AC 101-2-1(Rev 8)
3 July 2025

Civil Aviation Authority of Singapore

Advisory Circular

PERMITS FOR UNMANNED AIRCRAFT OPERATIONS

GENERAL

Advisory Circulars (ACs) are issued by the Director-General of Civil Aviation (DGCA) from time to time to provide practical guidance or certainty in respect of the statutory requirements for aviation safety. ACs contain information about standards, practices and procedures acceptable to CAAS. An AC may be used, in accordance with section 11 of the Air Navigation Act 1966 (ANA), to show that compliance with a statutory requirement has been achieved. The revision number of the AC is indicated in parenthesis in the suffix of the AC number.

PURPOSE

This Advisory Circular provides guidance on unmanned aircraft (UA) operations in Singapore that will require permit(s).

APPLICABILITY

This AC is applicable to persons whose activities necessitate applying and holding CAAS operator permits.

RELATED REGULATIONS

This AC relates specifically to Part 2 of Air Navigation (101 – Unmanned Aircraft Operations) Regulations 2019 ("ANR-101").

RELATED ADVISORY CIRCULARS

- AC 101-2-2 BVLOS Operations for Unmanned Aircraft

CANCELLATION

Revision 8 of this AC supersedes revision 7. This revision removes the term 'customised' when describing 'modified' UA to eliminate potential confusion and redundancy in terminology.

EFFECTIVE DATE
Revision 8 of this AC is effective from 3 July 2025.

OTHER REFERENCES
Nil.

1 UNMANNED AIRCRAFT OPERATOR'S RESPONSIBILITIES

1.1 An unmanned aircraft (UA) operator must ensure that the UA is operated in a safe manner without endangering the safety of any person, aircraft or property and that any reportable safety matter, of which, a non-exhaustive list can be found in **Appendix 1,** is notified to CAAS by the quickest available means.

1.2 A UA operator may be required to apply and hold a UA Operator Permits (OP) and/or Activity Permits (AP) depending on the purpose and complexity of operations and the mass of the UA.

2 APPLICABILITY OF THE PERMITS

2.1 A UA OP and AP are required to ensure the safe operation of UA and to mitigate any safety risks posed to other aviation users and the public when a UA is operated.

Outdoor UA Operations

2.2 A UA operator must apply for a UA OP and Class 1 Activity Permit (AP1) for any activity that is:

(a) For business or for a purpose that is neither recreation nor education regardless of the mass of the UA;

(b) For education purpose using a UA of total mass exceeding 7 kilograms;

(c) For recreation purpose using a UA of total mass exceeding 25 kilograms; or

(d) Beyond visual line-of-sight (BVLOS).

Note: Illustrations of "recreation purpose" and "education purpose" are described in **Appendix 2**.

2.3 A Class 2 Activity Permit (AP2) is required when a UA of total mass not exceeding 25 kilograms is operated outdoors for recreation purpose, or when a UA of total mass not exceeding 7 kilograms is operated outdoors for education purpose, under any of the following operating conditions:

(a) Altitude exceeding 200 feet above mean sea level (AMSL);

(b) Within 5 kilometres of any aerodrome; or

(c) Within any restricted area or danger area, as published in the Government Gazette.

Note: The restricted areas, danger areas and areas within 5 kilometres of an aerodrome are shown on OneMap (https://go.gov.sg/dronequery). OneMap is the only authoritative source for checking against the no-fly zones, other sources and mobile applications (such as those offered by the UA manufacturers) might not provide the correct information on no-fly zones in Singapore.

2.4 The holder of a UA Training and Assessment Organisation (UATO) approval is not required to obtain a UA OP or AP1. However, an AP2 will be required if the UATO

intends to fly the UA outdoors under any of the conditions as described in paragraph 2.3. For details on UATO requirements, please refer to AC 101-3-1 on “Approvals for UA Training”.

Indoor UA Operations

2.5 For UA operations conducted indoors, UA operators are to assess that these operations are unlikely to pose safety risks to other aviation users. The owner or occupier of an indoor premise is responsible for the safety of occupants and visitors.

2.6 A UA operator will need to apply and hold a UA OP and AP1 when operating a UA indoors for:

(a) Sporting activities that form part of an organised group activity or organised competition, race, or tournament;

(b) Events attended by more than 50 individuals at any time; or

(c) Flying displays.

Note: The revised definition for “indoor” means that permits are not required if a UA operator intends to operate his UA:

(i) for a purpose that falls outside of Paragraph 2.6; and

(ii) in cages or netted areas that are erected outside of a conventional building, for example in the school field, and even when the location being within 5km of any aerodrome.

3 UA OPERATOR PERMIT (OP)

3.1 A person applying for the grant, variation or renewal of a UA OP may refer to **Appendix 3** for the list of information and supporting documents required. The UA OP lists the approved UA brand(s), model(s) and type(s) of operations and is typically valid for up to one year. The holder of the UA OP may only conduct an operation within the scope granted in the OP. Applications for renewals and variations to the UA OP should be submitted in a timely manner to avoid delays that will interrupt operations.

3.2 CAAS grants, varies or renews a UA OP after satisfactory assessment that the applicant is fit and capable to conduct UA operations safely. The assessment considers, but is not limited to:

(a) The applicant's organisational structure;
(b) The airworthiness of each UA;
(c) The procedures for managing operations safely and maintaining compliance with UAS regulations, including:
  (i) operating registered and approved UA
  (ii) ensuring every UA pilot[1] involved (in single-piloted or multi-piloted configurations) holds a valid CAAS-issued UA pilot licence

[1] As defined in ANR-101, UA pilot, in relation to an unmanned aircraft, means the person who has operational control of that unmanned aircraft. Operational control refers to the ability to initiate, conduct, modify, or terminate a flight of an unmanned aircraft, including manipulating the aircraft's flight path, speed, altitude, and other flight parameters, or overriding automated systems when necessary.

(iii) complying with Centralised Flight Management System requirements.
(iv) procedures to manage operations safely, conducting of safety risk assessments.

3.3 Information supporting the UA OP assessment should be detailed within the Operations Procedures, which should be updated promptly if any changes occur.

3.4 For UA airworthiness assessment, the applicant is to provide details of the UA configuration and any modification[2] to CAAS as part of the permit application. If modifications are made to a UA after CAAS has approved an earlier configuration, the holder of the UA OP would need to submit a variation of OP application to seek approval for the updated UA configuration.

4 CLASS 1 AND CLASS 2 ACTIVITY PERMITS (AP1 AND AP2)

4.1 A person applying for an AP1 or AP2 may refer to **Appendix 4** for the list of information and supporting documents required. CAAS grants an AP1 or AP2 after satisfactory assessment of the specific aspects of the activity, such as:

(a) The location where the UA is intended to be operated;

(b) The type(s) of operation to be conducted;

(c) The date(s)/time(s) during which the operation(s) will be conducted at the location(s);

(d) The maximum operating altitude;

(e) Mitigation measures proposed by the operator to address site-specific circumstances such as nearby buildings/obstacles, crowds, visibility etc. at the time of operations; and

(f) Activity applied for is within the capability of the operator as approved in the UA OP, in the case of an AP1 application.

4.2 For multiple activity locations, a single AP1 or AP2 may be granted if the activity locations are proximate to one another. However, if the locations are far apart and/or the type of operation varies, an operator will have to apply for AP1s or AP2s for each location.

4.3 In the interest of aviation safety, the operation of a UA outdoors within 5 kilometres of a civilian airport or military airbase is subject to more stringent safety assessment by CAAS to prevent the UA from interfering with manned aircraft operation. UA operations within 5 kilometres of an aerodrome may be required to be de-conflicted from manned aircraft operations and on a case-by-case basis, may be subjected to more stringent requirements such as, usage of power-tethered system and/or a flight termination system to effectively mitigate any risk of a runaway UA.

[2] **Modification** refers to any changes or alterations made to the unmanned aircraft from the original configuration, which refers to (i) the Commercial-off-the-shelf configuration; or (ii) the configuration as provided in the original UA operator permit application. Modifications can involve changes to hardware, software, or system components.

Note: The power-tethered system is one that power is supplied to the UA via a cable tethered to the ground, such that should the tether disconnects, the UA would not be able to operate further. Some UA with a power-tethered system may have a safety battery to sustain a safe descent when the power tether is disconnected. The power-tethered system, including the tether cable and all attachment points, should withstand 1.5 times the UA's maximum thrust capacity.

4.4 An AP application that involves a flight test will be subject to safety assessment commensurate with the associated risks. Appendix 4 provide details on the different categories of flight tests and list the additional information and supporting documents that are to be submitted as part of the AP application.

4.5 A UA operator may apply for a single AP1 or AP2, known as a block permit, if the same UA operation is to be carried out multiple times over an extended period of time by the same UA type at the same location. As with any AP1 or AP2 application, the operating periods will be subject to coordination with relevant authorities to ensure that the UA flights can be safely conducted. Examples of such activities include:

(a) A wedding photographer (the holder of a UA OP) who takes aerial photographs (commercial purpose) at Hotel A (specific location) between 5pm to 11pm on 5 Jan, 6 Jan, 12 Feb, 14 Feb and 20 Feb (specific dates/times).

(b) A shipbuilder (the holder of an UA OP) performing aerial inspection of ships (specialised service) at Y shipyard (specific location) every day between 12pm and 4pm from 1 Jan to 31 Mar (a block duration).

4.6 An AP1 or AP2 holder may apply for a variation to the AP1 or AP2, before the original start date of the activity, should there be a change in the date(s)/time(s) of the activity.

4.7 A UA operator may apply for a “repeat” AP1 or AP2 for the same activity, i.e. same operation using same UA type at same location albeit at later date(s), which he had been granted an AP1 or AP2 previously. Using the example from paragraph 4.4(b), the shipbuilder may apply for a repeat AP1 for the same aerial inspection at the shipyard for a new period from 1 May to 31 July.

Note: A “repeat” is only allowed for AP1s or AP2s that are granted less than 1 year ago from the intended new period as mentioned above.

5 OTHER PERMITS

5.1 Where necessary, any one or more of the following permits may also be granted by the respective agencies:

(a) A permit granted by the Singapore Police Force (SPF) pursuant to section 32 of the ANA for taking photographs of a protected area;

(b) A permit granted by SPF pursuant to section 33 of the ANA for overflying a protected area;

(c) A permit granted by SPF pursuant to section 26 of the POA for using UA in a special event area;

(d) A permit granted by CAAS pursuant to section 35 of the ANA for discharging a substance from a UA; and

(e) A permit for use of radio frequencies and power limits that does not comply with the Info-communications Media Development Authority of Singapore (IMDA) guidelines on radio frequencies and power limits for short range devices.

5.2 The applicant should therefore provide the necessary details and supporting documents to identify the necessity for the grant of such permits.

6 PERMIT APPLICATION

6.1 Permit applications should be submitted through the eSOMS (https://esoms.caas.gov.sg):

(a) at least 1 month before the intended activity date/time for UA OP. UA OP applications involving BVLOS operations should be submitted at least 3 months in advance;

(b) at least 1 week prior to the intended activity date/time for AP initial approvals, variations and “repeats”. At least 1 month in advance for AP applications involving multiple UA, such as light shows and drone racing events; and

(c) with their associated fees, which cannot be refunded or transferred regardless of the application outcome. A list of applicable permit fees is listed in paragraph 7.

Note: An applicant who requires both his UA OP and AP to be varied, for example to add a new UA type, is advised that these processes will be processed sequentially. The AP variation approval is dependent on the approval of the UA OP variation.

6.2 Permit applicants should note the following guidelines:

(a) CAAS may reject permit applications when (i) information required by CAAS is not provided within 1 month of being requested and (ii) the permit applications, excluding those pertaining to BVLOS operations, are still inactive 3 months from the application date.

(b) For UA OP:
It is the responsibility of the holder of a UA OP to ensure the timely renewal of his UA OP. Once the UA OP expires, a renewal is not allowed and a new UA OP application will be required.

(c) For AP:
(i) There may be instances when certain requested operating parameters (such as activity dates, times, locations and heights) cannot be approved based on aviation safety and security considerations. Applicants should exercise flexibility in planning their activities.

(ii) Any change to the activity dates in the application should be submitted within 5 working days of the initial application, failing which the application may be rejected.

(iii) Applications to operate within areas as described in paragraph 4.3 are more complex and may have a longer processing time than the average activity permit processing time of 5 working days. These applications may or may not be approved subjected to security and safety assessment. There will be no refunds regardless of the outcome of the application.

7 FEES

7.1 As reproduced from the Second Schedule of ANR-101:

Permit Application Type			**Applicable Fees as of**		
			Current	**From 23 Dec 2022**	**From 15 Jan 2024**
UA Operator Permit (OP)	Initial	Operator assessment + 1st UA type	**$600**	**$650**	**$700**
		For each UA type added or substituted	**$400**	**$450**	**$500**
	Renewal	Renewal operator assessment	**$200**	**$250**	**$300**
	Variation	For each UA type added or substituted	**$400**	**$450**	**$500**
Class 1 Activity Permit (AP1)	Each activity or block of different dates/times of the same activity (i.e. same location, type of operations and UA type)		**$75**	**$90**	**$120**
	Repeat / Variation activity (same as previously approved Activity Permit) with new dates/times only		**$25**	**$35**	**$45**
Class 2 Activity Permit (AP2)	Each activity or block of different dates/times of the same activity (i.e. same location, type of operations and UA type)		**$60**	**$85**	**$110**
	Repeat / Variation activity (same as previously approved Activity Permit) with new dates/times only		**$20**	**$28**	**$36**

APPENDIX 1 LIST OF REPORTABLE SAFETY MATTERS

Some examples of reportable safety matters:

1 Any malfunctions of, or damage to, the UA structure, components, or subsystems, while in operation, which affect its airworthiness or led to difficulty in control of the aircraft.

2 Any damage to UA, due to foreign objects or environment, while in operation, which affect its airworthiness or led to difficulty in control of the aircraft.

3 Near collision of the UA with other aircraft or objects, near misses, or occurrence that has a potential of causing an accident.

4 Incapacitation of flying crew.

5 Any airspace infringement event.

6 Any other significant safety incidents that may endanger the operations of the UA and/or cause danger to persons and property.

7 Any occurrence during the operation of the UA leading to:

(a) Missing or total loss of the UA;

(b) Requiring major repairs of the UA; or

(c) Serious injury or fatality to people.

A UA operator should inform the CAAS UAS Duty Officer (Tel: +65 9830 6418) on a reportable safety matter relating to a UA within 24 hours of its occurrence and follow up with a written report within 3 working days to CAAS_UAS@caas.gov.sg.

APPENDIX 2 ACTIVITIES FOR RECREATION AND EDUCATION PURPOSES

1 RECREATION PURPOSE

1.1 As defined in ANR-101, “recreation purpose” means any activity engaged in for enjoyment, relaxation or leisure, but not taking part in —

(a) A sporting activity that forms part of an organised group activity or organised competition, race or tournament;

(b) A recreational activity provided in the course of carrying on a business; or

(c) A flying display.

Note: the definition for recreation has been clarified to exclude drone races.

1.2 Some examples of activities that are considered as “recreation purpose” include:

(a) An individual flying a UA for fun (which should be done in accordance with CAAS’ operating guidelines for safe and responsible operation of UA).

(b) An individual flying a UA higher than 200 feet above mean sea level for aerial photography for personal collection.

2 EDUCATION PURPOSE

2.1 As defined in ANR-101, “education purpose” means any lecture, tutorial, seminar, demonstration, class or similar activity on unmanned aircraft, offered or provided by an education institution mentioned in section 45 of the Private Education Act 2009 to students enrolled in that education institution.

2.2 Some examples of activities that are considered as “education purpose” include:

(a) A university or tertiary institute mentioned in section 45 of the Private Education Act 2009 conducting a course that involves flying of a UA for its enrolled students, as part of its full-time curriculum.

(b) A public educational institute within 5km of a civil airport / military airbase flying UA outdoors to demonstrate its capabilities to the students.

(c) Students of a public educational institute showcasing their UA as part of a school activity that is not open to the public.

(d) A teacher of a public educational institute educating his students on UA technology that involves flying of a UA as part of co-curricular activities.

(e) Students of a university or tertiary institute mentioned in section 45 of the Private Education Act 2009 conducting flight tests as part of their final year projects.

3 NON-RECREATION OR NON-EDUCATION PURPOSE

3.1 Some examples of activities that are neither considered as a “recreation purpose” nor “education purpose” include:

(a) A company providing aerial surveying or outdoor photography services for a public educational institute.

(b) A company conducting an outdoor flight demonstration with its UA to its prospective customers.

(c) A company (the business being agriculture) using its UA outdoors to survey crops or spray pesticides.

(d) A government agency (excluding the Singapore Armed Forces) using its UA to perform outdoor aerial surveillance, aerial fire-fighting or as part of the provision of emergency or essential services.

(e) A company, such as a factory, using its UA outdoors to deliver small articles between various locations in its compound.

(f) An outdoor performance involving UA at Chingay Parade or National Day Parade.

(g) A training service provider conducting UA flying courses outdoors for an educational institute’s students on its behalf.

(h) An individual sharing his personal collection of outdoor aerial photographs taken using his UA with business for marketing purposes, regardless of whether there are any monetary exchanges.

(i) An organiser conducting competitive UA races, flying displays or using UA as part of a ticketed show staged in the Singapore Indoor Stadium for an audience.

(j) A public educational institute using its UA to take photographs and videos of its activities and events.

(k) A company’s public communications department using a UA to take event photographs for marketing or publicity efforts.

(l) A volunteer using a UA to take photographs and videos for a charity event.

(m) A company using its UA to carry out inspections of its facilities or properties indoors. For example, tunnel inspections, sewage inspections or internal fuel tank inspections.

(n) A warehouse using its UA to stocktake its inventory indoors.

3.2 Permits may not be required for the activities described in paragraph 3.1(j) to (n) if the UA is operated indoors and there are less than 50 persons in attendance.

APPENDIX 3 DOCUMENTS REQUIRED FOR OP APPLICATION

The following documents are required for Operator Permit (OP) applications:

A. New UA OP Applications

1 A set of Operations Procedures, which should include the following information:

(a) Identity and contact details of the operator.

(b) Description of the operator's nature of work, and its organisational structure pertaining to UA operations, if applicable. The names of UA pilots, their UAPL references and licence ratings should be listed.

(c) General procedures for incident and accident reporting, and management of casualties arising from any accident.

(d) Description of an internal training programme to ensure competency and currency for all personnel involved in UA operations.

(e) Description of how the flight records, maintenance records and training records are managed.

(f) Details of every UA, including one that may be leased or borrowed from another operator, and its associated elements such as the ground control station:
- (i) Picture(s) clearly showing the UA and its associated elements,
- (ii) Specifications of the UA and its associated elements,
- (iii) Flight checks to be carried out for all envisaged UA operations,
- (iv) Emergency procedures to be carried out for all envisaged UA operations,
- (v) Maintenance regime of the UA and its associated elements.

(g) Description of the type(s) of operation to be conducted and the general procedures to conduct the operation safely.

Note: The set of Operations Procedures should be approved and signed by the responsible personnel for the organisation's UA operations to confirm that it and any included supporting documents will be complied with at all times.

As the purpose of the Operations Procedures is to describe how the operator operate safely in Singapore, it is intended for the set of Operations Procedures to be a "living document" that is useful to the operator in fulfilling its obligation to maintain the UA OP approval and to CAAS for its continued safety oversight. It is, therefore, essential that the Operations Procedures are regularly reviewed and changes are incorporated at the earliest opportunity to ensure it remains current. Any proposed amendment to the Operations Procedures, other than typographical changes, should be submitted to CAAS before incorporation. Applicants are to maintain proper revision control of the set of Operations Procedures and identify clearly to CAAS the amendments made in the Operations Procedures that are to be submitted to CAAS.

A template of the Operations Procedures, with explanatory notes indicated within, can also be found on CAAS website (https://www.caas.gov.sg/e-services-forms/forms/unmanned-aircraft-systems). Applicants are strongly encouraged to use the template and adjust the contents accordingly based on their operational needs.

2 If a UA is modified in a way that impacts its flight critical system[3], overall weight and balance, and/or performance capabilities and flight characteristics, the following information should be provided to support the airworthiness of the UA unless advised otherwise by CAAS:

(a) Details of analysis carried out to derive the key design parameters such as the maximum flight duration, maximum speed capable and maximum height capable;

(b) Details of acceptance tests or checks conducted to ensure UA is ready for first flight such as sensor accuracy checks, structural load tests, propulsion thrust measurement, weight and balance, control link range checks, failsafe function verifications, and interoperability tests. This should also not be confused with pre-flight checks;

(c) Details of environmental tests conducted to verify that the UA is able to operate with no or within acceptable margins of performance degradation in its intended environment such as temperature test, shock and vibration test, water ingression test, and EMI/EMC test.

Note: As it is not the intention for CAAS to certify the UA, it is not required for the operator to conduct the above tests in a certified test house. However, the operator should do its due diligence to ensure that any tests, checks or analysis conducted in-house are as accurate and controlled as possible.

3 If BVLOS UA operations is intended to be conducted, a BVLOS compliance checklist and its supporting documents will be required. For details on the assessment of BVLOS operations, please refer to AC 101-2-2 on “BVLOS Operations for Unmanned Aircraft”.

4 Supporting evidence of competency of the UA pilot(s) in the form of the licence numbers of relevant and valid UAPL issued by CAAS. For details on theory test, practical assessment and UAPL requirements, please refer to AC 101-4-1 on “UA Pilot Licence”. Specifically for UA more than 25kg, as part of the permit application process, documentation describing the training programme for all UA pilots operating the platform should be submitted. Within, there should be refresher training which will be performed at least once a year.

5 ACRA BizFile for Singapore-based organisations. For overseas-based entities that do not have an ACRA BizFile, an official letter of intent is required from a Singapore-based of type(s) of operation to be conducted in Singapore.

B. Applications to Vary the UA OP

1 For variations such as a change in the key management personnel of the operator, or the addition/substitution/removal of UA type(s) or type(s) of operations, a revised

[3] **Flight critical system** means a component of the UA, the failure of which could result in a catastrophic effect. Examples of flight critical system will include the flight control system, propulsion system and flight termination system.

Note: Catastrophic effect refers to failure that would prevent continued safe flight and landing resulting in one or more fatalities or serious injury to persons or major property damage external to the UAS; or uncontrolled loss of aircraft.

Operations Procedures is required. CAAS may also request for additional documents or information during such applications.

Note: (i) For a change in the operator name but without a change in the unique entity number (UEN), the updated ACRA BizFile will also be required for submission. If there is a change in the UEN, a variation to the UA OP is not allowed as there is a change in legal identity. The operator should apply for a new UA OP instead.
(ii) UA operators with previously submitted Operations Manuals are requested to amend their Operations Manuals to Operations Procedures at the earliest opportunity, being a variation or renewal of the UA OP, after this AC is published.

2 For variations that include the addition of a modified UA, or modifications to previously approved UA configurations, the applicant should refer to paragraph 2 in section A above for guidance on the information required to support the assessment of UA's airworthiness.

3 For variations to include additional UA pilots, the references of their CAAS issued UAPL should be reflected in the revised Operations Procedures. For details on theory test, practical assessment and UAPL requirements, please refer to AC 101-4-1 on "UA Pilot Licence".

C. Applications to Renew the UA OP

1 The revised Operations Procedures should be submitted if there are changes since the last issuance of the UA OP.

Note: UA operators with previously submitted Operations Manuals are requested to amend their Operations Manuals to Operations Procedures at the earliest opportunity, being a variation or renewal of the UA OP, after this AC is published.

2 The current list of UA pilots, identifying their names, UAPL numbers and licence ratings, if not already included in the Operations Procedures.

3 Records of any flight activities conducted over the past year.

4 Records of maintenance conducted on each UA over the past year.

Note: Decommissioned UA should be removed from the Operator Permit.

5 Records of training attended by personnel involved in the UA operations for the past year.

6 Summary of any UA incidents or accidents recorded in the past year.

7 Overseas-based entities are required to submit an official letter of intent from a Singapore-based organisation that has engaged their services, stating the date/time and purpose of type(s) of operation to be conducted in Singapore. If the overseas-based operator is unable to provide a letter of intent or the date(s)/time(s) stated in the letter of intent do not fall within the next validity period, the UA OP will not be renewed.

APPENDIX 4 DOCUMENTS REQUIRED FOR AP APPLICATION

1 In addition to the information required in the eSOMS AP application, an illustration of the whole operation process containing the following points may be required:

(a) Flight plan (take-off/landing, hover/flight path, height, speed, how visual line of sight is maintained, number and position of pilots and observers, etc);

(b) A map or floor plan (e.g. Google satellite map at the appropriate scale) of the activity site with annotation of launch/recovery point(s) and any horizontal flight path of the unmanned aircraft;

(c) If applicable, indicate if the activity is conducted for, or within proximity of an organised event where crowds are expected (marathon, festival, exhibition, parades, events, etc.).

(d) An illustration of how the unmanned aircraft will drift in the event of power failure at maximum operating height.

2 For each activity, please complete the Risk Assessment Form found online (https://www.caas.gov.sg/e-services-forms/forms/unmanned-aircraft-systems). To ensure that the risk assessment is relevant to the activity, the operator should identify all possible hazards specific to the activity and implement control/recovery measures to mitigate the risks. Hazards should be identified for each section of the form.

3 Supporting documents may be requested to prove the availability of systems, software, or mechanisms, e.g. manufacturer or product specification, that serve to:

(a) ensure that the UA operation can be confined within the planned area of operation;

(b) provide in-flight monitoring of critical system parameters (battery power, rotor performance etc.); and

(c) allow post flight review of the flight profile.

4 For an AP application involving a flight test, additional information and documents should also be submitted according to the category of flight test shown in the table below.

Flight Test Category	**Typical activities that are to be conducted as part of the Flight Test**	**Additional information and documents**
Category 1 (CAT 1)	<u>Functional and maintenance check</u> • Routine check flight to check UA functionality • Maintenance check flights.	Proposed flight test category, with justification to support the categorisation
Category 2 (CAT 2)	<u>Flight Test for Production verification</u> • Manufacturing quality control flight test for	(a) Proposed flight test category, with justification to support the categorisation

	newly produced UA based on previously approved design in the applicant's OP • Flight test to assess UA performance within flight envelope defined by manufacturers	(b) Flight test plan that contains the following details: (i) Purpose of flight test (ii) Date and timing of the flight test (including backup dates) (iii) Details of key personnel (Pilot-in-charge (PIC), Chief Safety Officer, Chief Operations Officer) including names, contact numbers and UAPL numbers (iv) Responsibilities of key personnel for the operation (v) Operational Procedures including pre-flight and post-flight procedures (vi) Site plan of the operation area, clearly indicating the location of PIC, Chief Safety Officer, Chief Operations Officer, supporting equipment and audience (vii) Intended flight path for the operation (viii) Risk assessment specific to the operation including the production flight or verification flight test plan (ix) Risk mitigation measures specific to operation (x) Emergency procedures, including procedures for dealing with potential uninvolved UA intrusions into test area or UA excursions beyond test area (xi) Test cut-off criteria (c) Any other agency approvals (e.g. IMDA, SPF, Mindef, etc.) in support of the flight test
Category 3 (CAT 3)	<u>Flight Test for Proof of concept</u> • Airworthiness evaluation flight test for prototype or post-modification UA • Flight to collect flight telemetry data (through onboard flight critical systems) for research and development • Flight test to assess UA performance outside flight envelope defined by manufacturers • All other flight tests not specified in CAT 1 and CAT 2.	

Note: Flight testing does not include training flight for operators or pilots, demonstrations of UA capability to potential customers or regular data collection through UA's payload.