Name of SOP	Indoor UAV Flight: Drones weighing <2.5kg and >250g
Effective Date	June 2017
Author	Ian McArthur
Reason for SOP	Check All that Apply: [*] Procedure/Process could cause critical injury. [ ] Procedure/Process could cause occupational illness. [ ] Procedure/Process could cause environmental impairment.[1] [*] Procedure/Process could damage University property [ ] Not critical, but requesting a review Provide Details: Indoor drone flight can potentially be hazardous to users if done improperly without following safety guidelines and common sense practice.
Approved by (supervisor)	BORZOO BONAKDARPOUR
Date reviewed by JHSC	August 9th, 2017
Date Last Reviewed	August 9th, 2017

Definitions

Terms	none
Acronyms	RMM – Risk Management Manual JHSC - Joint Health and Safety Committee EOHSS - Environmental and Occupational Health Support Services EPA – Environmental Protection Act OHSA – Occupational Health and Safety Act UAV – Unmanned Aerial Vehicle

Requirements

Applicable OHSA regulations and / or codes of practice.

1. RMM #101 - McMaster University Risk Management System

ISO/AWI 21384-3 (in development)

2. ANSI Unmanned Aircraft Systems Standardization Collaborative (UASSC) (in development)
3. RMM #300 McMaster University Safety Training and Orientation Program
4. RMM #301 McMaster University Standard Operating Procedures
5. RMM #309 McMaster University Lab Safety Handbook

Training and Competency

1. Training provided by resident PhD student Duy Vu of the department of Computing and Software.
2. Competency and understanding demonstrated by individual after the training.

Description of the Task

Location and time of work	**ITB 135**
Individuals involved	PhD, Graduate and Undergraduate Research Students
Equipment and supplies required	UAV – quad variant.
Personal protective equipment required	None

Sequential Steps to Complete the Work Safely

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General safety instructions

1. All users must obey the safety instructions listed in the UAV's instruction manual.
2. A sign must be posted on the door indicating that the drone is in flight. No entry into the lab is allowed during that time.
3. The operator should only access the UAV's operating space when the UAV is disarmed
4. When operating the UAV always have an emergency disarm command ready.
5. Never place yourself in a location that confines you between the UAV and another object.
6. If another person is inside or approaches the UAV's working space and the UAV is armed then send a disarm command immediately.
7. UAV(s) should never be operated outside of the working space (netted area) or unless secured at 4 corners.

Specific instructions for the operation of the UAV:

8. Place yourself in a location safely outside the UAV operating zone (the net).
9. Arm the UAV, perform flight test.
10. Turn off the UAV by pressing and holding the power button for 3 seconds until blue LEDs blink 3 times.

Contingency Plan and Reporting

Accident / injury response

Minor Cuts and Bruises:

1. Go to nearest first aid station for treatment.
2. Write and submit a safety incident report.

In the Case of Serious/Critical Injuries

1. Shutdown equipment, secure area to prevent further injury
2. Immediately arrange for medical and emergency assistance by calling Security at "88". Phone in ITB 135
3. Apply first aid as required
4. Notify laboratory supervisor (Borzoo Bonakdarpour) immediately
5. For all injuries complete a "Injury/Incident Report" and provide a copy to the Chair and EOHSS
6. In case of critical injury notify EOHSS immediately, ext 24352

Equipment Malfunction

1. Send disarm command from connected Ground Control Station

Equipment shutdowns

1. Send disarm command from connected Ground Control Station

Environmental Responsibility

Waste disposal procedures

Procedure does not require disposal

Building air quality

Procedure does not effect air quality

References

1. OHSA/ regulations
2. EPA and Municipal environmental regulations
3. RMM #100 McMaster University Environmental Health and Safety Policy
4. RMM #300 Safety Orientation and Training Program
5. RMM #301 Standard Operating Procedures
6. RMM #309 McMaster University Lab Safety Handbook

Distribution

1. Faculty of Engineering JHSC (for review)
2. Dr. Borzoo Bonakdarpour (project supervisor)
3. CAS research students working with drones
4. CAS Department Chair

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