

Finnish Rescue Services Standart Operating Procedures for RPAS



PELASTUSOPISTO

5/2019



KESKI-POHJANMAAN JA PIETARSAAREN
ALUEEN PELASTUSLAITOS
MELLERSTA ÖSTERBOTTENS OCH
JAKOBSTADSOMRÅDES RÄDDNINGSVÄRK



KYMPE
KYMENLAAKSON PELASTUSLAITOS

PSR
PALOSUOJELURAHASTO



MAKE A RISK ASSESSMENT

CHECK/EVALUATE:

- 1. Mission**
 - Type of mission, degree of difficulty
- 2. Operation area**
 - Airspace Assessment (Specific Hazard)
- 3. Sight Obstacles**
 - Buildings, trees, terrain
- 4. Flight Obstacles**
 - High masts, power lines
- 5. People**
 - Is the flight activity above a crowd of people
- 6. Signal interference**
 - Power lines, railway power lines, strong radio transmitters
- 7. Air space**
 - Prohibition area, restriction area, danger area
- 8. Weather conditions**
 - Wind, temperature, icing, humidity
- 9. Visibility/Light conditions**
 - VLOS maximum distance
- 10. Suitability of the equipment for the task**
 - Manufacturer's limit values
- 11. Suitability of the pilot for the mission**
 - Operator skills / task





FLIGHT OPERATIONS

1. After receiving the task, make a flight plan
2. Occupy a remote control area for flight operations
 - Departure and landing area
3. For emergency situations, design an alternative landing location and an emergency landing location
4. If possible, isolate the remote control and the starting point and the landing location
5. Repeat steps in case of interference Recall the procedures in case of a device malfunction
6. Evaluate the need for a RPA observer
7. Make sure Confirm your mission and flight permission with the incident commander
8. Check your own protective equipment and safety equipment
 - Helmet, goggles, reflective vests
9. Notify the incident commander when you start and finish your mission

DEVICE CHECK



- 1. Aircraft batteries**
 - Remote controller, RPA device, display
- 2. Aircraft memory card**
 - Check for adequate storage space
- 3. Check the device's compatibility with the task**
 - Camera, flight altitude, flight mode
- 4. Set the device to standby / ready**
 - Gps signal, screens
- 5. Check propellers, physical condition of the device**
- 6. If necessary, let the device heat itself**
- 7. Remember to start recording video!**



AIRSPACE CLOSING

Authority's order for AMC to restrict or ban aviation in accordance with section 11 of the Aviation Act (max. 3 days) if it is necessary for carrying out rescue missions. Authority will fill out separated form, where information below can be found. Filled form will be sent to amc.ops@ops-ansfinland.fi / tel 033869851

- 1. NAME** *Geographical location*
- 2. TYPE** *Temporary restriction area*
- 3. CAUSATION AND NATURE OF OPERATION**
 - a. *e.g. Securing rescue tasks*
- 4. RENOVATION OF THE AREA**

Not applicable/can be passed through by following rules xxx
- 5. OPERATING TIMES** *(Finnish time/SA)*
 - a. *1. Date, Start time 2. Date, End time or*
 - b. *3. Defined operating times*
- 6. TERRITORIES OF REGION / PART AREAS**

(coordinates WGS84 or regions published in AIP)

 - a. *Central point, e.g. 633115N 0222659E*
 - b. *Radius of the operating area, e.g. 5 KM*
 - c. *Areas upper limit, e.g. 1000M AGL above ground or 2000FT AMSL average sea level*
 - d. *Areas lower limit (SFC above ground) SFC (Surface)*
- 7. CONTACT DETAILS OF THE APPLICANT AUTHORITY**
 - a. *Name / Position / Organization*
 - b. *Tel./E-mail*
- 8. CONTACT DURING THE OPERATION WITH AMC**
 - a. *Tel. and alternative tel. (if needed)*
 - b. *VIRVE tel (if needed)*
- 9. RESPONDING TO INFORMATION**
 - a. *Name of the organization*
 - b. *Tel.*
- 10. ADDITIONAL INFORMATION**
 - a. *E.g. the restriction may be published x h before it becomes public*

INITIAL ASSESSMENT

The aim of initial assessment is to quickly collect information and forward it to the user. The aim is to collect information of the accident area to be used to create the situational picture.

STAGES OF INITIAL ASSESSMENT

1. Overview from high above, transfer 1

The RPA system is positioned above the target area with the aim to get one image of the accident (overall picture of the situation).

2. The boundaries of the accident area

A sufficient number of images are taken to find out the boundaries of the accident area. For example, in case of a structural fire, the preferred camera angle is sideways from above, and in a forest fire, directly from above.

3. Data transfer

From the target area/areas observed, data is forwarded to the operators (Incident Commander, Situational Centre, and Command Centre etc.). The data transferred may include, e.g. radio communication, data from different sensors, a single picture or a video.

4. Preparations for next mission

After landing the RPA system is maintained and preparations are made for a new flight.

5. Continuance of operations

Factors, such as charging the batteries, having memory cards available and assessing risks related to flight activities, are taken care of.



IC



H = Location of take-off/landing

IC = Incident commander

P = Pilot/operator of RPAS

DATA TRANSFER

OPERATIONAL READINESS

Preparations for a new mission

- charging
- reporting
- maintenance



TRANSITION 1

RETURN FROM MISSION

DATA TRANSFER

OVERALL PICTURE
OF THE TARGET AREA

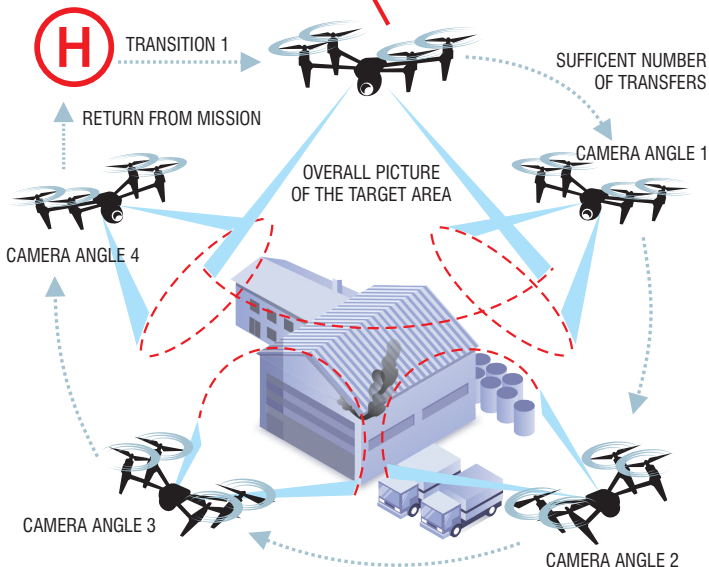
SUFFICIENT NUMBER
OF TRANSFERS

CAMERA ANGLE 1

CAMERA ANGLE 4

CAMERA ANGLE 3

CAMERA ANGLE 2





TARGET ASSESSMENT

The aim of target assessment is to collect information of the situation to help e.g. to rearrange the resources allocated for the rescue operation and a more efficient use of the units. The aim is to collect explicit information of the accident area to be used to support decision-making.

STAGES OF TARGET ASSESSMENT

1. Surveillance of one or more target areas, transfer 1.

A more specific assessment defined by the incident commander is made, e.g. the UN number, the cargo of the accident vehicle, number of persons etc. The RPA system is used on the target area, and with the help of the sensors chosen, relevant data is collected.

2. Data transfer

From the target area/areas, observed data, mainly images, is forwarded to the operators (Incident Commander, Situational Centre, and Command Centre etc.). The data transferred may also include, e.g. radio communication, data from different type of sensors, a single picture or a video.

3. Preparations for next mission

After landing the RPA system is maintained and preparations are made for a new flight.

4. Continuance of operations

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DATA TRANSFER



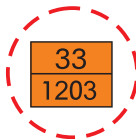
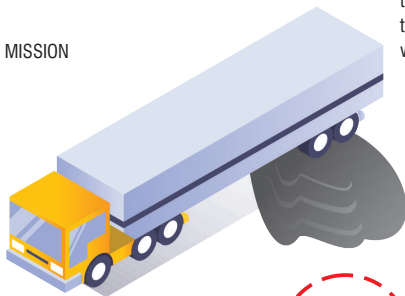
TRANSITION 1



SUFFICIENT NUMBER
OF TRANSFERS

Data is collected, e.g.
the temperature of the
target, warning sign,
water source ...

RETURN FROM MISSION





MONITORING

The aim of monitoring is to observe the development of the accident, i. e., the direction and speed of the fire spreading. Simultaneously it is possible to monitor the work safety, the effective use of resources and the continuity of the rescue operation.

STAGES OF MONITORING

1. Constant observation of the boundaries of the accident area, transfer 1-4

The intention is to make observations continuously around the boundaries of the accident area with the RPAS.

2. Repeated motoring of the accident area

The flights are repeated or the RPA stays in the air to monitor the development of the accident area, e.g. the spreading of fire in the terrain.

3. Data transfer

From the target area/areas observed, data is forwarded to the operators (Incident Commander, Situational Centre, and Command Centre etc.). The data transferred may include, e.g. radio communication, data from different sensors, a single picture or a video.

4. Preparations for next mission

After landing the RPA system is maintained and preparations are made for a new flight.

5. Continuance of operations

Factors, such as charging the batteries, having memory cards available and assessing risks related to flight activities, are taken care of.



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DATA TRANSFER

OPERATIONAL READINESS

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DATA TRANSFER

H

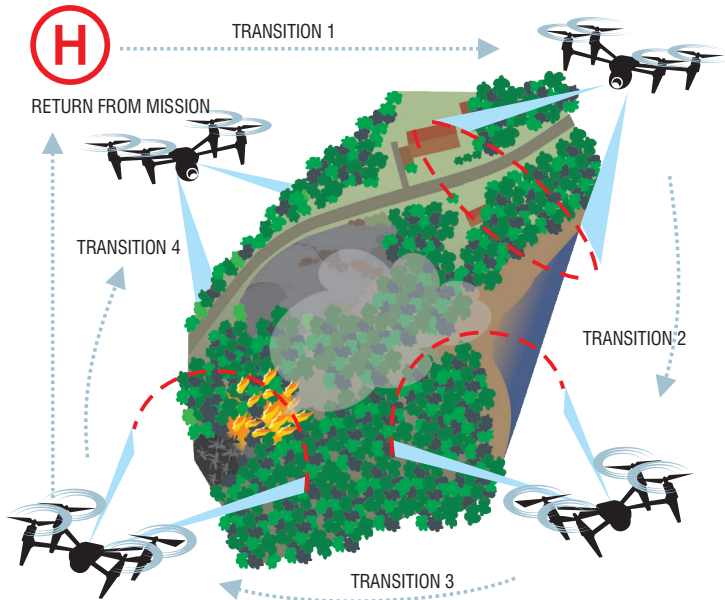
TRANSITION 1

RETURN FROM MISSION

TRANSITION 4

TRANSITION 2

TRANSITION 3





CONVERSION TABLES

SPEED

m/s	km/h	knots
1	3,6	1,9
2	7,2	3,9
3	10,8	5,8
5	18,0	9,7
8	28,8	15,6
10	36,0	19,4
15	54,0	29,2
20	72,0	38,9
25	90,0	48,6
30	108,0	58,3

ALTITUDE

meter	feet
10	~ 33
25	~ 82
50	~ 164
100	~ 328
150	~ 492
200	~ 656
300	~ 984
500	~ 1640
1000	~ 3280
1500	~ 4921

SPEED

km/h	m/s	knots
1	0,3	0,5
5	1,4	2,7
10	2,8	5,4
15	4,2	8,1
20	5,6	10,8
25	6,9	13,5
30	8,3	16,2
50	13,9	27,0
100	27,8	54,0
150	41,7	81,0
200	55,6	108,0