

Advisory Circular

APPROVALS FOR UNMANNED AIRCRAFT TRAINING

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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 AC provides guidance relating to an organisation seeking approvals to conduct unmanned aircraft (UA) basic training, UA pilot licence training or practical assessments / proficiency checks pursuant to the Air Navigation (101 – Unmanned Aircraft Operations) Regulations 2019 (“ANR-101”).

APPLICABILITY

This AC is applicable to an organisation seeking approval or have been approved to conduct UA basic training, UA pilot licence training or practical assessments / proficiency checks pursuant to ANR-101.

RELATED REGULATIONS

This AC relates specifically to Part 3 of the ANR-101.

RELATED ADVISORY CIRCULARS

AC 101-4-1 Unmanned Aircraft Pilot Licence (UAPL)

CANCELLATION

Revision (5) of this AC supersedes revision (4). In this revision, outcome-based expectations for the use of simulation-based training and assessment by UATOs as a substitute for outdoor practical training and assessment have been included.

EFFECTIVE DATE

This AC is effective from 1 September 2026.

OTHER REFERENCES

Nil.

1 INTRODUCTION

- 1.1 Pursuant to the ANR-101, a person must not provide UA basic training (UABT) unless that person holds a UABT approval. A person must also not provide any UA pilot licence (UAPL) training or conduct any practical assessment or proficiency check unless that person holds an Unmanned Aircraft Training and Assessment Organisation (UATO) approval.
- 1.2 The UABT is mandatory for UA users operating a UA with a total mass exceeding 1.5kg but not exceeding 7kg for recreation or education purpose. UABT provides the UA user with the relevant knowledge to operate their UA safely and responsibly.
- 1.3 The UAPL is mandatory for UA users operating a UA for non-recreation or non-education purposes or a UA with a total mass exceeding 7kg for all purposes. UAPL ensures that users have the necessary competency to operate the UAs safely.

UA BASIC TRAINING ORGANISATION (UABTO)

2 COMPONENTS OF UA BASIC TRAINING (UABT)

- 2.1 The UABT should be administered as an online course with a duration of approximately 2 hours, including the quiz. The UABTO should ensure that online UABT include, but not limited to, the following components:
 - (a) Means to secure user registration and login that is compliant to the Personal Data Protection Act (PDPA) (refer to **Appendix 1**);
 - (b) Courseware (refer to **Appendix 2**);
 - (c) A randomly generated 20 questions picked from a question bank that consist of at least 50 questions and corresponds with the module referenced in **Appendix 2**, to be administered.
 - (d) The quiz will only be considered completed when all 20 questions are correctly answered; and
 - (i) if a user answers a question incorrectly, a different question from the corresponding module in the question bank is generated; and
 - (ii) all questions from the question bank must be exhausted before recycling the same question.
 - (e) Means to provide trainees with a Certificate of Completion after successful completion of the quiz. The certificate should include the trainee's full name as per the NRIC (or other equivalent ID such as the passport), course title, date of completion of the UABT, name of UABTO, UABTO's Accountable Manager's signature and reference/serial number.

3 APPLICATION FOR UABT APPROVAL

- 3.1 An application for a UABT approval should be made via <https://esoms.caas.gov.sg>, and accompanied by the relevant application fee (refer to **Appendix 5**). Complete applications with all required documents and fees are typically processed within 2 months. Incomplete submissions or complex applications may require additional processing time. Applicants are encouraged to submit their applications well in advance of their planned training start date to allow for processing time.

3.2 The applicant is required to submit the following information as part of the application:

- (a) ACRA BizFile / Certificate of incorporation
- (b) CV of Accountable Manager (AM)
- (c) A manual including:
 - (i) Description of organisational structure, including the roles and responsibilities of personnel involved in activities relating to the approval
 - (ii) Description of the UABT programme such as the training syllabus, modality of quiz, estimated duration for completion, modality of certificate issuance, intended training fee etc.
 - (iii) Description of the record keeping system such as the list of records to be retained, storage/retrieval/disposal procedures etc.
 - (iv) Description of the online system implementation such as platform compatibility, user process flow, quiz administration, payment details etc.
 - (v) Description of the quality of the online system, including a declaration of compliance to IM8 and Personal Data Protection Act
- (d) E-learning script detailing the programme outline, on-screen graphics and text, voice over (if any), user interactions etc.
- (e) Question bank that consist of a minimum of 50 questions

3.3 The AM is normally the chief executive officer (CEO) who by virtue of position has overall (including financial) responsibility to run the organisation. If the AM is not the CEO, he/she should have the overall responsibility to run the organisation and have direct access to the CEO.

3.4 The AM is responsible to:

- (a) ensure that UABTO complies with regulatory requirements set by CAAS; and
- (b) ensure that sufficient funding is available to conduct activities to the approved standard.

4 RECORDS

4.1 The UABTO must maintain the following records for the specified retention period:

Records	Minimum Retention period
• Trainee's name, date of birth, contact address, contact number, email address • Date and time of which trainee completed the training • Reference/serial number of the certificate issued	Five years after the trainee has completed UABT

- 4.2 The UABTO should ensure that:
- (a) the integrity of records is maintained;
 - (b) the records are not deleted or altered; and
 - (c) there is a backup system of the records to provide continuity.
- 4.3 The UABTO should provide CAAS with records monthly or when required by CAAS.

5 VALIDITY OF UABT APPROVAL

- 5.1 The UABT approval will be valid for up to 1 year.

6 RENEWAL OF UABT APPROVAL

- 6.1 An application for renewal of approval should be made via <https://esoms.caas.gov.sg>, and accompanied by the prescribed application fee (refer to **Appendix 5**). Complete applications with all required documents and fees are typically processed within 2 months. Incomplete submissions may require additional processing time. Applicants are encouraged to submit their applications at least 2 months before the expiry of the approval to allow for processing time.
- 6.2 The applicant is required to submit the following information as part of the application:
- (a) Latest revision of the organisation manual if there are changes since the last issuance of the approval
 - (b) Latest revision of the e-learning script and question bank if there are changes since the last issuance of the approval
 - (c) Access credentials to the UABT system for CAAS' review and verification

7 VARIATION OF UABT APPROVAL

- 7.1 The approved UABTO must notify CAAS if there are changes to the courseware or question bank.
- 7.2 If there are any changes to the online system, key personnel or ownership of the UABTO, the approved UABTO should also notify CAAS.
- 7.3 An application for variation of approval should be made via <https://esoms.caas.gov.sg>, and accompanied by the prescribed application fee (refer to **Appendix 5**). Complete applications with all required documents and relevant fees are typically processed within 1 month. Incomplete submissions or complex applications may require additional processing time. As approval by CAAS is required before the organisation can proceed with implementation of the change, applicants are encouraged to submit their applications early to allow for processing time.

8 TRANSFERABILITY

- 8.1 A UABT approval granted to an organisation is not transferrable except as a result of a change in ownership. A new application is required in the event of a unique entity number (UEN) change.

UA TRAINING AND ASSESSMENT ORGANISATION (UATO)

9 APPLICATION FOR UATO APPROVAL

- 9.1 An application for a UATO approval should be made via <https://esoms.caas.gov.sg>, and accompanied by the prescribed application fee (refer to **Appendix 5**). Complete applications with all required documents and fees are typically processed within 2 months. Incomplete submissions or complex applications may require additional processing time. Applicants are encouraged to submit their applications well in advance of their planned training start date to allow for processing time.
- 9.2 The applicant is required to submit the following information as part of the application:
- (a) Organisation details
 - (i) Name of the organisation
 - (ii) Address of the organisation
 - (iii) ACRA BizFile
 - (b) Key personnel
 - (i) CV of Accountable Manager
 - (ii) CV of Head of Training
 - (iii) CV of Quality Manager
 - (c) List of instructors
 - (d) Letter of nomination of authorised flight examiners (UA) ("AFE(UA)")
 - (e) Scope of training and assessment (e.g. Class A Rotorcraft, Class A Aeroplane)
 - (f) An exposition document including:
 - (i) Organisation details
 - (ii) Description of facilities and equipment to conduct training and assessment
 - (iii) System to ensure competency of instructors and AFE(UA)s
 - (iv) System for record-keeping, document control and distribution
 - (v) Description of training curricula and policy
 - (vi) Quality assurance system
 - (g) Training course materials
 - (h) Intended pricing schedule for training courses to be offered
- 9.3 The UATO is required to demonstrate to CAAS that it has adequate staff, equipment, and infrastructure (e.g. sufficient classrooms and UA) to conduct UA flight training, practical assessment and proficiency checks. CAAS may conduct on-site inspections of the UATO's facilities to ascertain these aspects.
- 9.4 The UATO is not required to obtain an Operator Permit or a Class 1 Activity Permit to conduct practical training, assessments and proficiency checks which involves the flying of a UA. However, a Class 2 Activity Permit will be required if the UATO intends to fly the UA outdoors under any of the following 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://www.onemap.gov.sg/droneQuery>).

10 KEY PERSONNEL

- 10.1 The UATO should employ fit and proper individuals for the following key roles:
- (a) Accountable Manager (AM)
 - (b) Head of Training (HT)
 - (c) Quality Manager (QM)
- 10.2 The AM and QM should not be concurrently holding other training roles within the UATO.
- 10.3 The AM is normally the chief executive officer (CEO) who by virtue of position has overall (including in particular financial) responsibility to run the organisation. If the AM is not the CEO, he/she should have the overall responsibility to run the organisation and have direct access to the CEO.
- 10.4 The AM is responsible to:
- (a) ensure that UATO complies with the regulatory requirements set by CAAS;
 - (b) ensure that sufficient funding is available to conduct activities to the approved standard; and
 - (c) nominating the other key personnel and AFE(UA).
- 10.5 The HT must have direct access to the AM and meet the following requirements:
- (a) Hold a valid UAPL relevant to the scope of approval; and
 - (b) Is an instructor within the UATO.
- 10.6 The HT is responsible to:
- (a) ensure satisfactory training as well as supervising the progress of trainees;
 - (b) ensure instructors meet the required standards and performance;
 - (c) ensure AFE(UA) maintains recency and adheres to the assessment standards required by CAAS; and
 - (d) ensure sufficient resources are available to perform the activities under the scope of approval granted to the UATO.
- 10.7 The QM must have direct access to the AM and meet the following requirements:
- (a) At least 2 years' relevant experience in quality assurance; or
 - (b) Attended a quality assurance course acceptable to CAAS.
- 10.8 The QM is responsible for ensuring that the quality assurance system is properly implemented, maintained, continuously reviewed and improved.

11 INSTRUCTORS AND AUTHORISED FLIGHT EXAMINERS (UA)

- 11.1 Instructors employed by the UATO must meet the following requirements:
- (a) Holds a valid UAPL relevant to the scope of approval; and
 - (b) Competent to instruct.
- 11.2 The UATO will nominate an instructor to be authorised by CAAS as an AFE(UA). Upon authorisation by CAAS, the AFE(UA) will be responsible for the administration of practical assessment and proficiency checks on behalf of CAAS. The period of AFE(UA) authorisation is up to 24 months.
- 11.3 Each UATO should have 2 AFE(UA)s. CAAS will assess on a case-by-case basis should there be a need to have more to cope with the practical assessments.
- 11.4 To qualify for initial or additional authorisation, the AFE(UA) nominee must meet the following requirements:
- (a) Holds a valid UAPL relevant to the scope of approval and without limitations;
 - (b) At least 21 years old;
 - (c) Attended induction briefing by CAAS; and
 - (d) Passed practical evaluation by CAAS.
- 11.5 The AFE(UA) nominee should also have completed an internal AFE(UA) induction training conducted by the organisation.
- 11.6 To qualify for reauthorisation, the AFE(UA) must meet the following requirements;
- (a) Holds a valid UAPL relevant to the scope of approval and without limitations;
 - (b) Maintains recency with:
 - (i) at least 12 practical assessments or proficiency checks during the validity of the existing authorisation; and
 - (ii) at least 2 practical assessments or proficiency checks within each 6-month period during the validity of the existing authorisation;
 - (c) Attend refresher briefing and pass practical evaluation by CAAS not earlier than 6 months before the date of expiry of the existing AFE(UA) authorisation;
- 11.7 The AFE(UA) should also maintain instructor currency within the period of AFE(UA) authorisation.
- 11.8 Complete applications with all required documents are typically processed within 1 month. Incomplete submissions may require additional processing time. AFE(UA) nominees are encouraged to notify CAAS early to allow sufficient time to arrange for a practical evaluation.

12 EXPOSITION DOCUMENT

- 12.1 The UATO must provide and maintain an exposition document containing guidance on the policies, processes and procedures for the personnel concerned, to enable them to adequately discharge their duties in providing training and assessment.

- 12.2 The exposition document should define the course syllabi to achieve the competency required for UAPL, and state the learning objectives and standards to be met for each phase of training. Refer to the **Advisory Circular “AC 101-4-1 Unmanned Aircraft Pilot Licence (UAPL)”** for the UAPL learning outcomes.
- 12.3 The UATO should review the exposition document at least once a year to verify its clarity, implementations, effectiveness, accuracy and relevance. The review should minimally consider the following:
- (a) Changes in the organisation’s policies, procedures, practices and personnel;
 - (b) Changes to the content of training programmes;
 - (c) Changes resulting from new facilities and equipment;
 - (d) Changes to an approval document; and
 - (e) Changes to relevant regulations.
- 12.4 The UATO should have a system in place for the endorsement of changes and revision control to the exposition document. The system must also ensure effective distribution of the exposition document to all its personnel so that the latest version is always used.
- 12.5 Details on the contents of the exposition document can be found on **Appendix 3**.

13 FACILITIES AND EQUIPMENT

- 13.1 The UATO should be sufficiently equipped to enable adequate conduct of theory and practical training that is appropriate to the size and scope of the intended operations. These include the following:
- (a) Classroom(s) for theory training;
 - (b) Adequate location(s) for practical training and assessment;
 - (c) Sufficient UA types for practical training relevant to the approval with varying mass (e.g. less than 7kg and more than 15kg) and stability augmentation (e.g. attitude mode, rates mode, GPS mode for mission planning and execution) for purpose of training;
 - (d) Flight simulators (if any);
Note: Where flight simulators are used as a substitute for outdoor practical training and assessment, refer to **Appendix 4**.
 - (e) Course materials;
 - (f) Instructor / AFE(UA) guides; and
 - (g) Facilities to enable the following to be carried out adequately:
 - (i) Administrative functions;
 - (ii) Course development;
 - (iii) Maintenance of equipment; and
 - (iv) Record-keeping.
- 13.2 All equipment, including any UA, should be properly maintained in accordance with a maintenance plan before being used for practical training and assessment.

14 QUALITY ASSURANCE SYSTEM

- 14.1 The UATO should establish a quality assurance system that includes:
- (a) an independent audit function to monitor training and evaluation standards, the integrity of practical assessments and proficiency checks, and compliance with procedures; and
 - (b) a feedback system of audit findings to the person(s) and ultimately to the AM to ensure timely implementation of effective corrective and preventive action.
- 14.2 The quality assurance system should ensure conformance to standards and procedures, adequacy of training and assessment activities conducted as described in the exposition document. Every process that assists the UATO to achieve its results shall be identified and the activities and procedures documented. The UATO should specify the basic structure of the quality assurance system applicable to all training and assessment activities conducted.
- 14.3 The quality assurance system should be documented in the exposition document that is regularly kept updated. Refer to **Appendix 3** for details.

15 RECORDS

- 15.1 The UATO must maintain the following records for the specified retention period:

Records	Minimum Retention period
Trainee training, evaluation, practical assessment and proficiency check	Five years after the training or assessment has been completed
Qualifications, training and evaluation of instructors and AFE(UA)s	Five years after instructor or AFE(UA) has relinquished his role in UATO
Changes to key personnel	Five years after the change

- 15.2 The UATO must ensure that:
- (a) the records are complete such that there will be sufficient documentary evidence of each training action and for the reconstruction of the training history of each trainee, instructor or AFE(UA) in the organisation;
 - (b) the integrity of records is maintained by ensuring that the records are not removed or altered without authorisation; and
 - (c) there is a backup system of the records to provide continuity.
- 15.3 The UATO must maintain a personal record for every trainee, instructor and AFE(UA). The records should include:
- (a) Personal particulars;
 - (b) A copy of UAPL if applicable; and
 - (c) Detailed records of:
 - (i) Qualifications, training and evaluation for instructor and AFE(UA);
 - (ii) Training and evaluation for trainees; and
 - (iii) Results of practical assessments and proficiency checks.

- 15.4 The UATO should provide CAAS with a list of trainings and practical assessments / proficiency checks conducted minimally on a monthly basis or when required by CAAS.

16 VALIDITY OF UATO APPROVAL

- 16.1 The UATO approval will be valid for up to 1 year.

17 RENEWAL OF UATO APPROVAL

- 17.1 An application for renewal of approval should be made via <https://esoms.caas.gov.sg>, and accompanied by the prescribed application fee (refer to **Appendix 5**). Complete applications with all required documents and fees are typically processed within 2 months. Incomplete submissions or complex scope of approval may require additional processing time. Applicants are encouraged to submit their applications at least 2 months before the expiry of the approval to allow for processing time and audits.
- 17.2 The applicant is required to submit the following information as part of the application:
- (a) Latest revision of the exposition document if there are changes since the last issuance of the approval
 - (b) Latest revision of the training course materials if there are changes since the last issuance of the approval
 - (c) List of active instructors and AFE(UA)s
 - (d) List of courses conducted for past year
 - (e) List of practical assessments and proficiency checks conducted for past year
 - (f) Internal audit results for past year
- 17.3 An audit is required for the renewal of the UATO approval. CAAS will arrange for the audit once the required information and application fee are received.

18 VARIATION OF UATO APPROVAL

- 18.1 The UATO must notify CAAS of any variation that is significant to the operations of the UATO. These may include:
- (a) changes in scope of training;
 - (b) changes in the training programmes;
 - (c) changes to equipment used for training and assessment; or
 - (d) changes to location of the facilities.
- 18.2 Amendments made to the exposition document such as changes to procedures or key personnel must also be submitted to CAAS for acceptance. The UATO must not implement any proposed amendments to the exposition document until that amendment has been accepted by CAAS.
- 18.3 An application for approval variation or amendments to the exposition document should be made via <https://esoms.caas.gov.sg>, and accompanied by the prescribed application fee (refer to **Appendix 5**). Complete applications with all required

documents and relevant fees are typically processed within 1 month. Incomplete submissions or complex applications may require additional processing time. As approval by CAAS is required before the organisation can proceed with implementation of the change, applicants are encouraged to submit their applications early to allow for processing time.

19 TRANSFERABILITY

- 19.1 A UATO approval granted to an organisation is not transferrable except as a result of a change in ownership. CAAS should be notified when there is a change in ownership. A new application is required in the event of a unique entity number (UEN) change.

APPENDIX 1 UABT SYSTEM SECURITY REQUIREMENTS

The design of the UABT should include robust security controls and measures to ensure the reliability and privacy of the system and the data that is stored, processed or accessed by the system.

The UABTO should fully comply with the Personal Data Protection Act (PDPA) for the collection, use and disclosure of personal data and notify CAAS upon detection of any confirmed IT security incident or security breach affecting the system or its data, and provide CAAS with any follow-up actions to be taken.

Reference on security best practices can be found on the CSA Go Safe for Business website (<https://www.csa.gov.sg/resources/publications/be-safe-online/>).

APPENDIX 2 UABT LEARNING OUTCOMES

The UA basic training consists of 3 modules:

1. Air Law & Legislations
2. UAS General Knowledge
3. UAS Safety & Operations

AIR LAW & LEGISLATIONS		
Learning Objective	To equip trainee with relevant knowledge of the Air Navigation Act (ANA), ANR-101 and other associated advisory circulars for the safe and responsible operation of UA.	
Knowledge Areas	1.1	Regulations applicable to different UA operations (recreation, education and non-recreation / non-education purposes)
	1.2	Permits required for different UA operations and where to apply for the permits
	1.3	UA registration and how to apply for registration
	1.4	UAPL and its associated classes, categories and ratings; and how to apply for UAPL
	1.5	User operating guidelines (Do's & Don'ts)
	1.6	"No-fly" zones with the use of onemap.sg
	1.7	Penalties upon contravening provisions of the ANA and ANR-101

UAS GENERAL KNOWLEDGE		
Learning Objective	To equip trainee with basic aeronautical and technical knowledge of UA including the functionality of various UAS components and systems.	
Knowledge Areas	2.1	Different categories of UA (e.g. Aeroplane, Rotorcraft, Powered-lift, Airship, etc.)
	2.2	Different forces acting on an UA during manoeuvres and steady flight
	2.3	Components of different UA categories, and its functionality
	2.4	Critical systems of different UA categories, and how the systems interact with each other
	2.5	The common UA flight control modes (e.g. position hold, attitude hold, manual, way-point navigation etc.)
	2.6	Common radio-control (RC) modes (Mode 1, 2, 3 & 4)
	2.7	Critical specifications of UAS and their implication on performance
	2.8	Where to find the critical specifications of the UAS

UAS SAFETY & OPERATIONS		
Learning Objective	To equip trainee with necessary knowledge to ensure safe UAS operation, including required procedures and safeguards, and human performance affecting safe UA operations.	
Knowledge Areas	3.1	Conducting flight checks (pre-flight, in-flight & post flight) and the best practices to conduct such flight checks
	3.2	Identifying hazards affecting UAS operation and how to mitigate potential risks (e.g. environment, weather, etc.)
	3.3	Different emergencies (e.g. low battery, loss of GPS, loss of command link etc.) and its recovery procedures
	3.4	Conducting periodic UAS maintenance and the best practices to conduct such inspections, maintenance and repair
	3.5	Safety issues of non-commercial-off-the shelf UAS and how to mitigate them
	3.6	Physiological factors affecting operator's performance in ensuring safe UA operations. (e.g. alcohol, sickness, fatigue, etc.)
	3.7	Psychological factors affecting UA performance (e.g. lack of flying experience, lack of carefulness and sense of responsibility, etc.)
	3.8	Correct scanning techniques when operating UA
	3.9	Visual illusions and sun blindness and its preventive actions

APPENDIX 3 CONTENTS OF UATO EXPOSITION DOCUMENT

S/N	Chapter
1	Cover page with the following: - Organisation name and logo - Document title, document number and revision number - Organisation's Unique Entity Number (UEN) / Registered Number - Organisation's Address - Document Approval Signature
2	Document header/footer for every page, except the cover page, with the following: - Document title, document number and revision number - Page number
3	Distribution list (if any)
4	Amendment page / revision control page with the following: - Brief description of amendment since last revision - Affected pages - Date of amendment - Name of drafter who made the amendment
5	Glossary of significant terms and definitions (if any)
6	Table of Contents
7	Preamble relating to use and authority of the document, including a description of the following: - Intent of the document and scope of training and assessment (e.g. UAPL Class A – Rotorcraft) - Aim of the course in terms of what the trainee is expected to be able to do as a result of the training, level of performance, and training constraints observed - The organisation's quality statement
8	Organisation details with the following: - Organisation policy (e.g. vision and mission) - Organisation structure, including the names and designations - Roles & responsibilities of minimally the following personnels: - o Accountable Manager - o Head of Training - o Quality Manager - o Authorised Flight Examiner (UA) - o Instructor
9	Description, including pictures and specifications, of the facilities and equipment available such as: - Staff facilities for administrative work, courseware development, UA maintenance etc. - Classroom(s) for conduct of theory lessons and/or flight simulator training - Flying area(s) for conduct of practical lessons and assessment - UA models for conduct of practical lessons and assessment (include quantity available) - Flight simulators (if any)

S/N	Chapter
10	System to ensure competency of minimally the instructors and AFE(UA)s: - Induction training for new staff, which should minimally consist of familiarisation of the following: - o Exposition document - o Training materials and equipment manuals - o Guidebook for the conduct of training for instructors - o Guidebook for the conduct of assessment for AFE(UA)s - Currency training requirements for staff - Upgrade training requirements for staff who are out of currency
11	System for record keeping: - Records to be kept: - o Qualifications of staff - o Training records of staff - o Assessment records conducted by AFE(UA) - o Attendance records of trainees - o Training and evaluation records of trainees - o Feedback received from trainees and implementation of corrective action(s) - o Any other documents issued by UATO - Procedures to store/retrieve records, including assess rights and storage means
12	Description theory and practical training curricula, including: - Breakdown of training course programme - Reference(s) to training materials for trainees
13	Training policy describing the following: - Instructor-to-trainee ratio - Fatigue management system for instructors and AFE(UA)s - Fatigue management system for trainees - Wet weather programme
14	Policy regarding training effectiveness, including: - Procedures for trainee readiness evaluation - Procedures to correct unsatisfactory trainee progress - Feedback system for trainee to highlight training deficiencies
15	Scope of the quality assurance system with a description of quality plan, including: - Scope of audit - Audit schedule - Management review of audit results
16	Procedures for rectification of audit findings, including: - Root cause analysis - Identification and implementation of corrective actions - Verification of effectiveness of corrective actions.
17	Internal system for continuous improvement, including evaluation and analysis of experiences and trends concerning training standards.

APPENDIX 4 OUTCOME-BASED EXPECTATIONS FOR SIMULATOR USE

1 PURPOSE AND SCOPE

This appendix provides outcome-based expectations for the use of simulation-based training and assessment by UATOs as a substitute for outdoor practical training and assessment. Where land availability constrains outdoor training, simulators may be used as a proxy, provided required UAPL competencies are achieved to an equivalent standard. Notwithstanding, simulation-based training is not intended to be a full replacement for outdoor practical training, and UATOs are expected to incorporate live flying as part of the training programme to bridge any experiential gap between simulator-based training and actual flight operations.

The expectations in this appendix describe functional and behavioural characteristics intended to support effective training and assessment outcomes, while allowing UATOs flexibility to adopt simulator architectures, hardware, and software solutions best suited to their training needs. Simulator suitability will be assessed by CAAS with regard to the intended training and assessment objectives. Where a simulator is assessed to be unsuitable as a substitute, it may only be used as a supplementary training tool.

2 SIMULATOR CAPABILITY CRITERIA

2.1 AIRCRAFT BEHAVIOUR AND FLIGHT DYNAMICS

The simulation environment should provide UA behaviour and flight dynamics sufficient to support the development of required UAPL competencies:

- The simulator should present the simulated UA in six degrees of freedom (6-DOF), or equivalent level of motion modelling. The model need not be a precise replica of a specific UA type.
- The simulator should present the simulated UA as operable in both position-assisted modes (similar to global navigation satellite system (GNSS) assisted flight) and degraded navigation modes, such that differences in UA behaviour, controllability, or pilot workload are represented appropriately.
- The simulator should present UA responses to pilot control inputs in a realistic and internally consistent manner, such that the simulated UA behaviour does not appear unrealistic, counter-intuitive, or misleading to the pilot.

Examples of realistic pilot control input and UA response include (non-exhaustive):

- Pilot control inputs should result in proportionate, timely, and cumulative changes in UA behaviour, with stabilisation consistent with expected UA operation, such that responses are neither instantaneous, binary, exaggerated, nor artificially damped.
- UA response should exhibit plausible coupling between pilot control axes (i.e. roll, pitch, yaw, and throttle), such that control inputs along one axis may influence UA behaviour across others, requiring integrated management of trajectory and orientation.
- Where audio cues are provided, sound generated by the simulated UA should vary in a manner broadly consistent with its behaviour and relative positioning, such that changes in distance, power setting, or operating condition are perceptible to the pilot (e.g. increased sound intensity nearer the pilot).

2.2 PILOT VISUAL PERSPECTIVE

The visual presentation should be pilot-centric and reflect the perspective of a UA pilot conducting visual line of sight operations:

- The visual presentation should not automatically pan, slew, or reposition solely as a function of the UA's position, attitude, or movement.
- Movement of the visual presentation may be allowed where directly driven by the pilot's viewing direction or physical head movement, such as in virtual-reality or head-tracked simulation systems.
- Where the simulator employs immersive or projection-based visual systems, the visual configuration should support adequate spatial orientation and situational awareness.

2.3 ENVIRONMENT, OBSTACLES, AND COLLISION EFFECTS

The simulation environment should include background features and obstacles sufficient to support spatial awareness, obstacle avoidance, and emergency or contingency-based training:

- The simulation environment may allow inclusion of additional static or dynamic obstacles (e.g. other UA, birds, or ground objects) to support emergency or contingency-based training scenarios.
- Where obstacles are represented, basic collision effects should be modelled such that contact with obstacles results in plausible operational consequences (e.g. loss of control or termination of flight).

2.4 ENVIRONMENTAL CONDITIONS AND WEATHER EFFECTS

The simulator should support environmental conditions, sufficient to require appropriate pilot anticipation, control, and decision-making:

- Wind effects should be supported, with wind direction and strength capable of being fixed or varied to support both standardised assessment and scenario-based training.
- As pilots cannot physically sense wind in a simulated environment, the simulation may provide appropriate visual or informational cues (e.g. windsocks or movement of environmental references) to enable interpretation of prevailing wind conditions and application of appropriate compensatory control inputs and operational decisions.
- The simulated environment should be capable of representing environmental lighting effects (e.g. reduced visibility, sun-glare, or low-ambient-light conditions) sufficient to influence pilot perception, situational awareness, and operational judgement, including during night or reduced-visibility operations where applicable.

2.5 GROUND REFERENCES AND VISUAL AIDS

Where ground references, tracks, or visual aids are available within the simulation, such features should be capable of being disabled during formal assessment:

- During assessment, only essential ground markers relevant to evaluating pilot performance (e.g. cones or designated reference points) should be displayed, to support assessment of pilot competence rather than reliance on visual aids.

2.6 MISSION AND WAYPOINT PLANNING

The simulator should support mission-based operations, including waypoint-based or automated flight profiles:

- The simulator should allow the pilot to plan, modify, and execute missions or flight paths using a representative mission or waypoint planning interface, sufficient to support operational decision-making and oversight of automation.
- The simulator should support failure or degradation scenarios occurring during mission or waypoint-based operations, including low battery and loss or degradation of navigation capability.
- Such failures or degradations may be injected manually by the instructor or examiner, or automatically based on predefined logic, with appropriate audio or visual cues to enable pilot recognition and response.

2.7 REMOTE PILOT CONTROL INTERFACE

The simulated control interface should be representative of how the UA is operated during actual operations, supporting the control, monitoring, and management tasks:

- Such interfaces may take the form of a dedicated remote transmitter or equivalent aviation-style control interface with physical controls (e.g. control sticks, switches, or dials), and should not rely on general-purpose gaming controllers where such interfaces would undermine training realism or effective transfer of learning.
- Where operations involve a ground control station (GCS) (e.g. waypoint or mission planning), the simulation should support interaction with a representative GCS interface for planning, execution, and monitoring.

2.8 INSTRUCTOR AND EXAMINER OBSERVATION AND EVALUATION CAPABILITY

The simulator should enable instructors and examiners to effectively observe, evaluate, and exercise professional judgement on a trainee's training progress and competency:

- The simulator should provide an instructor/examiner view of the session, either as a separate view or the same operational view as the pilot, sufficient for monitoring pilot actions, UA behaviour, and scenario progression to support effective supervision and evaluation.
- Where available, the simulator may support recording or export of relevant telemetry or session data to facilitate objective debriefing, performance review, or post-assessment discussion.

APPENDIX 5 APPLICATION FEES FOR UABTO AND UATO

As reproduced from the second schedule of ANR-101:

UABT Approval

- 1) The fee for an application for the grant of a UABT approval is \$350.
- 2) The fee for an application to renew a UABT approval is \$150.
- 3) The fee for an application to vary a UABT approval is \$200.

UATO Approval

- 1) The total of the following fees must be paid for an application for the grant of a UATO approval:
 - a) for the first scope of work specified in the application is \$2,300.
 - b) for each additional scope of work specified in the application is \$1,600.
- 2) The fee for an application to renew a UATO approval is \$1,400.
- 3) The fee for an application to vary a UATO approval is \$1,600.

APPENDIX 6 FREQUENTLY ASKED QUESTIONS

S/N	Question	Answer
1	Can my organisation hold both the UATO and UABT approvals?	Yes, an organisation can hold both approvals. However, please note that the applications for the grant of a UATO approval and for a UABT approval will be treated independently.
2	Is the UATO required to provide training for all UA categories (i.e. rotorcraft, aeroplane, powered-lift, airship)?	No, a UATO is only required to provide both training and practical assessment on at least one UA category. However, please note that under the Class A rotorcraft category, the UATO must provide training and practical assessment on both the multi-rotor and helicopter sub-categories.
3	What is the minimum mass of UA to be used for training and assessment for Class A categories?	All UATOs should have UA of different mass with one weighing at least 1kg, and one at least 15kg but not exceeding 25kg, to allow trainees to have an appreciation in the difference in flying and handling characteristics.
4	How many instructors and AFE(UA)s does a UATO need?	All UATOs should have only 2 AFE(UA)s each. However, there are no restrictions for the number of instructors. UATOs may write in to CAAS if they require more than 2 AFE(UA)s due to an increase in demand for practical assessments.
5	Can the UAPL of the instructors have any limitations within?	UAPL holders with limitations of up to 7kg for the class/category/rating can only conduct training for theory. UAPL holders without any limitations within their licences, which is relevant to the UATO's scope of work, can conduct training for both theory and practical.
6	Can the UAPL of the AFE(UA)s have any limitations within?	No, AFE(UA)s cannot have any limitations within their licences relevant to the UATO's scope of work.
7	Can the instructors and/or AFE(UA)s be working for multiple UATOs?	No, the instructors and AFE(UA)s should not be working for multiple UATOs.