

ALLEGATO D

OPERATIONS MANUAL TEMPLATE

The operations manual shall contain at least the information listed below, if applicable, customised for the area and type of operation.

0. Cover and contact.

- 0.1. Cover identifying the UAS operator with the title 'Operations Manual', contact information and OM revision number.
- 0.2. Table of contents.

1. Introduction

- 1.1. Definitions, acronyms and abbreviations.
- 1.2. System for amendment and revision of the OM (*list the changes that require prior approval and the changes to be notified to ENAC*).
 - a) A description of the system for indicating changes and of the methodology for recording effective pages and effectivity dates; and
 - b) Details of the person(s) responsible for the revisions and their publication
- 1.3. Record of revisions with effectivity dates.
- 1.4. List of effective pages (*list of effective pages unless the entire manual is re-issued and the manual has an effective date on it*).
- 1.5. Purpose and scope of the OM with a brief description of the different parts of the documents.
- 1.6. Safety statement (a statement that the operations manual complies with the relevant requirements of ENAC Regulation, and contains instructions that are to be complied with by the personnel involved in flight operations);
- 1.7. an approval signature by the accountable manager or the UAS operator in the case of a natural person;

2. An overall description of the UAS operator's organisation

- a) The organisational structure and designated individuals. Description of the operator's organisational structure, including an organisational chart showing the different departments, if any (e.g. flight/ground operations, operational safety, maintenance, training, etc.) and the head of each department;
- b) Duties and responsibilities of the management personnel; and
- c) Duties and responsibilities of remote pilots and other members of the organisation involved in the operations (e.g. payload operator, ground assistant, maintenance technician, etc.).

3. Concept of Operations (ConOps)

A description of the concept of the operation, including at least:

- 3.1. the nature and description of the activities performed in the UAS operations, and the identified associated risks;
- 3.2. the operational environment and geographical area for the intended operations, including:
 - i. the characteristics of the area to be overflown in terms of the population density, topography, obstacles, etc.;
 - ii. the characteristics of the airspace to be used;
 - iii. the environmental conditions (i.e. the weather and electromagnetic environment);

- iv. the definition of the operational volume and risk buffers to address the ground and air risks;
- 3.3. the technical means used and their main characteristics, performance and limitations, including the UAS, external systems supporting the UAS operation, facilities, etc.;
- 3.4. the required personnel for conducting operations, including the composition of the team, their roles and responsibilities, selection criteria, initial training and recent experience requirements and/or recurrent training;
- 3.5. Risk analysis and methods for reduction of identified risks (description of methodology used bow-tie presentation or other).
- 3.6. the maintenance instructions required to keep the UAS in a safe condition, covering the UAS manufacturer's maintenance instructions and requirements, if applicable;

4. Normal procedures

4.1. General procedures valid for all operations

Operational procedures, which shall be based on manufacturer's instructions provided by the UAS manufacturer, and shall include:

- a) consideration of the following to minimise human errors:
 - i. a clear distribution and assignment of tasks; and
 - ii. an internal checklist to check that staff are performing their assigned tasks adequately;
- b) consideration of the deterioration of external systems supporting the UAS operation; in order to assist in the identification of procedures related to the deterioration of external systems supporting the UAS operation, it is recommended to:
 - i. identify the external systems supporting the operation;
 - ii. describe the deterioration modes of these external systems which would prevent the operator maintaining a safe operation of the UAS (e.g. complete loss of GNSS, drift of the GNSS, latency issues, etc.);
 - iii. describe the means put in place to detect the deterioration modes of the external systems; and
 - iv. describe the procedure(s) in place once a deterioration mode of one of the external systems is detected (e.g. activation of the emergency recovery capability, switch to manual control, etc.).
- c) Coordination between the remote pilot(s) and other personnel;
- d) Methods to exercise operational control; and
- e) Pre-flight preparations and checklists. These include, but are not limited to, the following points:
 - i. The site of the operation
 - A. the assessment of the operational volume and related buffers (the ground risk buffer, and air risk buffer when applicable), including the terrain and potential obstacles and obstructions that may reduce the ability to keep the unmanned aircraft in airspace line of sight or to scan the airspace, the potential overflight of persons who are not involved and potential overflight of critical infrastructure (a risk assessment of the critical infrastructure should be performed in cooperation with the responsible organisation for the infrastructure, as they are most knowledgeable of the threats);

- B. the assessment of the surrounding environment and airspace, including the proximity of UAS geographical zones and potential activities by other airspace users;
 - C. when UA VOs are used, the assessment of the compliance between visibility and planned range, the potential terrain obstruction, and the potential gaps between the zones covered by each of the UA VOs; and
 - D. the class of airspace and other aircraft operations (local aerodromes or operating sites, restrictions, permissions).
- ii. Environmental and weather conditions
 - A. the environmental and weather conditions suitable for conducting the UAS operation;
 - B. methods of obtaining weather forecasts
 - iii. Coordination with third parties, if applicable (e.g. requests for additional permits from various agencies and the military when operating, for example, in environmentally protected areas, areas restricted to photographic flights, near critical infrastructure, in urban areas, emergency situations, etc.);
 - iv. the minimum number of personnel in charge of duties essential to the UAS operation who are required to perform the operation, and their responsibilities;
 - v. the required communication procedures between the remote pilot(s) and any other personnel in charge of duties essential to the UAS operation and with any external parties, when needed;
 - vi. compliance with any specific requirements from the relevant authorities in the intended area of operations, including those related to security, privacy, data and environmental protection, and the use of the RF spectrum;
 - vii. the required risk mitigations in place to ensure the safe conduct of the operation; in particular, for the controlled ground area:
 - C. determination of the controlled ground area; and
 - D. securing the controlled ground area to prevent third parties from entering the area during the operation, and ensuring coordination with the local authorities, when needed;
 - viii. the procedures to verify that the UAS is in a suitable condition to safely conduct the intended operation, including flight termination system check before UAS operations start (e.g. update of geographical zones data for geo-awareness or geo-fencing systems; definition and upload of lost link contingency automatic procedures; battery status, loading and securing the payload;);
- f) launch and recovery procedures;
 - g) in-flight procedures, including those to ensure that the unmanned aircraft remains within the flight geography;
 - h) post-flight procedures, including the inspections to verify the condition of the UAS;
 - i) procedures for the detection of potentially conflicting aircraft by the remote pilot and, when required by the UAS operator, by airspace observer(s) or unmanned aircraft observer(s), as applicable;

- j) Dangerous goods (limitations on their nature, quantity and packaging; acceptance prior to loading, inspecting packages for any evidence of leakage or damage).
- 4.2. Procedures peculiar to a single operation

5. Contingency procedures

5.1. General procedures valid for all operations

- a) procedures to cope with the unmanned aircraft leaving the designated 'flight geography';
- b) procedures to cope with persons who are not involved entering the controlled ground area;
- c) procedures to cope with adverse operating conditions;
- d) procedures to cope with the deterioration of external systems supporting the operation; In order to help properly identify the procedures related to the deterioration of external systems supporting the UAS operation, it is recommended to:
 - ix. identify the external systems supporting the operation;
 - x. describe the deterioration modes of these external systems which would prevent the operator maintaining a safe operation of the UAS (e.g. complete loss of GNSS, drift of the GNSS, latency issues, etc.);
 - xi. describe the means put in place to detect the deterioration modes of the external systems; and
 - xii. describe the procedure(s) in place once a deterioration mode of one of the external systems is detected (e.g. activation of the emergency recovery capability, switch to manual control, etc.).
- e) if airspace observers are employed, the phraseology to be used;
- f) avoidance procedures to avoid any conflict with other airspace users;

5.2. Procedures peculiar to a single operation

6. Emergency procedures

- a) procedures to avoid, or at least minimise, harm to third parties in the air or on the ground;
- b) procedures to cope with the unmanned aircraft leaving the 'operational' volume;
- c) procedures for the emergency recovery of the unmanned aircraft (e.g. landing immediately, termination of the flight with FTS or a controlled crash/splash, etc.);

7. Emergency Response Plan (ERP)

When the UAS operator develops an ERP, the following should be considered:

- a) it is expected to cover:
 - i. the plan to limit crash-escalating effects (e.g. notify the emergency services and other relevant authorities); and
 - ii. (2) the conditions to alert ATM.
- b) it is suitable for the situation;
- c) it limits the escalating effects;
- d) it defines criteria to identify an emergency situation;
- e) it is practical to use;

- f) it clearly delineates the responsibilities of the personnel in charge of duties essential to the UAS operation;
- g) when considered appropriate by the competent authority, to be validated through a representative tabletop exercise¹ consistent with the ERP training syllabus.

8. Security

Security procedures as referred to in Art. 33 of ENAC Regulation “ Mezzi Aerei A Pilotaggio Remoto”; the procedures for the protection of personal data referred to in Art 34 of ENAC Regulation “ Mezzi Aerei A Pilotaggio Remoto”.

9. Guidelines to minimise nuisance and environmental impact

Guidelines from for remote pilots to plan UAS operations in a manner that minimises nuisances, including noise and other emissions-related nuisances, to people and animals;

To be referred to relevant environment regulations applicable to the specific operation.

10. Occurrence reporting procedures

Ref. Art. 29 of ENAC Regulation “ Mezzi Aerei A Pilotaggio Remoto”

11. Record-keeping procedures

The policy defining how the remote pilot(s) and any other personnel in charge of duties essential to the UAS operation can declare themselves fit to operate before conducting any operation.

¹ The tabletop exercise may or may not involve all third parties identified in the ERP.