accountable Manager is responsible for all organisational decisions; all SAERI crew and other staff report directly to the accountable manager. Once engaged in flight operations, the Remote Pilot is responsible for every aspect of the flight operation. The Visual Observer and any other support personnel report directly to the Remote Pilot.

### 2.3. Nominated Personnel

The table below lists all qualified Remote Pilots (to undertake commercial work) and visual observers employed by or contracted SAERI.

Remote Pilots		Support Personnel	
Name	Qualification	Name	Role
Neil Golding	CDP-C™	Stefanie Carter	Observer
		Paul Brewin	Observer
		Nathan Wenn	Observer
		Bran Black	Observer
		Lauren Shea	Observer
		Ander De Leca	Observer

## 2.4. Responsibility and Duties of the Remote Pilot

The Remote Pilot is responsible for the crew and the SUA whilst flight operations are being conducted. These responsibilities include:

- Ensuring that the Remote Pilot and crew are fit and capable of safely conducting the planned operation.
- Monitoring the crew's medical status and competency.
- Ensuring that the aircraft system is in a fully airworthy condition.
- Operating within the herein specified operating limitations for the aircraft.
- Utilising all relevant checklists and ensuring that pre-flight procedures have been completed before each flight.
- Keeping the pilot and aircraft log books up-to-date.
- Maintaining flight safety awareness.
- Maintaining currency for each SUA type they are qualified to operate.
- Only operating if reasonably satisfied that the flight can safely be made taking account of the prevailing weather conditions, obstructions and other hazards.
- Maintaining direct, unaided visual line of sight (VLOS) sufficient to monitor the aircraft's flight path in relation to other aircraft, persons, vehicles, vessels and structures for the purpose of avoiding collisions, unless agreed in writing from the relevant National Aviation Authority.
- For commercial operations, ensuring that the aircraft is operated within all and any limitations set out in the South Atlantic Environmental Research Institute (SAERI) commercial operations permission issued by the relevant National Aviation Authority.
- Ensuring that the operation is not likely to compromise the privacy or welfare of the crew or any others.
- Either arranging daily public liability insurance for each day and every flight conducted during flight operations (e.g. <https://flockcover.com/>), or ensuring that an annual policy that meets the requirements of EC Regulation No. 785/2004 is in place.

## 2.5. Responsibility and Duties of the Support Personnel

### Visual Observer

A Visual Observer is normally used for SAERI flight operations. It is acceptable for SAERI remote pilots to utilise client personnel to act as visual observer provided they have been properly briefed and accept the responsibilities of this role.

- During flight, maintain constant situational awareness of the area of operations including take-off/landing sites and access points, and checking for possible incursions such as military or civilian aircraft, birds or recreational radio control aircraft. If seen by the observer they should indicate clearly to the Remote Pilot the heading, direction and speed and what the hazard is. The Remote Pilot will then take the appropriate action.



- Ensure they are briefed by the Remote Pilot on a flight-by-flight basis to ensure they are aware of their responsibilities for standard and emergency procedures.
- Assist the Pilot with flight planning as appropriate.
- Assist with equipment deployment and testing in the field.
- Deal with any public enquiries.
- During flight, provide to the pilot periodic updates on location of the aircraft.
- Ensure the site remains secure and safe.
- Assist the Pilot with any weather checks during flight.
- Assist Pilot with any emergency situation as directed.

### Other Support Personnel

Additional personnel may be assigned to fulfil the roles of visual observers, crowd control, technical assistants etc. These additional support personnel will be properly briefed to fulfil their appointed roles.

## 2.6. Area of Operation

SAERI flight operations will be conducted in the United Kingdom and the Falkland Islands, in accordance with any geographic or other limitations stipulated in the granted commercial operations permission.

## 2.7. Operating Limitations and Conditions

All SAERI remotely piloted aircraft operations are subject to the operating limitations set out in Articles 94, 94A, 94B & 95 of the Air Navigation Order 2016 (Amendment 2019) unless specified otherwise in the granted commercial operations permission.

Specifically, SAERI Remote Pilots will not fly the SUA above 400' of the surface (Article 94A) and will not operate within the FRZ of any protected airfield without prior permission for such flight being given by either the ATC or FISU, in accordance with the specific conditions set out in Article 94A. FRZs are shown on the [DroneSafe FRZ map](#) which should be checked before each and every SUA Operation.

SAERI SUA will be operated within the limitations and conditions set out in the commercial operations permission with due regard to Article 241 of the Air Navigation Order 2016 for every flight operation.

When operating within the Falkland Islands, all SAERI remotely piloted aircraft operations are subject to the operating limitations set out in Article 73 of the Air Navigation (Overseas Territories) Order 2013. In addition, during commercial operations, SAERI will operate SUA within the limitations and conditions set out in the commercial operations permission issued by FICAD.

### 3. Operational Control

#### 3.1. Supervision of Operations

The Remote Pilot is responsible for overall supervision of operations, both ground based and airborne. The Remote Pilot is responsible for all operational decisions whilst the aircraft is engaged in flight operations.

#### 3.2. Accident Prevention and Flight Safety Programme

SAERI is committed to the safe operation of SUA and will actively investigate any occurrence, incident or accident it is involved in to identify any causal factors and take actions to help prevent repetition. Any relevant safety related information will be shared using the European Coordination Centre for Accident and Incident Reporting System (ECCAIRS) which is an [online portal](#). SAERI complies with the requirements set out in Regulation (EU) No. 376/2014.

An Accident is defined as: 'An occurrence associated with the operation of an aircraft which, in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time it comes to rest at the end of the flight and the primary propulsion system is shut down, in which:

- a person is fatally or seriously injured as a result of direct contact with any part of the aircraft, including parts which have become detached from the aircraft, except when the injuries are from natural causes, self-inflicted or inflicted by other persons; or,
- the aircraft sustains damage or structural failure which adversely affects the structural strength, performance or flight characteristics of the aircraft, and would normally require major repair or replacement of the affected component; or, the aircraft is missing or is completely inaccessible'.

A Serious Incident is defined as: 'An incident involving circumstances indicating that there was a high probability of an accident and associated with the operation of an aircraft which in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time it comes to rest at the end of the flight and the primary propulsion system is shut down.'

*NOTE:* The difference between an accident and a serious incident lies only in the result.

A Reportable Occurrence is defined as: 'Any incident which endangers or which, if not corrected, would endanger an aircraft or any other person.'

All reportable occurrences will be reported using the ECCAIRS online reporting portal found at [www.aviationreporting.eu](http://www.aviationreporting.eu). Accidents and serious incidents will also be reported to the Air Accident Investigation Branch by emailing [enquiries@aaib.gov.uk](mailto:enquiries@aaib.gov.uk) or calling 01252 512 299.

Any 'flyaway' aircraft must be immediately reported to the local police and the local Air Traffic Control. The relevant contact information for ATC can be identified using the Integrated Aeronautical Information Publication (IAIS) which can be found on the [National Air Traffic Services \(NATS\) Aeronautical Information Service \(AIS\) page](#). This information MUST be recorded on the On-Site Assessment Form.

An Airprox is a situation in which, in the opinion of a pilot or air traffic services personnel, the distance between aircraft as well as their relative positions and speed have been such that the safety of the aircraft involved may have been compromised. Any such situations should be reported using the online reporting form, which can be found on the [Airprox Board Website](#).

### 3.3. Flight Team Composition

SAERI normally operate with minimum two-person team consisting of a remote pilot and a visual observer. Circumstances may also require additional support staff such as spotters to assist the visual observer or crowd control personnel to maintain a cordon.

It is permissible to operate without a nominated Visual Observer for operations where the risks of airborne or ground incursions have been assessed to be acceptably low.

### 3.4. Operation of Multiple Types of SUA

SAERI remote pilots may operate multiple types of SUA provided that they have either passed an NQE Flight Operations Assessment for that category of aircraft (or have demonstrated their competence to fly that particular aircraft to the accountable manager) and that they are trained, current and fully conversant with the systems, capabilities and operational limitations of each aircraft. SAERI remote pilots are forbidden from simultaneously operating multiple SUA.

#### **Aircraft Operated**

<b>Aircraft Make and Model</b>	<b>Serial Number</b>	<b>Aircraft name</b>
DJI Phantom 4 Pro	189CF1HBA20095	Coastal Mapper 01 (CM1)
DJI Phantom 4 Pro	0AXDDBJ0A30556	Coastal Mapper 02 (CM2)
DJI Phantom 4 Pro V2	11UCF7V0A50139	Coastal Mapper 03 (CM3)

Full aircraft details, including Operating Limitations may be found in Appendix C.

### 3.5. Qualification Requirements

When operating within the UK, all SAERI remote pilots must be at least eighteen years of age, hold a valid remote pilot qualification issued by a CAA National Qualified Entity (where undertaking commercial work) or have demonstrated their competence to fly that particular aircraft for research purposes, and be current on the intended SUA to be deployed for the planned flight operation.

When operating within the Falkland Islands, all SAERI remote pilots must be at least eighteen years of age, have demonstrated their competence to fly that particular aircraft (either a qualification or sufficient logged experience), and be current on the intended SUA to be deployed for the planned flight operation.

SAERI currency requirements are that a remote pilot must have flown a minimum of two hours in the last three months and thirty minutes on the specific SUA in the four weeks preceding the planned operation. Qualifying flight time can be logged as commercial flight operations, training or test flights.

Where there is a request to use SUA owned by SAERI, the proposed remote pilot will be required to demonstrate their experience on that particular aircraft by successfully completing a short assessment flight, to the satisfaction of the accountable manager (or their nominated representative).

### 3.6. Crew Health

Crew health is critical to safe flight operations. If any member of crew does not feel fit for operations, they should inform the pilot as soon as possible.

If the Remote Pilot does not feel fit to carry out flights, then the flight must be postponed, or another suitably qualified pilot should take their place. If necessary, medical advice should be obtained before a crew member is allowed to resume operations. If necessary, medical advice should be obtained before operating the SUA whilst using prescription drugs.

SAERI personnel, support staff, and those having any supervisory duties are to ensure that they are not suffering from the effects, or after-effects, of alcohol or drugs (prescribed or purchased) when reporting for duty. No alcohol is to be consumed for the 10 hours immediately prior to being liable for flying duties. Additionally, those personnel directly involved with SUA flight safety are to minimise their intake of alcohol during the 24 hours before commencement of such activities.

SAERI flight operations team members should not operate more than ten hours in any twenty-four-hour period.

Remote Pilot and Crew should use the following mnemonic as an aid to assessing crew health prior to any SUA operation: -

- I** - Illness - is the pilot suffering from any illness?
- M** - Medication - is the pilot currently taking any drugs?
- S** - Stress - is the pilot overly worried about other factors in their life?
- A** - Alcohol - Has the pilot consumed any alcohol within the last 8 to 24 hours?
- F** - Fatigue - Has the pilot had sufficient sleep?
- E** - Eating - Has the pilot had sufficient hydration, sustenance and correct nutrition?

### 3.7. Logs and Records

All SAERI remote pilots must keep an accurate account of their personal flight time, the SUA flight time and any maintenance or incident log information. All pre-site and on-site assessments must be accurately recorded and kept for a minimum of thirty-six months. Remote pilots are responsible for checking the aircraft and maintenance logs before flight operations commence to ensure that they are familiar with any updates, upgrades or repairs.

Examples of Logs and Records may be found in Appendix D. Logs of all flights will be recorded electronically in an Excel spreadsheet (or an equivalent electronic logging system).

SAERI recommend that SUA flight records are downloaded using appropriate software for future reference.

## Part B – Operating Procedures

### 4. *Flight Planning and Preparation*

#### 4.1. Determination of the Intended Tasks and Feasibility

Prior to undertaking commercial work, an initial meeting with the client should be take place, to ascertain the feasibility of the completion of the assignment. The client must be made aware of the regulatory, safety and practical constraints associated with SUA operations. The Accountable Manager or Remote Pilot is responsible for ensuring that the client fully understands these constraints.

Once the operating site has been identified and the likely timing of the operation ascertained, the Remote Pilot will conduct an initial desk based survey of the site. The purpose of this desktop activity is to ascertain the surrounding area, its locality in respect of airspace classifications, local airfields, congested areas, etc.

The feasibility of these intended tasks should be thoroughly discussed with the customer and it must be clearly stressed that SAERI can and will only operate in accordance with the issued commercial operations permission and reserves the right to suspend or cancel any planned flight operations over safety concerns.

For mapping missions, the remote pilot should plan an aerial SUSA survey using relevant software (for example, Map Pilot for IOS) and ensure all relevant data is downloaded and available in “offline” operation mode prior to heading out into the field.

When undertaking aerial operations for scientific research, the feasibility of the work should be discussed with the accountable manager; within the Falkland Islands, a scientific research licence may be required from FIG. Note that where any flight operation deviates from the requirements set out in the legislation outlined in Section 1, permission in writing **MUST** be received from the relevant National Aviation Authority before the operation shall be allowed to proceed.

#### 4.2. Operating Site Location and Assessment

The proposed operating site location must be thoroughly assessed by the SAERI remote pilot. Utilising sources such as Google Earth, the DroneSafe FRZ Map, SkyVector, NATS Drone Assist, Skydemon Light, aeronautical charts and ordnance survey maps the following factors must be clearly established and recorded on the Pre-Site Assessment form

- Airspace classification type and required provisions (Class A, C, D or G)
- Any other nearby aircraft operations
- Industrial hazards such as live firing, gas venting, high intensity radio transmissions
- Check whether there are any local bylaws affecting the operation
- Physical obstructions such as wires, masts, buildings etc.
- Extraordinary restrictions such as segregated airspace around prisons, nuclear establishments etc. (suitable permission may be needed)
- Residential and recreational activities
- Public access
- Permission from landowner or other custodian with delegated authority

### 4.3. Risk Management

A site safety assessment must be completed by the Remote Pilot for each assignment. The risk assessment should be as specific to the site as possible. While there is always a degree of acceptable risk, it should always be minimised to ensure the flight operation is as safe as possible.

Some risks, e.g. weather, cannot be accurately established until the day of operation and it is the responsibility of the pilot to ensure that the flight can be conducted safely.

SAERI staff will use the Risk Assessment process found in Appendix D to record Hazards which affect normal flight operations. Potential mitigating factors should also be recorded. The Risk Matrix (also on Appendix D) should be used to help to determine if a proposed Flight Operation has acceptable risks.

If the pilot feels that the operation cannot be conducted safely, then the operation should be postponed until risks are mitigated. Under UK CAA legislation (CAP 393 Articles 94 and 95) and the Air Navigation (Overseas Territories) Ordinance 2013, the pilot is ultimately responsible to ensure a flight can be conducted safely. The pilot must not submit to peer or client pressures to fly in conditions that he feels are unsafe.

### 4.4. Communications

All SAERI flight team members should ensure that they have recorded contact numbers for the following services:

- Local air traffic control
- Local aerodromes or aircraft operating organisations
- Local police station (Usually 999/101)
- All crew personnel and client staff
- Event Organiser (if appropriate)

These numbers may be sourced using Internet search engines such as Google. Airfield contact information may be found using the UK Integrated Aeronautical Information Package (IAIP) [website](#).

### 4.5. Pre-notification

If any flight operation is planned to take place within the FRZ of a Protected Airfield, then the Remote Pilot must comply with the provisions of Article 94A of the Air Navigation Order 2016 with respect to seeking permission from the Protected Airfield prior to the Operation taking place. The Protected Airfield contact details for ATC, FISU or Airfield Operator (as appropriate) should be obtained and permission for the intended flight operation requested at least twenty-four hours in advance. Further notification to the Protected Airfield immediately prior to take-off may also be required.

When operating in the Falkland Islands, especially near Stanley Airport, the Remote Pilot should note that Falklands Helicopter Services (FHS) have recently started operating from the airport, even when the airport is closed for FIGAS flights. Therefore, if Stanley Airport is closed, Remote Pilots should ensure they liaise with FHS on the telephone numbers provided below ahead of any operations within the Stanley Airport ATZ:

**Falklands Helicopter Services:**

Tom Chater: +500 52538

Sparky Ewen: +500 52517

Jane Chater: +500 54690

In certain circumstances, particularly if members of the public are likely to be within visual range, it may be necessary to inform the local police of the intended flight operations to avoid interruption or concerns from the public.

In all cases, anyone within 50 metres of the planned flight operation must be under the explicit control of the Remote Pilot and be adequately briefed. These persons must be able to:

- Choose to participate or not with the planned flight operation
- Understand the risks posed to them inherent with the planned flight operation
- Have reasonable safeguards instituted for them during the planned flight operation
- Not have restrictions placed on their engagement with the purpose of the event or activity

If during an aerial operation, anyone not under the explicit control of the Remote Pilot approaches (for example a member of the public), the Remote Pilot should ensure a safe distance is maintained between them and the SUA, and support staff assigned to the project should liaise with this person. Once the area is safe, the aerial operation can continue.

#### 4.6. Site Permission

SAERI should obtain landowner or custodian permission for the area from which it is intended to operate (take-off and landing) before any planned flight operations take place. This permission must be recorded on the pre-site or on-site assessment forms and should be obtained in writing wherever possible.

The Remote Pilot must be mindful in the planning of the operation, and the need to seek landowner or custodian permissions, of the need to avoid committing trespass as a result of an SUA failure when overflying property.



#### 4.7. Weather Forecasts

The SAERI Remote Pilot should obtain detailed weather forecasts and predicted GNSS satellite coverage and availability for the specific flight operation location at least twenty-four hours in advance of any planned flight operation. Any available sources are acceptable but SAERI often uses:

- [Met Office](#)
- [Windy](#)
- [Weather Underground](#)
- [YR.no](#)
- [UAV Forecast](#)
- [Airfield TAFs and METARs](#)

The SAERI Remote Pilot is responsible for ensuring that the SUA is operated within the specific limitations as detailed in the SUA Operating Limitations set out in Appendix C.

#### 4.8. Preparation and Serviceability of Equipment

The SAERI remote pilot is responsible for checking that the remotely piloted aircraft system and any required equipment is in a 'fit for purpose' condition before any planned flight operations take place.

The remote pilot should examine the remotely piloted aircraft system logbook and the maintenance logbook to ensure that they are fully familiar with any issues, upgrades, updates, modifications or repairs recently completed on the aircraft.

The remote pilot should prepare and pack their equipment for any planned flight operation, guided by the Embarkation/Arrival checklist in Appendix D.

## 5. *On-site procedures and pre-flight checks*

### 5.1. Site Survey

The SAERI remote pilot should complete an On-Site assessment of the operating location to confirm the physical details uncovered by the Pre-Site assessment. Unexpected factors must be assessed and any required mitigation addressed. For commercial operations, SAERI remote pilots must comply with the limitations stated on the commercial operations permission.

### 5.2. Selection of Operating Area and Alternate

The SAERI remote pilot should select an appropriate operating location, alternate and emergency landing site. The operating location should be selected based on the following factors:

- Operating site size and shape
- Operating site surroundings such as trees, power lines etc.
- Operating site surface and gradient
- Physical

In selecting operating areas, due consideration must be given to ensuring that distances from people, vehicles, vessels and structures not under the control of the Remote Pilot, as set out in this Operations Manual and any relevant Permissions (e.g PFCO).

### 5.3. Crew Briefing

The SAERI Remote Pilot must brief any and all persons required to be under the control of the said Remote Pilot before any planned flight operations take place. All flight team members must attend this briefing. The briefing should cover the following points as a minimum:

- Identification of key personnel
- Ensure that everyone present understands their role, duties and requirements
- Identification of operating and emergency areas and no fly zones
- Proposed flight plans and actions
- Expected timescales for the operation
- Emergency procedures

During the crew briefing, if required, any communication devices should be tested and batteries checked (for example, two way radios should be issued and tested, or mobile phone numbers should be exchanged and tested/reception checked) along with any required identification badges, safety equipment or clothing.

#### 5.4. Cordon Procedure

The SAERI Remote Pilot will determine the need for cordoning (including warning signage) during the Pre-Site and On-Site assessments. The Remote Pilot must maintain at least 30 metres distance from people not under the control of the Remote Pilot during the take-off and landing procedures and 50 metres during flight operations. Flight Operations must be conducted at least 150 metres distance away from congested areas and 150 metres distance from gatherings of 1000 persons or more unless otherwise stated in any Commercial Operations Permission. Additional staff may be required to maintain these safety cordons or to control public access to the operating site.

#### 5.5. Communications

All South Atlantic Environmental Research Institute (SAERI) flight team members must remain within audible range of each other during flight operations. If operating location and conditions dictate, two way radios and/or mobile telephones should be utilised to ensure that communication is maintained. The Visual Observer should be situated next to the remote pilot. All communication with the remote pilot should be directed through the visual observer to avoid unnecessary distractions.

If the planned flight operation is to be conducted in the vicinity of other flight operations, sufficient communications must be established to ensure that all relevant parties are informed immediately prior to commencement and at the conclusion of any flight operation.

#### 5.6. Weather Checks

Immediately prior to flight operations, the actual on-site weather conditions should be assessed and documented. As a minimum for commercial operations, the following should be recorded:

- Maximum wind speed including gusts
- Outside air temperature
- Global Positioning Satellite availability

These factors should be considered in relation to the operating limitations of the SUA. Refer to the relevant limitations of the SUA for further guidance set out in Appendix C. Under no circumstances should any SAERI remotely piloted aircraft system be operated outside the documented limitations.

#### 5.7. Loading of Equipment

During all flight operations, the SAERI Remote Pilot is responsible for ensuring that all payloads are correctly and securely attached to the remotely piloted aircraft system in compliance with the relevant operating manual. In particular, the remote pilot should pay special attention to the:

- Secure fixing of any payloads, power sources or removable components
- Centre of gravity location and balance limitations
- Maximum permissible take-off mass

- Expected flight endurance as a result of the fitted payload

### 5.8. Preparation and Correct Assembly of the SUA

It is the responsibility of the Remote Pilot to ensure that the preparation of the aircraft before flight is completed in accordance with the manufacturer's directions and the any additional operating procedures set out in this Operations Manual.

### 5.9. Pre-Flight Checks

Pre-Flight checks must be conducted by the Remote Pilot using the SUA specific Pre-Flight Checklist in Appendix C of this Operations manual.

Checks must include the security of articles on the aircraft, including propellers, propeller guards, the gimbal and the camera. Checks pre-flight also refer to battery charge levels and also to settings based on the flight controller, relative to maximum altitude and distance. Only when the above points are checked and satisfactory, can the start-up procedure commence. Immediately after take-off, the Remote Pilot is required to check the controls to ensure the aircraft responds correctly control input.

## 6. *Flight Procedures*

The Remote Pilot must be confident that the flight can be made safely before commencing. All relevant safety measures need to be in place and involved personnel made aware of the imminent launch. Any local operating procedures need to be complied with.

### 6.1. Start-Up

- Inspect the SUA for any damage – in particular, check damage and ensure they are securely fastened.
- Remove the gimbal lock – check that the gimbal and camera are securely attached to the aircraft.
- Position the aircraft level and clear of any obstructions facing away from the remote pilot and approximately 3 metres away from any nearby flight team members.
- Call “AIRCRAFT ARMED” and then arm the flight battery.
- Switch on the control transmitter and the mobile device being used for image monitoring and telemetry display – load the DJI-GO App and initiate connection with the aircraft.
- Confirm that the aircraft has successfully run the diagnostic program, has connected to the controller, has sufficient satellite coverage and has recorded the current “home” point. Note that when working off vessels, a dynamic home point should be used if available. Otherwise, the aircraft may return to a specified location where the vessel has now moved away from.
- Calibrate the compass (magnetometer).
- Check that the charge state indicated for the battery is at an acceptable level to complete the flight.
- Check that the flight mode switch is in the correct position for the planned flight (normally P/GPS).
- Check LEDs are working and confirming status.
- In the case of an aerial mapping mission, ensure the MapPilot app, with planned mapping mission, is loaded on the controller tablet, and can be achieved safely and in the time available. Upload the mission to the SUSA, selecting the various options available if appropriate (for example – terrain following mode).
- Call “MOTORS STARTING” and then start the motors using combined stick command (both control sticks on the control transmitter to the bottom inner corners).

## 6.2. Take-Off

- Make final check on SUA status and look around to ensure area is clear
- Call “TAKING-OFF”.
- Manual take-off
  - Move throttle stick forwards to lift off.
  - Return throttle stick to the neutral (centre) position when aircraft is 2-3 metres above ground level to stop ascent and stabilise in the hover.
- Automatic take-off
  - Tap the take-off icon on the ground station application then follow on screen instructions to initiate take off.
  - Once SUA is stable in the hover, advance throttle stick to climb to 2-3 metres.
- Perform control check for pitch, roll and yaw to ensure correct operation.
- Final check of aircraft system status before start of mission.

## 6.3. In-Flight

- Maintain Visual Line of Sight (VLOS) at all times (unless permission has been provided by the relevant National Aviation Authority).
- Ensure Visual Observer is in audible range.
- Regularly check SUA status for battery remaining, GNSS satellites acquired and for any warning messages.
- Maintain good look-out, supplemented by the Visual Observer, for any air or ground incursions or other unexpected hazards.

## 6.4. Landing

- Check that the landing area is clear.
- Call “RETURNING TO LAND” to make your intentions known.
- Fly the SUA back to overhead the landing area and hover at approximately 3 metres.
- Rotate the SUA if necessary so that the front faces away from the Remote Pilot.
- If the area remains clear call “LANDING”.
- Manual landing
  - Move throttle stick backwards and control the rate of descent until touch-down.
  - Hold throttle stick fully back until motors stop.
- Automatic landing
  - Tap the landing icon on the ground station then follow on screen instructions to initiate landing.
  - Motors will stop automatically a few seconds after landing has been made.

- When recovering the SUA from a vessel, it may be necessary for the designated Remote Pilot support crew to physically catch the drone as the SUA is brought into land (for example, if a swell has developed and a safe landing cannot be made on deck). In this case, appropriate PPE should be donned by the support crew (face visor, hard hat and protective gloves) – see image below. The Remote Pilot should pilot the SUA down (front facing away from the support crew) to a level above (and in front of) the support crew. The support crew should then reach up and grasp the legs of the SUA. The Remote Pilot should then stop the motors, before the support crew recovers the SUA.



#### 6.5. Shutdown

- Approach the aircraft and switch off the intelligent flight battery.
- Call “AIRCRAFT SAFE”.
- Remove the aircraft from the landing zone.
- Record flight data to later be used to update pilot and aircraft log books.
- Switch off the control transmitter and ground station.
- Debrief crew if necessary.

## 7. *Emergency Procedures*

### 7.1. Aircraft Failure

If Remote Pilot has any reason to believe that the aircraft is not operating normally or cannot be fully under control of the Remote Pilot, he should:

- Call “EMERGENCY – AIRCRAFT FAILURE” to warn crew and people nearby.
- Switch to ATTI mode.
- Try to ascertain cause of problem and rectify if possible.
- If control restored land as quickly as possible in a safe location.
- If control is not restored invoke RTH function.
- If aircraft crashes pick up fire extinguisher and move to crash site as quickly as possible.
- Monitor for any signs of LiPo battery fire and be prepared to use fire extinguisher to prevent the spread of the fire.
- Assess and deal with any damage to property or injuries and report as appropriate.

### 7.2. Loss of Data Link

In the event of a loss of data link between the Ground Station and the SUA the Remote Pilot should:

- Call “EMERGENCY – RETURN TO HOME” to warn crew and people nearby.
- The SUA should automatically invoke RTH routine.
- Ensure landing area is clear.
- Monitor SUA as it executes RTH.

### 7.3. Fly-Away

- Call “EMERGENCY – FLYAWAY” to warn crew and people nearby.
- Instruct all nearby crew to visually track the SUA.
- Switch to ATTI Mode if possible.
- If control not recovered raise transmitter above head and repeatedly use Combined Stick Control input to attempt to shut down motors.
- If aircraft continues to fly-away make note of flight path, estimated flying time and then notify any relevant local parties, such as site operator, police and ATC.



#### 7.4. Aircraft Fire

- Call “EMERGENCY – FIRE” to warn crew and people nearby.
- Execute an emergency landing at the most suitable landing area. (visual observer may be able to offer guidance).
- Use fire suppression equipment to control any ensuing fires. Avoid inhaling any toxic fumes.

#### 7.5. Pilot Incapacitation

In the event that the Remote Pilot is incapacitated and therefore unable to operate the aircraft:

- The Remote Pilot or Visual Observer (if present) should activate the RTH function and call “FAILSAFE” to warn crew and people nearby.
- Remote Pilot or Visual Observer (if present) should clear the landing area of any items or equipment and people.
- Monitor the aircraft executing the RTH.
- Disarm battery once aircraft has landed and shut-down.

#### 7.6. Air Incursion

Should any crew member notice an incursion into the flight operations area by another aircraft:

- The Remote Pilot should be immediately informed by the crew member calling “AIRCRAFT INCURSION” and pointing or verbalising the location of the incursion.
- The Remote Pilot will assess the risk of collision and if necessary take whatever avoiding action most reduces or eliminates this risk. This will generally be to descend the SUA as quickly as possible. However, a judgement must be made by the Remote Pilot.
- Operations will only be resumed when the other aircraft has cleared the area.

#### 7.7. Ground Incursion

Should any crew member notice an incursion into the flight operations area by a person, animal, vehicle or any other ground based hazard:

- The Remote Pilot should be immediately informed by the crew member calling “GROUND INCURSION” and pointing or verbalising the location of the incursion.
- The Remote Pilot will assess the risk of collision and if necessary take whatever avoiding action most reduces or eliminates this risk. This will generally be to descend the SUA as quickly as possible. However, a judgement must be made by the Remote Pilot.
- Operations will only be resumed when the incursion has been cleared or has been brought under the control of the Remote Pilot.

## Part C – Training

SAERI maintains records of all staff training and assessments. No staff members will be permitted to become an active member of the flight team until adequate training has been completed, or until they have demonstrated their competence to the satisfaction of the accountable manager.

### Remote Pilot Training Programme

In addition to obtaining a remote pilot qualification recognised by the relevant National Aviation Authority, all and any remote pilots employed by or contracted to SAERI will be trained and assessed to the following program:

- Pre-Site and On-Site assessment procedures
- Remotely piloted aircraft system assembly procedures
- Pre-Flight and Post-Flight checklist procedures
- Safe power source management
- Safe take-off and landing procedures
- Basic flight manoeuvres
- Emergency procedures
- Correct record keeping procedures

All South Atlantic Environmental Research Institute (SAERI) remote pilots are required to ensure that they obtain at least two hours flight time every three calendar months. Flight simulator time is acceptable during periods of adverse weather conditions.

### Support Personnel Training Programme

All South Atlantic Environmental Research Institute (SAERI) support personnel will be trained by a suitable member of the flight team to the following program:

- Air and ground encroachments and correct procedures.
- Emergency procedures relevant to the person's role.
- Operating procedures relevant to the person's role.

## Part D - Appendices

### Appendix A – Copy of UK Commercial Operations Permission (PfCO)

Below is a copy of the current UK Permission for Commercial Operations for SAERI. Double click the embedded PDF below to open.

#### CIVIL AVIATION AUTHORITY

#### Air Navigation Order 2016



#### PERMISSION – Small Unmanned Aircraft / Small Unmanned Surveillance Aircraft – Sub 7kg




1. The Civil Aviation Authority, in exercise of its powers under Article 94(5) and Article 95(1) of the Air Navigation Order 2016, as amended, hereby permits **South Atlantic Environmental Research Institute**, ("the person in charge") being the person in charge of a Small Unmanned Aircraft (SUA) / Small Unmanned Surveillance Aircraft (SUSA) ("the aircraft") of the following class(es):
  - (a) SUA Multirotor / Helicopter with a Maximum Take-Off Mass (MTOM) not exceeding 7kg  
to conduct commercial operations with the aircraft.
2. This Permission is granted subject to the following conditions, namely, that the aircraft shall not be flown:
 

**General Operating Conditions for all Classes of SUA / SUSA:**

  - (a) Other than by persons employed by or contracted to South Atlantic Environmental Research Institute whilst being holder(s) of an appropriate recommendation issued by a UK National Qualified Entity for SUA/SUSA pilot competency, or an alternative existing aviation qualification determined to be acceptable to the CAA (CAP722 refers);
  - (b) Unless there is insurance cover for the aircraft that meets the requirements of EC Regulation No. 785/2004;
  - (c) At a height exceeding 400 feet above the surface level;
  - (d) Unless the aircraft is maintained within the direct, unaided **Visual Line of Sight (VLOS)** of:
    - (i) The person in charge of the aircraft or;
    - (ii) A competent observer, under the control of the person in charge who is operating in accordance with procedures specified in the approved Operations Manual;  
out to a maximum range of 500 metres unless a lesser radio transmission range has been specified by the manufacturer;
  - (e) Over or within 150 metres of an organised open-air assembly of more than 1,000 persons;
  - (f) Within 50 metres of any person, vessel, vehicle or structure that is not under the control of the person in charge of the aircraft, except that during take-off and landing this distance may be reduced to 30 metres;
  - (g) Unless it is equipped with a mechanism that will cause the 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 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 aircraft has reasonably satisfied himself that any load carried by the aircraft is properly secured, that the 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 flights are conducted in accordance with the current operations manual of the person in charge of the aircraft and a site safety assessment has been completed. Site safety assessments are to be made available to the Authority on request;
  - (j) Unless the person in charge of the aircraft maintains records of each flight made pursuant to this Permission and makes such records available to the Civil Aviation Authority on request;

## Appendix B – Certificate of Public Liability Insurance

Below is a copy of the current South Atlantic Environmental Research Institute (SAERI) EC785/2004 compliant public liability insurance documents (**double click to open the embedded PDFs**)

FLOCK 		Allianz 	
<b>Cover Note</b>			
This is to certify that the entity named in this note is registered on the Flock platform and is eligible to purchase Flock's flexible UAS insurance underwritten by Allianz Global Corporate & Specialty SE subject to the conditions specified below.			
<b>Policy Holder</b>			
Operator	South Atlantic Environmental Research Institute (SAERI)		
Flock Registration ID	D-PF-C-235892	Email Address	ngolding@env.institute.ac.fk
<b>Coverage</b>			
Flock's flexible UAS policies offer cover for legal liability to third parties including bodily injury, accidental damage of property noise and invasion of privacy, accidental damage to UAS, acts of war, terrorism, hijacking, acts of sabotage, unlawful seizure of aircraft and civil commotion as required by EC785/2004. Full details of the coverage can be found on the policy wording document attached (Wording) to this Cover Note. Policy limits for certain coverage types can be selected by the user at the time of purchase. As detailed in the Wording, Allianz Global Corporate & Specialty SE, certifies that the policies distributed by the Flock platform comply with all the requirements defined by the regulation EC785/2004.			
Policy	UAV pay-as-you-fly insurance for commercial operators [2019 - rev1] or equivalent		
Minimum limit of Liability Indemnity	The greater of: i) £1,000,000, or ii) the highest equivalent in GBP, during the Policy Period, of SDR750,000		
Eligible UAS range	Any UAS under 20kg MTOM of a type designed, manufactured, assembled and made available on the market by the manufacturer, which has not been modified since delivery by the manufacturer. The precise type is to be selected at the start of the Policy Period.		
Policy Underwritten By	Allianz Global Corporate & Specialty SE		
Cover Note Valid From:	03/06/2019	Cover Note Valid Until:	03/06/2020
<b>Conditions</b>			
Operator understands that insurance is a legal requirement for UAS commercial operations. During the coverage period, Operator is required to hold every permission, license and certificate legally required to perform commercial operations.			
Operator understands that Flock's flexible UAS policies cover flight activities for the duration of the policy only, and that it is the Operator's sole responsibility that each and every flight is covered.			
Flock's flexible cover will be automatically activated at the time of successful payment through the Flock Cover app and will only be valid for the selected policy duration, geographical limits and UAS.			
Flock's UAS policies are underwritten by Allianz Global Corporate & Specialty SE (FCA Registration FRN214374). You can check this by visiting the Financial Services Register or by contacting the FCA on 0800 111 67 68.			
		Signed by: Brian Kirwan Chief Executive Officer UK Allianz Global Corporate & Specialty SE	
		On: 03/06/2019	
Flock   Allianz Global Corporate & Specialty SE   UAS Operators Insurance Cover Note			

## Appendix C - SUA Operating Details & Pre-Flight checklist

### DJI Phantom 4 Pro



### SUA Specifications

<b>Manufacturer</b>	Da-Jiang Innovations (DJI)
<b>Airframe Model</b>	Phantom 4 Pro
<b>Airframe Type</b>	Multicopter - quadcopter
<b>Span</b>	350 mm (Diagonally excluding propellers)
<b>Weight</b>	1388g (Fully assembled, ready to operate)
<b>Propulsion Type</b>	4 x Electric brushless motors
<b>Power Source</b>	Electric – Single 4s 5870mAh/15.2v Lithium Polymer (LiPo) Battery
<b>Flight Management System</b>	On-board flight control system with manually operated DJI radio control transmitter or automated waypoint flying using the transmitter and an Apple iPad Mini running the DJI GO App connected to controller via Lightning lead.
<b>Command and Control Frequency</b>	2.400 - 2.483 GHz CE: 17 dBm 5.725 - 5.825 GHz CE: 14 dBm
<b>Video and telemetry transmission frequency</b>	2.400 - 2.483 GHz and 5.725 - 5.825 GHz

## SUA Limitations

<b>Maximum Operating Ceiling</b>	19685 ft (6000 m) AMSL
<b>Maximum Operating Endurance</b>	24 minutes (assuming good conditions and aircraft has been landed after mission with 20% battery level remaining)
<b>Maximum Airspeed</b>	36mph (31 knots) (A-mode); 31 mph (27 knots) (P-mode)
<b>MTOM</b>	1.40kg
<b>Maximum Operating Outside Air Temperature</b>	40° Celsius
<b>Minimum Operating Outside Air Temperature</b>	0° Celsius
<b>Maximum Wind Speed Including Gusts</b>	19 knots
<b>Maximum Ascent Speed</b>	5 metres per second
<b>Maximum Descent Speed</b>	3 metres per second
<b>Weather Limitations</b>	Not to be operated in precipitation or fog
<b>Maximum Operating Range</b>	2.400 - 2.483 GHz (Unobstructed, free of interference) CE: 2.2 mi (3.5 km) 5.725 - 5.825 GHz (Unobstructed, free of interference) CE: 1.2 mi (2 km)
<b>Balance Limitations</b>	15mm from Centre of Gravity location which is the centre point of the airframe
<b>Geofencing and Firmware Restricted No-Fly Zones</b>	Manufacturer imposes no-fly zones via firmware updates. User controlled geo-fencing may also be set up. <a href="#">Full Details Here</a>

## DJI Phantom 4 Pro V2



### SUA Specifications

<b>Manufacturer</b>	Da-Jiang Innovations (DJI)
<b>Airframe Model</b>	Phantom 4 Pro V2
<b>Airframe Type</b>	Multicopter - quadcopter
<b>Span</b>	350 mm (Diagonally excluding propellers)
<b>Weight</b>	1375g (Fully assembled, ready to operate)
<b>Propulsion Type</b>	4 x Electric brushless motors
<b>Power Source</b>	Electric – Single 4s 5870mAh/15.2v Lithium Polymer (LiPo) Battery
<b>Flight Management System</b>	On-board flight control system with manually operated DJI radio control transmitter or automated waypoint flying using the transmitter and an Apple iPad Mini running the DJI GO App connected to controller via Lightning lead.
<b>Command and Control Frequency</b>	2.400 - 2.483 GHz CE: 20 dBm 5.725 - 5.850 GHz CE: 14 dBm
<b>Video and telemetry transmission frequency</b>	2.4 GHz ISM & 5.8 GHz ISM

## SUA Limitations

<b>Maximum Operating Ceiling</b>	19685 ft (6000 m) AMSL
<b>Maximum Operating Endurance</b>	24 minutes (assuming good conditions and aircraft has been landed after mission with 20% battery level remaining)
<b>Maximum Airspeed</b>	36mph (31 knots) (A-mode); 31 mph (27 knots) (P-mode)
<b>MTOM</b>	1.40kg
<b>Maximum Operating Outside Air Temperature</b>	40° Celsius
<b>Minimum Operating Outside Air Temperature</b>	0° Celsius
<b>Maximum Wind Speed Including Gusts</b>	19 knots (10m/s)
<b>Maximum Ascent Speed</b>	P mode - 5 metres per second
<b>Maximum Descent Speed</b>	P mode - 3 metres per second
<b>Weather Limitations</b>	Not to be operated in precipitation or fog
<b>Maximum Operating Range</b>	2.400 - 2.483 GHz (Unobstructed, free of interference) CE: 2.5 mi (4 km) 5.725 - 5.850 GHz (Unobstructed, free of interference) CE: 1.2 mi (2 km)
<b>Balance Limitations</b>	15mm from Centre of Gravity location which is the centre point of the airframe
<b>Geofencing and Firmware Restricted No-Fly Zones</b>	Manufacturer imposes no-fly zones via firmware updates. User controlled geo-fencing may also be set up. <a href="#">Full Details Here</a>



### *Operating Instructions*

All Remote Aircraft Pilots should read, be familiar and follow the guidance and instructions set out in the manufacturer's user manual.

### *Pre-Flight Checklist*

The following checklist should be completed before each and every planned flight operation commences:

1. If necessary, check that daily public liability cover is in place and email confirmation of cover has been received from insurers (e.g. <https://flockcover.com/>)
2. Inspect the system for any damage
3. Remove gimbal lock - check that gimbal and camera are securely attached to aircraft
4. Check propellers for damage and ensure that they are securely fastened
5. Arm the aircraft, call "**AIRCRAFT ARMED**" then: -
6. Load DJI-GO app and initiate connection to aircraft
7. Check charge on the control transmitter and tablet are sufficient to complete the flight.
8. Check that the flight battery in the aircraft has sufficient charge to complete the flight
9. Check that the flight mode switch is in the correct position for the planned flight operation (normally P/GPS)
10. Check good GNSS fix?
11. Telemetry working?
12. Check correct remote operation of camera gimbal
13. Calibrate compass (magnetometer)
14. LEDs working and confirming status
15. Home point set?

### *Power System Management*

The Phantom 4 Pro & DJI Mavic Pro utilises Intelligent Flight Batteries. The intelligent flight battery incorporates smart charge and discharge functions, temperature sensing, overcharge, overcurrent and short circuit protection combined with battery condition and level indicators, battery error history and a power switch.

Only DJI approved battery chargers for the Phantom 4 Pro & DJI Mavic Pro should be used. Whilst the control transmitter and intelligent flight battery chargers have been integrated into one unit for convenience, it is recommended that only one battery is charged at a time. Batteries should be charged in well ventilated areas with suitable fire suppression equipment to hand.

### *Firmware updates*

Firmware updates may be required periodically as notified by the DJI GO application. Follow the firmware update instructions which may be downloaded from the manufacturer's website.

All update information such as version numbers and new functions must be recorded in the aircraft maintenance logbook. Any updated SUA must then undergo a full flight test as described previously. That flight test must be recorded in both the Aircraft Log and the Maintenance Log.

Systems with identified issues to firmware or software should be grounded until the problem can be rectified.

### *Repairs and Maintenance*

Any maintenance or repairs must be recorded in the Maintenance Log. The Phantom 4 Pro & Pro V2 are factory sealed units and in-house maintenance should be limited to the exterior components, such as landing legs, rotors, gimbal and attachment points. Any repair to the control system, GPS or other avionics must be performed by a DJI recommended repairer. Any replacement parts must be DJI branded and sourced from an authorised DJI distributor.

## Appendix D – Log Books and Forms

### *Pre-flight preparation/packing list*

	Embarkation	Check	Arrival	Check	Notes
Aircraft					
Remote Controller (charged)					
Batteries & Aux equipment (leads/chargers)					
Tablet for controller					
Camera/Equipment/Micro SD cards					
Laptop					
Warning signs & Take-off pad					
Zoning posts/cordoning materials					
Tool kit					
Anemometer					
First Aid Kit					
Fire extinguisher					
Job brief					
Flight Reference Cards, Log books & Operations manual					
Pilot supplies/equipment					
Flight crew supplies/equipment					
Rations, water & sun protection					

## Pre-Site Assessment



## SAERI Small Unmanned Aircraft: Pre-Site Assessment

<b>Client:</b>	<b>Date:</b>
<b>Operating platform (e.g. at sea/land):</b>	<b>Operating Site Details:</b>
	<b>Site name:</b>
<b>Planned operation date:</b>	<b>Height (AMSL):</b> (metres/feet)
	<b>Coordinates:</b>
<b>Crew/Equipment:</b>	<b>Vehicular Access:</b>
<b>Pilot in Charge:</b>	<b>Work required:</b>
<b>Observer 1:</b>	
<b>Observer 2:</b>	
<b>Observer 3:</b>	
<b>UAV to be used:</b>	

Relevance to operating site: (tick)	Item:	To check:	Findings:
	Airspace	Controlled or G (uncontrolled)	
	Surface/terrain	Flat, hilly, wet areas (lakes/sea)	
	Proximities	Airports/airfields/heli-pads etc	
	Hazards	Live firing, High Intensity Radio Transmissions (HIRT)	
	Other restrictions	Minefields etc	
	Sensitivities	Nature reserves, wildlife, recreational areas, bye-laws etc	
	People/Vehicles	Public access, Roads, footpaths, dog walkers, is cordoning required	
	Livestock	Any livestock?	
	Permission	Landowner permission / Research permit?	
	Weather	24 hr forecast	
	Satellites	Forecasted number of Sats (UAV Forecast)	
	NOTAMs	Any Notice to Airmen issued?	

Pre-notifications (if required)	Date/time notified & contact name?
<b>Police:</b> Stanley Police Station: +500 28100 / Emergency: 999	
<b>Stanley Airfield Air Traffic Control:</b> +500 27301	
<b>RAF Mount Pleasant Airfield Air Traffic Control:</b> +500 73661	
<b>Landowner:</b>	

*On-Site Assessment***SAERI Small Unmanned Aircraft: On-Site Assessment**

<b>Client:</b>	<b>Date:</b>
<b>Operating Site:</b>	<b>Recorded weather:</b>

<b>Relevance to operating site: (tick)</b>	<b>Item:</b>	<b>To check:</b>	<b>Findings:</b>
	Obstructions	Buildings, fences, power lines, trees etc	
	Visual limitations	Trees, buildings, mist/fog etc	
	People	Public access, footpaths, dog walkers, is cordoning required	
	Livestock	Any livestock?	
	Wildlife	Any sensitive wildlife?	
	Surface/terrain	Flat, hilly, wet areas (lakes/sea)	
	Permission	Landowner permission / Research permit?	
	Air traffic	Have Stanley/MPC ATC been informed?	
	Communication	Are two-way VHF radios required	
	Other sensitivities	Any other sensitivities	
	Proximity	Is there sufficient clearance (Section 73 of OT Air Safety Navigation – 30, 50, 150m)	
	Landing area	ID 1 <sup>st</sup> and 2 <sup>nd</sup> landing areas	
	Holding area	ID safe holding area	

*Risk Assessment*

Consequence Type	1 - Insignificant	2 - Minor	3 - Moderate	4 - High	5 - Major
LIKELIHOOD	RISK RATING				
5 - Almost Certain 6 months	11 (Medium)	16 (Significant)	20 (Significant)	23 (High)	25 (High)
4 - Likely 1 year	7 (Medium)	12 (Medium)	17 (Significant)	21 (High)	24 (High)
3 - Possible 3 years	4 (Low)	8 (Medium)	13 (Significant)	18 (Significant)	22 (High)
2 - Unlikely 5 years	2 (Low)	5 (Low)	9 (Medium)	14 (Significant)	19 (Significant)
1 - Rare >10 years	1 (Low)	3 (Low)	6 (Medium)	10 (Medium)	15 (Significant)

Risk Rating	Risk Level	Guidelines for Risk Matrix
21 to 25	High	A high risk exists and therefore appropriate mitigation must be devised immediately otherwise the field work should not take place.
13 to 20	Significant	A significant risk exists and appropriate mitigation should be devised as soon as possible to reduce the risk, otherwise the field work should be altered to lessen this risk.
6 to 12	Medium	A moderate risk exists and appropriate mitigations should be devised as part of the normal planning process.
1 to 5	Low	A low risk exists. No further mitigation required.

A SAERI Risk Assessment should be completed using the consequence/likelihood matrix outlined above using the approved template.

Pilot and Aircraft, Maintenance and Incident Logs – *Note that an electronic logbook containing the information outlined below (Excel spreadsheet) will be maintained.*

**Pilot and Aircraft Operating Hours**

Date of Flight	Take-off Time	Landing Time	Flight Time	Aircraft	Remote Pilot	Location	Purpose of Flight	Comments & Observations

**Maintenance Logbook**

Aircraft Name	Date of Maintenance	Reason for Maintenance	Maintenance Completed by	Parts Replaced	Test Flight Conducted	Aircraft Status	Comments and Observations

**Battery Logbook**

Date	Battery No.	Flight time	Battery level (take-off)	Battery level (remaining after flight)	Charge Time	Notes

**Incident Logbook**

Date of Incident	Approximate Time of Incident	Incident Type	Incident Details	Action Taken





**Appendix E – Referenced Documents**

REFERENCE	TITLE	ISSUE	DATE
CAP 393	The Air Navigation Order 2016	5.6	21/03/2019
CAP 1763	Air Navigation Order 2018 and 2019 Amendments - Guidance for Small Unmanned Aircraft users	2.0	28/02/2019
CAP 722	Unmanned Aircraft System Operation in UK Airspace – Guidance	7.0	30/07/2019
OT 2013-2870	<a href="#">The Air Navigation (Overseas Territories) Order 2013</a>	1.0	06/11/2013
CAP 382	Mandatory Occurrence Reporting	10	Dec 2016
EU 2015/1018	<a href="#">EU mandatory reporting guidance</a>	1.0	Dec 2015
Aircraft Manual 1	<a href="#">Phantom 4 PRO/PRO+ User Manual</a>	1.6	May 2018