

## Guideline : Operational Procedure

### Keep this in mind before flying Unmanned Aircraft

Before flight, make sure that the Remote Pilot in Command have brought the unmanned aircraft's registration and insurance policy, then carry it throughout the flight. Before every new flight the Remote Pilot have to get an overview of the surroundings area where the Remote Pilot intend to fly. To verify obstacles , congest people and the Prohibited airspace. the Remote Pilot will have to check before flight and be aware of it during the flight.

#### 1. Before Flight

- Bring the Unmanned aircraft's registration.
- Make sure the Remote Pilot are aware of any restrictions in the area where are going to fly.
- Observe the surroundings in which the flight is to take place and check for obstacles or people nearby.
- Make sure the unmanned aircraft system works properly.
- Make sure that the weight of the unmanned aircraft (Payload) does not exceed the maximum weight allowed by manufacturer.

During the flight the Remote Pilot have to make sure that the unmanned aircraft is in line of sight. Be observant of the area the Remote Pilot are flying in, so that the Remote Pilot don't collide with other aerial vehicles. If the Remote Pilot and unmanned aircraft in any way pose any risks or danger to people, animals or the environment, the Remote Pilot must immediately abort the flight in the most secure and controlled way possible. It is important that the Remote Pilot are well rested and do not suffer from any medical condition that may affect your control of the flight. The Remote Pilot should not fly if the Remote Pilot are under the influence of alcohol or other psychoactive substances. the Remote Pilot always use the unmanned aircraft system according to the manufacturer's user manual.

## **Your obligations during flight**

- Don't use alcohol or any other psychoactive substances
- Make sure the Remote Pilot are well rested and unaffected by anything else that might influence your ability to fly.
- Abort the flight if it poses a risk to other aircraft, people, animals or the environment.
- Make sure the Remote Pilot are familiar with the rules and restrictions in the areas where the Remote Pilot are flying.
- Use the unmanned aircraft system according to the manufacturer's user manual.
- Don't fly near or within areas where an emergency operation is in progress, unless the Remote Pilot have been given permission by the emergency services.

## **Things to do before flying**

### **1 Go through the mission**

Go through the planned route with all participants. Make sure that the start area is free of obstacles and people. The remote pilot should wear a safety vest and if possible, In the Flying area should have a sign with information about the flight. If the Remote Pilot are several people, it is important that the Remote Pilot clarify each person's role before start flight. It may be good to have an observer who is paying extra attention to the surroundings. The observer can help the remote pilot detect hazards and ensure that no one is in the area. Regardless of the role, it is

important to fly well rested and without being under the influence of alcohol or other intoxicants or substances that will affect your judgment or watchfulness.

## **2 Check the drone system**

Before Flight, it is important to ensure that entire unmanned aircraft system has the correct settings and that both hardware and software work properly. First and foremost, the Remote Pilot need to check the battery levels – both radio transmitters and unmanned aircraft should be fully charged before each new flight. Start the radio transmitter first, and then start the unmanned aircraft. Finally, the Remote Pilot can start any other equipment. It is important that the unmanned aircraft and all equipment are checked carefully before each start. It might be a good idea to appoint a technically responsible person if several users fly the same aircraft. Under “Checklists” below, the Remote Pilot will find an example of how the Remote Pilot can carry out an inspection of unmanned aircraft before each new start.

## **3 Check the area where the Remote Pilot are going to fly**

If the Remote Pilot have no local knowledge, the Remote Pilot must check in advance what the area looks like on a map or satellite imagery, and check what applies to the area in NOTAM. The main thing to check is that the Remote Pilot will not fly near any animals and people, if possible, that the Remote Pilot will be able to keep a distance to people. A good rule is to avoid areas where people sometimes gather, such as parks, recreational areas and areas where sports competitions or other events are organized. Do not fly over people not involved with your flight, in UAS geographical zones inside airport control zones (CTR) (in radius 9 kilometers from airport) , and must not fly into Prohibited area , Restricted area and Dangerous area (P or R or D area) that announced in Aeronautical Information Publication – Thailand or AIP-Thailand and also at government building and hospitals unless permission is given. Remember that the unmanned aircraft 's sensors can be disturbed by reflections from shiny surfaces, such as water or glass.

This may result in the unmanned aircraft lose control of its own position and altitude, which, in turn, may result in a crash.

#### **4 How to choose the take-off position**

Be careful when the Remote Pilot choose the location of take-off position so that both take-off and landing can be performed safely. The surface must be plenty of space, and the place must be located far from obstacles and people. Surfaces with gravel should be avoided. If this is not possible for some reason – use a launch pad. Check for alternative take-off and landing positions, in case the Remote Pilot have to make an emergency landing.

#### **5 Check the weather**

Before the Remote Pilot start the flight, check temperature, wind, fog and cloudiness, and keep in mind this may have a negative effect on the batteries. In that weather , the Remote Pilot will need detailed knowledge of the batteries, make sure the Remote Pilot are familiar with how the batteries are affected. Also, make sure the remote pilot keep them heated before start. At humid air may build up on the propellers, dramatically increasing the risk for crash. Keep in mind that wind speed often increases with altitude.

### **During flight**

#### **1. Starting the flight**

If the Remote Pilot are flying a multicopter unmanned aircraft, the Remote Pilot should check it while it is in the air at low altitude. Do this by lifting it around five meters above the ground and then let it hover in that position. Listen for unusual sounds and check that the steering is responding normally and that the battery levels are adequate. Finally, make sure the GPS is working properly.

#### **2. While flying**

As the remote pilot, it is important that can keep the fingers on the radio transmitter at all times. Also, make sure that the radio transmitter's aerials are pointed correctly to the unmanned aircraft for the best reception capability. This

is especially important for long distance flights. Never fly **more than 90 metres above the ground** and always keep the unmanned aircraft in line of sight. The Remote Pilot must also be aware of the area under and around the unmanned aircraft at all times. Try to rise to optimum altitude to reduce risks and noise, and avoid flying over animals, electrical lines and buildings. In most cases, the Remote Pilot are not allowed to fly over people. The Remote Pilot must not interfere with ongoing activities or emergency operations, unless the Remote Pilot have been granted permission from the emergency services. Immediately land the unmanned aircraft if a helicopter or other low flying aircraft approaches the area. If people or animals move toward the area, fly away from them to a safe place and wait until all is clear. If this is not possible – abort the flight and land the unmanned aircraft.

### **3. Be prepared for emergencies**

Emergencies can occur when the Remote Pilot least expect it, and therefore the Remote Pilot must be prepared. Emergencies may be the result of errors in the unmanned aircraft's system or construction, but they may also be caused by natural forces. Below are some examples of what might happen.

### **4. Compass interferences**

The compass function may be disrupted in areas with high electronic interference, for example where there are electrical wires, aerials or larger metal objects. The interference may then decrease and interrupt unmanned aircraft magnetic heading.

### **5. Engine malfunction**

Different unmanned aircrafts have different numbers of engines, and therefore react differently during an engine malfunction. It is more likely that a smaller unmanned aircraft with fewer engines crashes if one engine fails, while unmanned aircrafts with many engines (six or more) might be able to continue flying, and land

safely. A fixed wing unmanned aircraft can use its wings to land smoother without engines in case of a failure. Some types of unmanned aircrafts have an automatic rotation function that is activated in case of an engine failure. This means that the unmanned aircraft will start to rotate instead of falling straight down to the ground and land more softly. It also gives remote pilot and others in the area more time to seek protection from the falling unmanned aircraft. So find out how unmanned aircraft works and what it can handle.

#### **6. If the radio transmitter loses contact with the unmanned aircraft**

Contact between the radio transmitter and the unmanned aircraft can be lost. If RTH is activated, it is important that the Remote Pilot have set a safe altitude for an automatic return to home position. In addition, it is important that the Remote Pilot have the settings for RTH and start position that are best suited for the specific occasion. For example, if the unmanned aircraft is flying over water while the Remote Pilot are in a moving boat, it may be advisable not to let the unmanned aircraft fly back to its start position, which would mean it will land in the water. In this case, a better idea would be to have the unmanned aircraft follow the radio transmitter. This is done by placing out new home positions during the flight. A good idea is to include this in a checklist before the flight, so that remote pilot always prepared for what happens if the RTH is activated.

#### **7. Curious birds on collision course**

Not only is it important to be attentive to other aircraft in the airspace, but also to birds. Birds are often curious, sometimes even aggressive, disturbing the flight and posing an actual hazard. If the Remote Pilot are flying over water, you should also keep in mind that birds like to fly low, close to the surface of the water. If unmanned aircraft is surrounded by curious or aggressive birds, the Remote Pilot should consider landing and aborting the flight.

#### **8. Landing**

the Remote Pilot can land both automatically and manually. A common way is to activate RTH and let the unmanned aircraft fly back automatically to the starting

position or the radio transmitter and then land automatically – or to choose to take over and land manually. The Remote Pilot must check if there are any obstacles or risks in the landing area. Once the Remote Pilot have done this, land the unmanned aircraft at a safe distance from any obstacles and people. If the Remote Pilot land with a fixed wing unmanned aircraft, a larger area without trees and houses is required. After complete landing, switch off the power of the unmanned aircraft.

## **After flight**

### **1. Check the drone**

Carry out an inspection to look for damage and abnormal wear and tear on and around the body, cables and propellers. All loose parts, such as screws, brackets and joints, must be securely fastened. If remote pilot spin the propellers, they should not make much of a sound. A crunching noise may indicate dirt in the engine's ball bearings. If the propellers are damaged in any way, they must be replaced.

### **2. Batteries**

The batteries require careful maintenance. After each landing, remove them and charge them as soon as possible. The batteries should then be stored in a dark, cool and safe place on a fireproof surface. If the Remote Pilot don't recharge the batteries so that they have a chance to discharge into "store mode". If the Remote Pilot leave the batteries stored with too low charge (below 10 percent), they can take permanent damage and be dangerous to fly with.