

Aircraft without a pilot on board

Operation Manual

RO1

Declaration

I, Andreas Werth hereby confirm that the procedures and criteria described in this manual will be adhered to during pilotless aircraft operations.

Place... Celle,

Date: 2019-05-03.....

Signature..... 

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Introduction

The operator of type RO 1 must notify the Civil Aviation Authority of the start of a new company prior to the start of operations. The notification must include information such as the name of the company, address and contact information, as well as information about the type of aircraft that will be used.

Pilotless aircraft to be used in the RO 1 category may have an MTOM up to 2.5 kg and a maximum speed of 60 knots (30.87 m/s).

The operator must employ an Accountable Manager, Operations Manager, and a Technical Manager. One person may fill more than one role.

The Accountable Manager carries the main responsibility for the company. The Accountable Manager must make sure that the organization is adjusted to the size and the complexity of the company. The Accountable Manager must be at least 16 years old.

Operations Manager must ensure that operations are performed in accordance with the company's Operation Manual.

The Technical Manager must ensure that the company's aircraft are airworthy.

If the company is particularly complex, the operator must establish and maintain a system for quality that is tailored to the operations. The Quality Manager must ensure that the company's quality assurance system is maintained.

The operator must have an Operation Manual tailored to the complexity of the company's operations.

The Operation Manual must contain at least

- a) a description of the company's structure
- b) a description of the types of operations that the company performs
- c) a description of maintenance procedures
- d) an overview of all the aircraft that the company uses

This Operation Manual will mostly satisfy the requirements for RO1 operators, but the operator must make sure that the Operation Manual is in accordance with current regulations at all times.

1 Technical regulations

a) **Marking**

All aircraft shall be marked with name/ company name and telephone number.

b) **Storage time**

All documentation must be kept for at least 5 years.¹

c) **Accessible documentation during operations:**

- User manual for systems in use
- Insurance certificate issued in accordance with Regulation (EC) No 785/2004
- Operator flight time log
- Maintenance program
- Check lists to be used in all operations, ensuring that the systems are operated according to the manufacturers intentions and within the regulatory framework.

The minimum check lists to be attached:

- (a) Emergency procedures²
- (b) Preparations before flight
- (c) Before departure
- (d) After landing

d) **Logging**

A flight time log must be kept. The log should as a minimum contain information about which aircraft was used, who performed the flight, and what time and what area the flight took place.

e) **Airworthiness**

The operator must ensure that aircraft are maintained according to manufacturer's instructions.

f) **Use of altimeter and system for fail-safe**

All rotor-operated aircraft shall have an integrated system to ensure that the aircraft can land automatically in the event of loss of control on the part of the pilot or pilot in command. All aircraft without a pilot on board (fixed wing) shall have a redundant system that ensures control of the aircraft in the event of a main radio communication system failure. The pilot and pilot-in-command must ensure, using an altimeter or other methods that the aircraft does not fly higher than 120 meters above ground or water surface.

¹ It is recommended that you keep personal logs longer because this information might be important in the future.

² This includes a course of action when electronic and visual control of the aircraft has been lost.

2 Operational Regulation

2.1 General

- a) **Influence of alcohol etc.**
No one must fly any pilotless aircraft under the influence of alcohol or other intoxicants or narcotic substance. Section 6-11 and 6-13 of the Aviation Act shall apply accordingly.
- b) **Company close down**
The operator must notify the Civil Aviation Authority if the company closes down.
- c) **Transportation of goods etc.**
Transportation of goods is not allowed with this operation manual. See regulation.
- d) **Duty to yield to other aircraft**
Pilotless aircraft must yield to other aircraft.

2.2 Types of operations

- a) **VLOS**
Aircraft must be operated only within VLOS during daylight hours and within specified safe distances (*see 2.3 letters b and c*)
- b) **FPV**
Flying FPV (First Person View) is only allowed as long as the flight is VLOS and the pilot-in-command maintains visual contact with the aircraft at all times.
- c) **Pilot requirements**
The pilot must be able to demonstrate adequate skills for safe flying in accordance with the regulations.
- d) **Operation Manager**
Operation Manager shall ensure that operations are performed according to the company Operation Manual.

2.3 Preparations prior to the operation

- a) **Verify whether the operation requires advance permission.**
 - Landowner's permission to use area for takeoff and landing. The Act of June 10, 1977, no. 82 relating to motorized traffic in marginal lands and water courses also applies to pilotless aircraft.
 - Police – depending on local practice and operation
 - The municipality – depending on local practice and operation
 - Air Traffic Service – the pilot and the pilot-in-command are obligated to familiarize themselves with current airspace organization. The pilot and the pilot-in-command are also obligated to familiarize themselves with current airspace classification and the air traffic service unit responsible for the area in which an operation is planned. If the operation is planned near military restricted areas or areas with a military photography ban, the National Security Authority must be contacted.

- b) **The operation must be performed in accordance with VLOS and within operational restrictions imposed by the authorities.**
- The flight must be performed so that the aircraft at all times is observable by the naked eye without aids such as binoculars, camera etc. Vision correction aids such as glasses or lenses are allowed. The aircraft must at all times be manually controlled by the pilot-in-command in order to avoid collisions with other aircraft, persons, vessels, vehicles, and constructions on the ground.
 - The operator must on each individual occasion assess the necessity for sunglasses or a visor in order to maintain control of the aircraft.
 - Weather and light conditions are factors that limit visibility distance, and must be considered during each individual operation.
- c) **Assess the condition of the area of operation**
- Do not fly over people
 - Maximum altitude is 120 meters above ground or water surface
 - Do not operate less than 50 meters from persons, motor vehicles, or buildings that are not under the control of the pilot or the pilot-in-command
 - Do not operate less than 150 meters from crowds of more than 100 persons
 - Air traffic/aviation sports must not take place in the area of operation
 - Flying pilotless aircraft over or near military areas, embassies, or prisons is not allowed
 - To prevent third persons from accidentally or otherwise entering the area of operation, cordoning off the area may be necessary.
 - If it is likely that an audience will be present near the area of operation, the operator and any assistants must wear visibility vests or other similar type of uniforms.
- d) **Emergency landing areas**
- Preplanned and reconnoitered emergency landing areas are to be specified.
 - Identify and prioritize as many relevant emergency landing areas as possible for every flight. If possible, these may be programmed into the system, or the pilot keeps them in mind that there may be an initial rough assessment and prioritization of suitability before any incident occurs.
- e) Check whether NOTAM or other activity in the area of operation might affect or prevent the operation.
- f) **Extraordinary event**
Flying over or near a place where emergency services or the Norwegian Armed Forces have established an operative range connected to an accident or other extraordinary events is only allowed by permission from the person in charge of the operative range.
- g) **Operations near airports**
It is important to cooperate with other users of the airspace in order to avoid conflicts and dangerous situations.
- Flying a pilotless aircraft less than 5 km from an airport is prohibited unless the flight is cleared with the local Flight Control Service or Flight Information Service.
- h) **Restricted areas**

Flying in publicized restricted areas is not permitted unless the operations are performed in accordance with the terms for each individual restricted area, published in the Norwegian Integrated Aeronautical Information Packet (IAIP), which is published by Avinor.³

- i) **Distances between the aircraft/rotorcraft and the pilot**
Maximum distance between the aircraft and the pilot must never exceed the distance in which the pilot maintains full control of the aircraft

2.4 *General procedures immediately prior to flight*

a) **Safety Information**

Pertinent instructions must be given to involved personnel who are at risk of being within the field of impact in the event of loss of control, but who need to stay within the secured area due to the type of assignment. These may include:

- Operator's assistants
- Client
- Actors
- Others

b) **Extent of instructions:**

- Planned execution of the operation
- The personnel's planned assignments
- Common errors and indicators of possible errors
- Method of operation in case of errors
- Planned emergency landing areas

c) **Extent of instructions:**

If full control of the area of operation is not possible, it may be necessary to cordon off all or parts of the said area in order to maintain a safe distance and to prevent risk to the public.

d) **Verify that known hazards are identified, assessed and taken into consideration. These may include, but are not limited to:**

- Turbulence around buildings and objects
- Radio and cellular towers
- Other types of radiation fields
- Flocks of birds
- Power lines and masts
- Toll stations etc.

e) **Make sure that all necessary systems are activated:**

- GPS online
- «Home» position set
- «Fail-Safe» system activated

f) **Access permission is obtained from the Air Traffic Service or others if relevant**

g) **Repetition of relevant emergency procedures to be executed**

³ https://www.ippc.no/norway_aip/current/

- h) **Map out and prioritize relevant emergency landing areas**

2.5 *General procedures during flight*

a) **Meteorological conditions**

Verify that meteorological conditions are within the system limitations as indicated by the manufacturer. The operation must be terminated if the current conditions deteriorate in excess of the system limitations.

b) **Communication with the Air Traffic Service**

Unless other arrangements have been made with the Air Traffic Service, operator must be available at all times and be able to communicate without unnecessary delay.

c) **Ensure operation are executed within system limitations and in accordance with check lists**

d) **Monitor the aircraft status during flight. The operator must be familiar with the limitations of the given aircraft, such as flight time, distance etc.**

2.6 *General procedures after flight*

a) **Note time for landing (for log entry later). Inform the Air Traffic Service if relevant**

b) **Secure the system in accordance with the manufacturer's descriptions/procedures. See attached check list: "After Flight".**

c) **Logging**

- Technical log [name of person, date, flight time, place, technical status, any changes, repairs, and maintenance performed]
- Any other logs
- Minimum information to be included in the flight time log:
 - Flight time,
 - Aircraft used,
 - Who performed the flight,
 - The point of time/area where the flight took place