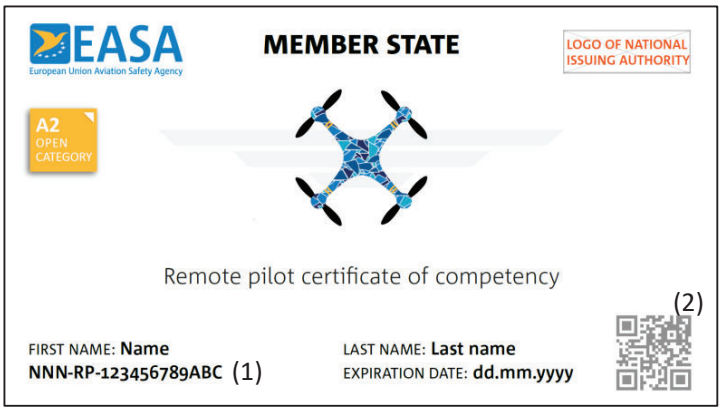
AMC1 UAS.OPEN.030(2) UAS operations in subcategory A2

REMOTE PILOT CERTIFICATE OF COMPETENCY

After the verification that the applicant has passed the online theoretical knowledge examination, has completed and declared the self-practical training and has passed the additional theoretical knowledge examination provided by the competent authority or by an entity recognised by the competent authority, the MS should provide the following certificate of competency to the remote pilot. The certificate may be provided in electronic form.



(1) Insert the identifier provided by the authority releasing the remote pilot certificate of competency. The reference should have the following format:

NNN-RP-xxxxxxxxx

Where:

— NNN is the ISO 3166 Alpha-3 code of the MS releasing the proof of completion;

— RP is a fixed field meaning: remote pilot; and

— Xxxxxxxxx are 12 alphanumeric characters (lower-case only) defined by the MS releasing the proof of completion.

As an example: (ESP-RP-123456789abc)

(2) QR code providing a link to the national database where the information related to the remote pilot is stored. Through the 'remote pilot identifier', number (1) all information related to the training of the remote pilot can be retrieved.

AMC1 UAS.OPEN.030(2)(b) UAS operations in subcategory A2

PRACTICAL SELF-TRAINING

(a) The aim of the practical self-training is to ensure that the remote pilot should be able to demonstrate at all times the ability to:

(1) operate a class C2 UAS within its limitations;

(2) complete all manoeuvres with smoothness and accuracy;

(3) exercise good judgment and airmanship;

(4) apply their theoretical knowledge; and

(5) maintain control of the UA at all times in such a manner that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

(b) The remote pilot should complete the practical self-training with a UAS that features the same flight characteristics (e.g. fixed wing, rotorcraft), control scheme (manual or automated, human machine interface) and a similar weight as the UAS intended for use in the UAS operation. This implies the use of a UA with an MTOM of less than 4 kg and bearing the Class 2 CE marking after the transition period relative to CE marking is closed.

(c) If a UAS with both manual and automated control schemes is used, the practical self-training should be performed with both control schemes. If this UAS has multiple automated features, the remote pilot should demonstrate proficiency with each automated feature.

(d) The practical self-training should contain at least flying exercises regarding take-off or launch and landing or recovery, precision flight manoeuvres remaining in a given airspace volume, hovering in all orientations or loitering around positions when applicable. In addition, the remote pilot should exercise procedures for abnormal situations (e.g. a return-to-home function, if available), as stipulated in the user's manual provided by the manufacturer.

AMC2 UAS.OPEN.030(2)(b) UAS operations in subcategory A2

PRACTICAL COMPETENCIES FOR PRACTICAL SELF-TRAINING

When executing the practical self-training, the remote pilot should perform as many flights as they deem necessary to gain a reasonable level of knowledge and the skills to operate the UAS.

The following list of practical competencies should be considered:

(a) Preparation of the UAS operation:

(1) make sure that the:

(i) chosen payload is compatible with the UAS used for the UAS operation;

(ii) zone of UAS operation is suitable for the intended operation; and

(iii) UAS meets the technical requirements of the geographical zone;

(2) define the area of operation in which the intended operation takes place in accordance with UAS.OPEN.040;

(3) define the area of operation considering the characteristics of the UAS;

(4) identify the limitations published by the MS for the geographical zone (e.g. no-fly zones, restricted zones and zones with specific conditions near the operation zone), and if needed, seek authorisation by the entity responsible for such zones;

(5) identify the goals of the UAS operation;

(6) identify any obstacles and the potential presence of uninvolved persons in the area of operation that could hinder the intended UAS operation; and

(7) check the current meteorological conditions and the forecast for the time planned for the operation.

(b) Preparation for the flight:

(1) assess the general condition of the UAS and ensure that the configuration of the UAS complies with the instructions provided by the manufacturer in the user's manual;

(2) ensure that all removable components of the UA are properly secured;

(3) make sure that the software installed on the UAS and on the remote pilot station (RPS) is the latest published by the UAS manufacturer;

(4) calibrate the instruments on board the UA, if needed;

(5) identify possible conditions that may jeopardise the intended UAS operation;

(6) check the status of the battery and make sure it is compatible with the intended UAS operation;

(7) update the geo-awareness system; and

(8) set the height limitation system, if needed.

(c) Flight under normal conditions:

(1) using the procedures provided by the manufacturer in the user's manual, familiarise with how to:

(i) take off (or launch);

(ii) make a stable flight:

(A) hover in case of multirotor UA;

(B) perform coordinated large turns;

(C) perform coordinated tight turns;

(D) perform straight flight at constant altitude;

(E) change direction, height and speed;

(F) follow a path;

(G) return of the UA towards the remote pilot after the UA has been placed at a distance that no longer allows its orientation to be distinguished, in case of multirotor UA;

(H) perform horizontal flight at different speed (critical high speed or critical low speed), in case of fixed wing UA;

(iii) keep the UA outside no-fly zones or restricted zones, unless holding an authorisation;

(iv) use some external references to assess the distance and height of the UA;

(v) perform return to home procedure — automatic or manual;

(vi) land (or recovery); and

(vii) perform landing procedure and missed approach in case of fixed wing UA; and

(2) maintain a sufficient separation from obstacles;

(d) Flight under abnormal conditions:

(i) manage the UAS flight path in abnormal situations;

(ii) manage a situation when the UAS positioning equipment is impaired;

(iii) manage a situation of incursion of a person into the area of operation, and take appropriate measures to maintain safety;

(iv) manage the exit from the operation zone as defined during the flight preparation;

(v) manage the incursion of a manned aircraft nearby the area of operation;

(vi) manage the incursion of another UAS in the area of operation;

(vii) select the safeguard mechanism relevant to a situation;

(viii) deal with a situation of a loss of attitude or position control generated by external phenomena;

(ix) resume manual control of the UAS when automatic systems render the situation dangerous; and

(x) carry out the loss of link procedure.

(e) Briefing, debriefing and feedback:

(i) conduct a review of the UAS operation; and

(ii) identify situations when an occurrence report is necessary and complete the occurrence report.

AMC1 UAS.OPEN.030(2)(c) UAS operations in subcategory A2

ADDITIONAL THEORETICAL KNOWLEDGE OF SUBJECTS FOR THE EXAMINATION FOR SUBCATEGORY A2

(a) By passing the additional theoretical knowledge examination, the remote pilot should demonstrate that they:

(1) understand the safety risks linked with a UAS operation in close proximity to uninvolved people or with a heavier UA;

(2) are able to assess the ground risk related to the environment where the operation takes place, as well as to flying in close proximity to uninvolved people;

(3) have a basic knowledge of how to plan a flight and define contingency procedures; and

(4) understand how weather conditions may affect the performance of the UA.

(b) The theoretical knowledge examination should cover aspects from the following subjects:

(1) meteorology:

(i) the effect of weather on the UA:

(A) wind (e.g. urban effects, turbulence);

(B) temperature;

(C) visibility; and

(D) the density of the air;

(ii) obtaining weather forecasts;

(2) UAS flight performance:

(i) the typical operational envelope of a rotorcraft, for fixed wing and hybrid configurations;

(ii) mass and balance, and centre of gravity (CG):

(A) consider the overall balance when attaching gimbals, payloads;

(B) understand that payloads can have different characteristics, thus making a difference to the stability of a flight; and

(C) understand that each different type of UA has a different CG;

(iii) secure the payload;

(iv) batteries:

(A) understand the power source to help prevent potential unsafe conditions;

(B) familiarise with the existing different kinds of battery types;

(C) understand the terminology used for batteries (e.g. memory effect, capacity, c-rate); and

(D) understand how a battery functions (e.g. charging, usage, danger, storage); and

(3) technical and operational mitigations for ground risk:

(i) low-speed mode functions;

(ii) evaluating the distance from people; and

(iii) the 1:1 rule.

GM1 UAS.OPEN.030(2)(c) UAS operations in subcategory A2

REMOTE PILOT COMPETENCIES REQUIRED TO OBTAIN A CERTIFICATE OF REMOTE PILOT COMPETENCY

A remote pilot may obtain the knowledge needed to pass the exam for a certificate of remote pilot competency in one of the following two ways:

(a) Competency-based training

(1) Competency-based training covers aspects related to non-technical skills in an integrated manner, taking into account the particular risks associated with UAS operations.

(2) Competency-based training should be developed using the analysis, design, development, implementation, evaluation (ADDIE) principles.

(b) Self-study

(1) A remote pilot may undertake self-study in many ways in order to obtain a certificate of competency. The purpose of this self-study is to acquire some basic competency and

familiarise themselves with the UA, as well as with the UAS operations they want to conduct.

(2) Examples of self-study:

(i) reading the manual or leaflet provided by the UA manufacturer;

(ii) reading related information or watching instructional films; and

(iii) obtaining information from others who have already experience in flying a UA.

The remote pilot may also undertake this study as classroom training, e-learning or similar training at a training facility. Since this training is not mandated by the MSs, the national aviation authorities (NAAs) are not required to approve the training syllabuses.

AMC1 UAS.OPEN.040(1) Operations in subcategory A3

AREAS WHERE UAS OPERATIONS IN A3 MAY BE CONDUCTED

(a) If an uninvolved person enters the range of the UAS operation, the remote pilot should, where necessary, adjust the operation to ensure the safety of the uninvolved person and discontinue the operation if the safety of the UAS operation is not ensured.

(b) A minimum horizontal distance from the person that is passing the area could be estimated as follows:

(1) no less than 30 m;

(2) no less than the height ('1:1 rule', i.e. if the UA is flying at a height of 30 m, the distance of the UA from the uninvolved person should be at least 30 m), and

(3) no less than the distance that the UA would cover in 2 seconds at the maximum speed (this assumes a reaction time of 2 seconds).

This minimum horizontal distance is intended to protect people on the ground, but can be extended to property and animals.

GM1 UAS.OPEN.030(1) and UAS.OPEN.040(1) UAS operations in subcategories A1 and A3

DIFFERENCE BETWEEN SUB-CATEGORIES A2 AND A3

Subcategory A2 addresses operations during which flying close to people is intended for a significant portion of the flight. The minimum distance ranges from 30 m to 5 m from uninvolved people. 5 m is only allowed when there is an active low-speed mode function on the UA, and the remote pilot has conducted an evaluation of the situation regarding the weather, the performance of the UA and the segregation of the overflown area.

Sub-category A3 addresses operations that are conducted in an area (hereafter referred to as 'the area') where the remote pilot reasonably expects that no uninvolved people will be endangered within the range of the unmanned aircraft where it is flown during the mission. In addition, the operation must be conducted at a safe horizontal distance of at least 150 m from residential, commercial, industrial or recreational areas.