



# Advisory Circular

## AC101-1

Revision 1

24 September 2015

### Remotely Piloted Aircraft Systems (RPAS) under 25 kilograms – Operating in compliance with Part 101 Rules

#### General

Civil Aviation Authority advisory circulars contains information about standards, practices, and procedures that the Director has found to be **an acceptable means of compliance** with the associated rule.

An acceptable means of compliance is not intended to be the only means of compliance with a rule, and consideration will be given to other methods of compliance that may be presented to the Director. When new standards, practices, or procedures are found to be acceptable they will be added to the appropriate advisory circular.

An advisory circular may also include **guidance material** to facilitate compliance with the rule requirements. Guidance material must not be regarded as an acceptable means of compliance.

#### Purpose

This advisory circular provides advice on best practice to be observed when operating small remotely piloted aircraft systems (RPAS) that weigh less than 25 kilograms and fly in accordance with Part 101 rules.

#### Related Rules

This advisory circular relates specifically to Civil Aviation Rule Part 101.

#### Change Notice

Revision 1 corrects and clarifies some airspace inconsistencies.

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## Glossary

The following terms are used throughout this document.

AC	advisory circular
AGL	above ground level
AIP	Aeronautical Information Publication
ATC	air traffic control
ATM	air traffic management
BVLOS	beyond visual line of sight
CAR	Civil Aviation Rules 1990
CAA	Civil Aviation Authority
EVLOS	extended visual line of sight
FPV	first person view
ICAO	International Civil Aviation Organisation
IAW	in accordance with
LAME	licensed aircraft maintenance engineer
LEP	list of effective pages
LSA	light sport aircraft
MFNZ	Model Flying New Zealand
NM	nautical miles
RP	remote pilot
RPA	remotely piloted aircraft
RPAS	remotely piloted aircraft system
SMS	safety management system
SOP	standard operating procedures
SC	support crew
UA	unmanned aircraft
UAS	unmanned aircraft system(s)
UAV	unmanned aerial vehicle
UAOC	unmanned aircraft operators certificate
VLOS	visual line of sight
VLA	very light sport aircraft
VMC	visual meteorological conditions

## Background

The civilian use of remotely piloted aircraft systems (RPAS) has markedly increased in recent years. Research and development into the civilian applications of RPAS is a dynamic and rapidly evolving area. Control and guidance systems are now available that enable these aircraft to perform a variety of tasks that were previously unachievable, unreasonably expensive, or involved too much personal risk. Consequently, RPAS have an increasing presence in controlled and uncontrolled airspace.

Growth of RPAS use is currently concentrated in smaller aircraft, similar to model aircraft in size (though not necessarily in performance). However, the use of larger, conventional aircraft is also growing.

RPAS operations will either be conducted under Part 101 or Part 102.

Part 101 operators are not required to seek authorisation from the Civil Aviation Authority (CAA). As a result, there are no direct controls over the skills and qualifications of the operator, or the airworthiness of the aircraft itself.

Part 101 applies to both recreational and commercial users. This means that a wide range of commercial activities can be conducted without any interaction with the CAA. This is in stark contrast with the approach taken by regulators overseas, where all commercial operators are required to obtain a certificate or seek permission from the regulatory authority, regardless of the risk of their operation.

This approach allows lower-risk commercial operations to take place without burdensome certification requirements, as long as the operators remain compliant with the restrictions set out in Part 101.

Part 102 is designed for higher-risk operators. It is extremely flexible, in that very few activities are specifically prohibited (other than carrying passengers, for example). Instead, certificates will be granted on a case-by-case basis, where the Director of Civil Aviation is satisfied that the operator has identified the risks associated with the intended operation(s) and has a plan in place to mitigate those risks. If an operator cannot comply with Part 101 this is a good signal that the operation may be higher risk and require certification.

The purpose of this advisory circular is to provide compliance guidance and explanatory material designed to assist operators understand what they can and cannot do under Part 101 (that is without certification). It should also assist operators to understand the difference between an RPAS operation under Part 101, and an RPAS operation that is more suitable for certification under Part 102.

Intending RPAS operators are welcome to contact the CAA at [rpas@caa.govt.nz](mailto:rpas@caa.govt.nz) if they wish to discuss their proposed operation or aircraft type, to determine the rules that may apply to them.

### What types of aircraft does this advisory circular apply to?

There are a wide range of terms used to describe the aircraft to which this advisory circular applies, including unmanned aerial vehicle (UAV), unmanned aerial system (UAS), 'drones' or model aircraft.

Part 101 and 102 use a number of different terms which are defined in different parts of the rules. For ease of reference, these are outlined below.

For Part 102 operations, the key term is 'unmanned aircraft'. An unmanned aircraft is:

***‘an aircraft designed to operate with no pilot on board and includes unmanned balloons, kites, control-line model aircraft, free flight model aircraft and remotely piloted aircraft’.***

The rules also refer to an unmanned aircraft *system* which is—

***‘an aircraft and its associated elements which are operated with no pilot on board’.***

Part 102 applies to *all* unmanned aircraft that do not operate under Part 101. This could include any fully autonomous aircraft (not to be confused with RPAS that can be programmed to operate automatically or on an automatic basis, where the operator may still intervene).

Under Part 101, the term used is ‘remotely piloted aircraft’. This is defined as a subclass of unmanned aircraft. A ‘remotely piloted aircraft’ is—

***‘an unmanned aircraft that is piloted from a remote station and—***

***(1) includes a radio controlled model aircraft, but***

***(2) does not include a control line model aircraft or a free flight model aircraft.***

A remotely piloted aircraft includes its associated remote pilot station or stations, the required command and control links, and any other components required to operate the system.

### **What about model aircraft?**

Model aircraft are traditionally regarded as small unmanned aircraft flown by hobbyists for purely recreational reasons. While Part 101 still refers to subcategories of ‘model aircraft’, such as free flight model aircraft and control line model aircraft, the more general term ‘model aircraft’ no longer exists. Model aircraft are now referred to as ‘remotely piloted aircraft’ under Part 101, and are unmanned aircraft for the purposes of Part 102. The rules do not make a distinction between remotely piloted aircraft that are operated for commercial or recreational purposes.

This position reflects the CAA’s view that the aviation-related risk posed by remotely piloted aircraft differs very little, between an aircraft that is used for recreational purposes or commercial purposes. As an example, the risk to persons or property from a small unmanned aircraft taking an aerial photograph or video is the same, whether the photograph or video is sold or retained for private use. The important aspect is that the risks to persons and property are managed in both cases.

Therefore, ‘model aircraft’ meet the definition of remotely piloted aircraft, and are subject to regulation under Part 101, or Part 102 if operating beyond the limits prescribed in Part 101.

Model Flying New Zealand (MFNZ) exists as an approved organisation under Part 101. For further information, consult AC101-1. The classification within the rule of model aircraft as remotely piloted aircraft, does not prohibit private operators or organisations from referring to these aircraft as model aircraft. It is purely for the functioning of the rules, and the addressing of risk, that they are defined as remotely piloted aircraft in the rule.

### **The basic framework of Part 101**

Part 101 only applies to RPAS weighing less than 25kg that can fully comply with Part 101. Any aircraft more than 25 kg and those that cannot comply with Part 101 must be certificated under Part 102.

RPAS weighing between 15-25 kg must be constructed or inspected, approved and operated under the authority of a person or association approved for this purpose by the Director. Currently the only approved association is Model Flying New Zealand (MFNZ). MFNZ’s website is <http://www.nzmaa.org.nz/>.

Operation of unmanned aircraft in accordance with the rules in Part 101 is subject to the following restrictions. There are 12 key things that are required under Part 101.

You must—

- (1) not operate an aircraft that is more than 25 kg and always ensure that it is safe to operate; and
- (2) at all times, take all practicable steps to minimise hazards to persons, property and other aircraft (i.e. don't do anything hazardous); and
- (3) fly only in daylight; and
- (4) give way to all crewed aircraft; and
- (5) be able to see the aircraft with your own eyes (e.g., not through binoculars, a monitor, or smartphone), to ensure separation from other aircraft (or use an observer to do this in certain cases); and
- (6) not fly your aircraft higher than 120 metres (400 feet) above ground level (unless certain conditions are met); and
- (7) have knowledge of airspace restrictions that apply in the area you want to operate; and
- (8) not fly closer than four kilometres from any aerodrome (unless certain conditions are met); and
- (9) when flying in controlled airspace, obtain an air traffic control clearance issued by Airways Corporation of New Zealand; and
- (10) not fly in special-use airspace without the permission of the administering authority of the area (e.g. restricted or military operating areas); and
- (11) have consent from anyone you want to fly above; and
- (12) have the consent of the property owner or person in charge of the area you want to fly above.

This list should not substitute for a full reading of Part 101. You should conduct a thorough assessment of your operation and ensure you understand the Civil Aviation Rules that apply to your operation, before deciding whether to operate under Part 101 and 102.

Some exceptions may apply, but generally if you cannot meet any of these requirements; this is a good signal that your operation will need to be certificated under Part 102.

To obtain a Part 102 certificate, the operator will need to make an application that includes an assessment of the risks, and proposed risk mitigation measures that satisfies the Director that the operation can be conducted safely, and does not pose undue risk to members of the public and to property. See advisory circular AC102-1 for details.

## **Pilot/operator qualifications**

Part 101 does not require a pilot qualification unless the flights are going to be conducted on, or within 4 km of an aerodrome.

However, to comply with Part 101 fully, the operator needs to understand what airspace he or she will be operating in. To do this, some knowledge of aeronautical charts, and how to read them, is required. Part 101 now requires all operators to have this knowledge. It can be gained from any

aviation training school, Aero Club or from a qualified, licensed or certificated pilot who is willing to provide guidance and supervise them. This is not an onerous requirement but is vital to the safety of the RPAS operation and integration with other airspace users. Useful links are given later in this advisory circular.

For Part 101 operations on or within 4 km of an aerodrome, other than a shielded operation<sup>1</sup> conducted outside of the boundary of the aerodrome, it is expected the pilot/operator would have the following minimum knowledge and qualifications—

- knowledge of the use of aeronautical charts and airspace so that an assessment, the operation's full compliance with Part 101 can be made; and
- a MFNZ wings badge relevant to the RPAS category being used e.g. fixed-wing, helicopter, multi-rotor; and
- if the operation requires the use of an aeronautical band radio (i.e. an operator is intending to communicate via radio with other manned aircraft operators), a pass in the flight radio telephone operators (FRTTO) exam is required (refer to advisory circular AC61-3 Pilot Licences and Ratings – Private Pilot Licence).

## Airworthiness

Internationally, no design or manufacturing standards currently exist for remotely piloted aircraft weighing less than 25 kg. Work is underway to develop standards, but until such time as these are recognised internationally and in New Zealand, no prescribed airworthiness standards apply to Part 101 operated aircraft.

Generally an aircraft will be 'airworthy' if it meets relevant design and performance standards. Because no standards are prescribed in the rules, operators will need to be satisfied that—

- their aircraft is fit for purpose for the intended use; and
- is of a suitable manufacturing standard; and
- is assembled, constructed and maintained in accordance with the manufacturers manual or instruction; and
- it can be operated in accordance with the manufacturers manual or instruction and within any limitations; and
- is checked for faults and defects before flight.

While it is not mandatory to do so, it is best practice to operate an RPAS in compliance with the operating handbooks provided by the manufacturer, if available. It could be considered hazardous if you do not (refer rule 101.13).

The manufacturer's guidelines relating to maintenance should also be closely followed. Pre-flight and post-flight inspections contained in manufacturers' handbooks should always be followed accurately.

Operators should also consider—

- establishing and implementing battery maintenance and testing programmes, especially for lithium polymer (LiPo) batteries<sup>2</sup>; and

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<sup>1</sup> Refer to the definition in rule 101.1 or explanation later in this AC

<sup>2</sup> It is important to remember that LiPo batteries are regarded as dangerous goods as defined in Part 1 *Definitions*.

- for fixed-wing and helicopter RPAS, service retirement lives should be considered based on the manufacturer's recommendations or operating history.

Other helpful guidance for intending RPAS operators is—

- commercially produced multi-rotors in the 15-25 kg weight bracket should only be considered for purchase, once they have been approved by an appropriate approved inspector, and an acceptable operating history can be shown by the manufacturer; and
- multi-rotor machines that are manufactured with optional rotor guards should be purchased with the guards, which should remain fitted at all times when the aircraft has any chance of approaching people, even if as the result of a loss of control; and

The construction, modification, inspection and operation of larger remotely piloted aircraft (15-25 kg), to be operated under Part 101, is subject to the requirements of oversight by an approved organisation in rule 101.215.

## General

Rules not mentioned below are considered self-explanatory and no further advisory information is required at this time.

## Subpart A - General

### 101.1 Applicability

Part 101 applies to unmanned aircraft including radio controlled, control line and free flight model aircraft under 25 kg, that comply with Part 101 when conducting flight operations.

It does *not* apply to unmanned aircraft that are being operated, under a valid unmanned aircraft operator certificate issued under Part 102. Please refer to Part 102 or advisory circular AC102-1 for further information on operator certification.

Part 101 Subpart A also applies to moored balloons, kites, free balloons, rockets, gyrogliders and parasails.

### 101.3 Definitions

Definitions in Part 1 have been amended to make radio controlled model aircraft a subset of remotely piloted aircraft. Part 101 contains definitions of control line and free flight model aircraft, as these are outside of the definition of remotely piloted aircraft.

### 101.5 Registration

This rule exempts RPAS operated under Part 101 from the registration requirements in Part 47, unless the operator wishes to register the aircraft. Reasons to register unmanned aircraft could include a desire to identify the aircraft, or the ability to allocate a transponder code, etc.

### 101.11 Controlled airspace

This rule provides the requirement to have an authorisation from the air traffic control (ATC) unit responsible for the airspace concerned before operating in controlled airspace. To facilitate a clearance in a timely manner, it is recommended operators contact the ATC unit concerned and discuss the proposed operation. In some cases, a Memorandum of Understanding should be considered to facilitate timely clearance issue. Use should be made of the airshare website to gain contact details for aerodrome operators and ATC units. The site can be accessed at <https://www.airshare.co.nz/>



## 101.12 Airspace restrictions

This rule requires that, before operating any unmanned aircraft, under Part 101, the operator, or supervisor of an operator, must be aware of the airspace restrictions, classifications and designations made under Part 71. Without this knowledge, an operator potentially places at risk other airspace users or people on the ground.

This knowledge can be obtained from flight training organisations, Model Flying New Zealand or suitably qualified pilots or anyone else who can inform the operator of what airspace they are operating in.

Visual navigation charts can be procured from the AIP shop at the following link:

[http://secureorders.airways.co.nz/aimsite/aip\\_shop/](http://secureorders.airways.co.nz/aimsite/aip_shop/). This information can also be found on the airshare site mentioned above. The ability to read and understand an aeronautical chart identifying restricted, military operating and danger areas; low flying zones, as well as controlled airspace, would be an acceptable means of demonstrating an awareness of airspace designations and restrictions required by rules 101.7, 101.9 and 101.11.

## 101.13 Hazard and risk minimisation

Operators have an overarching obligation to minimise hazards to persons, property and other aircraft. Even if an operator complies with all rules they are still obliged to make sure that they do not operate their aircraft in a hazardous manner. Operators must take all practicable steps to minimise hazards to persons, property and other aircraft. This means operators need to plan their flights and ensure that they contemplate the various hazards that exist or could arise during their flight. Things that could be considered hazardous include—

- (a) flight over gatherings of people or in proximity to crowds, irrespective of whether or not those people have given permission for the flight to be conducted over them; and
- (b) flight over property including buildings, structures, installations and vehicles where people may be present and could be harmed in the case of power, command and control, or propulsion failure; and
- (c) flights over roads or highways or other areas; and
- (d) flight in inappropriate weather or visibility conditions that could lead to loss of control; and
- (e) flights undertaken when the aircraft is not airworthy or correctly maintained (e.g. batteries not fully charged, range check not carried out, or pre-flight check including establishing “return home” set up not undertaken); and
- (f) operating when not fit to do so, either because of impairment, fatigue or as a result of a physical or mental health condition; and
- (g) flights undertaken in areas where the radio spectrum is in the 2.4 GHz range, and is known to be unreliable (e.g. some areas near the waterfront in Auckland and other areas of Christchurch. Local MFNZ clubs have good knowledge of such possible sites); and
- (h) flights undertaken without proper range testing prior to each operation.

In some cases it will not be possible to minimise the hazard to a point where it is safe to fly. For example, operating over crowds or gatherings of people who have given consent to the operation could still be hazardous if there is limited ability to land the aircraft safely in the event of system failure.

Flying other than in accordance with the rules will always be considered hazardous. This includes things such as—

- (i) flying in restricted or military operating areas without the administering authority's authorisation; and
- (j) flights undertaken when the operator is unaware of the specific airspace requirements for their area of operation; and
- (k) flights that take place without appropriate air traffic clearances or airfield operators' permission that disrupt other air operations.

Operators should consider privacy and courtesy concerns, to ensure they do not cause a public nuisance or commit offences for breaches of the rules, operating carelessly or for causing unnecessary endangerment.

### **101.15 Dropping of articles**

This rule does allow the dropping of articles as long as it does not create a hazard to persons or property on the ground.

This requires operators to assure themselves that the area the load is to be dropped into is clear of persons and property, including livestock and pets. As the rule allows the dropping of articles, it also indicates that a payload can be carried.

This rule should be considered in conjunction with rule 101.13.

## **Subpart E – Remotely Piloted Aircraft, Control Line Model Aircraft and Free Flight Model Aircraft**

### **101.202 Approved person or organisation**

As this rule prescribes, the Director must approve persons or organisations that are permitted to perform the functions of 101.202(1) through (6). These persons or organisations must be assessed case by case and listed below when approved.

#### **The Director has approved the following organisation**

Model Flying New Zealand for functions 101.202(1), (2), (3), (4), (5) and (6).

Other organisations may wish to be approved to provide the same service. Any application will be assessed on its merits by the Director. Interested parties should contact the CAA at [rpas@caa.govt.nz](mailto:rpas@caa.govt.nz) to discuss the process.

### **101.205 Aerodromes**

#### **101.205(a)(1)**

This rule outlines requirements relating to flying off an uncontrolled aerodrome, a controlled aerodrome, and within 4 km of an aerodrome.

Information on published aerodromes can be found at AIP New Zealand at this link: <http://www.aip.net.nz/>. [www.airshare.co.nz](http://www.airshare.co.nz) also provides useful information.

Any unmanned aircraft flying activity within these areas requires the pilot/operator to either be:

- (a) the holder of, or to be supervised by the holder of:
  - (i) an approved organisation pilot qualification:
  - (ii) a pilot licence issued under Part 61:
  - (iii) a microlight or glider pilot certificate issued by a Part 149 organisation:

- (b) under the direct supervision of a person appointed by an approved organisation to give instruction in unmanned aircraft operations.

These requirements do not apply to a person flying within 4 km of an aerodrome, if the activity is a shielded operation and is conducted outside the airfield boundary.

### **What constitutes a shielded operation?**

Shielded operations are defined in Part 101. Examples could be a flight that takes place in a stadium below the height of the roof, or a flight that takes place in a forested area below the height of the trees.

## **101.207 Airspace**

### **101.207(a)**

This rule covers general operations outside of a danger area and requires operators to avoid operating over persons, who have not given consent and property where the landowner has not given consent, to avoid operating above 400 feet above ground level, and to observe the surrounding area for other aircraft.

The operators do not need to comply with rule 101.207(a) if they are operating under the authority of an approved organisation, and that airspace was used by that organisation prior to 1 August 2015 (e.g. an approved MFNZ model flying area).

### **101.207(a)(1)**

This rule concerns the need to obtain the consent of property owners and people that the operators are flying over. It is a two-step requirement, where an operator must not use airspace above—

- (1) people unless they have the consent of people below the flight; and
- (2) an area of property unless prior consent has been obtained from any persons occupying that property or the property owner.

The rule is designed to account for the many different scenarios that are possible with an RPAS operation. It is important to note that this is only *one* aspect of the risk mitigation required as part of Part 101. There is still an overarching obligation to take practicable steps to avoid hazards.

If you cannot obtain consent, or obtaining consent is impractical, it may be a signal that your operation is too hazardous to be conducted under Part 101. You can apply to the CAA to be certified under Part 102. Part 102 allows the Director to work through different options with an operator and/or to relax or remove one or both of the consent requirements altogether.

These consent rules are targeted at delivering the following—

- (1) **Notice/awareness** – the person/persons affected are made aware of the operation and can respond to it.
- (2) **Communication/knowledge** – the rule contemplates an exchange of information about the hazards related to the operation or present in the area of intended operation.
- (3) **Control/management** – persons affected by the operation can remove themselves from the area or manage what they do in that space, and agree to be exposed to some level of hazard.

Neither requirement is intended to address the potential privacy or ‘nuisance’ issues associated with unmanned aircraft, and operators should not assume that obtaining consent exempts them, from other central or local government requirements on privacy or nuisance.

## **Requirement to obtain consent of people who you intend to fly over**

This requirement applies to both private property as well as public land, and public spaces.

What is required is engagement between the operator and any person on the ground who the aircraft will be flown over. Either verbal or written consent is sufficient. A written record is likely to be most useful so that you can confirm that the property owner (and anyone the RPAS will fly over) have given you their consent for your proposed RPAS operation should you need to confirm that after the flight.

Even if a person, or group of people, consents to an operation occurring, it remains the responsibility of the operator to ensure that the operation is not hazardous. This may mean that even if you obtain consent, you may determine that the nature of what you want to do still means the operation is hazardous to those people on the ground, and that the risk of your RPAS hitting someone on the ground is too high.

The rule is worded to take into account dynamic situations, such as in a park. While you will be expected to plan and manage the possibility of people suddenly appearing under your aircraft, you simply need to have taken reasonable steps to *avoid* flying over people. Therefore, if people run under your operation and this is out of your control, and you react to manage the risk, you will be in compliance with the rule. What the rule does mean is that you probably should not operate in an area, where there is a high chance that someone who you have not obtained consent from suddenly appears beneath your operation.

In practice, if a person on the ground unexpectedly moves below you and remains, you will simply need to take steps to move the aircraft away from the person or confirm that they consent to it being flown over them.

## **Requirement to obtain consent of the property owner**

The rule requires operators not to fly in airspace above property unless they have obtained the consent of the property owner or person controlling the space.

The requirement to obtain consent is consistent with your obligation to take all practical steps, to minimise the hazards associated with operating an RPAS. By obtaining consent from a property owner, you are far more likely to be aware of the safety hazards in the area, as the property owner is best placed to advise of potential hazards, and people who may be affected by the flight. The process of obtaining consent will also enable you to discuss what is and what is not appropriate regarding RPAS with the property owner.

Seeking consent from the property is a two-step process—

- (1) locate the landowner or person occupying that property (or their representative); and
- (2) seek the consent of those on the property or around your operation.

The consent itself could take multiple forms, such as informally verbal or written, or more formally, contractual. This will depend on the situation and the requirements of the landowner, the people involved and, potentially, the commercial imperatives of the operator.

It is also anticipated that people will be able to give consent on behalf of other people at a property. For example, a homeowner/tenant could speak on behalf of other people present at the house.

Consent may be implied or explicit depending on the situation involved, and therefore may not have to be sought from the same people repeatedly, if standing arrangements or understandings are already in place. Therefore, consent does not necessarily need to be obtained prior to each flight if you have entered an arrangement with the property owner, and they understand what you are proposing to do and when. For example, you may have a standing agreement with a farm owner to operate your RPAS in a paddock at weekends.

Existing agreements and arrangements may be sufficient in certain cases. For example, commercial contracts that already guarantee access or through the implied consent of operations that have already taken place.

This requirement applies to both private property as well as public land, and public spaces.

This does not need to be an onerous task. The objective of the rule is simply to create engagement between the operator and a person who can speak on behalf of the property or area that the operator wishes to fly over.

### **Public land & spaces**

Local authorities and the Department of Conservation (DoC) are best placed to understand the specific risks associated with RPAS-use in their territory. They are therefore best placed to engage with operators and provide the necessary consent.

This allows consideration of mixed or conflicting land uses in a way that the CAA would never be able to do. Local authorities and DoC will also be best placed to transfer knowledge of the risks posed to or by and RPAS operation to other users of public spaces, or conflicting imperatives of the council.

It will be up to the local authority to decide whether consent:

- is to be sought on a case-by-case /per operator basis:
- will be given on general basis:
- will be in the form of open permission for certain geographical areas/ managed via restriction on certain areas:
- if an operation is allowed or not based on whether the general public is present.

It will be up to the local authority to best assess how and where to offer consent. However, here are some ways in which offering consent may occur:

- by issuing blanket prohibitions on RPAS in certain public areas:
- by issuing allowances for certain public areas to be used for RPAS under certain conditions:
- legislating or imposing requirements about what is and is not allowed:
- as part of a general parks or other spaces policy.

This could be advertised through:

- the website of the local authority:
- notices in a local newspaper:
- signs at the affected areas (such as at entrance points).

Any operator wanting to know where they can fly on public land is advised to contact their local government authority.

It is important to note that civil aviation rules do not trump any local government policies or bylaws regarding use of RPAS or other policies on the use of public land.

### **101.207(c)**

The requirement to operate only in Class G airspace means that the operator needs to be aware of airspace classification. The same applies to other rules regarding low flying zones, restricted, military operating and danger areas. All of these types of area are explained in CAA guidance at [http://www.caa.govt.nz/safety\\_info/GAPs/NZ\\_Airspace.pdf](http://www.caa.govt.nz/safety_info/GAPs/NZ_Airspace.pdf).

An operator, who intends to fly above 400 feet, and outside a danger area designated for unmanned aircraft activity, is required to provide information on the operation to the New Zealand NOTAM<sup>3</sup> Office at least 24 hours before the intended operation. This notification must be made by a person or organisation approved for this purpose by the Director.

Currently the only organisation approved for this role is listed under paragraph 101.202 of this advisory circular, and therefore its processes for providing notification to the NOTAM office must be followed.

### **101.209 Visual line-of-sight operation**

This rule outlines requirements for an operator to ensure their operation remains within unaided visual sight (i.e. without the use of an instrument, such as binoculars or a telescope).

First-person view systems are permitted under this rule, but still require a separate observer, who has suitable training and competency, and can maintain unaided visual line of sight contact at all times, with the aircraft and have direct communication with the pilot. This observer is, among other things, to advise the pilot of any other traffic that enters the operational area, the direction it is coming from, and advice on the appropriate actions to take to maintain safe clearances.

### **101.215 Aircraft mass limits**

This rule prohibits the operation of remotely piloted aircraft weighing between 15 and 25 kg, under Part 101 unless its construction and operation has been authorised, or inspected or approved by an approved person or organisation.

Any RPAS more than 25 kg must be operated under the authority of an unmanned aircraft operator certificate issued under Part 102, irrespective of whether they intend to otherwise operate within the operating limits in Part 101.

The Director must approve a person or organisation to have responsibility for the tasks outlined above for 15-25 kg remotely piloted aircraft. Currently the only organisation that has been approved for this role is listed under paragraph 101.202 of this advisory circular and therefore its processes must be followed.

Other persons or organisations may wish to be approved to provide the same service. Any application will be assessed on its merits by the Director.

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<sup>3</sup> NOTAM – Notice to Airmen. A NOTAM is a notice filed with an aviation authority to alert aircraft pilots of potential hazards along a flight route or at a location that could affect the safety of the flight.

## **Additional Guidance for Operators**

### **Avoiding manned aircraft**

Unmanned aircraft are required to give way to all manned aircraft. It is the operator's responsibility to ensure that this rule is complied with at all times.

### **What to do when if a RPAS is lost or flies away?**

To prevent fly-away, it is important to follow manufacturers' pre-flight requirements without deviation. Failing to calibrate the internal compass, for example, can invalidate the "return home" process. It is recommended that operators' details, including contact details, are placed on the unmanned aircraft in a prominent position, so the aircraft can be returned in the case of a fly-away.

### **What level of human control is required?**

Human control is required for all flights except free flight model aircraft (and even in these cases, human control is carried out to a small degree via pre-flight trimming and fuel quantity measurement). In other cases, the level of human control varies from hands-on flying via control sticks, to preprogramming of a flight plan and then a point and click operation on the control station. This level of control is considered automatic flight. Fully autonomous operations are those that require no human input at all—in other words, the aircraft makes all the decisions regarding the flight itself. This situation is a possibility for the future.

### **Can I operate my RPAS under the influence of drugs or alcohol?**

Operators should never operate an unmanned aircraft when impaired by drugs or alcohol.

### **Where are there likely to be low flying aircraft and what can I do to operate safely in these areas?**

Low flying aircraft are generally located near airports, in low flying zones used for pilot training or when they are conducting an operation, that requires them to fly below the safe minimum altitudes published in Part 91. That is 1000 feet above congested areas and 500 feet above rural areas. These occasions include agricultural aviation and helicopter operations including emergency evacuations, search and rescue, etc. By gaining prior consent to use an area for a flight or series of flight, the operator will have an opportunity to discuss with the landowner if they anticipate any low level operations above their land by manned aircraft. In all instances, unmanned aircraft must not operate within low flying zones.