

Drone Standard Operating Procedure



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Terminology

CASA	Civil Aviation Safety Authority
CRP	Chief Remote Pilot
DO	Drone Operator
RPAS	Remotely Piloted Aircraft Systems
UAV	Uncrewed Aerial Vehicle
VLOS	Visual Line of Sight
DOC	Drone Operator Course
SAR	Search and Rescue
SOPs	Standard Operating Procedures
SOCC	State Operations Communication Centre

Contact Details

Chief Remote Pilot	Rob Adsett	
SOCC		07 5631 7400
Applicable Club Drone Pilot		

Applicability

These Standard Operating Procedures provide instructions for the operation and management of Sub 2kgs Uncrewed Aerial Vehicles (UAVs) and all persons involved in the operation of UAVs that are operating under Surf Life Saving Queensland (SLSQ) as Excluded Commercial Operators. These SOPs are subject to change at any time and should be considered non-current once printed.

Responsibilities of UAV Operator

For the purposes of this SOP a 'Drone Operator' is someone who has completed the Drone Operator Course. The Drone Operator in Command of the aircraft is responsible for:

- Creation of pre and post flight logs via Jotform
- Conduct of flight in accordance with company procedures;
- Safe operation of the aircraft;
- Acting in accordance with SLSQ procedures;

- Follow the Standard Operating Conditions as defined by CASA's legislation.
- Ensure through cleaning post flight is completed and batteries with 30% charge or less are placed on charge.
- Complete Drone Trial Survey (Clubs only)

Responsibilities of Camera Operator, Spotter & Others

All camera operators, spotters and other persons involved in the operation of UAV controlled under the authority of the ReOC or Sub-2Kg SOP are required to comply with the procedures and direction set out in the UAV SOP.

Signing on and off Surfcom

Operators are to ensure that radio communications are consistent with the Patrol Operations Manual Section 16.

Radio Call Signs

Unit	Call Sign
Club Drone Operator	Club UAV
Operations Support Drone Operator	TBC

Each shift, Volunteer Drone Operators and Drone Pilots are to:

Start of Day

- Check all equipment (operational/no damage)
 - Liaise with Lifeguards/Lifesaving service;
 - Sign on to Surfcom at the commencement of patrol;
 - Perform a radio check with patrol captain or Surfcom
 - Exclusion zone set up with correct signage
- Pre-flight:
- Sign in to Drone Logbook Ap on the Smart Controller, log in to DJI account on the smart controller
 - Complete Drone Logbook mission plan (Job Safety Analysis / intentions) Check equipment and ability to operate within CASA limitations
 - Weather is within limits (not windy/no rain) wind not gusting at 20knots or above

During Day

Incidents

- Shark: Advise relevant units and record accordingly
- Incidents: Advise relevant units and record accordingly

Operations:

- Flight path not over people/crowds (must be 30m away)
- Fly behind the break looking back in
- Fly at 30ft to 50ft
- Camera angle at 45° to 50°
- Ensure all tasking/flights that the outcome is possible with your level of training;
- Ensure the outcome is possible within the limitations of these SOPs;
- Ensure that this assistance is reported upon briefly and sent through to the Drone Captain and relevant regional Lifesaving Coordinator/Supervisor is advised.

End of Day

Sign off

- Equipment checked and stored
- SurfCom advised
- All reporting completed on Drone Logbook app on smart controller (connect to hotspot to sync data).
- Sign out of DJI and Drone Logbook account
- Complete LIMSOC requirements
- Drone captain advised of any issues

Flight Planning

Operation Area

All operators are required to ensure that the flight operations area is clear of people adhering to the 30mtr exclusion zone.

Pre Flight Check

All operators are required to notify Surfcom before flying to ensure Lifesaver 45 & 46 aren't in the area. (South East Queensland only). It is the responsibility of the operator to ensure they don't enter restricted airspace or exclusion zones.

Risk Assessment

All operators are required to complete the operational risk assessment at the start of each shift, unless conditions change considerably and another risk assessment must be completed.

Pre Flight Checklist

Item	Description	Check Completed
Screen	Smart Controller battery charged and operational Hotspot Smart Controller Logged into DJI account and Drone Logbook on the Smart Controller APPs	
Aircraft LiPo batteries	Charged and condition checked (press button once to check charge)	
Propellers	Checked for: - Condition - Tightness - Dents leading edges - Cracks or signs of stress - Correct Orientation - Motors Check for free movement - No abnormal movement or noises	
Frame	- Unfold the arms - Check for cracks or damage	
Battery	- Battery condition checked - Check for swelling - Check for visual damage - Inserted Correctly	
Lights	- Check for function - Check for damage	
Gimbal	- Remove gimbal casing - Check for damage	

Pre Start Checklist

Item	Description	Check
Controller	Switch ON Check battery voltage sufficient Correct MODE selected Switch positions set Fingers OFF controls	
Operator/Spotter	Location checked, ensure clear of populous areas	
UAV Start	Insert Battery Switch ON Check ESC introduction (beeping) Power UAV (use caution, remain clear of blades)	
Check settings	Return to Home at 30m (high enough to clear any obstacles) Home point set at current location Satellites (8 or more)	
Downlink	Power video receiver and video monitor on confirm picture	
Lift Off	Check controls and perform orientation familiarisation Fly mission	

UAV Operations Area

Every Operator needs to identify a staging area and ensure it meets the below requirements.

- All staging areas must be inside the exclusion zone.
- Where possible the staging and exclusion must be downwind of the patrol.
- They should always be clear of trees, overhead wires and buildings and must provide enough clearance to allow the craft to reach 5 metres high before an upwards angled flight out to the transect line.
- The staging area is to be 30 metre x 30 metre and separated from public areas by using traffic cones signage, and safety/warning tape.
- The staging area will ideally be located behind the IRB area as this provides a cleared corridor to the water's edge for take-offs and approaches to the beach.

Proximity Restrictions

There are several proximity restrictions that are mandatory for all UAVs operators in Qld they include:

- A flight ceiling of 15 metres (50ft) above ground level (AGL);
- Being at least 30 metres from any person not involved with UAV operations;
- At least 5.5km away from aerodromes with an operating control tower and 3 nautical mile radius of an uncontrolled aerodrome or helicopter landing site.
- All Drone Operators are limited to a maximum horizontal distance of a visual line of sight or 500 metres.

Take-off and Landing

The UAV should take off and hover approximately 5 metres (“hover height”) above ground level where controls and systems checks can be made prior to flight. After the checks have been made the UAV can fly towards the water keeping within the operational area and gradually increasing altitude. At no time should the UAV be flown over people; this includes swimmers and persons using watercraft. When returning to land the UAV should fly in within the marked exclusion zone entering the area at a height of 5 metres slowly decreasing altitude until landed.

Post Flight Checklist

Item	Description	Checked
Lipo Batteries	Removed and put on charge	
Propellers	Propellers checked for damage	
Motors	Check for free movement and for temperature changes in the motors. Temperature change may indicate a motor working harder than the others	
Frame	Check for Damage Check for Foreign objects	
Undercarriage	Check for damage	
Gimble	Check for damage Check for foreign objects	
Aircraft	Place back into case (at the end of shift)	
Sync	Sync DJI and Drone Logbook accounts, then sign out	

UAV Cleaning Procedure

To get rid of the dust, dirt and debris (like sand) use a small paintbrush.

After flying, wipe down your drone with a damp microfibre cloth. A microfibre cloth is perfect for cleaning your drone’s camera lens.

If your drone is stained and the damp cloth isn't working, add a little isopropyl alcohol to the mix to clean your drone. Or the use of alcohol wipes.

Using compressed or canned air is another way to clear build-up from the corners and crevices of your drone, like the circuit boards and around the motors. Use sparingly, as overuse may freeze and damage some parts.

Safe UAV Operations

UAV Airframe Damage In the event of airframe damage, the Drone Operator should make all attempts necessary to safely control and navigate the UAV to the exclusion zone, and where possible, land safely. If it is unable to land safely, the Drone Operator should control the situation and make sure that the UAV does not cause damage to people or property in the surrounding area.

Collision, Crash and Damaged Aircraft Where a collision or crash occurs, priority shall be given to reduce any further damage or injuries to persons or property. Attempts shall be made to shut down motors via the transmitter as soon as Standard Operating Procedures (UAVs) possible, battery power shall be disconnected, and the scene preserved. Public shall be restricted access to area until deemed safe.

The UAV shall be immediately inspected for potential of a damaged battery to monitor the potential of a battery fire. The UAV will be deemed unserviceable pending inspection by the Maintenance Controller. The Drone Operator shall notify patrol, the State Operations Centre via radio and the Drone Captain.

Lack of Airspace Separation

In the event that "lack of airspace separation" occurs i.e. where there is a risk of the UAV intersecting with the flight path of a crewed aircraft or other UAV, the following actions should be taken:

- Situation assessed by Drone Operator;
- Altitude dropped appropriately;
- Further evasive manoeuvres conducted if necessary;
- Hold position or initiate Return to Home (RTH)(ensure RTH function is set to 50ft);
- Aircraft landed; situation re-assessed.

In this scenario it is paramount that the Drone Operator act diligently to increase the distance between the two aircraft. A crewed aircraft has right of way over an UAV under all circumstances. Drone operations may encounter other recreational UAV's within the operational area, use the same actions as the "Lack of Separation Scenario" to decrease the risk of collision.

Maintenance

Aircraft Maintenance

All equipment maintenance should be carried out in an orderly process and using the checklist provided. It is the responsibility of the operator to ensure that no checks are missed.

Battery Management

Battery Care and Charger Use

- Only use the supplied Lithium Polymer (LiPo) chargers. Using the incorrect charger or charge rate may cause damage to batteries and is potentially a fire hazard;
- Batteries should always be balanced charged according to their associated specifications;
- Never charge hot or warm batteries, wait until they are less than 30°C;
- If a battery is noticed to be swollen either during charging or flight operations, it should be disconnected immediately and placed in a safe location for observation. Swollen batteries should be replaced immediately;
- If wires are accidentally shorted or connected incorrectly, the battery should be disconnected immediately and placed in a safe location for observation for 15 minutes;
- Never charge in enclosed or hot conditions;
- Only charge batteries that have 30% or less charge. Battery Storage - Store batteries at room temperature between 15°C and 27°C;
- Do not expose batteries to direct sunlight for extended periods of time;
- Charge in an open area on a non-flammable surface such as concrete floor
- It is possible to transport or temporarily store batteries in warm temperatures, such as that of a vehicle, however this should be limited to no more than 2 hours at a time. Battery Replacement - Battery usage should cease when a pack loses 20% of its rated capacity;
- Internal resistance of cell breaches 6 milliohm, you can check the battery levels in DJI Go prior to flight;

The process for swollen or damaged batteries follows:

- Remove from use;
- Notify Drone Captain to then notify Lifesaving Coordinator/supervisor;
- Batteries for disposal should be discharged using the “discharge function” on the DJI charging hub. Once completed, batteries should be wrapped in a suitable

Battery Replacement

- Battery usage should cease when a pack loses 20% of its rated capacity;
- Internal resistance of cell breaches 6 milliohm, you can check the battery levels in DJI Go prior to flight;

The process for swollen or damaged batteries follows:

- Remove from use;
- Advise Drone Captain;
- Drone Captain to notify Lifesaving Coordinator/Supervisor
- Batteries for disposal should be discharged using the “discharge function” on the DJI charging hub. Once completed, batteries should be wrapped in a suitable LiPo bag and disposed according to local battery disposal requirements

Club UAV Operations

If an operator identifies a Dangerous Marine Create in the water they must adhere to the below:

- Notify Lifesaving/Lifeguard service notified by radio or in person (whichever is quickest);
- If possible identify the:
 - Creature
 - Size in metres
 - Specific Species
 - Location of creature
 - Heading of creature (direction of travel)
 - Number of nearby water users

Media Capture and Approval

Before any media is permitted to be used written approval from SLSQ must be given. Clubs must ensure that they adhere to the Patrol Operations Manual Section 26.

To obtain permission, please contact media@lifesaving.com.au with the following information to allow us to review on a case-by-case basis:

- Name and location
- Date captured
 - Intended use (distribution channels, media outlets, social media, media release)
- A list of the file names requested for use
- A link to photos and/or videos