Drone Regulation 2020

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Getting The Deal Through

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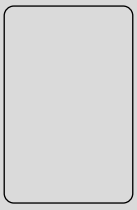

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Lexology Getting The Deal Through is delighted to publish the first edition of *Drone Regulation*, which is available in print and online at www.lexology.com/gtdt.

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Every effort has been made to cover all matters of concern to readers. However, specific legal advice should always be sought from experienced local advisers.

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Contents

Introduction

Laura Pierallini
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Drones are considered among the most dynamic and multi-purpose innovation of the 21st century to the point that, over the past few years, they have become widely used in several economic sectors worldwide. With a continuously growing trend and applications ranging from movie and TV shoots to delivery services, from agriculture to patrol and surveillance tasks, drones have entered on a large scale in a number of commercial markets and also military operations, confirming themselves to be extremely beneficial in practical situations where humans cannot gain access or act in an efficient and timely manner.

The use of drones represents one of the main developments of the aviation industry, for both civil and military purposes. Indeed, remotely piloted vehicles have proved to be flexible tools able to address many operational needs, thanks to a continuing enhancement of the technology behind them. Among the elements in favour of the use of drones, one definitely worth mentioning is the economic factor. Many comparative analyses between drones and manned aircraft have highlighted that remotely piloted systems bear reduced operating costs, for the following reasons:

- persistence: there are no limits related to the physical resistance of the pilot on board, therefore these systems are able to operate for longer periods with the alternation of remote pilots on the ground throughout the performance of the mission;
- capacity: the absence of pilots on board enlarges the possibility of carrying out risky operations. According to recent cost–benefit analyses, this circumstance would make the use of drones so useful in terms of strategic advantages that it would balance related concerns about economic efficiency; and
- flexibility: different types, volumes and technologies, as well as the possibility to change the payload, make such vehicles potentially suitable for any kind of operation or needs.

Regulatory overview

We found that approaches to regulation differ dramatically across the globe, but the elements of regulation are largely the same from country to country, with wide ranges on the level of restrictiveness of each element that are often dictated by whether a country favours the promotion of new technology or a safety-first approach. The standard example of national drone regulation tends to have the following four elements: pilot's licence, aircraft registration, restricted zones and insurance.

The requirements of the four elements mentioned vary on the basis of drone weight, drone altitude, drone use and pilot licence level. In general licensing, registration and insurance are not required for recreational small drones. However, for commercial drone usage, a sporting pilot licence has become the standard for countries without drone-specific licensing procedures.

Airspace is typically restricted around airports or other sites of national importance (eg, military bases, public buildings), and the use of drones over heavily populated areas is often either forbidden or severely restricted. Visual line of sight (VLOS) is normally required for all users, restricting the horizontal and vertical distance of drone flights, as well as meteorological and lighting conditions for operation.

In looking at the variation in these four regulatory components across the world, different approaches to national commercial drone regulation can be summarised as follows:

- Absolute ban: countries do not allow drones at all for commercial use.
- Effective ban: countries have a formal process for commercial drone licensing, but requirements are either impossible to meet or licences do not appear to have been released.
- Requirement for constant (VLOS): drones must be operated within the pilot's VLOS, thus limiting potential range.
- Along with VLOS flights, experimental use of beyond the visual line of sight (BVLOS) is possible with certain restrictions and pilot ratings.
- Permissive: countries have enacted relatively unrestricted legislation on commercial drone use. These countries have a body of regulation that may give operational guidelines or require licensing, registration and insurance, but upon following proper procedures operating a commercial drone is straightforward.
- Wait-and-see: countries have enacted little, if any, drone-related legislation and are currently monitoring the outcomes of other countries' regulations before providing more specific rules.

Even if the regulatory framework is continuously evolving and still uneven between different countries, we note a number of common trends extending across many territories:

- most areas typically have speed and maximum altitude restrictions, and require flight operations within the VLOS;
- flying close to restricted airspaces (airports, power plants, sensitive infrastructures, military installations, etc) is universally forbidden, as is flying over crowds and densely populated areas;
- usually drones are categorised depending on their maximum take-off weight, and heavier drones generally require registration and a remote pilot's licence;
- in most territories there are allowances for recreational operations (non-commercial) without any prior experience or licensing, but commercial flights are generally subject to licensing or regulatory permissions;
- in certain areas, such as Europe and North America, the authorities require mandatory insurance coverages for commercial operations, while insurance or liability issues are less clear in other regions; and
- in terms of privacy, no photos of other people or properties are permitted without prior authorisation.

Terminology and definitions

Different definitions are commonly used when referring to drones. Such terms include unmanned aircraft systems (UAS), unmanned aerial (or air) vehicles and remotely piloted aircraft (RPA). For the purpose of uniformity and to reflect the terminology given by the International Civil Aviation

(ICAO), most developed countries refer to drones as UAS, to include all types of unmanned systems, vehicles and aircraft, excluding model aircraft used for hobby or recreational purposes. Similarly, in conformity with universal measurements, references to weight and distance are commonly in kilograms (kg), metres (m) and kilometres (km).

Probably the most well-known and frequently used definition is the term 'drone'. It is widely used by the media, industry and the public, even if governmental and non-governmental entities now often avoid using this term in favour of more technical ones. This can be demonstrated by the fact that the term 'drone' is basically absent from documents of the European Union (where the preferred term is 'unmanned aircraft') and the ICAO (mainly referring to 'unmanned aircraft systems').

A recent significant terminological shift has seen the term 'unmanned aircraft systems' being used and defined. The ICAO has defined this to mean 'an aircraft and its associated elements which are operated with no pilot on board'. The term emphasises the importance of other components beyond just the aircraft (such as the ground control station), as it is a whole system definition.

Within the scope of UAS there are subcategories that need to be considered, as they provide a slight difference within the term UAS which may produce different legal consequences. The first subcategory is remotely piloted aircraft systems (RPAS) and includes the RPA, the operator, communication and data links, satellites, ground control stations, additional staff, support systems and any other part required to operate the aircraft. An RPAS must be controlled by a human pilot from a remote location. The term does not necessarily suggest, unlike those that use the word unmanned, that the aircraft is uninhabited by humans. Another subcategory is 'automatic and autonomous aircraft'. An automatic UAS 'is one that, in response to inputs from one or more sensors, is programmed to logically follow a predefined set of rules in order to provide an outcome'. These would receive some kind of pre-input data before commencing a flight, whereas an autonomous UAS is an 'unmanned aircraft that does not allow pilot intervention in the management of the flight'. These are UAS that do not require a pilot and act in a predetermined way.

UAS are considered to be aircraft pursuant to the Annexes to the Chicago Convention. In this respect the ICAO has stated that 'in the broadest sense the introduction of UAS does not change any existing distinctions between model aircraft and aircraft'. Model aircraft are those aircraft 'generally recognised as intended for only recreational purposes'. Therefore, model aircraft (being a significant portion of current civil UAS) will not fall within the scope of the Chicago Convention and will be subject to national laws.

Another relevant legal term is 'toy aircraft' that, within the European Union, fall under the scope of Directive 2009/48/EC on the safety of toys, as it 'shall apply to products designed or intended, whether or not exclusively, for use in play by children under 14 years of age'.

International air law

While the use of drones is developing fast worldwide, several questions on related legal aspects still remain open, in particular as to whether civil aviation conventions and treaties must apply to such vehicles. With reference to the main pillar and primary source of international air law, the Chicago Convention of 1944 does not contain any definition of aircraft within the body of its text.

Only Annex 7 to the Chicago Convention (heading Aircraft Nationality and Registration Marks) provides a specific meaning for aircraft, defining the same as 'Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface'. In March 2012, the sixth amendment to Annex 7 was adopted, whereby 'remotely piloted aircraft' have been included within the definition of aircraft, namely: 'An aircraft which is intended to be operated with no pilot on board shall be further classified as unmanned. Unmanned aircraft shall include unmanned free balloons and remotely piloted aircraft.'

With respect to unmanned aircraft, article 8 of the Chicago Convention (heading Pilotless Aircraft) states that:

> *No aircraft capable of being flown without a pilot shall be flown without a pilot over the territory of a contracting State without special authorization by that State and in accordance with the terms of such authorization. Each contracting State undertakes to insure that the flight of such aircraft without a pilot in regions open to civil aircraft shall be so controlled as to obviate danger to civil aircraft.*

This provision was originally established in 1944 with reference to pilotless rockets utilised during the second world war and, until some years ago, no specific objections have ever been raised in connection to such article. Only in 2003 was it clarified that a remotely piloted aircraft falls within the scope of article 8, as it is operated by a pilot located in a different place (eg, on the ground, or on board another aircraft) or through a totally autonomous system. As a consequence, according to the common implementation of the subject article, flying a remotely piloted aircraft requires a special national authorisation from the competent authorities of the airspace involved by the flight operations. Each country can establish its terms and conditions for the release of such authorisation. The consequence of the above is that the international community has now expressly recognised the inclusion of drones within the definition of aircraft.

In terms of liability issues, reference must be made to the Montreal Convention of 1999 (for the Unification of Certain Rules for International Carriage by Air). The criteria to apply the Montreal Convention to air transport are basically three: (i) it must have international character, so excluding domestic flights; (ii) it must be made by aircraft for reward, therefore for commercial purposes; and (iii) the aircraft must carry persons, baggage or cargo. In this context, even if drones are now considered a part of the large aircraft 'family', since at present very few international operations are performed with drones, the Montreal Convention seems to have limited application to such vehicles. Having said that, in light of the fast-growing use of drones in many economic activities – including, for instance, the transport of goods – nothing prevents the Montreal Convention becoming more relevant in the near future.

Similar considerations can be made for the Rome Convention of 1952 (on Damage caused by Foreign Aircraft to Third Parties on the Surface) in terms of current application to drones. According to the Convention, liability for compensation for damage caused to third parties belongs to the operator of the aircraft, even without proof of the operator's intent or negligence. Pursuant to article 1 of the Convention, 'any person who suffers damage on the surface shall, upon proof only that the damage was caused by an aircraft in flight . . . be entitled to compensation'. The Convention was drafted before widespread use of drones was envisaged. As it does not give a definition of the term aircraft, it may be presumed that the original definition of the Chicago Convention is applicable. The scope of the Rome Convention is essentially limited to certain international flights, since it governs only ground damage 'caused in the territory of a Contracting State by an aircraft registered in the territory of another Contracting State'. When damage has been caused by an aircraft registered in the state where the damage occurred, national law applies. If the aircraft that has caused the damage is not registered (as is often the case with drones), national law also applies. It follows that damage caused by drone operations in most cases does not fall within the purposes of the Rome Convention, since the operation of drones is normally a domestic matter rather than an international one – at least so far.

Air traffic management

At present there is no global and defined route for a 100 per cent safe integration of drones within non-controlled airspaces. One of the major problems is that there are no adequate technologies to track all drone users, nor are all systems equipped to transmit their identity and position to controlling stations. The exponential growth of drone operations is putting under pressure the efficiency of traditional air traffic management instruments. For this reason the industry is looking at innovative solutions to accomplish a transition towards a fully integrated air traffic system.

The challenges to be faced for a safe integration are even increased in respect of drones flown for complex operations, BVLOS and above crowds of people. For instance, autonomous drones flying beyond the horizon or over urban areas will need a dynamic link with airspace authorities and other aircraft, either manned or unmanned. To guarantee safe flights, both operators and controllers shall implement new procedures to assess and mitigate potential risks on the ground and in the air in relation to difficult missions.

The civil aviation authorities and air navigation service providers worldwide are working hard to allow smooth and harmless access of drones into low-flying airspace. As of 2018, many projects have been launched in this respect, from those aimed to set basic safety rules (especially in less developed countries) to others focusing on the implementation of connectivity tools for BVLOS operations (mainly in more industrialised areas).

Conclusions

We are currently witnessing rapid development in the use of drones throughout the world. When the first unmanned aircraft appeared on the market, their main use was related to hobby activities of private individuals. As a result, at that time, the regulatory needs were basically limited to liability, insurance and privacy issues strictly related to such private use. Nowadays the situation has significantly changed, since drones are utilised by several industries to accomplish a large number of aerial works, including medical activities, infrastructure monitoring, farming solutions, cargo and delivery services.

The dimension of the world market of commercial drones has been valued at almost US$6 billion in 2018. In the United States, the Federal Aviation Administration is expecting a huge growth of commercial drones in the medium term. According to recent studies, this market may treble by 2023, with a 170 per cent increase in the number of registered commercial drones (approximately 800,000 units in total). Furthermore, the 'recreational' market should include around 1.4. million model aircraft by 2023 as well. There are similar expectations in Europe, where it is foreseen that in the next 20 years the drone industry will directly employ more than 100,000 people and have an economic impact exceeding €10 billion per year, mainly in services.

In light of this continuously growing diffusion worldwide, the legal and regulatory framework is also in the process of being strengthened with detailed rules and procedures, aimed to cover any potential use of drones, both privately and for commercial purposes. With this in mind, we hope that this publication will serve as a preliminary guidance for any professional or private reader who may be willing to approach the world of drones and obtain an introductory picture of how this world is currently regulated by the competent authorities in different countries.

European Union

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EU drone regulation package

On 22 August 2018, Regulation (EU) 2018/1139 was published in the Official Journal of the European Union. This is generally known as the 'new' Basic Regulation as it replaced Regulation (EC) No. 216/2008 on common rules in the field of civil aviation. The new Basic Regulation came into force on 11 September 2018. It covers unmanned aircraft regardless of their operating mass. Therefore, the EU jurisdiction is now extended to all type of drones (either below or above 150kg operating mass). The scope of the new Basic Regulation is to establish common provisions applicable, among others, to the design, production, maintenance and operation of aircraft (including drones), as well as their engines, parts, non-installed equipment and equipment to control aircraft remotely, where the aircraft are: (i) registered in a member state; or (ii) registered in a third country and operated by an aircraft operator established in a member state; or (iii) unmanned aircraft neither registered in a member state nor in a third country and that are operated within the territory of the European Union.

According to recital 26 of Regulation (EU) 2018/1139:

> *Since unmanned aircraft also operate within the airspace alongside manned aircraft, this Regulation should cover unmanned aircraft, regardless of their operating mass. Technologies for unmanned aircraft now make possible a wide range of operations and those operations should be subject to rules that are proportionate to the risk of the particular operation or type of operations.*

Under Regulation (EU) 2018/1139 relevant definitions for drones are the following:

- 'unmanned aircraft' means any aircraft operating or designed to operate autonomously or to be piloted remotely without a pilot on board;
- 'remote pilot' means a natural person responsible for safely conducting the flight of an unmanned aircraft by operating its flight controls, either manually or, when the unmanned aircraft flies automatically, by monitoring its course and remaining able to intervene and change the course at any time; and
- 'equipment to control unmanned aircraft remotely' means any instrument, equipment, mechanism, apparatus, appurtenance, software or accessory that is necessary for the safe operation of an unmanned aircraft, which is not a part, and which is not carried on board that unmanned aircraft.

Pursuant to article 55 of the new Basic Regulation, the design, production, maintenance and operation of unmanned aircraft (and their engines, propellers, parts, non-installed equipment and equipment to control them remotely), as well as certification and registration duties, shall comply with the essential requirements set out in Annex IX. In particular, the essential requirements set out in Annex IX provide as follows.

Design

Unmanned aircraft must be designed and constructed so that they are fit for their intended function, and can be operated, adjusted and maintained without putting persons at risk.

If necessary to mitigate risks pertaining to safety, privacy, protection of personal data, security or the environment arising from the operation, unmanned aircraft must have specific functionalities that take into account the principles of privacy and protection of personal data by design and by default.

Production

The organisation responsible for the production or for the marketing of the unmanned aircraft must provide clear and consistent information to the operator of an unmanned aircraft or to the maintenance organisation on the kind of operations for which the unmanned aircraft is designed together with the limitations and information necessary for its safe operation, including operational and environmental performance, airworthiness limitations and emergency procedures.

Operations

The operator and the remote pilot of an unmanned aircraft must be aware of the applicable EU and national rules relating to the intended operations, in particular with regard to safety, privacy, data protection, liability, insurance, security and environmental protection.

The operator and the remote pilot must be able to ensure the safety of operation and safe separation of the unmanned aircraft from people on the ground and from other airspace users. This includes good knowledge of the operating instructions provided by the producer and of all relevant functionalities of the unmanned aircraft.

Registration

Without prejudice to obligations of member states under the Chicago Convention, unmanned aircraft the design of which is subject to certification (see below) shall be registered and marked by way of digital and harmonised national registration systems.

Operators of unmanned aircraft shall be registered if they operate any of the following unmanned aircraft:

- one that, in the case of impact, can transfer to a human kinetic energy above 80 joules;
- the operation of which presents risks to privacy, protection of personal data, security or the environment; and
- the design of which is subject to certification.

Certification

Taking into account the nature and risks of the activity concerned, the operational characteristics of the unmanned aircraft concerned and the characteristics of the area of operation, a certificate may be required for the design, production, maintenance and operation of unmanned aircraft.

If unmanned aircraft are subject to certification (see above), additional essential requirements are established. In particular.

Airworthiness

Unmanned aircraft must be designed in such a way that the safety of the person operating the unmanned aircraft or of third parties in the air or on the ground, including property, can be satisfactorily demonstrated.

Unmanned aircraft (including equipment) must function as intended under any foreseeable operating conditions, throughout, and sufficiently beyond, the operation for which the aircraft was designed.

Organisations involved in the design of unmanned aircraft must take precautions so as to minimise the hazards arising from conditions – both internal and external to the unmanned aircraft – that experience has shown to have a safety impact. This includes protection against interference by electronic means.

Organisation

Organisations involved in unmanned aircraft design, production, maintenance, operations, related services and training shall meet the following conditions:

- must have all the means necessary for the scope of its work;
- must implement and maintain a management system to ensure compliance with the relevant essential requirements, manage safety risks and aim for continuous improvement of this system. Such management system must be proportionate to the organisation's type of activity and size;
- must establish an occurrence reporting system, as part of the safety management system, to contribute to the continuous improvement of safety. Such reporting system must be proportionate to the organisation's type of activity and size;
- must establish arrangements, where relevant, with other organisations to ensure continuing compliance with the relevant essential requirements; and
- any person involved, including the remote pilot, shall possess the knowledge and skills necessary to ensure the safety of the operation and proportionate to the risk associated with the type of operation. This person shall also demonstrate medical fitness, if this is necessary to mitigate the risks involved in the operation concerned.

The essential requirements set out by Regulation (EU) 2018/1139 have established only a preliminary regulatory framework for drones within the European Union. Detailed provisions have been recently laid down by way of delegated and implementing acts adopted by the European Commission, on the basis of technical opinions released by the European Aviation Safety Agency (EASA) about the regulation of drones. The EASA has classified unmanned aircraft operations in three categories, taking into consideration the risks involved: open category (low risk); specific category (medium risk); certified category (high risk). This classification has been confirmed by the set of rules recently implemented by way of the mentioned EU Commission acts, namely: Delegated Regulation (EU) 2019/945 of 12 March 2019 on unmanned aircraft systems and on third-country operators of unmanned aircraft systems and Implementing Regulation (EU) 2019/947 of 24 May 2019 on the rules and procedures for the operation of unmanned aircraft. These Regulations came into force on 1 July 2019 but shall effectively apply in each member state from 1 July 2020.

Open category (low risk)

This category of operation that does not require a prior authorisation by the competent authority, nor a declaration by the operator before the operation takes place. Safety is ensured through operational limitations, compliance with industry standards, requirements on certain functionalities, and a minimum set of operational rules. Enforcement shall be ensured by the local authorities (eg, police).

In particular, the open category provides for a mandatory registration if the drone weight is more than 250 grams, visual line of sight operations only, maximum platform weight of 25kg, maximum altitude of 120 metres above ground level (except if flying over a fixed obstacle), limited flights over uninvolved people and prohibition to transport dangerous goods or to drop any material.

The open category is then further divided into three operational subcategories that allow different types of operations without the need for an authorisation, as follows:

- A1 (fly over people) – operations can be conducted only with low weight drones (less then 250g), basically those often defined as 'toy aircraft', so that risk of harm or injury to other people is very limited. Flights over open-air assemblies of people is in any case forbidden.
- A2 (fly close to people) – operations can be conducted only with drones up to 4kg weight that are compliant with specific product standards. The pilot must maintain the vehicle to a safe horizontal distance of 30 metres from uninvolved people and must have passed a competency examination before operating drones in this subcategory.
- A3 (fly far from people) – includes only operations that are conducted far from residential, commercial, industrial or recreational areas (often generally defined as 'congested areas').

Drones that are sold for operations within the open category will be subject to a set of product standards, comparable to the CE marking system for goods. In this respect, five classes of drones have been established (mainly based on the drone weight): C0 (can be flown in all subcategories); C1 (can be flown in all subcategories), C2 (can be flown in subcategories A2 and A3), C3 (can be flown in subcategory A3) and C4 (can be flown in subcategory A3). The full details of the product standards are laid down in the Annex to the Delegated Regulation (EU) 2019/945. Since drone manufacturers will need time to produce vehicles 100 per cent compliant with the new rules, some transitional provisions have been developed until 1 July 2022.

Specific category (medium risk)

This category of operation requires an authorisation by the competent authority following a risk assessment performed by the operator before the operation takes place, except for certain 'standard scenarios' for which a declaration by the operator is sufficient. A manual of operations shall list the risk mitigation measures. In the case of standard scenarios, the safety risk assessment has already been conducted by the EASA, or by the national Civil Aviation Authority, and, therefore, the drone operator must only comply with certain conditions and limitations provided by the authority for each specific scenario. Flight operations can be started once the authority has positively verified that the operator's declaration is accurate.

Standard scenarios will be published by the EU Commission as an Appendix to Implementing Regulation (EU) 2019/947.

Certified category (high risk)

Under this category of operation certification of the unmanned aircraft and its operator will be required, along with maintenance approval and licensing of the remote pilot. The certified category applies to drones with large dimensions (more than 3 metres) or engaged in the transport of dangerous goods or people. Being the most futuristic of the three categories, this category is strictly regulated and relevant rules are comparable to those applied to manned aviation.

Argentina

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GENERAL FRAMEWORK

Basic rules and regulators

1 What basic rules govern the operation of remotely piloted aircraft and unmanned aircraft (drones) in your jurisdiction? Which regulatory bodies are charged with enforcing these rules?

First of all, and for a better understanding, we must clarify that for Argentina a drone is not an aircraft. This means that, in principle, the provisions and principles of the aeronautical law do not apply completely to an unmanned air vehicle. Further, a member of a remote crew is the person that holds an authorisation of the National Administration of Civil Aviation (ANAC). This member is in charge of the remote control for the operation of the air vehicle remotely piloted during the term of the flight.

The basic rules that govern the operation are as follows:

- ANAC Resolution 457/2016;
- ANAC Resolution 368/2019 (Annex I);
- Ministry of Finance Resolution 40250/2016;
- Argentine Civil and Commercial Code (Law 26,994); and
- Argentine Aeronautical Code (Law 17,285 as amended).

ANAC has jurisdiction to enforce these rules, which are currently being revised.

2 What are the penalties for non-compliance with the laws and regulations governing drones?

Article 66 of Annex I of ANAC Resolution 368/2019 sets forth that ANAC is competent to supervise the compliance with the laws and regulations.

Although as stated in question 1, in Argentina a drone is not an aircraft, nevertheless, the aeronautical faults regime applies (Executive Decree 326/82 Regulatory of the Argentine Aeronautical Law).

Classification

3 Is there any distinction between public and private drones, as well as between leisure use and commercial use?

Yes, according to article 4 of ANAC Resolution 368/2019, there is a distinction between public and private drones and between leisure and commercial use:

- public drone: unmanned air vehicle designed for public service, including military and security forces;
- private drone: unmanned air vehicle that is not used for service to a public power, although the drone belongs to the state;
- leisure use: any type of activity where there is no intention of profit-making; and
- commercial use: any type of activity that includes remuneration for the service.

Also, Annex I of ANAC Resolution 368/2019 includes scientific and experimental use.

4 Is there a weight-based classification system for drones resulting in the application of different rules?

Yes, according to article 4 of ANAC Resolution 368/2019 there is a classification system based on a drone's weight, and different rules apply according to the type of operation and purposes:

- Class A: up to maximum certificated take-off weight (MCTW) 500g;
- Class B: between MCTW 501g and up to 5kg;
- Class C: more than MCTW 5kg empty and up to 150kg; and
- Class D: more than 150kg MCTW.

5 Is there any distinction between completely autonomous drones and remotely piloted drones?

Yes, there is a distinction between autonomous drones and remotely piloted drones.

Article 18 of Annex I of ANAC Resolution 368/2019 prohibits the operation of completely autonomous drones.

DESIGN AND MANUFACTURE

Regulation

6 Do specific rules regulate the design and manufacture of drones in your jurisdiction?

No, there is no specific rule to regulate the design and manufacture of drones.

Exceptionally, when drones are built by private individuals, they must be registered by their owners, after prior verification by ANAC that will determine, according to the information provided by the manufacturer, their MCTW categorisation.

Manufacturing authorisation

7 Must drone manufacturers obtain any licences or other authorisation to carry out their business? Are manufacturers subject to any other specific rules?

See question 6.

Product liability

8 Do general product liability rules (or other specific liability rules) apply to the manufacture of drones?

The Civil and Commercial Code in articles 1757 and 1758 establishes that every person is liable for damage caused by risk-prone or defective

items, for activities that are risky or dangerous by their very nature or by their realisation.

The responsibility is objective and unlimited. Administrative authorisation for the use of the item or the realisation of either the activity or compliance with the prevention measures is not exempt.

REGISTRATION AND IDENTIFICATION

Registration

9 Must drones be registered in a specific national registry? If so, who is entitled to register drones and what requirements and restrictions apply? Is the registry organised as an operator registry or an owner registry?

According to article 5 of Annex I of ANAC Resolution 368/2019, drones must be registered in a special registry that will be administered by the National Aircraft Registry, except for Class A and B drones for leisure purposes. Registration must be made by the owner.

Identification

10 Are drones identified through a marking system similar to that used for manned aircraft?

Yes, drones must be identified according to article 8 of Annex I of ANAC Resolution 368/2019.

Nevertheless, the Registry has not yet issued a ruling in this matter.

CERTIFICATION AND LICENSING

Basic requirements and procedures

11 What certificates or licences are required to operate drones and what procedures apply?

Article 30 of Annex I of ANAC Resolution 368/2019 sets forth that a drone operator who wants to operate commercially requires a CO-VANT certificate, which specifies the class of drone and the type of operation.

Also, article 46 of the aforementioned Resolution sets forth that anyone who wants to be a drone pilot needs a competence certificate, whose requirements are being of Argentine legal age, passing theoretical and practical training, and having medical certification.

Taxes and fees

12 Are certification and licensing procedures subject to any taxes or fees?

Articles 1 and 4 of ANAC Resolution 457/2019 set forth fees of 480 Argentine pesos for authorisation as a member of the remote tripulation and of 1,200 pesos for the authorisation of drone operation.

Eligibility

13 Who may apply for certifications and licences? Do any restrictions apply?

According to article 46 of Annex I of ANAC Resolution 368/2019, to obtain the certifications and licences the following requirements apply. One must:

- be of Argentine legal age;
- be able to read, speak and understand Spanish;
- possess a Class 4 aeronautical medical certification;
- have completed the instruction in a certified civil aeronautical instruction centre; and
- have passed a theoretical exam of basic aeronautical knowledge.

Remote pilot licences

14 Must remote pilots obtain any certifications or licences to operate drones? If so, do the relevant procedures differ based on the type of drone or operation?

Yes, remote pilots must obtain a certificate of competence under the same requirements that are listed in question 13.

Article 48 of Annex I of ANAC Resolution 368/2019 sets forth that the certificate of competence will allow the operation of B, C or D drone classes (fixed wing, rotating wing or aerostats).

Foreign operators

15 Are foreign operators authorised to fly drones in your jurisdiction? If so, what requirements and restrictions apply?

Yes, according to article 53 of Annex I of ANAC Resolution 368/2019, foreign operators are authorised to fly drones in Argentina.

If the foreign operator has a certificate of competence from its country, it must be filed with ANAC. The aforementioned authority will validate the certificate as long as it has been duly apostilled and translated into Spanish by an Argentine authorised translator. A foreign operator may also request an Argentine certificate following the requirements listed in question 13.

Certificate of airworthiness

16 Is a certificate of airworthiness required to operate drones? If so, what procedures apply?

According to article 9 of Annex I of ANAC Resolution 368/2019, the accreditation of an airworthiness certificate will not be required for the user of drones for their registration, but ANAC is empowered to follow the necessary verifications and request documentation that proves the airworthiness of Class C drones, all prior to its registration.

For the registration of Class D drones, ANAC will additionally require the existence of an official certification issued by the manufacturer that certifies the airworthiness status.

Class D drones manufactured in Argentina must have a certification issued by ANAC according to the rules of Part 21 of the Argentine Civil Aviation Regulations.

OPERATIONS AND MAINTENANCE

One drone, one pilot

17 Does the 'one drone, one pilot' rule apply in your jurisdiction?

Yes. Article 19 of ANAC Resolution 368/2019 establishes that simultaneous operation of more than one air vehicle by the same remote pilot station is prohibited.

Nevertheless, the aforementioned Resolution includes the figure of the observer, whose principal function is to assist the pilot in the operation.

Maintenance

18 Do specific rules regulate the maintenance of drones?

Every drone operator must ensure that the equipment involved in the operation is able to provide a safe flight. All drone operators must ensure that they comply with the preventive maintenance recommended by the manufacturer's manual.

Any user or drone operator of Classes B, C and D must perform preventive and corrective maintenance as well as all types of repairs in a maintenance organisation authorised by the manufacturer and confirmed by ANAC.

Basic operational rules and restrictions

19 | What rules and restrictions apply to flights performed in 'visual line of sight' (VLOS) and 'beyond visual line of sight' (BVLOS)? Is there a distinction in this regard?

Following article 10 of Annex I of ANAC Resolution 368/2019, the general rule is that a drone must operate under VLOS standards and, exceptionally, with an authorisation from ANAC, will be allowed BVLOS operations for commercial and scientific or experimental use.

20 | What rules and restrictions apply to critical and non-critical operations? Is there a distinction in this regard?

ANAC Resolution 368/2019 limits the operations of drones. One restriction refers to the prohibition of operating at night or with visual meteorological conditions that do not allow safe operation. In addition, several restrictions are established (eg, specified areas, heights, public safety). All restrictions may be waived by ANAC if there are reasonable arguments and the operator proves that certain risks will be mitigated by the adoption of relevant measures.

Transport operations

21 | Is air transport via drone (eg, cargo and mail) regulated in your jurisdiction? If so, what requirements, limitations and restrictions apply?

Yes, air transport via drone is regulated. To operate a drone for commercial purposes operators must obtain certification as a drone operator, which specifies the type of operation for which it is authorised and what kind of drone will be used. Cargo transportation can be operated with prior and express authorisation from ANAC. The transportation of people, animals and hazardous substances is prohibited.

22 | Do any specific provisions governing consumer protection and tracking systems apply with respect to cargo and delivery operations via drone?

No, there are no any specific provisions governing consumer protection that apply with respect to cargo and delivery operations via drones. In accordance with Law 24,240 as amended, if damage is committed by a drone, parties may use this legal framework to claim for damages. See question 8.

Insurance requirements

23 | What insurance requirements apply to the operation of drones?

Article 35 of ANAC Resolution 368/2019 establishes a mandatory insurance for drones operated for commercial activities.

Article 40 of ANAC Resolution 368/2019 sets forth that for drone operation for scientific and experimental proposes, mandatory insurance is required.

Article 27 of ANAC Resolution 368/2019 sets forth that drone Classes C and D that operate for leisure are also subject to mandatory insurance.

In the three cases mentioned above the amount of the premium must not be below 2,000 Argentine gold pesos. The Argentine gold peso is the currency used for the limitations of liability established by the Argentine Aeronautical Code. This currency, which is not currently used in Argentina, is quoted by the Argentine Central Bank.

Safety requirements

24 | What safety requirements apply to the operation of drones?

The main objective of ANAC is to achieve and maintain the highest uniform level of possible safety in the case of drones. This means ensuring the safety of airspace users as well as the safety of persons and goods on the ground.

According to article 13 of ANAC Resolution 368/2019, drones may not be operated above 43 metres from the ground within a controlled airspace. No drones can be operated within a radius of 5km of the geometric centre of the runway of an aerodrome. Exceptionally and whenever the nature of the operation so requires and appropriate safety measures are established, the Argentine Air Navigation Company (EANA) may grant special authorisation for operation in areas mentioned above.

For operation of drones in non-controlled airspace, see question 26.

AIRSPACE

Air traffic control

25 | How is air traffic control regulated in your jurisdiction? Which authority provides air traffic control services for drones?

In Argentina, air traffic control is regulated by EANA and state-owned entities are dependent on the Ministry of Transport.

There is no regulation that stipulates which authority provides air traffic control services for drones. Nevertheless, operation of drones that could interfere with aircraft falls under the control of EANA.

Restrictions

26 | Are there any airspace restrictions on the operation of drones?

Drones cannot be operated over densely populated areas or agglomerations of people. Exceptionally, ANAC may authorise such an operation for sport events, events of public interest and mass demonstrations or meetings of people in public spaces. However, any operator that intends to perform operations according to the conditions raised above should establish procedures to prevent the operation from endangering the safety of third parties on the ground and to coordinate these with EANA.

Also, above uncontrolled airspace, drones are limited to operate up to a maximum height of 122 metres above ground level, unless special authorisation has been obtained by ANAC.

In the case of non-controlled airspace, the chief of the aerodrome may authorise drone services.

Article 14 of ANAC Resolution 368/2019 sets forth a non-drone zone.

Article 15 of ANAC Resolution 368/2019 lists the specific requirements for the operation of drones as follows:

- in the approximation or climb on take-off from an aerodrome or heliport; except with specific approval of EANA or the aerodrome chief.
- at a distance less than 1km from the lateral limit of a corridor intended for operations according to Visual Flight Rules, except when a specific authorisation has been granted by EANA;
- at a distance less than 500 metres from the heliport reference point; except when authorisation by EANA has been granted;
- in controlled airspace, visual corridors and helicopters, established in the aeronautical information publications, provided prior special authorisation has been obtained from EANA;
- in areas that are prohibited, restricted or dangerous, as established in the aeronautical information publications. In this airspace an authorisation may be granted by EANA for the following reasons: public safety, humanitarian, natural disasters;
- on security facilities, distilleries, flammable tanks, atomic and hydroelectric power plants and facilities for the processing or handling of explosives or radioactive materials;

- on military installations, or at a lateral distance of less than 5km of such facilities;
- when the Air Defence Identification Zone is activated; and
- from a moving vehicle and during acrobatics manoeuvres.

ANAC has the power to exceptionally authorise the operation of drones over restricted areas, and to include more restrictions in the future.

Take-off and landing

27 | Must take-off and landing of drones take place in specific areas or facilities?

See question 26.

LIABILITY AND ACCIDENTS

Cargo liability

28 | Are there any specific rules governing the liability of drones for losses or damage to cargo?

No, there are no specific rules that govern the liability of drones for losses or damage to cargo.

Nevertheless, the general rules of liability of the Civil and Commercial Code will apply to any loss or damage (see question 8).

Third-party liability

29 | Are there any specific rules governing the liability of drones for damage to third parties on the surface or in the air?

Since there are no specific rules that provide a mandatory provision for insurance for third parties on the ground, the liability rules of the Civil and Commercial Code will be applicable in case of damage by drones to third parties on the ground. As an example in 2015 in Buenos Aires, a drone fell on the head of a passer-by and the operator was detained by the police, in violation of article 94 of the Argentine Criminal Code, which imposes a penalty of one month to three years in prison or fines of 1,000 to 15,000 pesos and disqualification between one and four years for those who cause injuries due to recklessness or negligence, for lack of skill in their art or profession, or for non-observance of regulations or duties in their position.

Accident investigations

30 | How are investigations of air accidents involving drones regulated in your jurisdiction?

Investigations of air accidents involving drones are not regulated in this jurisdiction.

Nevertheless, following the ICAO Convention, the Accidents Investigation Board that answers to the Ministry of Transport is in charge of determining the cause of accidents and incidents to or produced by aircraft.

Accident reporting

31 | Is there a mandatory accident and incident reporting system for drone operators in your jurisdiction?

Article 65 of ANAC Resolution 368/2019 sets forth that drone operators or pilots are responsible for notifying the nearest authority of any accident or incident.

Safety management and risk assessment

32 | Are drone operators required to implement safety management systems and risk assessment procedures within their organisation?

Pursuant to article 33 of ANAC Resolution 368/2019, drone operators should have a manual of operations and an adequate risk management system to operate, which includes the information and instructions necessary for safe operation and must include at least the following procedures:

- take-off and landing;
- route;
- to abort a critical system in the case of failure;
- in case of loss with data link;
- to evaluate the area of operation; and
- for the identification of potential risks and hazards and for their mitigation.

ANCILLARY CONSIDERATIONS

Import and export control

33 | Do specific import and export control rules apply to drones in your jurisdiction?

Regarding the import and export of drones, for the purposes of determining the taxes and fees that have to be paid, the technical specifications of the drone must be taken into account to determine the tariff position.

Argentine Customs can determine the tariff classification of a drone for example, as being a mobile camera, a toy or an unmanned vehicle.

It is necessary to specify if it is a temporary or definitive import. In the first case, those who want to import a drone have to explain the temporary nature of the work and the lack of similar tools in Argentina.

For definitive imports, there is no clear provision so drones will fall under consideration of the Argentine Customs tariff classification, and consequently the applicable tax.

Data privacy and IP protection

34 | How are personal data privacy and IP protection regulated in your country with specific reference to drone operations?

Drones with the capacity to carry out surveys with image sensors, magnetic prospecting or of any other type are subject to compliance with the regulations established in Law 25,326 on Data Protection.

In principle, this Law indicates that the collection of data will be legal if it is done with the consent of the data owner as provided for in articles 5 (consent) and 6 (prior information). Also, Law 25,326 determines the exceptions to the requirement of consent, and these are:

- those collected in a public act for public dissemination;
- in a private act, by its organiser and according to customary use;
- operations performed exercising the functions of the state;
- in the case of disasters or emergencies; and
- when collected in a property for own use, without invading the privacy of third parties.

UPDATE AND TRENDS

Sector trends and regulatory developments

35 Which industry sectors have seen the most development in the use of drones in your jurisdiction and which sectors are expected to see further development in future? Have there been any notable recent regulatory developments relating to drones?

The sector of industry that has seen the most development in the use of drones in Argentina is agriculture.

In 2015, the National Institute of Agricultural Technology, which reports to the Secretary of Agribusiness, began a round of conferences and training throughout the country for the implementation of drones in agricultural activities.

They are also being increasingly used for eisure and activities related to sports and media. The Argentine government has expressed the desire to implement delivery of food and medicines in marginalised areas with difficult access and far from the big cities.

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GENERAL FRAMEWORK

Basic rules and regulators

1 What basic rules govern the operation of remotely piloted aircraft and unmanned aircraft (drones) in your jurisdiction? Which regulatory bodies are charged with enforcing these rules?

The Civil Aviation Act 1988 (Cth) and subordinate legislation regulates civil aircraft operations in Australia. Specific rules and regulations for unmanned aircraft are contained in Part 101 of the Civil Aviation Safety Regulations 1998 (CASR). Pursuant to CASR101.028, the Civil Aviation Safety Authority (CASA) has also issued the Part 101 (Unmanned Aircraft and Rockets) Manual of Standards 2019 implementing certain standards in relation to the safety and regulatory oversight of remotely piloted aircraft (RPA).

There are changes to the requirements contained in the Civil Aviation Safety Amendment (Remotely Piloted Aircraft and Model Aircraft – Registration and Accreditation) Regulations 2019 (the 2019 Amendment Regulations) primarily relating to registration and accreditation, with the majority of changes to take effect between November 2019 and May 2020.

It is also important to note that Part 101 regulates all forms of unmanned aircraft including RPA (more commonly referred to as 'drones'), unmanned balloons, rocket-powered unmanned aircraft and model aircraft). For the purposes of this chapter, we have focused on the regulations applicable to RPA.

CASA is a Commonwealth government body that regulates Australian aviation safety and is the safety regulator responsible for RPA.

2 What are the penalties for non-compliance with the laws and regulations governing drones?

The offences outlined in the CASR are offences of strict liability, as defined in the Criminal Code Act 1995. Offences for non-compliance with the safety regulations are measured by penalty units that, under the Crimes Act 1914 (Cth), means an amount of A$210 per unit.

Although fines are the most common form of penalty for non-compliance, there may be other offences that an individual commits if they are non-compliant with the regulations. For example, it is an offence to operate an RPA in a way that creates a hazard to another aircraft, another person or property (CASR101.055). The maximum fine that a court could impose for contravention of this regulation is 50 penalty units. However, the Civil Aviation Act 1988, the Aviation Transport Security Act 2004 and aviation security regulations also contain criminal offences for interference with the safe conduct of air transport or reckless flying, which may apply and may result in imprisonment.

Classification

3 Is there any distinction between public and private drones, as well as between leisure use and commercial use?

Yes. The regulations distinguish between state and civil aircraft as well as between commercial and recreational use.

RPA operated by the Australian Defence Force would fall under the definition contained in the Civil Aviation Act 1988 of 'state aircraft' and, as such, are subject to the Defence Aviation Safety Regulations.

Civil (that is, non-state-owned) RPA are subject to the CASR, with differing regulatory requirements applicable depending on weight and whether or not the use is:

- recreational, which means only for the pleasure, leisure or enjoyment of the remote pilot and which does not generate a direct commercial outcome of any sort for the pilot or any third party; and
- commercial, which means the RPA is operated for hire or reward.

4 Is there a weight-based classification system for drones resulting in the application of different rules?

Yes. The weight of RPA is largely determinative of the rules that will apply, in particular whether the RPA is 'excluded' from a substantial amount of the safety regulations. The safety regulations work on the basis that what is not expressly excluded is to be considered as included and subject to the full suite of safety regulations. On this basis, RPA are separated into the following weight categories.

Micro: gross weight of 100g or less (this will be amended to 250g under the 2019 Amendment Regulations)
Micro RPA operations are currently categorised as excluded RPA operations, requiring neither an RPA operator's certificate nor remote pilot licence. However, these operations are subject to operating conditions. It is important to note that under the 2019 Amendment Regulations, micro RPA will not be considered 'excluded RPA' but will be covered by a new subpart 101FA of the CASR that applies to excluded RPA, micro RPA and model aircraft.

Very small: gross weight of more than 100g and less than 2kg (this will be amended to gross weight of more than 250g, but no more than 2kg under the 2019 Amendment Regulations)
Currently, when operated for recreational purposes or specific training purposes under the CASR or for commercial purposes in accordance with the standard operating conditions, very small RPA are treated as excluded RPA.

All other operations of very small RPA outside these exceptions or outside the standard operating conditions require a RPA operator's certificate for the operator and a remote pilot's licence for the pilot.

Small: gross weight of at least 2kg and less than 25kg

Currently, if small RPA are being used for sport or recreational or specific training or competency purposes under the CASR, they are considered to be excluded RPA. A small RPA being used for certain purposes stated in the CASR (ie, aerial spotting or aerial photography), over land owned or occupied by the owner of the RPA, to standard operating conditions specified by CASA without remuneration, are also considered to be an excluded RPA.

All other operations of small RPA outside these exceptions or outside the standard operating conditions require an RPA operator's certificate for the operator and a remote pilot's licence for the pilot.

Medium: gross weight of at least 25kg but no more than 150kg (or, for airships, an envelope capacity of 100m³ or less)

Currently, medium RPA that are used for sport or recreational or specific training or competency purposes under the CASR are considered to be excluded RPA. A medium RPA being used for certain purposes stated in the CASR (ie, aerial spotting or aerial photography), over land owned or occupied by the owner of the RPA, to standard operating conditions specified by CASA without remuneration and the person operating the RPA holds a remote pilot's licence, is also considered to be an excluded RPA.

Currently, the only difference from the small RPA class is that for medium RPA flown under the above-mentioned requirements, the remote pilot must also hold a remote pilot's licence.

The 2019 Amendment Regulations will affect the RPA categories above by changing some of the factors that classify certain RPA as excluded RPA. Further, the amendments will require a person who operates an excluded RPA, micro RPA or model aircraft to obtain accreditation or hold a remote pilot's licence.

Large: gross weight greater than 150kg (or for airships, more than a 100m³ envelope capacity)

Large RPA are considered to be 'included' RPA, even if operated for sport or recreation, and as such are regulated by the additional provisions for RPA (subpart 101.F). To operate a large RPA the operator must hold an RPA operator's certificate and the pilot must hold a remote pilot's licence, and a person may operate a large RPA only with CASA's approval (CASR101.275).

Currently, CASA also requires that the operator of a large RPA register the RPA.

5 | Is there any distinction between completely autonomous drones and remotely piloted drones?

Yes there is. RPAs are piloted by a remote pilot (who is not on board) who manipulates the flight controls of an RPA, or who initiates and monitors the flight, and is responsible for its safe conduct during flight time. The focus of the regulations is currently on RPA operations.

Autonomous aircraft are unmanned aircraft that do not allow pilot intervention during all stages of the flight. Under CASR101.097, approval is required from CASA before an autonomous aircraft is launched or released.

DESIGN AND MANUFACTURE

Regulation

6 | Do specific rules regulate the design and manufacture of drones in your jurisdiction?

Yes, but only for large RPA. A person may only operate a large RPA if an experimental certificate or a special certificate of airworthiness (restricted category) has been issued under CASR101.255.

Special certificates of airworthiness, such as experimental certificates, are issued to permit the operation of aircraft that do not meet the requirements of Annex 8, Airworthiness of Aircraft, to the Chicago Convention, but are capable of safe operations under defined operating conditions and purposes. Experimental certificates of airworthiness are generally limited in duration and are not intended to be used as a permanent operating category for commercial operations.

A restricted certificate of airworthiness can be issued if the RPA has been type certified in the restricted category (CASR 21.185).

Manufacturing authorisation

7 | Must drone manufacturers obtain any licences or other authorisation to carry out their business? Are manufacturers subject to any other specific rules?

There are general rules such as those provided under the Australian Competition and Consumer Act 2010 (Cth) that relate to manufacturers (discussed in question 8).

Product liability

8 | Do general product liability rules (or other specific liability rules) apply to the manufacture of drones?

The liability provisions of the Australian Consumer Law (ACL) (contained in Schedule 2 of the Competition and Consumer Act 2010 (Cth)) generally apply to a manufacturer that supplies consumer goods in trade or commerce. Under the ACL, any supply of goods to a person is a supply to a 'consumer' if either the price payable for the goods does not exceed A$40,000 or the goods are of a kind ordinarily acquired for personal, domestic or household use or consumption. The majority of RPA available on the market – either for recreational or commercial operations – would likely fall within these criteria and therefore the manufacturer would be bound by the consumer guarantee provisions of the ACL. This includes but is not limited to the guarantee as to acceptable quality, the guarantee to supply by description and the guarantee as to repairs and spare parts.

The product liability provisions of the ACL give consumers a right to seek compensation from a manufacturer who has supplied a product with safety defects if that product has caused loss or damage.

In addition to the product liability provisions in the ACL, people who have been injured, or who have otherwise sustained loss or damage, may have common law rights of action.

REGISTRATION AND IDENTIFICATION

Registration

9 | Must drones be registered in a specific national registry? If so, who is entitled to register drones and what requirements and restrictions apply? Is the registry organised as an operator registry or an owner registry?

Currently, CASA requires only operators of large RPA to register their aircraft under Part 47 of the CASR.

The 2019 Amendment Regulations extend the requirement for registration under a broad new CASR 47.096 to micro RPA, very small RPA, small RPA, medium RPA and model aircraft. This provision does not apply to an RPA that is prescribed by an instrument for the purposes of this new CASR. CASA may issue such an instrument prescribing classes of RPA below 'medium' weight that may be excluded for the purposes of registration. There has not yet been any instrument issued by CASA exempting certain classes of RPA from this new CASR.

Identification

10 | Are drones identified through a marking system similar to that used for manned aircraft?

Only large RPA are currently required to carry a manufacturer's data plate and an aircraft registration identification plate (CASR 101.015 and 21.820).

CERTIFICATION AND LICENSING

Basic requirements and procedures

11 | What certificates or licences are required to operate drones and what procedures apply?

Certification and licensing requirements for RPA operations are affected by the purpose of operation and the size of the RPA as outlined in question 4.

Currently, pilots of RPA used for commercial operations that are not excluded RPA (see question 4) require a remote pilot's licence. This licence is the individual pilot's permission to fly and the holder of such a licence will need to be employed by someone who holds an RPA operator's certificate (ReOC), which is similar to an air operator's certificate (AOC) for traditional aviation operations. Like the AOC, a ReOC authorises the holder to conduct included (most commercial) operations using the types of RPA and under the conditions endorsed on the certificate.

A ReOC is required for any operation that is not an excluded RPA operation.

As mentioned in question 4, the 2019 Amendment Regulations will introduce changes requiring a person who operates an excluded RPA, micro RPA or model aircraft to obtain accreditation or hold a remote pilot's licence.

Taxes and fees

12 | Are certification and licensing procedures subject to any taxes or fees?

To obtain a remote pilot's licence, individuals must pay for a training course, and pay a nominal application fee. To obtain an ReOC, applicants must pay a nominal application fee to attain the certificate, which will be initially valid for 12 months.

Registration of RPA is subject to a nominal registration fee.

Eligibility

13 | Who may apply for certifications and licences? Do any restrictions apply?

A person is eligible to be certified as an RPA operator provided there exist:

- an organisation and structure that is appropriate for the safe operation of RPA;
- enough qualified and experienced personnel to undertake the proposed operation safely;
- facilities and equipment appropriate to carry out the proposed operations using RPA of the type to be used;
- suitable documented practices and procedures to carry out the operations, including practices and procedures for the maintenance of the operator's RPA; and
- nominated suitable persons to be chief remote pilot and maintenance controller.

Only a legal person can be certified as an RPA operator and two or more persons cannot jointly be certified as an RPA operator.

To be eligible for a remote pilot's licence, the applicant will be categorised as either having no aeronautical qualifications or previous aeronautical qualifications. Generally, an applicant with no aeronautical qualifications must have passed aeronautical knowledge theory exams, undergone practical RPA training, pass a practical test and gain at least five hours of flight experience.

Remote pilot licences

14 | Must remote pilots obtain any certifications or licences to operate drones? If so, do the relevant procedures differ based on the type of drone or operation?

Remote pilots must obtain licensing and certifications to operate drones as provided in questions 11 and 13.

Foreign operators

15 | Are foreign operators authorised to fly drones in your jurisdiction? If so, what requirements and restrictions apply?

International operators may be authorised to fly if they are able to provide the following information to CASA:

- a comprehensive description of the planned operations;
- details of the aircraft to be flown (ie, the performance characteristics);
- a copy of the company operations manual and the flight and maintenance manual for the aircraft;
- a copy of the risk assessment for the event, based on ISO 31000 principles;
- a copy of the remote pilot's and operator's RPA credentials; and
- any national aviation authority approvals that permitted the mission in that authority's jurisdiction.

CASA will conduct strict verification of international operators before any operations are conducted in Australian territory.

Certificate of airworthiness

16 | Is a certificate of airworthiness required to operate drones? If so, what procedures apply?

Certificates of airworthiness are currently only required for large RPA as detailed in question 6.

OPERATIONS AND MAINTENANCE

One drone, one pilot

17 | Does the 'one drone, one pilot' rule apply in your jurisdiction?

Yes – only one RPA may be flown per pilot unless he or she holds approval from CASA to operate more than one RPA at a time and the conditions imposed on the approval are complied with (CASR101.300(5)).

Maintenance

18 | Do specific rules regulate the maintenance of drones?

A ReOC holder must appoint a maintenance controller and have maintenance manuals for all RPA it operates. The maintenance controller has the following functions and duties:

- ensuring that all maintenance carried out on the operator's RPA is carried out in accordance with the operator's approved documented procedures;
- ensuring the personnel carrying out maintenance for the operator are competent to do so;
- maintaining a record of the serviceability or otherwise of the operator's RPA systems;
- ensuring that each item of equipment essential to the operation of the operator's RPA is serviceable;

- maintaining a thorough technical knowledge of the operator's RPA systems; and
- investigating all defects in the operator's RPA systems.

In addition, large RPA must be maintained in accordance with Part 4A of Civil Aviation Regulations. The registration holder for a Class B experimental aircraft must maintain the aircraft in accordance with any conditions noted on the experimental certificate. A person who carries out maintenance on a large RPA must comply with any directions given in writing by CASA in relation to the maintenance of the RPA, or the maintenance of RPA of a class that includes the RPA (CASR101.260).

Basic operational rules and restrictions

19 What rules and restrictions apply to flights performed in 'visual line of sight' (VLOS) and 'beyond visual line of sight' (BVLOS)? Is there a distinction in this regard?

Operating conditions which apply to RPA operations require that an RPA is to be operated only by VLOS of the person operating the RPA. This means that the remote pilot must be able to continually see, orient and navigate the aircraft to meet their separate collision avoidance responsibilities, with or without corrective lenses, but without the use of binoculars, a telescope or other similar device. Meteorological conditions must permit unaided visibility of the RPA, the surrounding airspace and the ground beneath so that the remote pilot can avoid collisions and infringements of the regulations.

Under CASR 101.073, the rule for VLOS above does not apply if a person holds an approval from CASA to operate beyond BVLOS and the conditions imposed on the approval are complied with. Furthermore, there are several requirements under CASR101.300 pertaining to remote pilots that must be complied with for BVLOS operations.

BVLOS operations (ie, operations in which the pilot does not have direct visual contact with the aircraft) are not routinely permitted.

In 2019, the Part 101 (Unmanned Aircraft and Rockets) Manual of Standards 2019 was published and provides the extensive and prescriptive requirements for approval for extended visual line of sight (EVLOS) operations, which must be complied with.

In particular, Chapter 5 of the Manual of Standards provides that the chapter applies for RPA operations conducted by a certified RPA operator and lists the requirements for the grant of an approval by CASA and includes extensive requirements for a remote pilot to satisfy prior to conducting any EVLOS operations.

20 What rules and restrictions apply to critical and non-critical operations? Is there a distinction in this regard?

There is currently no distinction between critical and non-critical operations. The standard operating conditions require that an RPA is operated during daytime only. CASA may issue a general approval for the operation of RPA at night for RPA operator certificate holders.

Transport operations

21 Is air transport via drone (eg, cargo and mail) regulated in your jurisdiction? If so, what requirements, limitations and restrictions apply?

Transportation operations conducted by RPA are regulated by the same regime discussed in other questions that applies to commercial RPA operations. There are exemptions or approvals that may be applied for from CASA for certain operations.

Currently, a delivery RPA is able to transport small 'just-in-time' supplies to someone within approximately 10km of the base station. This might include food, medicine, or even small items of hardware. A prominent operation in Australia that was granted certain exemptions or approvals was Project Wing, which required a safety case to be submitted to CASA as part of the application process.

22 Do any specific provisions governing consumer protection and tracking systems apply with respect to cargo and delivery operations via drone?

The ACL imposes minimum standards in relation to services provided to consumers. The ACL service standard guarantees will apply to RPA delivery services to consumers.

Under the ACL a minister for the Commonwealth is empowered to issue specific safety standards relating to methods of delivery services. If a supplier contravenes the published safety standards, they may be subject to a penalty and held responsible for any loss suffered following the contravention (ACL section 107). Alternatively, the Commonwealth minister may issue an Information Standard, or declare an Information Standard, contravention of which will also attract a penalty under section 136.

At this time, no ministerial safety standard has been issued with respect to RPA delivery.

Insurance requirements

23 What insurance requirements apply to the operation of drones?

Insurance is not currently compulsory under legislation for RPA operators although CASA strongly advises that RPA operators speak to insurers about their potential liability and to consider whether they will need insurance.

Safety requirements

24 What safety requirements apply to the operation of drones?

In addition to the safety requirements contained in the CASR, a job safety assessment is required for certain RPA by a certified RPA operator. The job safety assessments takes place in accordance with the RPA operator's documents and procedures and requires the identification of safety risks, formulating risk mitigation measures and risk management plans for the operation.

AIRSPACE

Air traffic control

25 How is air traffic control regulated in your jurisdiction? Which authority provides air traffic control services for drones?

Air traffic control services are conducted by Airservices Australia. For the purposes of providing air traffic services, Airservices Australia may give instructions to aircraft concerning the use of controlled aerodromes or certain classes of airspace. These instructions must first be published in the Aeronautical Information Publications (AIPs) or by way of a Notice to Airmen (NOTAM). RPA may only be flown in CASA approved areas, which are published in NOTAM and AIPs as an aeronautical chart. An operator of an RPA may apply to CASA to get another area approved for the operation of unmanned aircraft of the same kind as the aircraft and in accordance with any conditions of the approval (CASR101.030).

Restrictions

26 | Are there any airspace restrictions on the operation of drones?

Airspace restrictions apply to both excluded and included RPA; however, there are exemptions available to included RPA to allow for a greater use of airspace. The standard operating conditions provide that an RPA:

- must not be operated higher than 400ft above the ground. A person may operate an RPA above this level in controlled airspace only if they have been approved by CASA and in accordance with an air traffic control clearance (CASR101.070);
- must not be operated over or near an area affecting public safety or where emergency operations are under way;
- must not be operated within 30 metres of a person who is not directly associated with the operation of the RPA;
- must not be operated over or above populous areas. In respect of RPA operations, 'populous' does not have its common meaning; rather, it is defined in the regulations as: 'an area [that] has a sufficient density of population for some aspect of the operation, or some event that might happen during the operation (in particular, a fault in, or failure of, the aircraft. . .) to pose an unreasonable risk to the life, safety or property of somebody who is in the area but is not connected with the operation';
- must not be operated in prohibited or restricted areas. A prohibited area is an area of airspace where the operation of all civil aircraft is prohibited. Restricted areas are prescribed areas of airspace, either temporary or permanent, in which flight may be permitted, but only with the express permission of the controlling authority for that area; and
- must not be operated within a certain distance of controlled aerodromes.

RPA pilots and operators are also able to consult a service available as a safety app entitled Open Sky, which informs fliers as to where and when they are able to lawfully fly. This initiative, produced by Wing Aviation LLC, is the first major development in CASA's digital platform that was introduced following the retirement of its earlier Can I fly there? app.

Take-off and landing

27 | Must take-off and landing of drones take place in specific areas or facilities?

The take-off and landing of RPA are subject to operating conditions under the CASR.

Certain local councils have also introduced ordinances restricting the operation of RPA on council land. In addition, use of RPA is also restricted in national parks and other nature reserves.

LIABILITY AND ACCIDENTS

Cargo liability

28 | Are there any specific rules governing the liability of drones for losses or damage to cargo?

There are no specific legislative provisions applying to liability of RPA operators for cargo. Cargo RPA operations would be subject to the more general liability provisions of the ACL, and therefore attract the guarantee provisions if the services are provided to consumers.

Third-party liability

29 | Are there any specific rules governing the liability of drones for damage to third parties on the surface or in the air?

Statutory liability schemes apply throughout Australia to impose strict and unlimited liability on aircraft operators – and, in certain circumstances, aircraft owners – for damage caused by aircraft to persons or property on the ground. The liability regime is based on the Damage by Aircraft Act 1999 (Cth).

Owing to Constitutional limitations, the Act only applies to aircraft on international or interstate flights, flights from Commonwealth land, and aircraft owned by corporations. 'Aircraft' is given the same meaning as in the Civil Aviation Act, but excludes model aircraft. Accordingly, an RPA being used for a purpose other than sport or recreation is within the definition of an 'aircraft' in the Commonwealth Act. However, if an RPA is not owned by a corporation, not operated on an international or interstate flight and is not flown from Commonwealth land, then the Damage by Aircraft Act (Cth) does not apply.

There are additional State Acts that also apply strict and unlimited liability. For example, there are states, such as Victoria, that do not define aircraft at all and whether the Commonwealth definition of 'aircraft' might be adopted in those states is unclear. The legislation in those states adopts the Commonwealth Air Navigation Regulations and the definition of 'aircraft' under the Air Navigation Act 1920 does not expressly exclude model aircraft.

The key point of difference to make is that these State Acts will apply to individuals.

The strict and unlimited liability regime applies to any personal injury or property damage caused on the ground by an RPA. This includes direct and indirect property damage.

If an RPA collides with someone or something on the ground, pursuant to the Damage by Aircraft Act (Cth) the operator and owner of the RPA will be liable for any injury or damage, irrespective of the cause. This is the case even if, for example, there was a malfunction caused by a defect in design.

Accident investigations

30 | How are investigations of air accidents involving drones regulated in your jurisdiction?

The Australian Transport Safety Bureau (ATSB) is an independent Commonwealth government statutory agency responsible for investigating accidents and other transport safety matters involving civil aviation and, therefore, including RPA. The ATSB performs its functions in accordance with the provisions of the Transport Safety Investigation Act 2003, which sets out the procedures relevant to investigating air accidents.

Accident reporting

31 | Is there a mandatory accident and incident reporting system for drone operators in your jurisdiction?

Notification of accidents and serious incidents must be given immediately to the ATSB in accordance with the Transport Safety Investigation Act 2003. Written notifications must be submitted within 72 hours of an accident, serious incident or incident, in accordance with the Act.

Safety management and risk assessment

32 Are drone operators required to implement safety management systems and risk assessment procedures within their organisation?

Applicants for RPA operator's certificates must have suitable documents, practices and procedures, and an organisation and structure that is appropriate for the safe operation of RPA to be eligible for certification as an RPA operator (CASR101.330). In addition, when applying to CASA for an exemption to the standard operating conditions (seeking approval for specialised operations), a thorough and specific operation risk assessment is required.

Currently only operators of large RPA are required to develop and implement a drug and alcohol management plan.

ANCILLARY CONSIDERATIONS

Import and export control

33 Do specific import and export control rules apply to drones in your jurisdiction?

There are no RPA specific import and export control rules that apply in Australia. This position may change, however, as Recommendation 7 of the Senate Rural and Regional Affairs and Transport References Committee's Report recommended that the Australian government develop import controls to enforce airworthiness standards for foreign manufactured RPA systems.

Data privacy and IP protection

34 How are personal data privacy and IP protection regulated in your country with specific reference to drone operations?

Personal data privacy

Privacy law in Australia and its applicability to RPA operations is not clear and is complex. Privacy rights in the fast-growing RPA industry are a primary concern to the public where RPA operate in low altitude airspace.

At the Commonwealth level, there is the Privacy Act 1988, which deals with personal information collected and how that information must be handled, used and disclosed in accordance with certain privacy principles. Section 13(1)(a) of the Act states that an act or practice of an entity to which the Privacy Act applies is an interference with the privacy of an individual if that entity's act or practice breaches an Australian Privacy Principle in relation to personal information about the individual. Does this apply to RPA operators? As a general summary, the Privacy Act applies to government agencies or many organisations that meet a certain threshold. For organisations, that threshold is an annual turnover of A$3 million or more. Small businesses and hobbyists are, therefore, generally exempt from the Act, except in certain circumstances. This may include where a small business discloses personal information about another individual to anyone else for a benefit, service or advantage.

The concept of 'personal information' under the Act is broad and is technologically neutral to ensure sufficient flexibility to encompass changes in information-handling practices over time and, as such, it will affect RPA operations.

At the state level, there is a matrix of legislation in some states and territories for the regulation of the use of surveillance devices. There is potential for the use of surveillance equipment (or 'optical surveillance devices') attached to RPA to be captured by this legislation and, if not complied with, potentially be in breach of surveillance legislation.

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IP protection

Although no specific regulation exists in relation to RPA operations and intellectual property, video footage and photographs captured by an RPA will be protected by the general copyright law framework in Australia. The crux of this framework, the Copyright Act 1968 (Cth), separates these two forms of material. In relation to video footage, labelled 'cinematograph films', copyright subsists in the exclusive right to do any or all of the following:

- to make a copy of the film;
- to cause the film, insofar as it consists of visual images, to be seen in public, or, insofar as it consists of sounds, to be heard in public; and
- to communicate the film to the public.

Photographs on the other hand, being considered 'artistic works' for the purposes of the Copyright Act, grant to their author the exclusive right:

- to reproduce the work in a material form (including photocopying, scanning or printing the work);
- to publish the work; and
- to communicate the work to the public.

The owner of a photograph, and hence the entity upon whom copyright is bestowed, is the party that, at the time when the photograph was taken, was the owner of the material of which the photograph was taken (section 208 Copyright Act).

UPDATE AND TRENDS

Sector trends and regulatory developments

35 Which industry sectors have seen the most development in the use of drones in your jurisdiction and which sectors are expected to see further development in future? Have there been any notable recent regulatory developments relating to drones?

Industry estimates provided to CASA in 2018 suggested that there are well in excess of 150,000 RPA in Australia, a figure that would have undoubtedly grown further over the past few months.

Most notably in Australia, the advent of the Google-backed Project Wing delivery operations, which earlier this year conducted delivery trials to parts of suburban Canberra, has been significant. The success of Project Wing's early stages is likely to encourage further development in the area of goods transportation.

RPA usage in real estate has also expanded in recent years, serving as a tool for property sales and marketing through aerial photography and video, as has RPA usage in emergency response.

To date, CASA has been one of the most forward-acting regulators in the world in this space and has proactively regulated and deregulated RPA in Australia. The 2019 Amendment Regulations are the most recent changes to the regulatory regime applicable to RPA.

Brazil

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GENERAL FRAMEWORK

Basic rules and regulators

1 | What basic rules govern the operation of remotely piloted aircraft and unmanned aircraft (drones) in your jurisdiction? Which regulatory bodies are charged with enforcing these rules?

Drone is a popular name used for remotely piloted aircraft (RPA). The principal rule over the subject is RBAC-E 94 issued by the Brazilian National Civil Aviation Agency (ANAC) in May 2017, which expressly regulates the requirements for unmanned aircraft for civil use. General laws such as the Brazilian Aeronautical Code (Brazilian Law 7.565 of 1986) and criminal, civil and administrative laws in Brazil (principally regulating personal inviolability and personal image) should also be observed. Local rules and guidance issued by the Brazilian National Telecommunications Agency (ANATEL) and the Air Space Control Department (DECEA) must be observed as well. Military use of drones is not subject to RBAC-E94 but to DECEA rules only.

2 | What are the penalties for non-compliance with the laws and regulations governing drones?

The same penalties applicable to general aviation are applicable to the use and operation of drones as they are considered aircraft. General administrative penalties listed in the Brazilian Aeronautical Code and other administrative penalties issued by ANAC, DECEA and ANATEL apply to the use and operation of drones. Illegal operations can be typified in the Brazilian Law of Penal Violations or in articles 261 and 132 of the Brazilian Penal Code where penalties vary from custodial sentences to imprisonment from two to five years.

Classification

3 | Is there any distinction between public and private drones, as well as between leisure use and commercial use?

Yes. Public drones are considered for military use or any state authority and are not subject to the RBAC-E 94 issued by ANAC but only to DECEA's rules. The RBAC-E 94 applies only to the civil use of drones.

4 | Is there a weight-based classification system for drones resulting in the application of different rules?

Yes. The RBAC-94 divided RPA into three classes according to their take-off weight:

- class 1: RPA with maximum take-off weight (MTOW) above 150kg;
- class 2: RPA with MTOW above 25kg and equal or below 150kg; and
- class 3: RPA with MTOW below or equal to 25kg.

5 | Is there any distinction between completely autonomous drones and remotely piloted drones?

Yes. Autonomous drones are prohibited in Brazil. Brazil ratified the Chicago Convention, which in article 8 prohibits the operation of autonomous aircraft.

DESIGN AND MANUFACTURE

Regulation

6 | Do specific rules regulate the design and manufacture of drones in your jurisdiction?

Yes. Subpart E of the RBAC-E 94 lists all necessary regulations to be fulfilled by manufacturers to obtain ANAC's approval. ANATEL governs radio frequency regulations in Brazil and also rules the specific characteristics that manufacturers should follow for RPA operation in Brazil. All RPA projects must be previously authorised by ANAC. Different requirements apply depending on each class of RPA and the type of operation: whether visual line of sight (VLOS) or beyond visual line of sight (BVLOS). The request for the approval of a project must contain a flight manual and a maintenance manual.

Manufacturing authorisation

7 | Must drone manufacturers obtain any licences or other authorisation to carry out their business? Are manufacturers subject to any other specific rules?

Manufacturers do not need a specific licence to carry out their businesses although the projects of RPA should be approved by ANAC (see question 6). ANAC has from time to time published updated lists of authorised projects on its website.

Product liability

8 | Do general product liability rules (or other specific liability rules) apply to the manufacture of drones?

General liability rules specified in the Brazilian Consumer Code (Federal Law 8.078 of 1990) apply to any defect for which the manufacturer is liable. The RBAC-E 94 does not impose any specific civil or criminal liability on manufacturers, although general liabilities covered in the Brazilian Aeronautical Code (article 302) should apply to manufacturers.

REGISTRATION AND IDENTIFICATION

Registration

9 Must drones be registered in a specific national registry? If so, who is entitled to register drones and what requirements and restrictions apply? Is the registry organised as an operator registry or an owner registry?

RPA must be registered with ANAC. ANAC has developed a specific system (SISANT) for the registration of RPA under class 3 flying below 400ft and not the BVLOS. It is an owner register following general aircraft registration rules but registration procedures are much simpler for drones. The owner can upload the drone information through the SISANT, which will automatic generate a number registration of nine characters to be fixed in the fuselage of the aircraft clearly visible for inspections. The owner should just specify its name, address, tax ID (Natural Persons Register or the National Registry of Legal Entities (CNPJ) and email address. The drone can be registered in the name of a person or a company. In the latter case, the owner should inform the CNPJ of the registration number, which is the tax number registration for companies in Brazil. The applicant should also give the following details of the respective drone: name, model, manufacturer, serial number and a picture that clearly identifies the specific drone, including the manufacturer's serial number or mark. The SISANT issues a registration certificate that should be carried by the RPA owner or pilot during the drone's operation.

Identification

10 Are drones identified through a marking system similar to that used for manned aircraft?

Each drone under class 3 with an MTOW of 250g, flying under BVLOS and under 400ft must have a nine-digit code number to be obtained in accordance with our reply to question 9. If a drone is included in class 3 but flying beyond the visual line of sight or over 400ft, it should obtain a specific registration mark with ANAC as applicable for other aircraft.

CERTIFICATION AND LICENSING

Basic requirements and procedures

11 What certificates or licences are required to operate drones and what procedures apply?

All RPA should be registered with ANAC. Each RPA should have a certificate of airworthiness unless if operating in class 3 with an MTOW of 250g and below 25kg, flying BVLOS and under 400ft, which should only obtain the necessary registration through the SISANT system as described in more detail in question 9.

For pilot licences, see question 14.

Taxes and fees

12 Are certification and licensing procedures subject to any taxes or fees?

Nominal fees determined by ANAC should apply.

Eligibility

13 Who may apply for certifications and licences? Do any restrictions apply?

The owner of a drone should apply to obtain the necessary certifications as more particularly described in question 9. If the operation of the drone requires a flight plan, the pilot or the owner of the respective drone should obtain the necessary authorisations from ANAC and DECEA to operate the drone.

Remote pilot licences

14 Must remote pilots obtain any certifications or licences to operate drones? If so, do the relevant procedures differ based on the type of drone or operation?

Each pilot is liable for the operation of the drone and should be more than 18 years old. All pilots operating in classes 1 and 2 should have medical certificates as detailed in the RBAC-E 94 and should be registered with ANAC. Pilots operating in class 3 above 400ft above ground level should also be licensed by ANAC and have medical certificates as required for each type of flight. Pilots operating in classes 1 and 2 are subject to the necessary authorisations for general pilots issued by ANAC in accordance with the RBHA 91, which lists the general rules for operation of civil aircraft. Pilots operating in VLOS and below 400ft do not require specific licences.

Foreign operators

15 Are foreign operators authorised to fly drones in your jurisdiction? If so, what requirements and restrictions apply?

Foreign operators are also subject to the same rules as national operators and should obtain all the local licences to operate RPA.

Certificate of airworthiness

16 Is a certificate of airworthiness required to operate drones? If so, what procedures apply?

Except for aeromodels or drones under class 3 flying in VLOS below 400ft above ground level, all other RPA should have a certificate of airworthiness. Other RPA in class 3 and under class 2 should obtain a special airworthiness certificate described in the RBAC-E 94. RPA in class 1 should obtain a certificate of airworthiness subject to the rules applicable to general aircraft (RBAC 21).

OPERATIONS AND MAINTENANCE

One drone, one pilot

17 Does the 'one drone, one pilot' rule apply in your jurisdiction?

Yes.

Maintenance

18 Do specific rules regulate the maintenance of drones?

Yes. RBAC-E 94 determined that maintenance rules for drones are defined by their manufacturer.

Basic operational rules and restrictions

19 What rules and restrictions apply to flights performed in 'visual line of sight' (VLOS) and 'beyond visual line of sight' (BVLOS)? Is there a distinction in this regard?

In accordance with RBAC-E 94, there are multiple rules that apply to each class of RPA depending on whether it is operating in VLOS or BVLOS. A drone flying BVLOS must have a special airworthiness certificate for RPA called a CAER.

20 | What rules and restrictions apply to critical and non-critical operations? Is there a distinction in this regard?

In accordance with the guidance published by DECEA, night flights can interfere with the VLOS and should thus respect the provisions in the ICA 100-12, item 4.2.4 published by DECEA. DECEA suggests such flights should take place during the day.

Transport operations

21 | Is air transport via drone (eg, cargo and mail) regulated in your jurisdiction? If so, what requirements, limitations and restrictions apply?

Such transport is not authorised or regulated in Brazil.

22 | Do any specific provisions governing consumer protection and tracking systems apply with respect to cargo and delivery operations via drone?

Such transport is not allowed in Brazil.

Insurance requirements

23 | What insurance requirements apply to the operation of drones?

Third-party liability insurance is mandatory to drones with an MTOW over 250g. However, ANAC has not established any specific limit for liability. All other insurances are optional. Public drones do not require mandatory insurance.

Safety requirements

24 | What safety requirements apply to the operation of drones?

In accordance with DECEA's guidance, flights are prohibited in airport areas, penitentiaries and areas of critical infrastructure such as thermal plants and energy stations. For flights below 100ft (approximately 30 metres) operation shall occur approximately 5.4km from airfields. For flights between 100ft and 400ft, operations of drones should keep at least 9km away from airfields. Such operations close to airfields can be requested through the SARPAS (DECEA's system) also requiring issuance of notice to airmen (NOTAM).

Drones should not be operated near third parties who have not authorised the flights of drones and are subject to other DECEA rules. Finally, DECEA's guide requires flights to be at least 30 metres from private buildings unless authorised by its owners. Flights above 200ft can interfere with helicopter flights so they also require approval of flight plans by DECEA, and flights above 400ft require issuance of NOTAM and a segregated airspace.

AIRSPACE

Air traffic control

25 | How is air traffic control regulated in your jurisdiction? Which authority provides air traffic control services for drones?

Air traffic control for aircraft including drones is regulated by DECEA.

Restrictions

26 | Are there any airspace restrictions on the operation of drones?

Yes. See detailed information in question 24.

Take-off and landing

27 | Must take-off and landing of drones take place in specific areas or facilities?

Yes. First, take-off and landing should be at a distance from third parties unless they have given authorisation for a flyover. The exception applies only for drones operated by public authorities (military use or by other bodies controlled by the government). For aerial survey activities, specific authorisation from the Ministry of Defence is also required. Pursuant to RBAC-E 94, operations in airfields must be authorised by the operator of the respective airfield, and ANAC can, at its sole discretion, establish specific rules for such operations.

LIABILITY AND ACCIDENTS

Cargo liability

28 | Are there any specific rules governing the liability of drones for losses or damage to cargo?

Cargo transport includes people, animals or hazardous cargo. There are few exceptions in relation to hazardous cargo transport, such as when these products are used for agrobusiness activities or forestry activities. Electronic cargo transport is authorised if used during the flight, such as photo cameras or computers. Public cargo transport is not subject to such rules.

Third-party liability

29 | Are there any specific rules governing the liability of drones for damage to third parties on the surface or in the air?

Yes. In accordance with RBAC-E 94, all drones with an MTOW above 250g must have third-party liability insurance; however, ANAC has not established any specific limit.

Accident investigations

30 | How are investigations of air accidents involving drones regulated in your jurisdiction?

Investigations of air accidents involving drones follow the same regulation as general aircraft. DECEA and the Ministry of Defence through the Aeronautical Accidents Investigation and Prevention Center (CENIPA) are the authorities in charge of such investigations. Military police are also authorised to proceed with investigations. Any citizen can report an aircraft accident to ANAC, including drone accidents.

Accident reporting

31 | Is there a mandatory accident and incident reporting system for drone operators in your jurisdiction?

The Ministry of Aeronautics' specific authority CENIPA is resonsible for analysing aircraft accidents or incidents.

Safety management and risk assessment

32 | Are drone operators required to implement safety management systems and risk assessment procedures within their organisation?

Operators should follow the procedures suggested by manufacturers and also obtain the necessary approvals for flight plans with DECEA.

ANCILLARY CONSIDERATIONS

Import and export control

33 Do specific import and export control rules apply to drones in your jurisdiction?

Yes. All drones should be seal-approved by ANATEL, which is the public body in charge of radio frequency control. Most imported drones will not have ANATEL's seal so the owner of the drone should register it on the ANATEL website through a system named MOSAICO and fill in all the technical information of the drone purchased abroad. If this information is not uploaded prior to the drone's importation into Brazil and the Customs clearance authority seizes the drone, the owner has still the option to sign a statement of responsibility certifying that registration with ANATEL will take place shortly after the drone's entry into Brazil. All the forms and information can be obtained on ANATEL's website. A drone that already has ANATEL's seal does not require any specific registration at importation. After importation to Brazil, all rules in relation to registration and authorisations with ANAC and DECEA should be complied with. Nominal fees apply for the registration of drones with ANATEL.

Data privacy and IP protection

34 How are personal data privacy and IP protection regulated in your country with specific reference to drone operations?

General law over personal data privacy and IP protection applies to manufacturers of drones, which can choose whether to protect it or not.

UPDATE AND TRENDS

Sector trends and regulatory developments

35 Which industry sectors have seen the most development in the use of drones in your jurisdiction and which sectors are expected to see further development in future? Have there been any notable recent regulatory developments relating to drones?

The public use of drones has become much more intensive over the years for various activities such as mapping the Amazon forest, controlling areas of illegal deforestation, mapping the Savanna region and controlling fires. Aerial survey is also a trending activity for the use of drones.

In the private sector, agrobusiness and photo business have prominent positions. Agrobusiness has used drones to control plagues and map cattle in extensive areas.

Different authorities such as ANAC, DECEA, ANATEL and airport operators in Brazil have been working together to implement major rules for the safe use of drones, principally trying to guarantee that such operations occur far from airports, avoiding aircraft accidents.

Public investors such as the Brazilian National Bank of Economic and Social Development (BNDES) and the Financier of Projects and Studies (FINEP) have been investing in the sector over the years. BNDES has authorised the use of the BNDES credit card for the purchase of drones used for private business activities, and FINEP has been investing in the manufacturing business.

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GENERAL FRAMEWORK

Basic rules and regulators

1 | What basic rules govern the operation of remotely piloted aircraft and unmanned aircraft (drones) in your jurisdiction? Which regulatory bodies are charged with enforcing these rules?

On 1 June 2019, new Canadian regulations governing the operation of remotely piloted aircraft systems (RPAS) came into effect (Part IX of the Canadian Aviation Regulations). The regulations govern operations performed by small RPAS with a maximum take-off weight between 250g and 25kg.

The regulations do not govern the operation of an RPAS with a maximum take-off weight of less than 250g.

Members of the Model Aeronautics Association of Canada (MAAC) are exempt from the regulations when operating RPAS (weighing between 250g and 35kg) within Canadian airspace while abiding by all applicable MAAC safety guidelines.

The regulations are enforced by the Minister of Transport (Transport Canada) and the Royal Canadian Mounted Police.

2 | What are the penalties for non-compliance with the laws and regulations governing drones?

Most of the regulatory provisions are enforced through the assessment of administrative monetary penalties, which carry a maximum fine of C$5,000 for individuals and C$25,000 for corporations, and include the potential suspension or cancellation of a person's pilot certificate. More serious contraventions may be pursued as indictable offences or punishable on summary conviction, where permitted.

Classification

3 | Is there any distinction between public and private drones, as well as between leisure use and commercial use?

There is no distinction between public and private RPAS, nor is there any distinction between leisure use and commercial use. However, pilots are prohibited from operating RPAS over or within a security perimeter established by a public authority in response to an emergency. Operations of RPAS conducted in the service of a public authority within the security perimeter are permitted.

4 | Is there a weight-based classification system for drones resulting in the application of different rules?

For RPAS with a maximum take-off weight between 250 grams and 25kg, the regulations allow 'basic operations' and 'advanced operations' by qualified operators (see question 11 for further details). For operation of an RPAS with a maximum take-off weight in excess of 25kg, the regulations require that operators obtain a special flight operations certificate (SFOC), issued upon application to, and approval of, Transport Canada.

The regulations do not govern the operation of an RPAS with a maximum take-off weight of less than 250g.

Members of the MAAC are exempt from the regulations when operating RPAS (weighing between 250g and 35kg) within Canadian airspace while abiding by all applicable MAAC safety guidelines.

5 | Is there any distinction between completely autonomous drones and remotely piloted drones?

Operation of an autonomous RPAS is permitted if the operator is able take immediate control of the aircraft at any time.

DESIGN AND MANUFACTURE

Regulation

6 | Do specific rules regulate the design and manufacture of drones in your jurisdiction?

There are specific rules for the design and manufacture of RPAS that are to be used for certain operations. If an RPAS is to be used in controlled airspace or at a distance of less than 30 metres from another person except for a crew member or other person involved in the operation, the manufacturer of the RPAS must provide the Minister of Transport with a declaration that it meets various safety requirements. An operator can check Transport Canada's website to determine if a particular RPAS manufacturer has provided the necessary declaration for the operator's intended operation.

Manufacturing authorisation

7 | Must drone manufacturers obtain any licences or other authorisation to carry out their business? Are manufacturers subject to any other specific rules?

There are no specific rules that require an RPAS manufacturer to obtain licences or authorisation to carry out a business.

Product liability

8 | Do general product liability rules (or other specific liability rules) apply to the manufacture of drones?

Yes, the general common law on product liability applies to the manufacture of RPAS. Certain provinces also have statutory causes of action that may govern the liability of manufacturers, distributors and suppliers. These frameworks may also apply depending on where a particular RPAS was manufactured or sold.

REGISTRATION AND IDENTIFICATION

Registration

9 Must drones be registered in a specific national registry? If so, who is entitled to register drones and what requirements and restrictions apply? Is the registry organised as an operator registry or an owner registry?

RPAS with a maximum take-off weight between 250g and 25kg must be registered with Transport Canada's registry of remotely piloted aircraft. The registry is organised as an owner registry. A person is qualified to be the registered owner of a remotely piloted aircraft if they are:

- a citizen or permanent resident of Canada who is at least 14 years old;
- a corporation incorporated under the territorial, provincial or federal laws of Canada; or
- a municipal, provincial or federal entity.

Identification

10 Are drones identified through a marking system similar to that used for manned aircraft?

Yes. Registered RPAS are assigned a registration number. The registration number must be clearly visible on the RPAS. Transport Canada suggests marking an RPAS with a permanent marker, a permanent label or engraving.

CERTIFICATION AND LICENSING

Basic requirements and procedures

11 What certificates or licences are required to operate drones and what procedures apply?

In general, basic operations consist of operations conducted in uncontrolled airspace and more than 30 metres horizontally (never above) from bystanders. In general, advanced operations consist of operations conducted in controlled airspace or within 30 metres of bystanders (measured horizontally). Operations within controlled airspace require advance permission from the air traffic control services provider (Nav Canada), in the form of a written RPAS flight authorisation.

Basic operations may be performed by individuals who are at least 14 years old and have successfully completed an online knowledge exam to obtain a pilot certificate.

Advanced operations may be performed by individuals who are at least 16 years old, have successfully completed an online knowledge exam to obtain a pilot certificate, and have completed a flight review with a Transport Canada approved training provider.

Other types of operations (such as beyond visual line of sight or RPAS weighing over 25kg) cannot be undertaken unless the operator has applied for and has been granted an SFOC by Transport Canada.

Taxes and fees

12 Are certification and licensing procedures subject to any taxes or fees?

The fee for the online knowledge exam (see above) is C$10. The fee for a flight review is set by the training provider. There is no fee for the submission of an application for an SFOC.

Eligibility

13 Who may apply for certifications and licences? Do any restrictions apply?

A person who is at least 14 years old may apply for a pilot certificate to conduct basic operations using an RPAS with a maximum take-off weight between 250g and 25kg.

A person who is at least 16 years old may apply for a pilot certificate to conduct advanced operations using an RPAS with a maximum take-off weight between 250g and 25kg.

Remote pilot licences

14 Must remote pilots obtain any certifications or licences to operate drones? If so, do the relevant procedures differ based on the type of drone or operation?

See question 11.

Foreign operators

15 Are foreign operators authorised to fly drones in your jurisdiction? If so, what requirements and restrictions apply?

A foreign operator must apply for an SFOC to fly an RPAS for any purpose (recreational, work or research). The foreign operator must already be permitted to use the RPAS for the same purpose in the foreign operator's home country. The home country's approval or authorisation must be included with the application for an SFOC.

Certificate of airworthiness

16 Is a certificate of airworthiness required to operate drones? If so, what procedures apply?

A certificate of airworthiness is not required to operate an RPAS. However, the regulations state that no pilot shall conduct the take-off or launch of a remotely piloted aircraft, or permit the take-off or launch of a remotely piloted aircraft to be conducted, unless the pilot ensures that:

- the aircraft is serviceable;
- the RPAS has been maintained in accordance with the manufacturer's instructions;
- all mandatory actions have been completed in accordance with the manufacturer's instructions; and
- all equipment required by regulation or the manufacturer's instructions are installed and serviceable.

In addition, no pilot may conduct certain advanced operations, unless the manufacturer of the RPAS being used has provided a declaration to the Minister of Transport, which includes confirmation that the manufacturer meets the documentation requirements set out in the regulations and the technical requirements set out in Transport Canada Standard 922 – RPAS Safety Assurance.

OPERATIONS AND MAINTENANCE

One drone, one pilot

17 Does the 'one drone, one pilot' rule apply in your jurisdiction?

The Canadian Aviation Regulations permit a pilot to operate up to five RPAS at a time where the system is designed to allow for the flight of multiple RPAS from a single control station (and provided that the aircraft are operated in accordance with the manufacturer's instructions). For operations involving more than five RPAS, an SFOC is required.

Maintenance

18 | Do specific rules regulate the maintenance of drones?

All owners are required to keep records regarding any maintenance, repair or modification performed on their RPAS.

As described in question 16, a pilot is prohibited from conducting a take-off unless the pilot ensures that the aircraft is serviceable, the RPAS has been maintained in accordance with the manufacturer's instructions, all mandatory actions required by the manufacturer's instructions have been taken, and all equipment required by the Canadian Aviation Regulations is installed and serviceable. A person who applies to operate an RPAS under an SFOC must include maintenance instructions and a description of how maintenance will be performed with the application.

Basic operational rules and restrictions

19 | What rules and restrictions apply to flights performed in 'visual line of sight' (VLOS) and 'beyond visual line of sight' (BVLOS)? Is there a distinction in this regard?

The current framework of the Canadian Aviation Regulations provides only for VLOS operations. All BVLOS operations require special permission with an SFOC.

20 | What rules and restrictions apply to critical and non-critical operations? Is there a distinction in this regard?

No pilot is permitted to operate an RPAS at night unless the RPAS is equipped with position lights sufficient to allow the aircraft to be visible to the pilot and any visual observer. Although night vision goggles are permitted, the position lights must be visible without the use of any such goggles and the goggles must be capable of detecting all light within the visual spectrum.

Transport operations

21 | Is air transport via drone (eg, cargo and mail) regulated in your jurisdiction? If so, what requirements, limitations and restrictions apply?

Air transport via RPAS is not currently regulated in Canada. Except where permitted in accordance with an SFOC, pilots are prohibited from operating an RPAS if the aircraft payload includes explosive, corrosive, flammable or bio-hazardous material, weapons, ammunition or other equipment designed for use in war, or if the payload could create a hazard to aviation safety, cause injury to persons, or is attached to the aircraft by means of a line (unless such an operation is conducted in accordance with the manufacturer's instructions).

22 | Do any specific provisions governing consumer protection and tracking systems apply with respect to cargo and delivery operations via drone?

There are no specific regulations governing consumer protection and tracking systems with respect to cargo and delivery operations.

Insurance requirements

23 | What insurance requirements apply to the operation of drones?

The Canadian Aviation Regulations do not include any specific insurance requirements for basic or advanced operations of an RPAS. Transport Canada recommends that pilots purchase public liability insurance (as do we), but no such insurance is required by regulation. Transport Canada also notes that most home insurance policies will not cover the use of RPAS.

Safety requirements

24 | What safety requirements apply to the operation of drones?

The pilot is ultimately responsible for ensuring the safety of all persons on the ground and those involved with a particular operation. For example, the Canadian Aviation Regulations set out a minimum horizontal distance that an RPAS may operate from any other person not involved in the operation.

AIRSPACE

Air traffic control

25 | How is air traffic control regulated in your jurisdiction? Which authority provides air traffic control services for drones?

NAV Canada operates Canada's civil air navigation system. Air traffic control services are not specifically provided for RPAS, but if a pilot with an advanced operations licence intends to operate within controlled airspace, he or she must submit an online RPAS Flight Authorization Request to NAV Canada, which specifies, among other things, the proposed time and location of the operation, emergency contact information, and particulars of the means by which communication will be maintained with the appropriate air traffic services unit (ie, a cell phone or radio).

Restrictions

26 | Are there any airspace restrictions on the operation of drones?

Special permission is required to operate in any restricted or controlled airspace (including within close proximity to airports).

Take-off and landing

27 | Must take-off and landing of drones take place in specific areas or facilities?

There are no specific areas or facilities where take-off and landing must take place. However, the Canadian Aviation Regulations provide that prior to conducting a take-off or landing, the pilot must ensure that there is no likelihood of collision with any person, obstacle or aircraft, and that the site is suitable for the intended operation.

LIABILITY AND ACCIDENTS

Cargo liability

28 | Are there any specific rules governing the liability of drones for losses or damage to cargo?

No. However, if an RPAS is carrying a payload, the pilot must immediately cease operations if the payload incurs unanticipated damage.

Third-party liability

29 | Are there any specific rules governing the liability of drones for damage to third parties on the surface or in the air?

There are no specific rules governing liability, but the Canadian Aviation Regulations prohibit the operation of an RPAS in a reckless or negligent manner that endangers or is likely to endanger aviation safety or the safety of any person. RPAS pilots must immediately cease operations if aviation safety or the safety of any person is endangered or likely to be endangered. The regulations require pilots to always give way to power-driven heavier-than-air aircraft, airships, gliders and balloons, and prohibits them from operating an RPAS in such proximity to another aircraft as to create a risk of collision.

Accident investigations

30 How are investigations of air accidents involving drones regulated in your jurisdiction?

Civil aviation occurrences that take place in or over Canada are investigated by the Transportation Safety Board of Canada (the TSB). The purpose of a TSB investigation is to prevent recurrence. The Canadian Aviation Regulations do not provide for any specific rules concerning accident investigations. Most incidents (such as RPAS' unintended contact with terrain, not involving any other person or aircraft) will not be investigated by the TSB.

Accident reporting

31 Is there a mandatory accident and incident reporting system for drone operators in your jurisdiction?

An owner or operator of an RPAS must report accidents to the TSB if a person is killed or sustains a serious injury as a result of coming into direct contact with any part of the RPAS, including parts that have become detached from the RPAS.

The Canadian Aviation Regulations require a pilot to stop flying immediately in the case of any injury to a person, unintended contact with a person or aircraft, or any time the RPAS becomes uncontrollable or is not kept within the intended boundaries of its flight. A pilot must keep records of incidents for 12 months and surrender them to the Minister of Transport upon request.

Safety management and risk assessment

32 Are drone operators required to implement safety management systems and risk assessment procedures within their organisation?

The Canadian Aviation Regulations do not require an RPAS pilot conducting basic or advanced operations to maintain a safety management system. However, if an organisation intends to conduct operations that are beyond the scope of the regulated advanced operations, Transport Canada may require the operator to implement a safety management system or risk assessment procedure as part of the conditions for the issuance of the SFOC.

ANCILLARY CONSIDERATIONS

Import and export control

33 Do specific import and export control rules apply to drones in your jurisdiction?

There are no specific rules related to the import and export of RPAS in Canada. However, a manufacturer may be required to provide a declaration to the Minister of Transport as to the safety of the RPAS design if it is to be used for certain operations (see question 6).

Data privacy and IP protection

34 How are personal data privacy and IP protection regulated in your country with specific reference to drone operations?

Although Canadian privacy laws do not explicitly reference RPAS, these laws apply to pictures, videos and other information collected by an RPAS. A pilot is responsible for all personal information collected by the RPAS. The Copyright Act governs intellectual property law protection (specifically, copyright rights) in Canada. This includes photographs, audio and video captured by RPAS. Businesses in Canada must follow the Personal Information Protection and Electronic Documents Act when using RPAS, and may also be subject to provincial private-sector privacy laws.

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UPDATE AND TRENDS

Sector trends and regulatory developments

35 Which industry sectors have seen the most development in the use of drones in your jurisdiction and which sectors are expected to see further development in future? Have there been any notable recent regulatory developments relating to drones?

A potential next step in RPAS regulatory development in Canada would be the regulation of BVLOS operations. Transport Canada is currently running a BVLOS pilot project with four companies. Opportunities exist for the use of RPAS in industries including agriculture, construction, defence and public safety, energy, entertainment, infrastructure, insurance, surveying, mining, oil and gas, forestry (including forest fire suppression), photography, real estate and others. RPAS-based delivery operations could transport medical supplies, food, clothing and other general items to remote communities across Canada's vast geography that are otherwise difficult to access.

France

Zornitza Atanassov, Benjamin Potier and Grégory Laville de la Plaigne
Clyde & Co

GENERAL FRAMEWORK

Basic rules and regulators

1 | What basic rules govern the operation of remotely piloted aircraft and unmanned aircraft (drones) in your jurisdiction? Which regulatory bodies are charged with enforcing these rules?

Basic rules are encompassed in two Orders of 17 December 2015: the first on the use of airspace by unmanned aircraft (NOR: DEVA1528469A; Order of 17 December 2015 on the use of drones) and the second on the design of unmanned civil aircraft, the conditions of their use and their operator capacities (NOR: DEVA1528542A; Order of 17 December 2015 on the design of drones). Also applicable are Order of 18 May 2018 on the requirements applicable to remote pilots using unmanned aircraft for purposes other than leisure (NOR: TRAA1733652A) and Decree No. 2018-375 of 18 May 2018 on the training required for remote pilots of unmanned aircraft used for leisure purposes. Reference must also be made to Decree No. 2018-882 of 11 October 2018 on the registration of unmanned aircraft and Order of 19 October 2018 on the registration of unmanned aircraft (NOR: TRAA1800537A).

The Code of Transport (notably its articles L. 6214-1 to L. 6214-5, which refer specifically to unmanned aircraft) is applicable to the operation of drones.

EU Regulations 2019/945 (on unmanned aircraft systems and on third-country operators of unmanned aircraft systems) and 2019/947 (on the rules and procedures for the operation of unmanned aircraft) have also entered into force and are applicable in France to the operation of drones.

The authorities in charge of enforcing these rules are the Director General of Civil Aviation, the Director of Military Air Traffic and the Director General for Overseas.

2 | What are the penalties for non-compliance with the laws and regulations governing drones?

Administrative and criminal sanctions are provided in the Code of Transport (articles L. 6231-1 to L. 6232-13). Among these sanctions, some are applicable to drones: for instance, the administrative authority can withhold ae drone in the case of an accident or if the airworthiness documents cannot be presented; up to six months' imprisonment and €15,000 penalty for flying, by clumsiness or negligence, over an area prohibited by law; up to one year's imprisonment and €45,000 penalty for entering or staying above such prohibited area; and up to one year's imprisonment and a €75,000 penalty for using a drone without airworthiness documents or with expired ones.

Classification

3 | Is there any distinction between public and private drones, as well as between leisure use and commercial use?

There are indeed some distinctions between drones depending on their use.

State drones may operate in violation of legal provisions when necessary regarding the mission accomplished (eg, safety mission, police mission – article 10, Order of 17 December 2015 on the use of drones).

In the case of leisure-use drones above 800 grams, the remote pilot must undergo training on knowledge of the regulations (article L. 6214-2, Code of Transport and Decree No. 2018-375 of 18 May 2018).

When drones are used for purposes other than leisure or for experimental activities (development or testing of drones), remote pilots must undergo training on the knowledge of the applicable regulation, depending of the scenario under which the drone will be used (see Order of 18 May 2018). These 'specific activities' identify four scenarios:

Scenario	Populated area	Third-party overflight	Flight in sight	Maximum horizontal distance from the pilot	Maximum mass
S-1	No	No	Yes	200m	-
S-2	No	No	Possibly no	1,000m	≤ 2kg if height > 50m
S-3	Yes	No	Yes	100m	8kg if non-captive drone
S-4	No	Possibly yes	Possibly no	-	2kg

4 | Is there a weight-based classification system for drones resulting in the application of different rules?

As mentioned previously, different rules may indeed be applicable to drones depending on their weight. An illustration of these differences is given hereafter.

One of the thresholds is 800 grams. Above 800 grams, the remote pilot must hold a licence (see question 3: article L. 6214-2, Code of Transport and Decree No. 2018-375 of 18 May 2018). Some drones below this weight must be equipped with a reporting system (article L. 6111-1, Code of Transport; a Decree is about to be issued to fix the drones covered by the text). Drones above 800 grams used for 'specific activities' must be registered; under 800 grams registration is not compulsory (Decree No. 2018-882 of 11 October 2018 and Order of 19 October 2018 on the registration of unmanned aircraft).

Another threshold is 25 kilograms. Drones above this weight and used for specific activities must be registered with a unique identification number, which must be affixed on the drone and the remote pilot

must be able to present at any time during the operation of the drone the registration certificate (article L. 6111-1, Code of Transport).

Eventually, depending on the weight of the drone and the scenario of specific activities under which it is used, there may be a requirement to obtain an approval (certificate of airworthiness). This approval is required for drones above 25kg, drones of 2 to 25kg used under scenarios S-2 and S-4 and drones under 2kg used under scenarios S-2 and S-4 (Order of 17 December 2015 on the design of drones).

5 | Is there any distinction between completely autonomous drones and remotely piloted drones?

A technical distinction is made between autonomous and remotely piloted drones. Actually, article 2 of Order of 17 December 2015 on the design of drones, defines three types of drones: remotely piloted (manual) drones, automatic drones and autonomous drones. However, unless specifically mentioned, the same regulation applies to autonomous drones and remotely piloted drones. For instance, the use of autonomous drones for specific activities is forbidden except in the case of captive aerostats (drones connected by any physical means to the ground, a fixed structure, any mobile element or the remote pilot). Captive autonomous aerostats are subject to the same conditions as remotely piloted drones used under scenarios S-1 or S-3 except as regards provisions on remote pilots (article 1.5, Annex III of Order of 17 December 2015 on the design of drones).

DESIGN AND MANUFACTURE

Regulation

6 | Do specific rules regulate the design and manufacture of drones in your jurisdiction?

In any case, a drone must always be delivered with an information notice on the use of the drone (article L. 425-1, Consumer Code; Decree 2019-348 of 19 April 2019).

Order of 17 December 2015 on the design of drones provides for provisions on airworthiness.

As mentioned before, there is a requirement for approval (certificate of airworthiness delivered by the Civil Aviation Safety Directorate) for drones above 25kg, drones of 2kg to 25kg used under scenarios S-2 and S-4 and drones under 2kg used under scenarios S-2 and S-4.

When this approval is not required, the operator must ensure that the drone meets the legal conditions for its use and notably the security conditions. For instance:

- non-captive aerostats must be accompanied by a user file, comprising a user and maintenance manual (article 2.2.3 of Annex III of the Order);
- non-captive aerostats above 2kg and used in scenario S-3 must be equipped with a third-party protection device (which limits to 69 joules the impact energy following a free fall from the maximum operating height, which can be triggered by the remote pilot even in the event of malfunction of the on-board automations controlling the trajectory and when the device comprises a parachute, the time required for its deployment and stabilisation of the drone shall result in a loss of height of the aircraft of 15 metres or less from a hover or level flight position at a minimum speed) (article 2.2.5 of Annex III of the Order);
- captive and non-captive aerostats above 25kg must meet the technical airworthiness requirements established by the Ministry of Civil Aviation, notably security of the means of restraint, the resistance of the structure of the aircraft or the resistance of the envelope of the aerostat, the analysis of third-party security, the quality of flight, etc (articles 2.4.2 and 2.5.2 of Annex II of the Order).

Manufacturing authorisation

7 | Must drone manufacturers obtain any licences or other authorisation to carry out their business? Are manufacturers subject to any other specific rules?

There is no regulation in this regard.

Product liability

8 | Do general product liability rules (or other specific liability rules) apply to the manufacture of drones?

General product liability rules are applicable to the manufacture of drone (articles 1245 to 1245-17, Civil Code).

REGISTRATION AND IDENTIFICATION

Registration

9 | Must drones be registered in a specific national registry? If so, who is entitled to register drones and what requirements and restrictions apply? Is the registry organised as an operator registry or an owner registry?

According to article L. 6111-1 of the Code of Transport, drones above 800g must be registered on the website (https://alphatango.aviation-civile.gouv.fr/login.jsp) by their owner. This process is different from the necessity for the professional operator of the drone to declare each drone he or she uses for specific activities.

As for drones above 25kg, they must not only be registered but need also a unique registration number (immatriculation).

Identification

10 | Are drones identified through a marking system similar to that used for manned aircraft?

In the same manner as manned aircraft and as mentioned previously, drones above 25 kilograms must be registered with a unique registration number. There is also a requirement to engrave nationality and registration marks on a fire-resistant identity plate affixed to the drone. See article L. 6111-1, Code of Transport.

CERTIFICATION AND LICENSING

Basic requirements and procedures

11 | What certificates or licences are required to operate drones and what procedures apply?

An operator of drones must not necessarily hold a specific licence. However, any operator of drones for 'specific activities' must declare its activity to the Civil Aviation Safety Directorate (https://alphatango.aviation-civile.gouv.fr/login.jsp), which will allow the operator to obtain a unique operating number. This declaration must be renewed every 24 months. The operator must then ensure that the operating aircraft meets all the legal requirements (registration, unique number of registration, airworthiness certificate, etc) and that the remote pilots who are to operate the drones have the necessary certificates.

Taxes and fees

12 | Are certification and licensing procedures subject to any taxes or fees?

The online training to obtain the certificate to operate leisure drones above 800 grams is free.

In the case of professional use of drones, if the remote pilot decides to have recourse to a private entity for practical training, he or she will have to pay for the chosen training (the basic price being around €1,000).

Eligibility

13 | Who may apply for certifications and licences? Do any restrictions apply?

There is no restriction as to nationality or financial stability. However, some restrictions apply as to the age of the remote pilot.

Candidates for the certificate to operate drones above 800g and up to an operating empty weight of 150kg must be above 14 years old (article 5 of Order of 12 October 2018).

In the case of use for specific activities in scenarios S-1 to S-3, the candidate for the certificate must be above 16 years old (article 3a) of Order of 18 May 2018).

The remote pilot candidate for the certificate to operate a drone for specific activities in scenario S-4 must be above 18 (article 4a) of Order of 18 May 2018).

Remote pilot licences

14 | Must remote pilots obtain any certifications or licences to operate drones? If so, do the relevant procedures differ based on the type of drone or operation?

The remote pilot of leisure drones above 800 grams and up to an operating empty weight of 150kg must undergo online training (https://fox-alphatango.aviation-civile.gouv.fr/) to attest of his knowledge of the regulation (article L. 6214-2, Code of Transport; Decree No. 2018-375 of 18 May 2018 and Order of 12 October 2018). The training takes the form of multiple-choice questions and the number of attempts to succeed is not limited. The certificate is valid for a period of five years and its renewal requires taking the training again. Candidates for the certificate must be above 14 years old.

In the case of use for specific activities in scenarios S-1 to S-3, the remote pilot must also hold a certificate following theoretical examination (organised by the General Direction of the Civil Aviation), but also practical training for which he or she may have recourse to a private entity whose training activities have been declared to the Regional Directorate of Enterprise, Competition Policy, Consumer Affairs, Labour and Employment (Directorate) (article 3 of the Order of 18 May 2018).

For remote pilots wishing to use a drone under specific activities scenario S-4 (see question 3), they will also need to hold a pilot's licence (for aircraft, helicopter or glider) and must have completed at least 50 hours flight (article 4 of the Order of 18 May 2018).

When the remote pilot intends to operate a drone above 25 kilograms (except captive aerostats) he or she must obtain a competency certificate from the Civil Aviation Safety Directorate (the service DSAC/IR), following a demonstration flight whereby the pilot shows his or her ability to use the drone and react in the case of breakdown (article 4.3 of Annex III of the Order of 17 December 2015 on the design of drones).

Foreign operators

15 | Are foreign operators authorised to fly drones in your jurisdiction? If so, what requirements and restrictions apply?

French legislation is applicable to any drone flight on French territory be it by a foreign operator or not.

If the operator or remote pilot has obtained a valid certificate from a foreign authority (notably in a European Union member state), such certificate may serve as a basis for the delivery of a certificate from the Civil Aviation Safety Directorate on the ground of the mutual recognition principle as long as the foreign certificate warrants the same level of safety.

For instance, articles 10, 101 to 103 of the Order of 18 May 2018 provide for this mutual recognition within the European Union.

Certificate of airworthiness

16 | Is a certificate of airworthiness required to operate drones? If so, what procedures apply?

See also question 6. There is a requirement for approval (certificate of airworthiness) for drones above 25kg, drones of 2 to 25kg used under scenario S-2 and S-4 and drones under 2kg used under scenario S-2 and 4 (Order of 17 December 2015 on the design of unmanned civil aircraft, the conditions of their use and their operator capacities).

The request for approval must be addressed to the service DSAC/NO/NAV of the Civil Aviation Safety Directorate and must be accompanied by a technical file of the drone demonstrating compliance with the applicable technical conditions and by the user and maintenance manual. Depending on the complexity of the drone, a demonstration flight may be requested.

OPERATIONS AND MAINTENANCE

One drone, one pilot

17 | Does the 'one drone, one pilot' rule apply in your jurisdiction?

No, the rule 'one drone, one pilot' does not apply in France.

Maintenance

18 | Do specific rules regulate the maintenance of drones?

Although maintenance of drones is part of the rules remote pilots and operators must know, there are no specific regulations in this regard.

Basic operational rules and restrictions

19 | What rules and restrictions apply to flights performed in 'visual line of sight' (VLOS) and 'beyond visual line of sight' (BVLOS)? Is there a distinction in this regard?

The principle is that flights must be performed in VLOS. However, four scenarios are established for the use of drone for specific activities and two of these scenarios provide for the possibility of a flight performed BVLOS (see also question 3 for the details on the four scenarios).

In such cases, any BVLOS flight is subject to the following rules:

- A preliminary declaration before the Ministry of the Armies on the website AlphaTango.
- Any BVLOS flight above 150 metres height (or 50 metres if the aircraft is above 2kg) must be operated either within a segregated portion of airspace from other airspace users or under a derogation granted by the territorially competent prefect.
- Any BVLOS flight of an aircraft of more than 2kg and above 50 metres requires a specific authorisation from the Civil Aviation Safety Directorate (service DSAC/IR or DSAC/NO/OH).
- If the BVLOS flight is to be operated in the vicinity of an aerodrome, an authorisation of the air control is required.
- The remote pilot must be assisted by another person so that he or she can be alerted in case of danger or act on the flight by using his or her own control lever.

20 | What rules and restrictions apply to critical and non-critical operations? Is there a distinction in this regard?

In principle, as provided in Order of 17 December 2015 on the use of drones, drones cannot fly within forbidden areas (within the meaning of Regulation (EU) No. 923/2012), or within regulated or dangerous areas.

They are not concerned with minimum overflight heights provided in Order of 11 December 2014 for the implementation of Regulation No. 923/2012 except in respect of establishments bearing distinctive low-level overflight prohibition marks. They cannot operate within the vicinity of the landing or take-off infrastructures or under the easement of an aerodrome, unless they are authorised to do so. Drones are not allowed to fly by night although state drones may depart from those rules when authorised by the territorially competent prefect, after consulting the territorially competent civil aviation service and the territorial defence service.

Such rules are applicable to both critical and non-critical operations.

Transport operations

21 | Is air transport via drone (eg, cargo and mail) regulated in your jurisdiction? If so, what requirements, limitations and restrictions apply?

Air transport via drone is not specifically regulated in France. There is only one route for delivering mail by drone in the Var region, between Saint-Maximin-la-Sainte-Baume and Pourrières. This route was authorised by the National Directorate of Civil Aviation in 2016 after two years of testing.

22 | Do any specific provisions governing consumer protection and tracking systems apply with respect to cargo and delivery operations via drone?

There is no specific route for delivery operations, and there is no specific regulation on consumer protection and tracking systems.

Insurance requirements

23 | What insurance requirements apply to the operation of drones?

Various insurance mechanisms may apply to the operation of drones depending once more on their use. In any case, civil liability coverage is the basis. When drones are used for professional or commercial activities, there exist specific insurance policies, protecting the drone itself, the steering devices and the on-board equipment. Additional coverage may be subscribed in relation to cybersecurity, operating loss, legal protection, etc.

Safety requirements

24 | What safety requirements apply to the operation of drones?

This question is partly connected to question 20. Basic safety requirement encompassed in Order of 17 December on the design of drones are applicable to the operation of drones, such as not overflying people (in the case of leisure-use drones), always keeping the device in sight (under the exception provided for specific activities BVLOS flights), complying with the maximum heights of flight (or obtaining the required authorisation to fly over the maximum heights), never operating drones from a mobile position (such as a car), or never dropping cargo in flight from the drone.

AIRSPACE

Air traffic control

25 | How is air traffic control regulated in your jurisdiction? Which authority provides air traffic control services for drones?

The Air Navigation Services Directorate, a service of the Civil Aviation Safety Directorate, ensures the operational responsibility of air traffic control.

Restrictions

26 | Are there any airspace restrictions on the operation of drones?

This question is partly connected to question 20. There are restrictions on areas that may by overflown and on overflying heights.

Take-off and landing

27 | Must take-off and landing of drones take place in specific areas or facilities?

There are no specific areas and facilities on which drones must take off or land.

The only requirement is to respect the rules applicable for drone use and provided by Order of 17 December 2015 on the use of drones.

LIABILITY AND ACCIDENTS

Cargo liability

28 | Are there any specific rules governing the liability of drones for losses or damage to cargo?

There are no specific rules governing the liability of drones for losses or damage to cargo.

Third-party liability

29 | Are there any specific rules governing the liability of drones for damage to third parties on the surface or in the air?

No specific rules govern the liability of drones for damage to third parties on the surface or in the air. Article L. 6131-1 of the Code of Transport refers in this regard to the provisions of the Civil Code. Article L. 6131-2 of the Code of Transport provides further that the aircraft operator is automatically liable for damage caused by the aircraft or parts thereof to the people or to the goods. Any incident that is solely the fault of the victim may mitigate the liability of the pilot or exonerate him or her from any liability.

Accident investigations

30 | How are investigations of air accidents involving drones regulated in your jurisdiction?

Article L. 6222-1 of the Code of Transport provides that an investigation must be carried out when the aircraft is involved in an accident or serious incident, except where the aircraft is used for military, customs or police operations where it is not listed in Annexe II of Regulation (EC) No. 216/2008 replaced by Annexe I of Regulation (EU) 2018/1139. The latter encompasses among others:

> *(a) tethered aircraft with no propulsion system, where the maximum length of the tether is 50 m, and where: (i) the MTOM of the aircraft, including its payload, is less than 25 kg, or (ii) in the case of a lighter-than-air aircraft, the maximum design volume of the aircraft is less than 40 m^3;*
> *(b) tethered aircraft with a MTOM of no more than 1 kg.*

For the first time in France, the Bureau of Investigation and Analysis for the Civil Aviation Safety opened in mid-July an investigation into a drone accident where two persons were injured at Le Barcarès (France).

Accident reporting

31 | Is there a mandatory accident and incident reporting system for drone operators in your jurisdiction?

Improving the quality and safety of civil drone operations relies on the involvement of pilots, operators and manufacturers following accidents or incidents that have or may have an impact on safety. This is the reason why the Order of 17 December 2015 on the design of drones provides in Annexe III that the operator of drones must not only report any event that has put the safety of third parties at risk or could have put it at risk in other circumstances, but also in the case of scenarios S-2 and S-4 (see also question 3) and on request of the Ministry in charge of Civil Aviation, transfer any recorded data and data analysis on the flight following an accident or serious incident.

Safety management and risk assessment

32 | Are drone operators required to implement safety management systems and risk assessment procedures within their organisation?

Article 3.4 of Annex III of Order of 17 December 2015 on the design of drones provides that the operator must establish a Manual for Specific Activities. This is a document describing how the drone operating conditions must be complied with and including at least information on the operator's organisation, a description of the specific activities, the level of pilot competence, a list of competent pilots and the aircraft they are qualified to use, a description of the reporting, analysis and event monitoring process and the general aircraft implementation procedures (preparing the flight, protecting third parties, complying with the flying requirements, etc).

Article 3.5 of Annex III of Order of 17 December 2015 provides that the operator must ensure that the rules encompassed in the Manual for Specific Activities are known and applied by the user of the drone. The operator must ensure that the pilots have the required competences to operate the drones and keep a record of each pilot. Every year, the operator establishes a declaration to the Ministry in charge of Civil Aviation to inform on the number of flight hours and the difficulties encountered.

ANCILLARY CONSIDERATIONS

Import and export control

33 | Do specific import and export control rules apply to drones in your jurisdiction?

As regards export, specific rules are applicable if the drone is to be considered as a dual-use item as defined in Regulation (EC) No. 428/2009 (ie, an item that can be used for both civil and military purposes). A dual-use drone is a drone (i) whose maximum autonomy is equal to or greater than 30 minutes but inferior to one hour and whose ability to take off and have a stable controlled flight with wind gusts is equal to or greater than 46.3km/h (25 knots), or (ii) whose maximum autonomy is above one hour. If the drone does not meet these criteria, the exporter must pay attention to the payload of the drone, which may be considered as a dual-use item: for instance, sensors and lasers (see list of internationally agreed dual-use controls, Commission Delegated Regulation (EU) 2017/2268). For dual-use drones, an export authorisation must be obtained from the Service for Dual-Use Items, which will conduct a thorough assessment of the product, its use and destination.

As regards import, Decree No. 2001-1192 on export, import and transfer control of dual-use items provides in article 8 that any importer may request from the Ministry for Industry an international import licence for the foreign supplier to be able to obtain from its national authorities the authorisation to export the drone. The importer may also request a delivery verification certificate proving that the drone has arrived at its destination. The Ministry for Industry has a period of five months to accede to the request or not.

If the drone is not a dual-use item, no specific rules are applicable to its export or import.

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Data privacy and IP protection

34 | How are personal data privacy and IP protection regulated in your country with specific reference to drone operations?

The drone cannot be used freely for aerial shots. Article D.133-10 of the Civil Aviation Code provides that the operator must ensure that the area where he or she intends to shoot is not one forbidden by the prefectures, the regional civil aviation directorates, the aeronautical districts or, for the overseas territories, by the offices of government delegated and civil aviation services.

Then, to take aerial shots outside the prohibited areas, the operator must declare to the Director of Civil Aviation his or her intention to do so when the images or data are in the visible spectrum field. The operator must obtain an express authorisation from the same authority if the recording concerns images or data outside the visible spectrum (ie, thermographer, radar).

In any case, the General Data Protection Regulation (of 27 April 2016) is applicable to drone aerial shots. Third parties cannot be filmed without their consent and no image can be released without the authorisation of these third parties.

UPDATE AND TRENDS

Sector trends and regulatory developments

35 | Which industry sectors have seen the most development in the use of drones in your jurisdiction and which sectors are expected to see further development in future? Have there been any notable recent regulatory developments relating to drones?

In addition to military applications and the development of the use of drones by firefighters and police to conduct investigations or rescue operations, there has been a significant increase in the sale of leisure drones, as well as their use in the cinema and audio-visual sector (film

and documentary production). The use of drones is also in progress in the field of building and architecture, particularly in the context of 3D modelling. Drones are also used in precision agriculture.

Germany

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GENERAL FRAMEWORK

Basic rules and regulators

1 | What basic rules govern the operation of remotely piloted aircraft and unmanned aircraft (drones) in your jurisdiction? Which regulatory bodies are charged with enforcing these rules?

In German law, depending on its intended use, a drone is referred to as a 'flight model' or 'unmanned aviation system'. According to article 1, paragraph 2 of the German Air Traffic Act, flight models and unmanned aviation systems fall under the term 'aircraft'. For this reason, the provisions of general aviation law apply to the civil use of drones. Various German aviation laws contain specific provisions on drones, in which licensing regulations, operating restrictions, etc, are regulated. These are primarily the provisions of the Air Traffic Regulation (LuftVO), in particular article 21a-f, the Air Traffic Act (LuftVG) and the Air Traffic Approval Regulation (LuftVZO).

The German Federal Aviation Authority (LBA) or the aviation authority of the respective federal state is responsible for monitoring and ensuring compliance with the laws and regulations.

On 24 May 2019, the European Commission adopted the Implementing Regulation (EU) 2019/947 on the rules and procedures for the operation of unmanned aircraft. This Implementing Regulation will apply from 1 July 2020 and harmonises the regulations on unmanned aircraft throughout the European Union.

2 | What are the penalties for non-compliance with the laws and regulations governing drones?

According to article 44, paragraph 1, no. 17a-17e LuftVO in conjunction with article 58, paragraph 1, no. 10 and paragraph 2 LuftVG, violations against the drone provisions stipulated in the LuftVO are administrative offences punishable with a fine of up to €50,000.

Classification

3 | Is there any distinction between public and private drones, as well as between leisure use and commercial use?

In respect of civil drones, a distinction is made between flight models and unmanned aviation systems. The purpose of use is decisive for the definition of these terms. If the drone is operated solely on a private basis for the purpose of sports or leisure activities, it is called a flight model. In the case of any other use of the drone, especially commercial use, the drone is called an unmanned aviation system. Most regulations apply equally to both types of drones. However, with regard to some requirements and specifications, a distinction is made between flight models and unmanned aviation systems.

4 | Is there a weight-based classification system for drones resulting in the application of different rules?

In Germany, there is a weight-based classification system for drones. For drones with a maximum take-off weight (MTOW) of more than 0.25kg, article 19, paragraph 3 LuftVZO stipulates an obligation to mark the drone. Before the drone is operated for the first time, a permanent and fireproof badge must be affixed to the drone showing the name and address of the owner.

If the drone has an MTOW of more than 2kg and if it is operated outside a flying field for model aircraft, in addition to the badge, the owner must have a proof of knowledge that was issued by a body acknowledged by the LBA or an aerial sports association.

If the MTOW of the drone is more than 5kg, an operating licence is also required as per article 21a, paragraph 1, no. 1 LuftVO.

Flight models with an MTOW of more than 25kg require a type certification in accordance with article 1, paragraph 1, no. 8 LuftVZO.

The Implementing Regulation provides for a differentiation on the basis of three risk categories instead of weight classification. This subdivision is based on a risk-based approach and is intended to provide a legal framework for all types of drones without weight restrictions. In particular, a distinction is made between the open category (low risk), the specific category (medium risk) and the licensed category (higher risk). Depending on the category, different requirements should apply.

5 | Is there any distinction between completely autonomous drones and remotely piloted drones?

Currently, regulations governing the operation of completely autonomous drones do not exist, as this type of drone is prohibited under German law.

DESIGN AND MANUFACTURE

Regulation

6 | Do specific rules regulate the design and manufacture of drones in your jurisdiction?

German law does not provide for specific rules on the design and manufacture of drones. Therefore, EU regulations apply.

According to article 10 of the Implementing Regulation (EU) 2019/947, unmanned aircraft must comply with the technical requirements, regulations and procedures for airworthiness issued on the basis of article 58 of Regulation (EU) 2018/1139.

Article 55 of Regulation (EU) 2018/1139, which refers to Annex IX of that Regulation, regulates the basic requirements for unmanned aircraft. Section 1 of Annex IX states that an unmanned aircraft must be designed and constructed to perform its intended function and to be capable of being operated and maintained without endangering a

person. It shall also have appropriate and specific characteristics and functions that take into account the principles of protection of privacy and personal data by technology and default. In addition, simple identification must be ensured. Moreover, as per section 2, the aircraft must be designed in such a way and have appropriate characteristics so that the safety of the operator, third parties in the air or on the ground and material assets is safeguarded. Furthermore, the aircraft shall be designed in such a way that the likelihood of failure is minimised, that it functions unconditionally and that its operation is facilitated as far as possible.

Manufacturing authorisation

7 Must drone manufacturers obtain any licences or other authorisation to carry out their business? Are manufacturers subject to any other specific rules?

This is also mainly governed by EU law.

Manufacturers of unmanned aircraft are subject to the European regulations for development and manufacturing companies, especially Regulations (EU) 2018/1139 of 4 July 2018 and 748/2012 of 3 August 2012.

In addition, the German Regulation on the Inspection of Aircraft (LuftGerPV) applies.

According to Regulation (EU) 748/2012, design and manufacturing companies must demonstrate their capability in accordance with the provisions of Annex I (Part 21). The approval of a manufacturing and development company in Germany is issued by the LBA.

Product liability

8 Do general product liability rules (or other specific liability rules) apply to the manufacture of drones?

In Germany, specific rules on product liability particularly for drone manufacturers do not exist. Therefore, the rules of German civil law apply (ie, the German Civil Code (BGB) and the Product Liability Act (ProdHaftG)).

The manufacturer is subject to the provisions of article 823 BGB et seq, which is a liability in tort. Under these provisions, the manufacturer is liable for damage incurred by third parties in connection with manufacturing defects. Article 823 BGB stipulates that a person who, intentionally or negligently, unlawfully harms the life, body, health, freedom, property or another right of another person is liable for such damage.

The ProdHaftG regulates the legal relationship between the manufacturer and the user. The aim of the law is to prevent unsafe products from being brought into the market. The manufacturer is subject to certain requirements and obligations, in particular the duty of care. Under article 1, paragraph 1 ProdHaftG, the manufacturer of a product is obliged to compensate the injured party for the damage if, as a result of a product's defect, a person is killed or if he or she suffers an impairment to his or her body or health, and also if an object is damaged. The burden of proof for the defect, the damage and the causation between the defect and the damage is with the injured party.

REGISTRATION AND IDENTIFICATION

Registration

9 Must drones be registered in a specific national registry? If so, who is entitled to register drones and what requirements and restrictions apply? Is the registry organised as an operator registry or an owner registry?

Under German law, civil drones do not have to be registered in a national register.

Identification

10 Are drones identified through a marking system similar to that used for manned aircraft?

As per articles 19, paragraph 1, and 1 paragraph 4, no. 2 LuftVZO, drones are exempt from type certification and, therefore, are not identified through a marking system used for manned aircraft. Such a mark is only affixed to the aircraft if it has a type certification and a certificate of airworthiness or if it is registered in the aircraft register. Both are not the case for drones. Exceptions are flight models with a permissible take-off weight of more than 25kg. According to article 1, paragraph 1, no. 8 LuftVZO, such flight models are subject to type certification.

However, as per article 19, paragraph 3 LuftVZO, the owner of a drone with a MTOW of 0.25kg or more must affix to the drone a permanent and fireproof badge with his or her name and address at a visible place before it is operated for the first time. The marking obligation is intended to ensure that in the event of damage caused by a crash or a collision with other aircraft, the responsible person can be prosecuted under both criminal and civil law.

CERTIFICATION AND LICENSING

Basic requirements and procedures

11 What certificates or licences are required to operate drones and what procedures apply?

The regulations are based on the weight of the drone, as this is the indicator of the risk posed by the drone.

According to article 21a LuftVO, permission must be obtained from the responsible aviation authority in the following cases:

- if the take-off mass exceeds 5kg;
- for rocket-powered drones, if the mass of the propellant exceeds 20g;
- for internal combustion engine-powered drones operated at a distance of less than 1.5km from residential areas;
- for drones taking off at a distance of less than 1.5km from the perimeter of aerodromes. At aerodromes, the operation of unmanned aviation systems and flight models also requires the approval of the air traffic control (ATC) authority and the aerodrome management; or
- for the operation of drones at night (night being defined in article 2, No. 97 of the Implementing Regulation (EU) 923/2012).

Pilots of unmanned aircraft with a take-off mass of more than 2kg must prove their knowledge of:

- the use and navigation of such aircraft;
- the relevant basic air law; and
- local airspace regulations.

Such proof can be provided with:

- a valid pilot licence or a certified copy thereof;
- a certificate of a passed examination issued by a body recognised by the LBA; or
- a certificate of instruction issued by an authorised air sports association or a club for the operation of flight models.

The operation of unmanned aviation systems by or under the supervision of:

- authorities, if this takes place for the fulfilment of their tasks; and
- safety organisations involved in emergencies, accidents and disasters;
- does not require a permission or proof of knowledge.

The competent authority for granting the above-mentioned permission is the locally competent aviation authority of the relevant German federal state.

As per article 21b LuftVO, the following types of drone operations are prohibited:

- beyond the sight of the operator if the MTOW of the drone is 5kg or less;
- at a height and lateral distance of 100 metres from crowds, accident scenes, disaster areas and other operation sites of authorities and organisations with safety or security missions as well as mobile establishments and troops of the army;
- at a height and lateral distance of 100 metres from the outer boundaries of industrial facilities, prisons, military facilities, energy production facilities;
- at a height and lateral distance of 100 metres from governmental authorities, embassies and consulates and police facilities;
- at a height and lateral distance of 100 metres from federal highways and railway facilities;
- over certain nature reserves;
- over residential estates if the MTOW of the drone exceeds 0.25kg or if the device or its equipment is able to receive, transfer or record optical, acoustic or radio signals, unless the owner of the premises or the resident has expressly consented to the overflight; and
- at a height and lateral distance of 100 metres from the boundaries of a hospital.

According to the Implementing Regulation (EU) 2019/947, there will be a subdivision of drones into the operating categories 'open', 'special 'and 'certified', on the basis of which the permit requirements will be determined.

Taxes and fees

12 | Are certification and licensing procedures subject to any taxes or fees?

The competent authority for issuing the permit is the locally competent aviation authority of the relevant German federal state. The fees arising from the administrative procedure are levied by the relevant authority on the basis of its national administrative provisions. For example, the fees for issuing a permit in the federal state of Baden-Württemberg amount to €100–300.

Eligibility

13 | Who may apply for certifications and licences? Do any restrictions apply?

German law does not impose any requirements on the applicant for a permit under article 21a LuftVO. Pursuant to article 21a, paragraph 3 LuftVO, the required permit is rather granted if the operation does not pose a safety risk for air traffic or a risk for public safety and order.

Remote pilot licences

14 | Must remote pilots obtain any certifications or licences to operate drones? If so, do the relevant procedures differ based on the type of drone or operation?

Under German law, a general licence or certification for the operation of drones does not exist. However, in particular cases, a permit is required.

According to article 1, no. 6 of the German Regulation on Aviation Personnel (LuftPersV), pilots of flight models with an MTOW of more than 25kg require a pilot licence.

As indicated above under question 11, as per article 21a, paragraph 4 LuftVO, a pilot of a drone with a take-off weight of more than 2kg is obliged to provide proof of specific knowledge for pilots of unmanned aircraft if the drone is operated outside flying fields for model aircraft. Accordingly, operators of drones with a take-off mass of more than 2kg require a certificate of sufficient knowledge and skills in usage and navigation, of the relevant provisions of aviation law and of the local airspace regulations. The certificate is valid for five years.

To obtain a permit to operate an unmanned aviation system, the applicant must be 16 years or older.

To obtain a permit to operate a flight model, the applicant must be at least 14 years old.

Article 9 of the Implementing Regulation (EU) 2019/947 provides for a minimum age of 16 for remote pilots operating unmanned aircraft systems in the open and special categories. The Implementing Regulation regulates the requirements on the knowledge and skills of the remote pilot on the one hand and on his or her state of health on the other. In addition, the category in which the respective drone is classified is decisive for the required conditions.

Foreign operators

15 | Are foreign operators authorised to fly drones in your jurisdiction? If so, what requirements and restrictions apply?

The LuftVO regulates the requirements and conditions for the participation in air traffic in the Federal Republic of Germany. Participation is independent of the nationality of the operator. Foreign operators are, therefore subject to the same conditions as domestic operators.

Licences acquired by domestic or foreign operators in a third country can be recognised by the LBA as sufficient if they have been issued in accordance with Regulation (EU) 1178/2012.

According to article 13 of the Implementing Regulation (EU) 2019/947, for the operation of drones in the category 'special' that shall be carried out wholly or partly in the airspace of another member state, the drone operator must submit an application to the competent authority of the member state in which the operation shall be carried out.

Certificate of airworthiness

16 | Is a certificate of airworthiness required to operate drones? If so, what procedures apply?

According to article 1 LuftZVO, a type certification is required for certain aircraft and thus a certificate of airworthiness. Unmanned aircraft are expressly exempted from type certification (article 1, paragraph 4, sentence 1, no. 2 LuftVZO). A certificate of airworthiness is, therefore, not required for drones. However, flight models with a maximum take-off mass of more than 25kg are subject to type certification according to article 1, paragraph 1, no. 8 LuftVZO and require a certificate of airworthiness.

According to article 10 of the Implementing Regulation (EU) 2019/947, unmanned aircraft must comply with the technical requirements, regulations and procedures for airworthiness issued on the basis of article 58 of Regulation (EU) 2018/1139. According to article 3, paragraph 1 (c), drones in the 'certified' category require approval as per the Delegate Regulation (EU) 2019/945.

OPERATIONS AND MAINTENANCE

One drone, one pilot

17 | Does the 'one drone, one pilot' rule apply in your jurisdiction?

A regulation comparable to the one drone, one pilot rule, which regulates the simultaneous operation of several drones by one pilot, does not exist in German law. German law rather only recognises the opposite case where one aircraft is operated by several persons (article 2, paragraph 3 LuftVO).

Maintenance

18 | Do specific rules regulate the maintenance of drones?

The maintenance obligation for aircraft is regulated in article 13, paragraph 3 of the Regulation on the Inspection of Aircraft (LuftGerPV). The airworthiness of drones that are flight models with a maximum take-off mass of more than 25kg under article 1, paragraph 1, no. 8 LuftZVO, must be reviewed every 12 months. If any changes have been made to these flight models, they also have to be checked before the first flight. All other unmanned aircraft as per article 1, paragraph 4, no. 2 LuftVZO are not mentioned in article 12, paragraph 1 LuftGerPV and are, therefore, not subject to statutory requirements on maintenance or servicing.

According to article 10 of Implementing Regulation (EU) 2019/947, which applies as from 1 July 2020, unmanned aircraft must comply with the technical requirements, regulations and procedures for airworthiness issued on the basis of article 58 of Regulation (EU) 2018/1139.

Basic operational rules and restrictions

19 | What rules and restrictions apply to flights performed in 'visual line of sight' (VLOS) and 'beyond visual line of sight' (BVLOS)? Is there a distinction in this regard?

According to article 21b, paragraph 1, no. 1 LuftVO, in Germany, drones with a take-off weight of up to 5kg may generally only be operated within sight.

According to article 21b, paragraph 1 LuftVO, the operation takes place outside the pilot's visibility (ie, beyond visual line of sight) if the pilot can no longer see the unmanned aircraft without special optical aids or is no longer able to clearly recognise its flight position.

However, the operation of an unmanned aircraft with the aid of a visual device, in particular video glasses, is deemed not to be outside the pilot's sight if such operation takes place at altitudes below 30 metres and the take-off mass of the aircraft does not exceed 0.25kg, or if the pilot can be immediately alerted of any hazards by another person who has the drone in his or her sight permanently and who is observing the airspace.

20 | What rules and restrictions apply to critical and non-critical operations? Is there a distinction in this regard?

As per article 21b LuftVO, amongst others, the following types of drone operation are prohibited:

- beyond the sight of the operator if the MTOW of the drone is 5kg or less;
- at a height and lateral distance of 100 metres from crowds, accident scenes, disaster areas and other operation sites of authorities and organisations with safety or security missions as well as mobile establishments and troops of the army;
- at a height and lateral distance of 100 metres from the outer boundaries of industrial facilities, prisons, military facilities or energy production facilities;
- at a height and lateral distance of 100 metres from governmental authorities, embassies and consulates and police facilities;
- in a height and lateral distance of 100 metres from federal highways and railway facilities;
- over certain nature reserves;
- over residential estates if the MTOW of the drone exceeds 0.25kg or if the device or its equipment is able to received, transfer or record optical, acoustic or radio signals, unless the owner of the premises or the resident has expressly consented to the overflight; and
- at a height and lateral distance of 100 metres from the boundaries of a hospital.

Although night flights with drones are generally prohibited in the German federal states of Baden-Württemberg, Niedersachsen and Sachsen-Anhalt, in the other federal states it is often possible to obtain an operating permit for an individual operation, although it will be subject to certain conditions. In particular, a justified purpose must be put forward to the authority. In addition, the responsible aviation authority must be convinced that the night flight creates only a low risk potential. In case of doubt, the assessment of the risk potential is at the discretion of the authority concerned.

If the operation of a drone is permitted at night, there are requirements in respect of the drone's lighting. The visual flight rules, including the rules for night flights, are regulated uniformly throughout the EU by the Standardised European Rules of the Air in the Implementing Regulation (EU) 923/2012. According to this Regulation, all aircraft, including drones, are required to be equipped with special lighting. Annex 1 to articles 17 and 19, paragraph 7 LuftVO stipulates that green, red and white position lights with clearly defined luminous intensities and beam angles as well as additional white indicators upwards and downwards must be used.

Transport operations

21 | Is air transport via drone (eg, cargo and mail) regulated in your jurisdiction? If so, what requirements, limitations and restrictions apply?

German law does not expressly regulate the operation of drones for logistical purposes.

However, article 13 LuftVO prohibits the dropping of objects or other substances from aircraft. The dropping of ballast such as water or fine sand, fuels, tow ropes, tow banners and similar objects is allowed if they are dropped or discharged at places where there is no danger to persons or property.

According to article 21b, paragraph 1, sentence 1, no. 10 LuftVO, the transport of hazardous substances via drone is generally prohibited (eg, explosives and pyrotechnic objects, radioactive substances, objects, liquids or gaseous substances that are capable of causing panic, fear or horror in humans when dropped or released).

The locally competent aviation authority of the relevant German federal state may permit exceptions to the ban on dropping substances if there is no danger to persons or property.

As per article 13, paragraph 3 LuftVO, the Federal Ministry of Economics and Energy or the body designated by it regulates the dropping of mail.

In Germany, the delivery of goods with drones is currently not permitted. Drones are also not permitted for commercial use over longer distances.

22 | Do any specific provisions governing consumer protection and tracking systems apply with respect to cargo and delivery operations via drone?

Such provisions do not exist under German law.

Insurance requirements

23 | What insurance requirements apply to the operation of drones?

Drones are subject to the regulations on liability for third-party damage in accordance with article 33 et seq LuftVG. As incidents with drones are considered as incidents in connection with the operation of an aircraft, accidents caused by drones are normally not covered by private liability insurance. Rather, an owner's liability insurance is required.

According to article 43 LuftVG, the owner or operator (*Halter*) is obliged to take out liability insurance with sufficient cover before the

aircraft is put into service. Under German law, insurance is compulsory for the statutory liability for third-party damage caused by drones, regardless of whether the drone is used privately or commercially. This is a mandatory insurance regardless of size and weight.

According to article 102 LuftVZO, the liability insurance contract for third-party damage must cover the liability for the *Halter* resulting from the operation of an aircraft. Group insurance is permitted for flight models.

Safety requirements

24 | What safety requirements apply to the operation of drones?

Article 21b LuftVO regulates – as in question 20 – the prohibitions on the use of airspace (ie, in and over which areas drones may not be used).

AIRSPACE

Air traffic control

25 | How is air traffic control regulated in your jurisdiction? Which authority provides air traffic control services for drones?

The German authority responsible for air traffic control services in Germany is Deutsche Flugsicherung (DFS), based in Langen near Frankfurt airport. It operates on behalf of the Federal Ministry of Transport and Digital Infrastructure.

According to article 27c LuftVG, the scope of ATC services include air traffic services, communication services, navigation services, surveillance services, aeronautical information services and aeronautical meteorological services.

The DFS is also the competent ATC authority for drone flights.

The DFS provides information on drone flights on its homepage (https://www.dfs.de/dfs_homepage/de/Drohnenflug/Regeln/). In addition to general regulations, it also provides approach maps and information on airports.

Furthermore, the DFS offers a drone app that can be downloaded from its website. With this app, a drone flight can be planned and checked in advance. The app contains all the regulations and rules relating to drone operations.

The DFS also offers a drone check on its website. After answering various questions by clicking yes or no, the user receives an overview of all regulations in respect of the concrete drone and the concrete drone operation he or she plans (licensing requirements, operating regulations, etc).

Restrictions

26 | Are there any airspace restrictions on the operation of drones?

In general, drones may not fly higher than 100 metres above ground (article 21b, paragraph 1, no. 8 LuftVO). According to article 21b, paragraph 1, no. 9 LuftVO, the operation of drones is prohibited in control zones at an altitude above 50 metres.

Before operating a drone in controlled airspace and the airspace above airfields with ATC units, an ATC clearance must be obtained from the responsible ATC unit in accordance with article 21 LuftVO. This applies for drone operations in controlled airspace closer than 1.5km to the airfield boundary and at altitudes of more than 50 metres.

In addition, article 21b LuftVO regulates further prohibitions concerning the use of airspace. See question 20. In individual cases, exceptions are possible, which can be applied for with the responsible aviation authority in the respective German federal state.

Take-off and landing

27 | Must take-off and landing of drones take place in specific areas or facilities?

The regulations of article 21b LuftVO apply – see question 20.

In addition, according to article 25 LuftVG, aircraft and thus also drones may only take off and land outside the airfields approved for them if the landowner or other entitled person has given his or her consent and the aviation authority has issued a permit.

LIABILITY AND ACCIDENTS

Cargo liability

28 | Are there any specific rules governing the liability of drones for losses or damage to cargo?

According to current German law, drones are not permitted for commercial use over long distances. Also, the dropping of objects from aircraft is not allowed in Germany. Therefore, the use of drones in the cargo sector is very limited. There are no special regulations in Germany regarding liability for damage to, or loss of, cargo in connection with transport by drone.

Third-party liability

29 | Are there any specific rules governing the liability of drones for damage to third parties on the surface or in the air?

According to article 33 LuftVG, the *Halter* of the drone is liable for third-party damage caused by the operation of an aircraft and thus a drone. This is a strict liability regardless of fault. This strict liability also applies in the event of unavoidable events or force majeure. The *Halter* is the person who uses the drone for his or her own account and has the power of disposition or control over it. The *Halter* is not always the owner as the owner may allow a third person to use the drone for his or her own account and with his or her own power of control. The *Halter* is also liable if or she he does not operate the drone himself or herself.

An exception to the above applies if the injuring party operates the aircraft or drone without the knowledge and consent of the *Halter*. Then, this person is solely responsible for the damage as per article 33, paragraph 2 LuftVG. However, the *Halter* remains obliged to compensate the damage if the use of the aircraft or drone by the injuring person was made possible through the *Halter*'s fault.

According to article 37, paragraph 1 LuftVG, the liability is limited to maximum amounts. For damage arising from an accident involving aircraft or drones with a maximum take-off mass of less than 500kg, liability is limited to a capital amount of 750,000 special drawing rights. If a person is killed or injured by a drone, the liability is limited to a capital amount of €600,000 per damaged person or up to a pension amount of €36,000 per year for each damaged person.

In addition to strict liability according to article 33 LuftVG, article 823 of the BGB also provides for a fault-based liability. This type of liability is not subject to liability limits.

As explained under question 23, article 43, paragraph 2 LuftVG stipulates the obligation to take out liability insurance for the use of drones. Private liability insurance is not sufficient.

Accident investigations

30 | How are investigations of air accidents involving drones regulated in your jurisdiction?

The authority responsible for the investigation of accidents and severe disruptions following the operation of civil aircraft in Germany is the Federal Bureau of Aircraft Accident Investigation (BFU).

Under article 7 LuftVO, accidents of civil aircraft must be reported immediately to the BFU by the pilot or the owner of the aircraft.

Under German law, accident investigation and reporting is governed by the Law on the Investigation of Accidents and Disruptions in the Operation of Civil Aircraft (FlUUG), which is the transposition of Directive 94/56/EC into German law. Furthermore, Regulation (EU) 996/2010 applies.

The FlUUG applies to accidents and disruptions that occur in the Federal Republic of Germany and, with regard to drones, applies to:

- accidents in which:
  - a person suffers a fatal or severe bodily injury in connection with an aircraft; and
  - an aircraft has suffered damage because of which the aircraft's performance, its structural strength or flight characteristics are impaired and the reparation involves considerable efforts or a replacement of the damaged part;
- disruptions that impair or could impair the safe operation of a flight;
- fatal injuries; and
- severe injuries, especially if an accident:
  - requires a hospital stay of more than 48 hours within seven days of the injury;
  - entails bone fractures (except simple fractures of fingers, toes or nose);
  - entails lacerations with severe bleeding or injuries of nerves, muscles or tendons;
  - entails damage to inner organs; or
  - entails second or third-degree burns or of more than 5 per cent of the body surface.

The BFU establishes a report on every investigation in which, inter alia, the details of the accident or disruption, the aircraft concerned, the external circumstances, the results of the investigations and the discovery of the (potential) cause of the accident or disruption are indicated. When establishing the report, the BFU may hear the operator of the aircraft, the manufacturer, representatives of foreign states, ATC and the German Meteorological Service. The BFU may also request assistance, information, documents and equipment from other states for conducting the investigation.

Accident reporting

31 | Is there a mandatory accident and incident reporting system for drone operators in your jurisdiction?

According to article 7, paragraph 1 LuftVO, the pilot must immediately notify the BFU of accidents and serious incidents within the meaning of article 2, no. 1 and no. 16 of Regulation (EU) 996/2010.

The notification can be made by telephone, fax or online.

According to article 7, paragraph 4 LuftVO, the report must contain the information listed in nos. 1 to 10 (eg, name and current location of the person providing the report, extent of personal injury and damage to property, purpose of the flight).

Safety management and risk assessment

32 | Are drone operators required to implement safety management systems and risk assessment procedures within their organisation?

German law does not yet require drone operators to carry out safety management systems and risk assessment procedures. There are only operating prohibitions according to article 21b, paragraph 1 LuftVO (see question 20).

This will change with the applicability of the Implementing Regulation (EU) 2019/947 as from 1 July 2020. According to article 3, drones are divided into three operating categories ('open', 'special' and 'certified'). Drones that fall under these operating categories are subject to a risk assessment in accordance with article 11, paragraph 2 of the Regulation.

ANCILLARY CONSIDERATIONS

Import and export control

33 | Do specific import and export control rules apply to drones in your jurisdiction?

In the EU, most drones fall under the dual-use provisions (ie, they can be used for both civil and military purposes). For this reason, the import and export of such products is strictly monitored. If an assembly or a product that falls under the dual-use regulations according to Regulation (EC) 428/2009 shall be exported to a country outside the EU, an export licence must be applied for at the Federal Office of Economics and Export Control.

In the case of export of a drone but also when a drone shall stay temporarily in a country outside the EU (eg, for service flights, demonstrations or trade fairs), an ATA Carnet certificate must be applied for. These customs documents considerably simplify customs clearance and, in the case of temporary stays, import duties do not have to be deposited as security.

Data privacy and IP protection

34 | How are personal data privacy and IP protection regulated in your country with specific reference to drone operations?

In the case of photos or films taken by drones, the General Data Protection Regulation (GDPR) and the German Federal Data Protection Act apply. However, these Regulations do not specifically refer to drones.

According to article 21b, paragraph 1, no. 7 LuftVO, the operation of drones over residential properties is prohibited if the device or its equipment is capable of receiving, transmitting or recording optical, acoustic or radio signals, unless the owner or authorised user of the property who are affected by the operation of the drone over the respective residential property has expressly consented to the overflight.

According to the new Implementing Regulation (EU) 2019/947, drone pilots must be registered if the aircraft is equipped with a sensor to collect personal data.

UPDATE AND TRENDS

Sector trends and regulatory developments

35 | Which industry sectors have seen the most development in the use of drones in your jurisdiction and which sectors are expected to see further development in future? Have there been any notable recent regulatory developments relating to drones?

In February 2019, the German Unmanned Aerial Vehicle Association conducted a study on the German drone market: https://www.bdli.de/sites/default/files/global_upload_upload/Analyse%20des%20deutschen%20Drohnenmarktes.pdf. The information below was derived from this study.

Almost 500,000 drones are in operation in Germany. Among these, 455,000 are used on a private basis. Some 19,000 drones are used on a commercial basis, for example, for surveying or measuring, mapping, inspection, filming and photography.

In Germany, there are around 400 companies whose core business is unmanned aircraft.

In an international comparison, Germany is in the midfield concerning the size of its drone market.

The DFS expects more than one million drones to fly in German airspace by 2020. The growth of the drone market will be driven primarily by the commercial market.

The above-mentioned study also shows that surveying or measuring is the main field of application for drones (79 per cent), followed by inspection activities (inspection of buildings and infrastructures such as wind turbines and high-voltage lines) (53 per cent). In third place are film and photography (35 per cent); in fourth place are mapping tasks (33 per cent). Other fields of application are data collection (15 per cent), transport (5 per cent) and others (19 per cent).

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GENERAL FRAMEWORK

Basic rules and regulators

1 | What basic rules govern the operation of remotely piloted aircraft and unmanned aircraft (drones) in your jurisdiction? Which regulatory bodies are charged with enforcing these rules?

Remotely piloted aircraft (RPAs) and unmanned aircraft (drones) are governed by the Civil Aviation Requirements (CAR) issued by the Directorate General of Civil Aviation (DGCA) from time to time. At the time of drafting, the relevant regulations that deal with RPAs and unmanned aircraft are (i) CAR section 3 – Air Transport Series – X Part 1 Issue I dated 29 August 2018; (ii) AIP Supplement 164 of 2018 issued by the Airports Authority of India dated 30 November 2019 and (iii) the DGCA RPAS Guidance Manual issued on 3 June 2019 by the DGCA.

The DGCA is the regulatory body charged with enforcing the above-mentioned rules.

2 | What are the penalties for non-compliance with the laws and regulations governing drones?

In the case of violation of the CAR, the following penalties may be imposed: an operator's unique identification number (UIN) or unmanned aircraft operator permit (UOAP) issued by the DGCA may be suspended or cancelled.

Breach of compliance to any of the requirements of the CAR and falsification of records or documents may attract penal action, including imposition of penalties as per the Indian Penal Code 1860 (IPC), which includes but is not limited to:

- section 287: negligent conduct with respect to machinery (carrying a maximum sentence of imprisonment that may extend to six months or a fine that may extend up to 1,000 Indian rupees, or both);
- section 336: act endangering life or personal safety of others (carrying a maximum sentence of imprisonment that may extend to three months or a fine that may extend to 250 rupees, or both);
- section 337: causing hurt by an act endangering the life or personal safety of others (carrying a maximum sentence of imprisonment that may extend to six months or a fine that may extend to 500 rupees, or both);
- section 338: causing grievous hurt by an act endangering the life or personal safety of others (carrying a maximum sentence of imprisonment that may extend to two years or a fine that may extend to 1,000 rupees, or both); or
- any other relevant section of the IPC.

Penalties for contravention or failure to comply with any rules or directions issued under Rule 133A of the Aircraft Rules 1939 (the rule under which CARs are issued), are punishable to the extent of imprisonment for a term not exceeding six months or a fine not exceeding 200,000 rupees or both.

Classification

3 | Is there any distinction between public and private drones, as well as between leisure use and commercial use?

As such there is no distinction between public and private drones; however, there is a distinction in the process for obtaining a UIN depending on whether the operator of the drone is a public or private entity. To illustrate this further, drones owned wholly by the central or state government or by any company or corporation owned and controlled by either the central or state governments are exempted from obtaining security clearance from the Ministry of Home Affairs. Further, specific intelligence wings of the government such as the National Technical Research Organisation, Aviation Research Centre and Central Intelligence Agency are completely exempt from having to obtain a UIN or an unmanned aircraft operator permit (UAOP).

Further, there is no specific distinction between drones for commercial or leisure use; however, there is a clear distinction between the requirement of having to obtain an UOAP for drones that are usually used for commercial use and for drones that are usually used for leisure. An example is that operators of nano drones (see question 4 for classification of drones according to weight) operating below 15.24 metres above ground level (AGL) in uncontrolled airspace or enclosed premises and operators of micro drones operating below 60.96 metres AGL in uncontrolled airspace or enclosed premises do not require a UOAP, while all small, medium-sized and large drones require the operator to obtain a UOAP. Further, there is also a distinction in the requirement for remote pilot training – while drone pilots operating drones in the nano or micro category in uncontrolled airspace do not require formal ground or practical remote pilot training, remote pilots of all other categories of drones are required to complete fairly rigorous ground training following by practical training.

4 | Is there a weight-based classification system for drones resulting in the application of different rules?

Drones are classified on the basis of weight as below:

- nano: less than or equal to 250g;
- micro: greater than 250g and less than or equal to 2g;
- small: greater than 2kg and less than or equal to 25kg;
- medium: greater than 25kg and less than or equal to 150kg; and
- large: greater than 150kg.

There are also clear and distinct differences in the rules applied to different drones.

UIN and UOAP requirements
Nano drones operating under 50ft in uncontrolled airspace or enclosed premises are exempted from obtaining a UIN, while nano and micro drones operating below 50 and 200ft respectively, are exempt from obtaining a UOAP.

Remote pilot training requirements
Pilots of nano and micro drones intending to operate in uncontrolled airspace are exempt from the requirements of remote pilot training. All others, falling in any other category, except for the categories mentioned hereinabove, are required to obtain UINs, UOAPs and such remote pilots are also required to fulfil the requirements of the remote pilot training.

Security and safety requirements
Operators of nano drones need not notify any incident or accident to the concerned authority, while all other operators must do so.

Equipment requirements
Nano drones intending to operate up to 50ft in uncontrolled airspace or enclosed premises are exempt from mandatorily being equipped with features such as a global satellite system (GNSS); autonomous flight termination system or return to home options; flashing anti-collision strobe lights; app-based real-time tracking; fire-resistant identification plates with the UIN inscribed; and flight controllers with data logging capability.

Operating requirements
Nano drone operators need not obtain permission before undertaking a flight, while all other categories must mandatorily obtain permission through the online app-based Digital Sky platform. Further, nano and micro drones intending to operate up to 15.24 metres and 60.96 metres in uncontrolled airspace or enclosed premises respectively need not file a flight plan 24 hours before actual operations and also are not required to obtain air traffic control (ATC) and air defence clearance. Nano drone operators operating below 15.24 metres are exempted from informing the local police office concerned in writing prior to commencing operations.

Minimum standard for manufacturing of RPAs requirements
Nano drones are exempt from the requirement of the drone manufacturer providing a certificate of compliance to the DGCA.

5 | Is there any distinction between completely autonomous drones and remotely piloted drones?

The CAR applies to RPAs and autonomous aircraft alike. The CAR specifically states that both RPAs and autonomous aircraft are various sub-sets of unmanned aircraft that are operated with no pilot on board. As such, there is no distinction between completely autonomous drones and remotely piloted drones.

DESIGN AND MANUFACTURE

Regulation

6 | Do specific rules regulate the design and manufacture of drones in your jurisdiction?

The CAR provides for extensive rules regulating the design and manufacture of all drones apart from nano and micro drones. These are contained in an annexure to the CAR (Annexure XIV) and regulate items such as all-up weight, wing span and rotor diameter, stall speed, cruise speed, range, endurance, operational altitude, ceiling height, propeller speed, powerplant, payload, shock absorbing mechanisms, type of data link used for communication, type of material for construction, fabrication method, structural protection against deterioration or loss of strength, compliance with the Digital Sky platform specifications for No Permission – No Take-Off (NPNT), GNSS receivers for horizontal and vertical position fixing, geo-fencing capabilities, autonomous flight termination system or return to home function, flashing anti-collision strobe lights, RFID and GSM sim card, flight controller with flight data logging capability, ADS-B equipment, etc.

The CAR states that in relation to nano and micro categories of drones, the minimum standards for manufacturing as envisaged by the designer or original equipment manufacturer, shall be considered. Furthermore, for all other categories of drones, the manufacturer is also to provide a certificate of compliance along with NPNT compliance to DGCA.

The Guidance Manual further clarifies the matter by stating that a manufacturer should develop and ensure that their drones meet the minimum standards specified in the CAR, and should also carry out necessary tests as may be required on the test sites specified by the government.

Manufacturing authorisation

7 | Must drone manufacturers obtain any licences or other authorisation to carry out their business? Are manufacturers subject to any other specific rules?

At the moment, apart from the manufacturing requirements set out in question 4, no other licence or authorisation is required for drone manufacturers to carry out their business. No other specific rules apply.

Product liability

8 | Do general product liability rules (or other specific liability rules) apply to the manufacture of drones?

The CAR and other rules and regulations issued by the DGCA do not specifically deal with product liability; however, India has other laws that deal with liability for manufacturing or defective goods such as the Consumer Protection Act, 1986, other statutes and the general application of the Law of Torts.

REGISTRATION AND IDENTIFICATION

Registration

9 | Must drones be registered in a specific national registry? If so, who is entitled to register drones and what requirements and restrictions apply? Is the registry organised as an operator registry or an owner registry?

All applicants, except those in the nano category, will have to apply to the DGCA to obtain a UIN, which will be valid for a particular make and model of RPA and any changes to it will have to be communicated to the DGCA and other concerned authorities.

Requirements for issue of UIN
A UIN will be granted to those persons, if the RPA is wholly owned by:
(1) a citizen of India; or
(2) the central or any state government or any company or corporation owned or controlled by either of the said governments; or
(3) a company or a body corporate provided that:
- it is registered and has its principle place of business in India;
- its chairman and at least two-thirds of its directors are citizens of India; and;
- its substantial ownership and effective control is vested in Indian nationals; or

(4) a company or corporation registered elsewhere than in India, provided that such company or corporation has leased the RPA to any organisation as mentioned in point (2) or (3) above.

Documents required for registration of UIN

An applicant who is eligible as per the provisions laid down by the DGCA must submit a duly filled application along with requisite documents through the Digital Sky platform (CAR Series X Part I, section 3, paragraph 6.2 – Air Transport issued on 27 August 2018, effective from 1 December 2018) and must provide the following information:

- contact details of owners or lessee with a valid CIN, GSTIN or PAN card;
- purpose and base of operation;
- specification of the RPA;
- weight of compatible payload and maximum load carrying capacity of the RPA;
- RPA flight manual or manufacturer's operating manual (as applicable);
- manufacturer's maintenance guidelines for the RPA (as applicable);
- manufacturer's certificate of compliance with NPNT;
- ETA from WPC Wing, Department of Telecommunication for RPA; and
- security clearance (not older than five years from the date of application) for all – from the Ministry of Home Affairs (MHA) except in case of central government or state government or any company or corporation owned or controlled by either of the said governments.

In the case of a citizen, he or she may either obtain security clearance from the MHA or submit self-attested copies of at least two of three valid identity proofs such as passport, driving licence or Aadhaar card. And in the case of foreign remote pilots employed by Indian entities, the DGCA (except in the case of central or state governments or any company or corporation owned or controlled by them) shall forward the documents for security clearance to the security agencies in accordance with procedure being followed for foreign aircrew temporary authorisation in relation to airline pilots.

Requirements for issue of UAOP

Except for (i) nano category RPAs operating below 50ft in uncontrolled or enclosed airspace and (ii) micro RPA operating below 200ft in uncontrolled or enclosed airspace with prior intimation to the local police, all civil RPA operators require a UAOP. This would mean that nano and micro category RPAs (ie, RPAs weighing less than or equal to 2kg) shall not be required to obtain UAOP (CAR Series X Part, I section 3, paragraph 7 – Air Transport issued on 27 August 2018, effective from 1 December 2018).

Other civil RPAs (except as mentioned in the preceding paragraph) are required to submit an application along with the requisite fee for issuance of UAOP (Annexure VI) with the DGCA at least seven working days prior to actual commencement of operations, along with several documents as listed in Annexure VI of the CAR.

The UAOP will be issued by the DGCA within seven working days provided all the documents are complete. Such UAOP shall be non-transferrable and will be valid for a period of five years from the date of issuance. Further, a copy of UAOP shall be, for their information, provided to the MHA, Bureau of Civil Aviation Security (BCAS), Indian Air Force, Air Traffic Services providers and the District Administrator (Superintendent of Police).

In the case of RPAs taken on lease by an Indian entity from a foreign entity, the UOAP shall only be issued to the Indian organisation. The renewal of UAOP shall be subject to fresh security clearance from the MHA.

Identification

10 Are drones identified through a marking system similar to that used for manned aircraft?

All RPAs (except for nano category intending to operate up to 15 metres AGL in uncontrolled airspace or enclosed premises) are identified through an UIN inscribed on a fire-resistant identification plate. The marking system used for manned aircraft is not used here.

CERTIFICATION AND LICENSING

Basic requirements and procedures

11 What certificates or licences are required to operate drones and what procedures apply?

As stated above, a drone must have been issued a UIN by the DGCA while all operators, apart from nano and micro drone operators, must obtain a UAOP from the DGCA. The training requirements are also applicable, as mentioned herein in question 4.

The detailed procedure is reproduced in question 9.

Taxes and fees

12 Are certification and licensing procedures subject to any taxes or fees?

The various fees payable by an applicant are as follows:

- for grant of UIN – 1,000 Indian rupees;
- for a grant of UAOP – 25,000 rupees; and
- for renewal of UAOP – 10,000 rupees.

Eligibility

13 Who may apply for certifications and licences? Do any restrictions apply?

With the exception of foreign nationals, all others can apply for grant of a UIN. The CAR states that the following persons can apply for UIN:

(1) a citizen of India; or

(2) central government or any state government or any company or corporation owned or controlled by either of the said governments; or

(3) a company or a body corporate provided that:
   - it is registered and has its principal place of business within India;
   - its chairman and at least two-thirds of its directors are citizens of India; and,
   - its substantial ownership and effective control is vested in Indian nationals; or

(4) a company or corporation registered elsewhere than in India, provided that such company or corporation has leased the RPAs to any organisation mentioned in point (2) or (3) above. In the case of point (4), the UIN will be issued in the name of the Indian company.

Remote pilot licences

14 Must remote pilots obtain any certifications or licences to operate drones? If so, do the relevant procedures differ based on the type of drone or operation?

Operators of nano drones below 15.24 metres AGL in uncontrolled airspace or enclosed premises and operators of micro drones operating below 60.96 metres AGL in uncontrolled airspace or enclosed premises do not require a UOAP while all small, medium and large drone operators require a UOAP. Further, there is also a requirement for remote pilot training – while drone pilots piloting drones in the nano or micro

category in uncontrolled airspace do not require formal ground or practical remote pilot training, remote pilots of all other categories of drones are required to complete fairly rigorous ground training following by practical training.

Foreign operators

15 | Are foreign operators authorised to fly drones in your jurisdiction? If so, what requirements and restrictions apply?

Foreign nationals are not permitted to operate drones in India. There is, however, only one exception to the rule, that is, foreign operators who are employed by Indian entities can operate in India; however, the DGCA shall forward their documents for a rigorous security clearance to security agencies in accordance with the procedure being followed by pilots giving the foreign aircrew temporary authorisation. In a practical sense, it is virtually impossible for foreign nationals to fly drones legally in India.

Certificate of airworthiness

16 | Is a certificate of airworthiness required to operate drones? If so, what procedures apply?

A certificate of airworthiness is not required for operation of a drone in India.

OPERATIONS AND MAINTENANCE

One drone, one pilot

17 | Does the 'one drone, one pilot' rule apply in your jurisdiction?

Yes, the CAR specifically prohibits the operation of more than one drone by a single remote pilot at the same time.

Maintenance

18 | Do specific rules regulate the maintenance of drones?

The CAR, which regulates operations of drones in India, specifically provides that maintenance of the drone should be carried out as per the approved procedures provided by the manufacturer. It also requires ground equipment to be maintained as per the recommendations of the manufacturer.

Basic operational rules and restrictions

19 | What rules and restrictions apply to flights performed in 'visual line of sight' (VLOS) and 'beyond visual line of sight' (BVLOS)? Is there a distinction in this regard?

Under the present CAR, drone operations are only permitted within the VLOS although the DGCA has invited expressions of interest from experts for conducting experimental BVLOS drone operations in India.

20 | What rules and restrictions apply to critical and non-critical operations? Is there a distinction in this regard?

As of now, the regulations do not per se differentiate between critical or non-critical operations. As per the CAR, all drone operations have to be done during daylight, and night operations are prohibited. However, if the drone is a nano or a micro drone and the operations are being conducted in an enclosed area then they may be conducted at night.

Transport operations

21 | Is air transport via drone (eg, cargo and mail) regulated in your jurisdiction? If so, what requirements, limitations and restrictions apply?

As per the current regulatory framework, drones cannot be used for any such purpose.

22 | Do any specific provisions governing consumer protection and tracking systems apply with respect to cargo and delivery operations via drone?

Not applicable.

Insurance requirements

23 | What insurance requirements apply to the operation of drones?

The regulations require drone operators to have third-party liability insurance. However, there is no minimum prescribed amount that has to be insured. The amount of insurance cover is to be assessed by the operator himself or herself.

Safety requirements

24 | What safety requirements apply to the operation of drones?

The following are the prescribed safety requirements that are applicable to the operation of drones in India.

- Before commencing a flight, a drone operator is required to carry out a safety risk assessment to include (i) hazard identification, (ii) determination of severity and likelihood of hazard on the operation, (iii) mitigation measures to reduce the risk identified, and (iv) verification of mitigation actions of the RPA operations including that of launch or recovery sites. The site (including emergency operation zone and any safety zone for the operation of RPAs) shall be under the full control of the operator.
- Designated safe areas should be established by the RPA operator for emergency RPA holding and flight terminations.
- The take-off and landing areas should be properly segregated from public access.
- For operations in the controlled airspace, the remote pilot shall establish and maintain contact with ATC prior to entering the controlled airspace.
- No person shall act as a remote pilot for more than one RPA operation at a time. If two or more persons are available as remote pilots for a flight, at any given moment, there shall be only one person acting as a remote pilot in command.
- RPAs shall, at all times, give way to manned aircraft.
- RPAs shall not discharge or drop substances unless specially cleared and this is mentioned in the UAOP.
- RPAs shall not transport any hazardous material such as explosives or animal or human payload.
- RPAs shall not be flown in a manner to cause danger to any person or property.

The regulations place the onus of safe custody and operations of a drone on the operator, who is required to report the loss of any drone to the local police, the DGCA and the BCAS. If the drone is damaged beyond repair, the same needs to be intimated to the DGCA. The operator of the drone is also required to ensure the optimal safety of the ground control station. Lastly, it is the responsibility of the operator to ensure that a BCAS-approved security programme is followed before each flight.

AIRSPACE

Air traffic control

25 How is air traffic control regulated in your jurisdiction? Which authority provides air traffic control services for drones?

Air traffic in India is jointly regulated by the DGCA and the Airports Authority of India, although in the future it is expected that the DGCA shall be the sole regulator of air traffic in India. The air traffic services are, in general, provided by the Airports Authority of India with regard to drones, except for nano and micro drones, which are intended for operation within 15.24 metres and 60.96 metres in uncontrolled airspace respectively. All drone operators intending to operate in controlled airspace are required to establish and maintain contact with the nearest ATC unit. As such, ATC services for drones are provided by the Airports Authority of India.

Restrictions

26 Are there any airspace restrictions on the operation of drones?

Drones can fly only up to an altitude of 121.92 metres and cannot enter restricted airspace.

Take-off and landing

27 Must take-off and landing of drones take place in specific areas or facilities?

The regulations do not prescribe any particular area or facility for the take-off or landing of drones. The only requirement that has been mandated is that drones should take off and land at places that are segregated from public access.

LIABILITY AND ACCIDENTS

Cargo liability

28 Are there any specific rules governing the liability of drones for losses or damage to cargo?

As drones are not permitted to be used for cargo operations, there are no rules governing this aspect.

Third-party liability

29 Are there any specific rules governing the liability of drones for damage to third parties on the surface or in the air?

Apart from the requirement for each drone operator to have valid third-party liability insurance cover, there are no specific rules that govern liability of drones for damage caused to a third party. The rules provide that it shall be the responsibility of the drone operator to ensure that the drone remains clear of all manned and unmanned air traffic. Further, it requires the drone to be operated in a manner that poses no danger to any person or property.

Accident investigations

30 How are investigations of air accidents involving drones regulated in your jurisdiction?

The regulations mandatorily require the operator of a drone to report any incident or accident involving the drone to the Director of Air Safety, DGCA. The DGCA in turn has to inform the Indian Air Force and the Airports Authority of India. The DGCA, being the authority tasked with the safety and registration of drones, is the regulator tasked with investigating air accidents involving drones. However, as this technology is fairly new, there would be a tremendous amount of support from both the Indian Air Force and Airports Authority of India in such an accident investigation.

Accident reporting

31 Is there a mandatory accident and incident reporting system for drone operators in your jurisdiction?

Yes, operators of all drones except nano drones are mandatorily required to report any incident or accident to the Director, Air Safety or the DGCA. The reporting has to be done via the Digital Sky platform and in a particular format that has been provided in the CAR.

Safety management and risk assessment

32 Are drone operators required to implement safety management systems and risk assessment procedures within their organisation?

The regulations require the operator of a drone to establish a standard operating procedure, which shall encompass various aspects associated with the safety of the drone, including safety management and risk assessment. The regulations specifically require the operator to carry out a risk assessment of drone operations, including of take-off and landing sites.

ANCILLARY CONSIDERATIONS

Import and export control

33 Do specific import and export control rules apply to drones in your jurisdiction?

Yes, the regulations do govern imports of drones in India as drones are included in the 'restricted' list of items that may be imported into India, which means that without prior approval, no drone may be imported into the country. Before an operator can import a drone into India he or she must obtain an equipment type approval from the Department of Telecommunication for operating the drone on a delicensed frequency band. Once the approval is granted, the operator has to then approach the DGCA to obtain an import clearance. Once the import clearance is granted an applicant must approach the Director General of Foreign Trade for the issuance of an import licence. Thereafter, on the grant of the import licence, the drone may be imported into India.

Data privacy and IP protection

34 How are personal data privacy and IP protection regulated in your country with specific reference to drone operations?

The drone regulations require the operator to ensure that privacy standards of any entity or organisation are not breached. Apart from the limited mention of privacy in the regulations, there are no specific rules or regulations that govern personal data privacy or IP protection with regard to drones. There are, however, regulations regarding privacy under the general laws of the country governing IP and privacy. India is yet to frame its privacy legislation.

UPDATE AND TRENDS

Sector trends and regulatory developments

35 Which industry sectors have seen the most development in the use of drones in your jurisdiction and which sectors are expected to see further development in future? Have there been any notable recent regulatory developments relating to drones?

Primarily, it is the military and defence sector that has seen the maximum application of drone technology, although sectors such as agriculture and infrastructure are catching up. However, as the regulations do not permit BVLOS operations, the full potential of drone technology has not been exploited. The CAR is intended to be amended in the near future to cater to the dynamic industry and to expand the ambit of the regulations to give a boost to the industry as a whole.

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GENERAL FRAMEWORK

Basic rules and regulators

1 | What basic rules govern the operation of remotely piloted aircraft and unmanned aircraft (drones) in your jurisdiction? Which regulatory bodies are charged with enforcing these rules?

The following basic rules established by the Italian Civil Aviation Authority (ENAC) currently govern the operation of drones in Italy:

- Regulation on Remotely Piloted Aerial Vehicles – Issue No. 4 of 21 May 2018;
- Informative Notice No. 007/2017 on the implementation of standard scenarios for specialised critical operations;
- Guidelines 2016/004-NAV in respect of the design certification process;
- Guidelines 2017/001-NAV on the risk assessment for flight operations;
- Circular LIC-15 of 9 June 2016 regarding training centres and pilot licences; and
- Circular ATM-09 of 24 May 2019 on the use of airspace.

Until the entry into force of Regulation (EU) 2018/1139 on 11 September 2018 (the 'new' Basic Regulation in the field of civil aviation), the operation of drones in Italy was only governed by national rules, since drones with maximum take-off weight (MTOW) up to 150kg (ie, the vast majority) did not fall within the application of the previous EU Basic Regulation (216/2008). Otherwise, as of 11 September 2018, the new Basic Regulation applies to all drones – regardless of their MTOW – and the European Commission has recently issued delegated and implementing acts (namely Delegated Regulation (EU) 2019/945 of 12 March 2019 and Implementing Regulation (EU) 2019/947 of 24 May 2019) laying down detailed provisions regarding the production, registration and operation of drones in the European Union. These acts will be effective from 1 July 2020. Therefore, at present we are in a transition phase where each national civil aviation authority is amending its national rules to comply with the new EU regulation package. From the Italian side, ENAC has complied with the EU regulation package by way of the above-mentioned rules and relevant amendments (as appropriate).

The regulatory bodies in charge of enforcing these rules are ENAC, the Italian Air Navigation Service Provider (ENAV) and the National Agency for Flight Safety (ANSV).

2 | What are the penalties for non-compliance with the laws and regulations governing drones?

Penalties for non-compliance with the laws and regulations governing drones include conviction to economic fines and terms of imprisonment, depending on whether flight operations are conducted for recreational (ie, personal use) or business purposes, pursuant to articles 1174, 1216, 1228 and 1231 of the Italian Navigation Code.

Classification

3 | Is there any distinction between public and private drones, as well as between leisure use and commercial use?

Yes, the ENAC Regulation makes a distinction between leisure use and commercial use. Namely, drones for leisure use are called aero models and defined as 'exclusively operated for recreational and sport purposes, with no devices to allow autonomous flight and under the continuing visual line of sight of the operator'. On the other hand, commercial drones are those operated for reward or for a business purpose, such as aerial photographs, TV and movie cameras, environmental monitoring, agricultural applications, advertising, patrol and surveillance activities and training courses.

Pursuant to article 744 of the Italian Navigation Code, state drones (ie, public) are military drones and those owned by the state and engaged in public services of the police force, customs, firefighters, the Civil Protection Department or in any other national services. All other drones are considered to be private.

4 | Is there a weight-based classification system for drones resulting in the application of different rules?

Yes, under the ENAC Regulation there is a weight-based classification system for drones. Accordingly flight operations, registration procedures, licensing and authorisation requirements are increasingly regulated on the basis of the MTOW. The relevant classes of drones are the following: up to 0.3kg MTOW; up to 2kg MTOW; less than 25kg MTOW; and 25kg MTOW or more.

5 | Is there any distinction between completely autonomous drones and remotely piloted drones?

Yes, according to the definitions given by the ENAC Regulation, a remotely piloted drone is under the continuing operational control of a remote pilot. However, a completely autonomous drone is that on which the pilot is not empowered to intervene at any time and so it cannot control the flight after the pre-set route.

DESIGN AND MANUFACTURE

Regulation

6 | Do specific rules regulate the design and manufacture of drones in your jurisdiction?

Yes, any manufacturer wishing to engage in the serial production of drones must apply to ENAC to obtain the certificate of design, which

is issued by ENAC upon positive assessment of specific safety and operational requirements. To obtain a certificate of design the manufacturer must:

- hold a suitable productive organisation of means and personnel;
- provide ENAC with a complete drone configuration;
- have carried out all the necessary tests and analysis to ascertain specific conditions and limitations related to the safety of drones; and
- prepare relevant flight manual and maintenance manual for subsequent use by the operator.

The certificate of design issued by ENAC includes the following information:

- details of the manufacturer;
- drone configuration;
- scenarios of permitted flight operations, including relevant conditions or limitations; and
- related technical documents.

Any single drone produced by a manufacturer must be accompanied by a statement of conformity issued by the manufacturer itself, attesting compliance of the single product with the configuration laid down in the relevant certificate of design.

Manufacturing authorisation

7 | Must drone manufacturers obtain any licences or other authorisation to carry out their business? Are manufacturers subject to any other specific rules?

Yes, manufacturers must obtain a certificate of design before commencing production and marketing of a specific drone model (see question 6).

Product liability

8 | Do general product liability rules (or other specific liability rules) apply to the manufacture of drones?

Yes, general product liability rules apply to the manufacture of drones, as laid down by the Italian Consumer Code (Law No. 206/2005).

REGISTRATION AND IDENTIFICATION

Registration

9 | Must drones be registered in a specific national registry? If so, who is entitled to register drones and what requirements and restrictions apply? Is the registry organised as an operator registry or an owner registry?

Drones with a MTOW of 25kg or more and flying within Italian airspace must be registered in the Drone Registry held by ENAC. In addition, irrespective of their MTOW, drones must also be registered on a specific website called www.d-flight.it, where they are assigned an identification code to be shown on both the aircraft and the ground control station.

Application for registration must be submitted by the drone's owner to ENAC, provided that the operator (if it differs from the owner) is also entitled to be mentioned in the Drone Registry.

Identification

10 | Are drones identified through a marking system similar to that used for manned aircraft?

Yes, drones with an MTOW of 25kg or more are identified with dedicated registration marks following the same rules established for manned aircraft. The registration marks must be applied on both the aircraft and the ground control station.

CERTIFICATION AND LICENSING

Basic requirements and procedures

11 | What certificates or licences are required to operate drones and what procedures apply?

No certificates or licences are required to operate drones with operating MTOW of less than 25kg, provided that the relevant pilot must be duly certified by ENAC (see question 14).

On the contrary, operators willing to fly drones with MTOW of 25kg or more must obtain a prior licence from ENAC, which is released if the operators' business organisation meets the following requirements:

- holding appropriate technical and operational instruments or assets for the intended flight operations and characteristics of the drone fleet;
- appointing a technical director for the management of operations, airworthiness and training;
- having the availability of duly certified drones (see questions 6 and 16);
- employing pilots duly certified by ENAC (see question 14); and
- preparing the applicable flight operations manual and distributing the same to all the staff involved.

Taxes and fees

12 | Are certification and licensing procedures subject to any taxes or fees?

ENAC charges €90 per hour to process a licensing application (usually it takes four to five hours to complete the procedure).

In addition, ENAC fees in relation to flight operations range from €94 for non-critical operations to €309 for critical operations and research or development flights (see question 20).

Eligibility

13 | Who may apply for certifications and licences? Do any restrictions apply?

No restrictions apply to drone operators in terms of market access, including nationality of ownership or financial stability.

Remote pilot licences

14 | Must remote pilots obtain any certifications or licences to operate drones? If so, do the relevant procedures differ based on the type of drone or operation?

The Italian system provides for a weight-based distinction. Namely, to pilot drones with an MTOW of less than 25kg, a pilot certificate is required. Pilot certificates are issued by ENAC approved training centres, following successful completion of a training programme and a practical exam. Programmes and exams are based on different drone categories. In addition, the applicant must obtain a certificate of medical fitness comparable to those required for pilots of light aircraft. However, pilots of drones with an operating mass of 25kg or more (or to be engaged in 'beyond line of sight' operations) must obtain a pilot's licence from ENAC as per the procedures established for flight crew members of manned aircraft. In this case training, medical and aero knowledge requirements are, therefore, stricter and more regulated than those provided for drones of less than 25kg.

Foreign operators

15 | Are foreign operators authorised to fly drones in your jurisdiction? If so, what requirements and restrictions apply?

Once Regulation (EU) 2018/1139 (the 'new' Basic Regulation in the field of civil aviation) is fully applicable following the issuance of the implementing acts by the European Commission, all EU operators will be allowed to fly drones in the territory of the European Union without any 'nationality' restrictions imposed by the member states. Until then, foreign authorisations will not be automatically recognised in Italy. Therefore, currently foreign companies willing to operate drones in Italy must obtain a prior authorisation from ENAC subject to compliance with the Italian regulations.

Certificate of airworthiness

16 | Is a certificate of airworthiness required to operate drones? If so, what procedures apply?

In the case of research and development flights for experimental purposes, as well as for specialised operations with drones that are not produced serially, the airworthiness is certified by ENAC with the release of a permit to fly for each specific drone. The permit to fly is valid for the time necessary to complete operations (for experimental purposes) or for three years (in the event of specialised activities).

However, drones produced on a serial basis must obtain a certificate of airworthiness to certify compliance with the type certificate issued by ENAC to the relevant manufacturer.

OPERATIONS AND MAINTENANCE

One drone, one pilot

17 | Does the 'one drone, one pilot' rule apply in your jurisdiction?

Generally, yes, but it must be noted that in the event of flight performed in 'extended visual line of sight' (EVLOS) – being such operations carried out at a distance exceeding the limits of the 'visual line of sight' (VLOS) operations – the flight command and control must be transferred to another pilot once the drone is no longer within the VLOS of the first pilot. Therefore, for EVLOS operations drones are commonly under the command and control of more than one pilot.

Maintenance

18 | Do specific rules regulate the maintenance of drones?

Drone operators must prepare a maintenance programme to ensure the continuing airworthiness of drones, following the instructions released by the relevant manufacturer. In addition, operators must set up a data recording system with respect to flight hours, safety-related events, maintenance activities and replacement of components.

Ordinary maintenance can be carried out by the same operator upon having attended a maintenance course with the relevant drone manufacturer, or with external organisations certified by the manufacturer.

Manufacturers (and related external organisations) are authorised to perform maintenance on drones belonging to their own production, including heavy and extraordinary maintenance.

Basic operational rules and restrictions

19 | What rules and restrictions apply to flights performed in 'visual line of sight' (VLOS) and 'beyond visual line of sight' (BVLOS)? Is there a distinction in this regard?

Yes, different regulations apply to VLOS flights and BVLOS flights. In addition, ENAC has also regulated the operation of EVLOS.

During VLOS flights the operator must always remain able to keep a visual contact with the drone without the assistance of devices, in order to monitor the flight performance at any time and avoid collision with – and damage to – other aircraft, persons, vessels, vehicles and infrastructures. Daily flights are permitted up to a maximum height of 150 metres 'above ground level' and within a maximum horizontal distance of 500 metres from the remote operator. Higher heights and distances can be authorised by ENAC on a case-by-case basis, upon submission of an appropriate risk assessment from the operator.

EVLOS operations are those conducted in areas exceeding the limits of BVLOS scenarios, in relation to which VLOS requirements are satisfied by alternative means (such as additional ground control stations) that allow a continuous view of the drone by the operator.

BVLOS flights are performed beyond the VLOS heights and distances within segregated airspace (either temporary or permanent), always provided that ENAC identifies specific limitations and conditions from time to time on the basis of the intended flight operations and relevant risk assessment submitted by the operator to ENAC itself.

20 | What rules and restrictions apply to critical and non-critical operations? Is there a distinction in this regard?

Yes, under the Italian system a distinction is made between critical and non-critical operations.

Non-critical operations are conducted in VLOS and do not overfly congested areas, crowds of people, urban territories and sensitive infrastructures. Before the commencement of non-critical operations, the relevant operator must submit to ENAC a self-declaration attesting compliance with the applicable regulations and setting out limits or conditions under which the operations will be conducted. The operator is also responsible for making an appropriate risk assessment and to evaluate the continuing presence of a non-critical scenario. Before submitting the said self-declaration to ENAC, the operator is also responsible for performing test flights aimed to ensure adequate control of the drone, with a main focus on safety procedures.

Critical operations performed within 'standard scenarios' (as published by ENAC) follow the same rules above regarding non-critical operations. However, critical operations not falling within the mentioned standard scenarios (also called specialised operations) require a prior authorisation from ENAC. The relevant application must include the following:

- registration marks, type, configuration and manufacturer's statement of conformity of the drones to be used;
- results of the test flights;
- description of the planned operations;
- risk assessment documentation; and
- the flight manual, maintenance manual and operations manual of the drones to be used.

Furthermore, the operator must hold an appropriate technical and operational organisation certified by ENAC. The authorisation is granted for an indefinite period of time, to the extent that no changes are made to the systems or operations. In this respect the operator must inform ENAC of any such changes in good time, and in any case ENAC is always empowered to carry out periodic inspections and checks on the ongoing activities of the authorised operators.

During critical operations drones are allowed to overfly urban areas only in VLOS scenarios, to the extent that acceptable safety levels can be satisfied, as follows:

- the command and control primary system must be compliant with the EUROCAE ED-12 standards and design reliability level D;
- in the case of data link loss the system must be able to maintain control of the operations or at least to mitigate consequences; and

- the drone must be equipped with a flight termination system independent from the ground control station.

Otherwise, overflying crowd of people for whatever reasons (eg, sport events, entertainment shows, processions) is in all cases forbidden.

Transport operations

21 | Is air transport via drone (eg, cargo and mail) regulated in your jurisdiction? If so, what requirements, limitations and restrictions apply?

No, it is not. However, recently a number of a test cargo flights took place in the context of a research programme overseen by ENAC. The results of the research programme carried out by ENAC will be one of the key elements to support the development of a future regulation on air transport via drone for both commercial and governmental use.

22 | Do any specific provisions governing consumer protection and tracking systems apply with respect to cargo and delivery operations via drone?

No they do not, provided that generally the Italian Consumer Code (Law No. 206/2005) applies to consumer protection issues.

Insurance requirements

23 | What insurance requirements apply to the operation of drones?

No drone flights can be conducted unless a third-party liability insurance exists for each type of operation, in compliance with the coverage laid down by Regulation (EC) No. 785/2004 on insurance requirements for air carriers and aircraft operators (as amended from time to time).

Safety requirements

24 | What safety requirements apply to the operation of drones?

See answers 19 and 20.

AIRSPACE

Air traffic control

25 | How is air traffic control regulated in your jurisdiction? Which authority provides air traffic control services for drones?

The public body providing air traffic control services for drones is the Italian Air Navigation Service Provider (ENAV). In 2015, ENAV started a joint project with ENAC to establish technical and operational conditions aimed to allow a safe use of drones in different scenarios, with a main focus on BVLOS operations, overflight of urban areas, night-time flights and autonomous flights. For such purposes, ENAC and ENAV work in close cooperation with the SESAR Joint Undertaking, a public–private partnership responsible for the coordination and concentration of all EU research and development activities in air traffic management.

In 2016, ENAV was assigned a project for the set-up of an unmanned traffic management platform aimed at providing dedicated services to the drone industry. The services are accessible through the website www.d-flight.it and include:

- registration of drones and provision of a unique code;
- graphic presentation of no-fly zones;
- electronic identification with a tag to be applied on the drone;
- tracking tools;
- mission planning for BVLOS operations; and
- locator and geo-fencing systems.

Restrictions

26 | Are there any airspace restrictions on the operation of drones?

Yes, there are. In general, overflying crowds of people, demonstrations or events is always forbidden, unless a specific authorisation is granted by ENAC. Likewise, drones cannot fly inside aerodrome traffic zones, over take-off and landing areas, or within 5km of airport infrastructures.

Take-off and landing

27 | Must take-off and landing of drones take place in specific areas or facilities?

No they must not, provided that take-off and landing operations cannot take place within restricted areas (eg, within 5km of airports). In addition, as mentioned, BVLOS flights must be performed inside segregated airspace (including take-off and landing phases).

LIABILITY AND ACCIDENTS

Cargo liability

28 | Are there any specific rules governing the liability of drones for losses or damage to cargo?

No there are no specific rules in this respect, also because air cargo transport via drones is not yet regulated in Italy.

Third-party liability

29 | Are there any specific rules governing the liability of drones for damage to third parties on the surface or in the air?

No there are no specific rules in this respect. Therefore, general rules apply in terms of liability of drones for damage to third parties on the surface or in the air. Namely, article 965 of the Italian Navigation Code and the Rome Convention of 1952 apply to damage to third parties on the surface and provide for a strict liability principle against the operator. It means that evidence of the existence of a direct connection between the drone operation and the damage shall be sufficient to allocate liability, irrespective of whether the operator has acted with fault, negligence or wilful misconduct. In turn, article 966 of the Italian Navigation Code relates to damage to third parties in the air, according to which:

- if the collision is due to coincidence or force majeure, or if liability cannot be ascertained, then each operator shall bear its own damages;
- if the collision is caused by negligence of only one of the involved operators, the same shall be responsible for all damage; or
- if the collision is the result of joint negligence of all the operators involved, then each party shall bear its share of liability.

Accident investigations

30 | How are investigations of air accidents involving drones regulated in your jurisdiction?

Investigations of air accidents involving drones in Italy are mainly governed by Regulation (EU) No. 996/2010 (on the investigation and prevention of accidents and incidents in civil aviation). The authorities in charge of such investigations are ENAC and the ANSV. To fulfil their duties, ENAC and the ANSV may access the relevant drones, facilities, flight data records and any other useful documentation for the purposes, subject to the confidentiality and privacy obligations provided by the applicable laws.

Accident reporting

31 | Is there a mandatory accident and incident reporting system for drone operators in your jurisdiction?

Yes, there is a mandatory reporting system. In particular, operators, manufacturers and pilots of all drones (regardless of their MTOW, except model aircraft) shall report to ENAC any occurrences as per Annex V of Regulation (EU) No. 2015/1018 (laying down a list classifying occurrences in civil aviation to be mandatorily reported). Reports must be submitted to ENAC within 72 hours of the event pursuant to Regulation (EU) No. 376/2014 (on the reporting, analysis and follow-up of occurrences in civil aviation).

Also, pursuant to Regulation (EU) No. 996/2010 (on the investigation and prevention of accidents and incidents in civil aviation), in the case of accident or serious incident, the involved parties must inform ANSV within 60 minutes of the event, in the forms established by the same authority.

Safety management and risk assessment

32 | Are drone operators required to implement safety management systems and risk assessment procedures within their organisation?

Yes, they are. Specifically, both for critical and non-critical activities drone operators must hold an appropriate technical and operational organisation, as well as prepare an operations manual setting forth the necessary procedures to manage flight activities and maintenance of systems. The operations manual must also include risk assessment processes in respect of the intended operations and the handling of mitigation actions.

ANCILLARY CONSIDERATIONS

Import and export control

33 | Do specific import and export control rules apply to drones in your jurisdiction?

No specific import and export control rules apply to drones, provided that drones are subject to the restrictions laid down by the Regulation (EC) No. 428/2009 (setting up a Community regime for the control of exports, transfer, brokering and transit of dual-use items). In 2015, drones were included in the list of dual-use items under Annex 1 to the Regulation, for the export of which an authorisation must be required pursuant to article 3 thereof.

Data privacy and IP protection

34 | How are personal data privacy and IP protection regulated in your country with specific reference to drone operations?

There are no specific rules for data privacy and IP protection with reference to drone operations. Therefore, the generally applicable legislation is also valid for drones. Namely, in terms of data privacy reference must be made to the Italian Privacy Code (Legislative Decree No. 196/2003) and Regulation (EU) 2016/679 (on the protection of natural persons with regard to the processing of personal data and on the free movement of such data), while the Italian Industrial Property Code (Legislative Decree No. 30/2005), the Italian Copyright Code (Law No. 633/1941) and certain provisions of the Italian Civil Code apply to IP protection matters.

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UPDATE AND TRENDS

Sector trends and regulatory developments

35 | Which industry sectors have seen the most development in the use of drones in your jurisdiction and which sectors are expected to see further development in future? Have there been any notable recent regulatory developments relating to drones?

As mentioned, currently we are in a transition phase where the civil aviation authorities of each member state (including ENAC) are amending their internal rules to comply with the essential requirements established by Regulation (EU) 2018/1139 (the 'new' Basic Regulation in the field of civil aviation), in force since 11 September 2018 and applicable to all types of drone, regardless of their MTOW.

Among the industry sectors where it seems there are significant expectations of growth and development for the use of drones – especially in the mid to long term – it is worth mentioning the air monitoring of large energy infrastructures (eg, oil and gas pipelines, electric power plants and solar panel lots). The reasons for such expectations are both technically and economically driven. Indeed, drones are able to detect anomalies, damage and failures in a more efficient way than any other movable devices, along with reduced operating costs, as they require a small number of personnel compared to other monitoring activities.

Mexico

Carlos Sierra
Abogados Sierra

GENERAL FRAMEWORK

Basic rules and regulators

1 | What basic rules govern the operation of remotely piloted aircraft and unmanned aircraft (drones) in your jurisdiction? Which regulatory bodies are charged with enforcing these rules?

The rules governing the operation of remotely piloted aircraft systems (RPAS) are contained in the Mandatory Circular CO AV-23/10 R4 (CO AV-23/10 R4) issued by the Civil Aviation Authority (the Aviation Authority). The Aviation Authority is also in charge of its enforcement. It is important to mention that any types of RPAS not regulated under the aforementioned Mandatory Circular are to be regulated and specified at the Aviation Authority's discretion.

2 | What are the penalties for non-compliance with the laws and regulations governing drones?

Any breach of the provisions contained in the CO AV-23/10 R4 will be subject to a penalty by the Aviation Authority as per article 89 of the Civil Aviation Law, which consists of an administrative fine of 200 to 5,000 units of measurement and update (UMA). For illustrative purposes, one UMA is 84.49 pesos, which at the date of publication is equivalent to US$4.50. However, and in addition to any penalty by the Aviation Authority, other sanctions ranging from administrative to criminal offences may be imposed depending on the respective local legislation and penalty committed.

Classification

3 | Is there any distinction between public and private drones, as well as between leisure use and commercial use?

Drones carrying out military and police operations are not governed by the CO AV-23/10 R4. However, for private drones, a distinction is made as follows:

Classification of remotely operated aircraft systems		
Maximum take-off weight	Classification	Use
Less than or equal to 2k.	Micro RPAS	Private recreational Private non-commercial Commercial
More than 2kg and up to 25kg	Small RPAS	Private recreational Private non-commercial Commercial
More than 25 kg	Big RPAS	Private recreational Private non-commercial Commercial

4 | Is there a weight-based classification system for drones resulting in the application of different rules?

As stated in question 3, a distinction is made based on maximum take-off weight, resulting in the application of different rules.

In general, micro RPAS for private recreational use, private non-commercial and commercial use, as well as small and big categories for private recreational use do not require any operation authorisation. On the other hand, small and big RPAS for non-commercial and commercial use will always require operation approval. Big RPAS must have a type certificate and a certificate of registration to operate as specified in the regulation.

It is important to mention that with regard to the maximum flight altitude, pilots of all micro RPAS and private recreational small and big RPAS must operate under 400ft (122 metres), while small and big RPAS for commercial and private non-commercial use must operate within the airspace Class G and D, respectively. On the one hand, Class D airspace is that from the surface to 2,500ft, in which instrument flight rules (IFR) and visual flight rules (VFR) flights are permitted and all flights are provided with air traffic control service. On the other hand, within Class G airspace, IFR and VFR flights are permitted, and a flight information service could be provided if requested.

5 | Is there any distinction between completely autonomous drones and remotely piloted drones?

The CO AV-23/10 R4 does not expressly distinguish between completely autonomous drones and RPAS as it is limited to regulating the latter, and any other types of unmanned aircraft are outside its scope.

DESIGN AND MANUFACTURE

Regulation

6 | Do specific rules regulate the design and manufacture of drones in your jurisdiction?

Mexican manufacturers of micro and small RPAS must assure that all aircraft have a device that does not automatically allow the aircraft to fly beyond a specific horizontal and vertical distance from the pilot. In the case of big RPAS manufacturers, apart from having to include the aforementioned distance control devices, they must assure that all aircraft have a device that allows its automatic identification and a type certificate issued by the Aviation Authority.

It is important to note that all manufacturers must:

- include in their product information that advise the owner or users of the RPAS of its rightful registration duty before the Aviation Authority; and

- request that the new user provides all information required in Appendix J RPAS Registry Marketed in Mexico of the CO AV-23/10 R4, if the RPAS's maximum take-off weight exceeds 0.55lb (0.25kg).

Manufacturing authorisation

7 Must drone manufacturers obtain any licences or other authorisation to carry out their business? Are manufacturers subject to any other specific rules?

All drone manufacturers' licences are subject to Aviation Authority approval and will be subject to compliance with the specific rules set out in the CO AV-23/10 R4.

Product liability

8 Do general product liability rules (or other specific liability rules) apply to the manufacture of drones?

While there are no specific liability rules applicable to the manufacture of drones, general product liability rules may apply. In Mexico, there are two main sources regarding product liability: the Civil Code and the Federal Consumer Protection Law, which involves civil liability, product liability and hidden defects.

REGISTRATION AND IDENTIFICATION

Registration

9 Must drones be registered in a specific national registry? If so, who is entitled to register drones and what requirements and restrictions apply? Is the registry organised as an operator registry or an owner registry?

As stated in the CO AV-23/10 R4, all owners and commercial developers of RPAS must register them before the Aviation Authority (www.sct.gob.mx/transporte-y-medicina-preventiva/aeronautica-civil/3-servicios/35-rpas-drones/) if its maximum take-off weight exceeds 0.55lb (0.25kg), before starting any operation. Likewise, any additional mechanical or software modification must be reported to the Aviation Authority. There is no fee for the registration, and such can only be made by Mexican nationals over 18 or by the parents or legal guardians of underage users.

Additionally, with regard to big RPAS, the following documentation is required for RPAS's registration before the Aeronautical Mexican Registry (RAM):

- registration format mentioning the user of the RPAS;
- the company by-laws, should it be a legal entity, or the name and official ID, if a natural person;
- power of attorney granted before a notary public (if applicable for legal entities);
- address in Mexico for receiving notifications;
- evidence of payment of the duties generated from the registration;
- importation declaration (if applicable);
- copy of aircraft invoice and its translation by a certified translator (if applicable); and
- cancellation of foreign registration marks (if applicable).

Identification

10 Are drones identified through a marking system similar to that used for manned aircraft?

All RPAS shall be identified with a non-flammable material label that includes the manufacturer, model, serial number and the registry number, which shall be fixed on the RPAS surface. Additionally, with regard to big RPAS for commercial use, a certificate of registration must be issued by the Mexican Registry, which must be painted together with the nationality marks on the aircraft's surface.

CERTIFICATION AND LICENSING

Basic requirements and procedures

11 What certificates or licences are required to operate drones and what procedures apply?

Generally, all RPAS shall be registered by both the commercial entity that sells it and the owner. However, owners, in addition to the marketer's registry, for big RPAS must submit an application to obtain a certificate of registration issued by the RAM.

Furthermore, if the operation involves any aerial photography, topography or orographic activity, a special authorisation by the National Defence Secretariat (SEDENA) and the National Institute of Statistics and Geography shall be issued.

Moreover, with regard to the type certificate, the application must be filed before the Aviation Authority, together with the approval plan, certificate of airworthiness and applicable manuals. For it to be granted, it must also comply with the corresponding verification inspections as determined by the Authority (if applicable, subject to the Authority's discretion). Validations and authorisations are granted with indefinite validity.

Regarding the operation approval, the application must be filed with the operating manual, aeronautic study of safety and risk management, civil liability insurance policy, aircraft registration and identification, pilot licence, type certificate and airworthiness certification. In this case, all operation approvals will be valid for a two-year term, subject to the applicant's compliance with the applicable law and regulation.

Taxes and fees

12 Are certification and licensing procedures subject to any taxes or fees?

Despite there being no express tax or fee provided in the CO AV-23/10 R4 for the certification and licensing procedures, general taxes for the importation of RPAS may apply to these procedures and fees and duties imposed by the Aviation Authority for the issuance of certificates and licences such as the certificate of registration and certificate of airworthiness. It is important to mention that remote pilot licence duties may also apply.

Eligibility

13 Who may apply for certifications and licences? Do any restrictions apply?

The CO AV-23/10 R4 provides that only Mexican nationals may apply for RPAS registration and therefore for any certification and licence depending on their classification.

Remote pilot licences

14 Must remote pilots obtain any certifications or licences to operate drones? If so, do the relevant procedures differ based on the type of drone or operation?

According to the CO AV-23/10 R4, for the operation of small and big RPAS, remote pilots must obtain a certification and licence that may vary depending on the classification of the aircraft and that will be valid for a three-year term. Such requirements have been set out in Appendix C, but include:

- attendance at an authorised training centre;
- documentary proof of Mexican birth;

- current constancy of psychophysical aptitude;
- duties' payment receipt; and
- a minimum number of hours of flight registered.

Foreign operators

15 | Are foreign operators authorised to fly drones in your jurisdiction? If so, what requirements and restrictions apply?

RPAS holding foreign registration marks or operated by a foreign operator cannot operate within Mexican airspace. A special permit may be requested from SEDENA for scientific purposes should the operator be of a different nationality.

Certificate of airworthiness

16 | Is a certificate of airworthiness required to operate drones? If so, what procedures apply?

The operator of big RPAS must comply with all airworthiness directives issued by the Aviation Authority, as per provision 7.2(s) of the CO AV-23/10 R4. In this sense, if an operation of approval is needed for big RPAS, then a certification of airworthiness must be previously granted, for which the requirements include:

- a copy of the final assignment of registration marks granted by the RAM;
- the type certificate;
- the civil liability insurance policy approved by the Aviation Authority;
- a record of all airworthiness directives for the aircraft or the principal components (if applicable);
- a record of the service manuals for the aircraft or the principal components (if applicable);
- a record of the components that are time-limited (if applicable); and
- maintenance services approved by the Aviation Authority must be filed before the Aviation Authority.

OPERATIONS AND MAINTENANCE

One drone, one pilot

17 | Does the 'one drone, one pilot' rule apply in your jurisdiction?

Yes. There may only be one pilot during the operation of the drone. Depending on the type of drone, as aforementioned, the pilot's certification must be registered before the authorities.

Maintenance

18 | Do specific rules regulate the maintenance of drones?

As set out in the CO AV-23/10 R4, Provision 7.2(r), the RPAS's operator must comply with the maintenance provisions and airworthiness instructions provided by the manufacturer. In this sense, further requirements can be found in Appendix B on Airworthiness Assurance, which requires the filing of the:

- description of the maintenance and inspection programmes;
- applicable manuals (flight, maintenance and parts manuals);
- compliance with airworthiness standards; and
- proof of the necessary equipment in accordance with the type of operation.

Basic operational rules and restrictions

19 | What rules and restrictions apply to flights performed in 'visual line of sight' (VLOS) and 'beyond visual line of sight' (BVLOS)? Is there a distinction in this regard?

For all type of RPAS, pilots must operate the aircraft in VLOS for them to be able to see the aircraft throughout the entire flight to be aware at all times of the aircraft's location, altitude, direction and the existence of other air traffic or dangers, and ensure that the aircraft does not endanger the physical integrity or life of people or any possible damage to property.

20 | What rules and restrictions apply to critical and non-critical operations? Is there a distinction in this regard?

RPAS must be operated during the official hours of daylight between sunset and sunrise, unless special authorisation has been issued by the Aviation Authority either for night flights or operations carried out by instrumentation (IFR). For night flights, the following criteria must be considered: for private recreational use, these operations are prohibited; for commercial and non-commercial use:

- RPAS must have an operation approval;
- the micro RPAS pilot must have a pilot's authorisation;
- pilots of small and big RPAS must have the express capacity to operate at night noted in their licence;
- position lights must be installed on the aircraft; and
- RPAS must have a type certificate, if they are big RPAS.

Transport operations

21 | Is air transport via drone (eg, cargo and mail) regulated in your jurisdiction? If so, what requirements, limitations and restrictions apply?

Air transport via drone is not yet regulated in Mexico.

22 | Do any specific provisions governing consumer protection and tracking systems apply with respect to cargo and delivery operations via drone?

Not applicable to Mexico's drone regulation.

Insurance requirements

23 | What insurance requirements apply to the operation of drones?

The CO AV-23/10 R4 provides that all RPAS require a minimum insurance coverage for third-party liability for injury, death, loss and damage caused to any other third parties or property derived from the operation of the RPAS within Mexican airspace. The insurance policy must be issued by a Mexican insurance company and its approval by the Aviation Authority is required prior to the commencement of operations. The minimum insurance coverage is provided within article 72 of the Civil Aviation Law.

Safety requirements

24 | What safety requirements apply to the operation of drones?

Generally, to secure all drones operational safety, operators must ensure the RPAS are at all times in an acceptable condition to operate. Thus, as set out in the CO AV-23/10 R4, operators must refrain from the following actions:

- dropping any object, including objects with parachutes;
- operating when safety conditions are not guaranteed;

- operating in restricted zones;
- not operating within the sight of the pilot;
- operating over crowds either in open or closed areas; and
- acting carelessly or in a negligent manner and placing third parties in danger.

AIRSPACE

Air traffic control

25 How is air traffic control regulated in your jurisdiction? Which authority provides air traffic control services for drones?

Navigation Services in Mexican Airspace is the department responsible for the security, smooth-running and order of Mexican airspace. It provides air traffic control services for all types of aircraft so, in the absence of a particular authority, it also serves drone air traffic.

Restrictions

26 Are there any airspace restrictions on the operation of drones?

RPAS must be more than 5 nautical miles (nm) (9.2km) from any aerodromes and 0.5nm (0.9km) from any heliport. Within the existing area between 5nm and 10nm around aerodromes, pilots must operate the RPAS at a maximum altitude of 328ft. To be able to operate within the area of 5nm around aerodromes, RPAS will require a special authorisation issued by the Aviation Authority and must have a device that allows its automatic identification and a device that does not allow it to fly beyond a certain altitude according to the following criteria:

Maximum altitude (m)	Close proximity area to aerodromes (nm)
Prohibited	0-2
30	2-3
50	3-4
75	4-5

In addition, devices for manned aircraft are necessary to operate within the area of 10nm around aerodromes and airspace D. In the case of big RPAS, prior coordination with the air traffic control services and the corresponding operation approval will be required.

To be able to operate within the area of 0.5nm around heliports, an RPAS will require approval for operation issued by the Aviation Authority and must have a device that does not allow it to fly beyond a certain altitude according to the following criteria:

Maximum altitude (m)	Close proximity area to aerodromes (nm)
Prohibited	0-0.1
30	0.1-0.3
50	0.3-0.5

In the same sense, RPAS shall be operated with the following minimum distance from clouds: (i) 150 metres below the clouds; and (ii) 600 metres of horizontal distance from the clouds. With regard to public areas involving crowds, if there are fewer than 12 people, micro RPAS are allowed to operate while maintaining at all times an altitude higher than 150ft (46 metres). All other RPAS cannot fly over crowds.

Take-off and landing

27 Must take-off and landing of drones take place in specific areas or facilities?

As per provision 7.2 of the CO AV-23/10 R4, the only restriction regarding take-off and landing is that pilots must not operate in the prohibited, restricted or dangerous zones established in the Mexican aeronautical information publication.

LIABILITY AND ACCIDENTS

Cargo liability

28 Are there any specific rules governing the liability of drones for losses or damage to cargo?

To date, there is no specific regulation governing loss or damage to cargo.

Third-party liability

29 Are there any specific rules governing the liability of drones for damage to third parties on the surface or in the air?

As per provision 7.2(j) of the CO AV-23/10 R4, pilots are liable for the operation, use and damage or injuries that RPAS may cause. In this sense, all RPAS destined for private non-commercial use and commercial use, despite their classification, must have a third-party liability insurance policy to operate, in terms of article 72 of the Civil Aviation Law and approved by the Aviation Authority.

Accident investigations

30 How are investigations of air accidents involving drones regulated in your jurisdiction?

The CO AV-23/10 R4 has no specific regulation on reporting requirements in the case of drone accidents. This notwithstanding, general rules may apply for which all information with regard to an accident involving an aircraft, whatever the type, model, size, etc, its investigation and rescue missions are considered confidential. The Aviation Authority has an express restriction in disclosing or divulging any information regarding accidents, with the exception of (i) other aviation authorities that may request involvement in the investigation of an accident, in accordance with Annex 13 of the ICAO Convention or (ii) Mexican authorities that may request information as part of a criminal, civil or commercial court proceeding, which again would be proceedings subject to non-disclosure restrictions.

Accident reporting

31 Is there a mandatory accident and incident reporting system for drone operators in your jurisdiction?

With regard to the regulation on reporting requirements in case of accidents, although the CO AV-23/10 R4 does not foresee a mandatory reporting system, surveillance and security actions are set out and required to be notified to the corresponding or closest command of the airports listed in Appendix L.

On the one hand, any sighting of RPAS within the restricted areas or near aerodromes and heliports can be reported immediately by any person, whether legal or natural, using the RPAS sighting report available on the Aviation Authority's website.

On the other hand, any injury or death to a third party, or damage to a property, can be reported immediately using the RPAS damage report available on the website of the Aviation Authority within 10 days.

Safety management and risk assessment

32 Are drone operators required to implement safety management systems and risk assessment procedures within their organisation?

An aeronautic study of safety and risk management is required to obtain approval for operation and to assess the level of risk in the operating area. In this sense, mitigation measures should be included in such a study and an analysis of the consequences of each risk must be classified in terms of its probability, seriousness and tolerance assessment.

ANCILLARY CONSIDERATIONS

Import and export control

33 Do specific import and export control rules apply to drones in your jurisdiction?

Specific requirements may apply to importing drones, depending on their classification. On the one hand, the micro or small RPAS, importers must ensure that all RPAS have a device that does not automatically allow the aircraft to fly beyond a horizontal distance from the pilot and a device that does not allow it to fly beyond a certain altitude. On the other hand, major RPAS importers must ensure that, in addition to the aforementioned, they have:

- a device for its automatic identification;
- an import declaration;
- a type certificate; and
- a certification of airworthiness issued by the Civil Aviation Authority from the State Registry.

Data privacy and IP protection

34 How are personal data privacy and IP protection regulated in your country with specific reference to drone operations?

With regard to personal data privacy and IP protection, other than the pilot's general liability for misuse given in the information on the aircraft, specific rules have not been defined yet. However, general regulations for personal data privacy, governed by the Federal Law for the Protection of Personal Data in Possession of Private Parties, and for intellectual property governed by the Industrial Property Law, apply.

UPDATE AND TRENDS

Sector trends and regulatory developments

35 Which industry sectors have seen the most development in the use of drones in your jurisdiction and which sectors are expected to see further development in future? Have there been any notable recent regulatory developments relating to drones?

In Mexico, the drone industry has been limited to military use, in the public sphere, while in the private sector, most of it is attributed to recreational use. However, real estate photography, commercial production, construction and industrial inspections have been the most recently developed industrial sectors. In this sense, it is expected that these sectors will be developed exponentially in the short term along with the provision of fumigation and fertilisation services on fields, as well as crop control, three-dimensional mapping of land and logistics services. Unfortunately, despite recent regulatory proposals, Mexico does not yet have an appropriate legal framework governing the use of RPAS and unmanned aircraft and the penalties deriving from non-compliance.

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GENERAL FRAMEWORK

Basic rules and regulators

1 | What basic rules govern the operation of remotely piloted aircraft and unmanned aircraft (drones) in your jurisdiction? Which regulatory bodies are charged with enforcing these rules?

Part 101 of the Civil Aviation Regulations of 2011 governs the operation of remotely piloted aircraft (RPA) and unmanned aircraft (drones) in South Africa or remotely piloted aircraft systems (RPAS). There are also a number of ancillary documents issued in pursuance of the Regulations including the Directives of the director of Civil Aviation Authority, Aeronautical Information Circulars and Technical Guidance Materials, which are also applicable. The Regulations are to be read together with Civil Aviation Technical Standard 101.

The South African Civil Aviation Authority is the enforcing body.

2 | What are the penalties for non-compliance with the laws and regulations governing drones?

Any person who contravenes or commits an offence under the Civil Aviation Act or the Regulations will be liable on conviction to a fine or to imprisonment for a period not exceeding 10 years or to both such fine and imprisonment. The director of Civil Aviation may also impose an administrative penalty on any person for any failure to comply with the Civil Aviation Act.

Classification

3 | Is there any distinction between public and private drones, as well as between leisure use and commercial use?

Yes, Part 101 distinguishes between RPAS that are operated for commercial, corporate, non-profit and private operations.

For private operations, RPAS may only be used where there is no commercial outcome, interest or gain and only in instances where the pilot observes all statutory requirements relating to liability, privacy and any other laws enforceable by any authorities.

4 | Is there a weight-based classification system for drones resulting in the application of different rules?

RPAs are classed according to line-of-sight energy (kJ), height (feet) and MTOM (kg) in accordance with SA-CATS 101.

Weight classes are Class 1A, 1B, 1C and 2A, being respectively m<1.5; m<7; m<20; m<20.

5 | Is there any distinction between completely autonomous drones and remotely piloted drones?

The distinction is made in Part 101, which does not apply to autonomous unmanned aircraft and their operations or other types of aircraft that cannot be managed on a real-time basis during flight, nor to model and toy aircraft.

DESIGN AND MANUFACTURE

Regulation

6 | Do specific rules regulate the design and manufacture of drones in your jurisdiction?

Other than the requirement for an identification plate and the nationality and registration marks that must be affixed to the RPA, the only design issue required is that it be fitted with a mode C or S transponder capable of displaying the unique squawk code issued to it, unless otherwise exempted by the director; and be fitted with an altimeter, capable of displaying to the operator of the RPAS the RPA's altitude above ground level, corrected for ambient pressure (QNH); and be fitted with a functioning strobe light or lights, installed in such a way that they are visible from both below and above the RPA; at all azimuth angles, and in the case of an aeroplane, be fitted with functional navigation lights.

Manufacturing authorisation

7 | Must drone manufacturers obtain any licences or other authorisation to carry out their business? Are manufacturers subject to any other specific rules?

Other than the requirement for an RPAS operating manual from the manufacturer to accompany the application for approval of the safety system, there are no known requirements for the manufacturer.

Product liability

8 | Do general product liability rules (or other specific liability rules) apply to the manufacture of drones?

Product liability claims are based on the law of contract, delict or statutory provisions that set out liability for defective products. The common law rules of negligence liability would be applicable to the product liability of manufacturers and, in certain instances, the provisions of the Consumer Protection Act would apply to a manufacturer of drones, although the Act does not apply to a transaction where the consumer is a juristic person whose asset value or annual turnover at the time of the transaction equals or exceeds the threshold value of 2 million rand.

REGISTRATION AND IDENTIFICATION

Registration

9 Must drones be registered in a specific national registry? If so, who is entitled to register drones and what requirements and restrictions apply? Is the registry organised as an operator registry or an owner registry?

The registry is organised as both an owner registry in respect of registration of an RPA and as an operator registry in respect of the holder of an RPAS operators certificate (ROC).

RPAs are registered under the SA Civil Aviation Authority register and owners are issued with a certificate of registration by the director of Civil Aviation and are deemed to have South African nationality.

Identification

10 Are drones identified through a marking system similar to that used for manned aircraft?

All RPAs are issued with a registration mark that must be affixed to it, together with an identification plate (engraved, stamped or etched) with its nationality and registration marks.

The South African nationality marks are the capital letters ZS, ZT and ZU.

CERTIFICATION AND LICENSING

Basic requirements and procedures

11 What certificates or licences are required to operate drones and what procedures apply?

In the case of commercial, corporate and non-profit operations, the following documents are required: an RPAS letter of approval (RLA) issued by the director; a certificate of registration for each RPAS; a RPAS operating certificate; and in the case of commercial operations, an air services licence.

The procedure to obtain the relevant licences is by way of an application to the director of Civil Aviation together with the payment of a fee. The application must be accompanied by (i) a copy of the certificate of registration of each RPA to be operated; (ii) a copy of the RLA for each device to be operated; and (iii) for an initial issue, an original operations manual containing the information required to demonstrate how the operator would ensure compliance with the regulations and safety standards; and a maintenance programme in accordance with the manufacturer's instructions, whether through action or inspection.

The holder of a ROC must also conduct background checks on all personnel employed to handle, deploy or store RPAS.

Taxes and fees

12 Are certification and licensing procedures subject to any taxes or fees?

The fee payable for the issuance of a RPAS operating certificate is 4,210 rand and for each additional aircraft in the ROC, 840 rand.

For the registration of a remotely piloted aircraft a fee of 800 rand is payable and for aviation personnel standards a fee of 660 rand is payable for the issuing of a remote pilot licence (RPL).

Eligibility

13 Who may apply for certifications and licences? Do any restrictions apply?

The operator of an RPAS must be the holder of a valid ROC, including the operations specifications attached to it. RPAS must be operated by duly qualified and licensed pilots who can be any person over the age of 18 who has the relevant medical certificate and has completed a theoretical examination as well as skills tests and flight training from a training facility authorised by the Civil Aviation Authority.

Save for the above, there are no restrictions on the applicants as regards nationality of ownership, although in the case of commercial operations a domestic air service licence from the Air Service Licensing Council must be obtained and will be issued where:

- the applicant is a natural person, a resident of the Republic; or
- if the applicant is not a natural person:
  - is incorporated in the Republic and at least 75 per cent of the voting rights in respect of such person is held by residents of the Republic, and that such will be actively and effectively in control of the air service; and
  - the RPAS that will be used in operating the air service is a South African aircraft.

Remote pilot licences

14 Must remote pilots obtain any certifications or licences to operate drones? If so, do the relevant procedures differ based on the type of drone or operation?

Pilots must be in possession of an RPL issued in the relevant category except when undergoing a skill test or receiving flight instruction.

To qualify for an RPL applicants must:

- not be less than 18 years of age;
- hold at least a valid Class IV medical certificate for BVLOS operations or operations involving RPAS classified as Class 3 or higher; or for all other classes or types of operation, submit a self-declared medical assessment report provided that an applicant who cannot meet the requirements of the medical assessment must submit a Class 4 medical certificate; and
- hold at least a restricted certificate of proficiency in radiotelephony (aeronautical); and where required, have completed the flight training and have passed the theoretical knowledge examination; and, finally, have passed a skills test.

Foreign operators

15 Are foreign operators authorised to fly drones in your jurisdiction? If so, what requirements and restrictions apply?

Foreign operators that wish to conduct commercial operations must also apply for and hold a domestic air services licence issued under the terms of the Air Services Licensing Act. See question 13.

Certificate of airworthiness

16 Is a certificate of airworthiness required to operate drones? If so, what procedures apply?

No certificate of airworthiness is required, but the RPAS must be compliant with the manufacturer's instructions for equipment maintenance through actions or inspections, and the owner must submit a maintenance programme for the RPAS to the director of Civil Aviation for approval.

OPERATIONS AND MAINTENANCE

One drone, one pilot

17 | Does the 'one drone, one pilot' rule apply in your jurisdiction?

The one drone, one pilot rule applies in South Africa in that operators must register and be issued with a ROC for each RPA to be operated, although an RPL is issued to an applicant in the relevant category and not for a specific RPA.

Maintenance

18 | Do specific rules regulate the maintenance of drones?

Continuing system maintenance

An RPAS must be compliant with the manufacturer's instructions for continued equipment maintenance through actions or inspections, and the owner must submit a maintenance programme for the RPAS to the director for approval. Maintenance engineers must be no less than 18 years of age, be a South African citizen or in possession of a valid permanent residence permit or valid temporary work permit with a letter of employment and have successfully completed appropriate training, provided by:

- an organisation approved by the competent authority in the country where the training organisation is located;
- an approved original equipment manufacturer; or
- a training facility approved by the director;

or demonstrate the ability to perform maintenance functions where no training for the particular RPA is offered or available.

RPAS maintenance

Maintenance on an RPA or any component thereof must be carried out in respect of an RPA classified as a Class 3 and higher, the holder of a valid RPAS maintenance technician (RMT) authorisation, or in respect of an RPA classified as Class 2 and lower, by the ROC holder provided that the holder can demonstrate to the satisfaction of the director its ability to perform the required maintenance on the RPA.

An RMT authorisation will only be issued to a person not less than 18 years of age; who is a South African citizen or in possession of a valid permanent residence permit or valid temporary work permit with a letter of employment and has successfully completed appropriate training, and demonstrates the ability to perform maintenance functions where no training for the particular RPA is offered or available.

The person responsible for maintenance of RPAS must maintain a personal logbook recording all the work carried out on an RPAS and its components.

Basic operational rules and restrictions

19 | What rules and restrictions apply to flights performed in 'visual line of sight' (VLOS) and 'beyond visual line of sight' (BVLOS)? Is there a distinction in this regard?

Visual line of sight

Private RPAS operators are restricted to operating RPAS with a maximum take-off weight of 7kg, can only fly in daylight and clear weather conditions and can only operate in restricted VLOS, meaning an operation within 500 metres of the remote pilot and below the height of the highest obstacle within 300 metres of the RPAS, in which the remote pilot maintains unaided visual contact with the RPAS to manage the flight and meet separation and collision avoidance responsibilities.

Beyond visual line of sight

An RPA may not be operated beyond VLOS unless by the holder of a ROC and as approved in the operations manual.

BVLOS operation may be approved subject to the operator meeting the requirements prescribed in Document SA-CATS 101.

Approved BVLOS operations may only be conducted in VMC, below 400ft above surface level, unless otherwise approved.

The principal restrictions applicable to the private operation of RPAs are that an RPA cannot be operated above 121.92 metres above the ground, within a 10km radius of any aerodrome, within 50 metres of any person, property structure and building or public road, or within controlled, restricted or prohibited airspace, unless approved by the authority.

RPAs, save in certain circumstances, must be equipped with an altimetry system or equivalent, that is capable of displaying to the operator on the RPAS, the altitude and height of the RPA above ground level.

An RPA that is not equipped with an altimetry system or equivalent may only be operated under restricted VLOS.

Weather conditions

An RPAS may not be operated in weather conditions that do not allow unobstructed visual contact to be maintained with the RPA by other airspace users and by the operator unless in BVLOS or night operations approved by the director in the operations manual.

20 | What rules and restrictions apply to critical and non-critical operations? Is there a distinction in this regard?

An RPA may not be operated at night except in restricted VLOS operation, or by the holder of an ROC, and the holder of an ROC intending to operate an RPA at night, shall, as a minimum have each RPA approved under their ROC for night operations subject to compliance with the requirements prescribed in Document SA-CATS 101.

An RPA may not be operated at night in controlled airspace in visual meteorological conditions in an aerodrome traffic zone and controlled airspace below 121.92 metres and subject to compliance with the further conditions prescribed in Document SA-CATS 101.

Transport operations

21 | Is air transport via drone (eg, cargo and mail) regulated in your jurisdiction? If so, what requirements, limitations and restrictions apply?

The regulations do not currently cater for transport operations by drones; however, to operate commercially, the definition of an air service in the domestic Air Services Licensing Act – as any service operated by means of an aircraft for reward – could arguably bring cargo and mail transport operations into the fold of the Act and consequently the need for a Class III licence.

A Category A4 (fixed wing), H1 (multi-rotor) and H2 (helicopter) and type of operations approved for G16 (other: RPAS), as well as any additional G-codes applicable to the intended operation, is required.

22 | Do any specific provisions governing consumer protection and tracking systems apply with respect to cargo and delivery operations via drone?

Presumably the provisions of the Consumer Protection Act, the privacy laws and the liability regime (outlined in question 8) would apply equally to transport of cargo and delivery operations by drones.

Insurance requirements

23 | What insurance requirements apply to the operation of drones?

ROC holders must be adequately insured for third-party liability, with a minimum cover of 500,000 rand per RPAS.

Safety requirements

24 | What safety requirements apply to the operation of drones?

To apply for a ROC where no certification exists from an ICAO contracting state, the holder of a ROC must establish a safety management system commensurate with the size of the organisation or entity and the complexity of its operations accompanied by an RPAS operating manual from the manufacturer.

In addition the safety management system must include a process to identify actual and potential safety hazards and assess the associated risks together with a process to develop and implement remedial action necessary to maintain an acceptable level of safety.

In addition the operator must make provision for continuous and regular assessment of the appropriateness and effectiveness of safety management activities.

AIRSPACE

Air traffic control

25 | How is air traffic control regulated in your jurisdiction? Which authority provides air traffic control services for drones?

Air traffic control and the operation of air navigation infrastructures, air traffic and air navigation services fall under the auspices of the Air Traffic and Navigation Services Company Limited, a state-owned enterprise.

Restrictions

26 | Are there any airspace restrictions on the operation of drones?

No RPAS may be operated in controlled airspace, except by the holder of a ROC and as approved by the director in the operator's operations manual.

The principal restrictions applicable to private RPA operations are that they may only be operated in controlled airspace below 121.92 metres and within a 10km radius of any aerodrome, and within 50 metres of any person, property or public road, or within controlled, restricted or prohibited airspace.

In addition, private operators are restricted to operating RPAS with a maximum take-off weight of 7kg, and only fly in daylight and clear weather conditions and only operate in restricted VLOS (ie, within 500 metres of the remote pilot and below the height of the highest obstacle within 300 metres of the RPAS in which the remote pilot maintains unaided visual contact with the RPAS to manage the flight and meet separation and collision avoidance responsibilities).

Take-off and landing

27 | Must take-off and landing of drones take place in specific areas or facilities?

Public roads may not be used as a place of landing or take-off of an RPA, except by the holder of a ROC and as approved by the director in the operator's operations manual, and when approved by the relevant local authority.

LIABILITY AND ACCIDENTS

Cargo liability

28 | Are there any specific rules governing the liability of drones for losses or damage to cargo?

There are no specific rules governing the liability for losses or damage to cargo for RPA, although they may not carry dangerous goods as cargo as regulated by Part 92 of the Regulations, except by the holder of an ROC and as approved by the director in the operations manual.

Third-party liability

29 | Are there any specific rules governing the liability of drones for damage to third parties on the surface or in the air?

Section 8 of the Civil Aviation Act imposes a strict liability regime for material damage or loss caused by an aircraft in flight, taking off or landing, or by any article falling from such aircraft to any person or property on land or water, and accordingly damages may be recovered from the registered owner of the aircraft in respect of such damage or loss without proof of negligence or intention or other cause of action as though damage or loss had been caused by his or her wilful act, neglect or default.

Accident investigations

30 | How are investigations of air accidents involving drones regulated in your jurisdiction?

All notified accidents and serious incidents are investigated by an investigator-in-charge in terms of the provisions of Part 12 of the Civil Aviation Regulations read together with SA CATS 12.

The purpose of investigation of an accident or incident is to determine, in terms of the provisions of Part 12, the facts of an accident or incident in the interest of the promotion of aviation safety and the reduction of the risk of aviation accidents or incidents, and not to establish legal liability. Once accident investigations are concluded, a report is compiled in the interest of promoting aviation safety.

Accident reporting

31 | Is there a mandatory accident and incident reporting system for drone operators in your jurisdiction?

Accidents and incidents involving RPAs must be reported in the event of any injury or death to a person, or damage to property or destruction of the RPA beyond economical repair.

Incidents involving an RPA where loss of control occurred must also be reported to the holder of the ROC by a third party in an accident or incident.

Safety management and risk assessment

32 | Are drone operators required to implement safety management systems and risk assessment procedures within their organisation?

Operators are required to implement a RPAS safety management system that forms part of the application for the issue of an RLA, which includes the documentation regarding the standard to which the RPAS was designed or equivalent documentation that demonstrates a level of safety acceptable to the director; or documentation demonstrating system safety.

In addition, the operations manual must contain a safety management system and quality assurance programme.

ANCILLARY CONSIDERATIONS

Import and export control

33 Do specific import and export control rules apply to drones in your jurisdiction?

There are no specific rules applicable to the importation and exportation of drones, save that no RPA may be sold within the Republic unless the seller has, by way of a packaging label, or in the case of the resale thereof, by way of written notification, notified the buyer of the requirements of the Civil Aviation Regulations.

The importation and sale of RPAs will attract VAT at the effective rate of 15 per cent. The sale of an RPA that is exported should not attract any VAT as the transaction would be zero-rated for the purposes of VAT.

Data privacy and IP protection

34 How are personal data privacy and IP protection regulated in your country with specific reference to drone operations?

There is currently no dedicated data protection legislation in South Africa, but the Consumers Protection Act, the National Credit Act, the Promotion of Access to Information Act, the Electronic Communications and Transactions Act and the Regulation of Interception of Communications and Provision of Communications Related Information Act do provide some form of protection.

The Protection of Personal Information Act of 2013 is the closest thing to a dedicated data protection legislation such as the EU Data Protection Directive, although the Act has not been fully implemented.

The Constitution of South Africa and the common law continue to provide the right to privacy and impose certain restrictions on the processing and disclosure of personal information.

UPDATE AND TRENDS

Sector trends and regulatory developments

35 Which industry sectors have seen the most development in the use of drones in your jurisdiction and which sectors are expected to see further development in future? Have there been any notable recent regulatory developments relating to drones?

The use of RPAS across industries such as mining, construction, agriculture, land management, security and law enforcement has increased as has their use in aerial data acquisition or inspections of an asset.

It is expected that growth areas will include disaster response and management, security surveillance and law enforcement missions, while the film industry, which is sizable, will continue to grow with innovative uses and more sophisticated equipment.

The regulation of autonomous unmanned aircraft will no doubt come under the spotlight of the authorities, due if to nothing else but pressure from commercial operators.

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GENERAL FRAMEWORK

Basic rules and regulators

1 What basic rules govern the operation of remotely piloted aircraft and unmanned aircraft (drones) in your jurisdiction? Which regulatory bodies are charged with enforcing these rules?

The legal framework applicable to drone operations in Spain is composed of international conventions and accords, European regulations and directives, and domestic legislation.

At an international level, conventions such as the Convention on International Civil Aviation, of 7 December 1944 (the Chicago Convention), and the International Civil Aviation Organization (ICAO) Circulars set forth the main rules on how drones must be treated by states. Spain, as a state party to the Chicago Convention, must comply with its provisions, resolutions and recommendations issued by ICAO.

From the perspective of European Union legislation, the main applicable legislative pieces are:

- Regulation (EC) No. 216/2008 of the European Parliament and of the Council, of 20 February 2018, on common rules in the field of civil aviation and establishing a European Aviation Safety Agency;
- Regulation (EU) 2018/1139 of the European Parliament and of the Council, of 4 July 2018, on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, and amending, among others, Regulation (EC) No. 216/2008;
- Commission Delegated Regulation (EU) 2019/945, of 12 March 2019, on unmanned aircraft systems and on third-country operators of unmanned aircraft systems; and
- Regulation (EU) 2019/947, of 24 May 2019, on the rules and procedures for the operation of unmanned aircraft.

When applicable, these new regulations will extend the regulatory strength of the European Aviation Safety Agency (EASA) more than the limited regulations only applicable to the use of drones weighing more than 150kg and harmonising the regulations to allow cross-border drone operations across the different member states. In addition to these rules, a lot of Acceptable Means of Compliance and Guidance Material has also been published to accommodate the many differing uses of drones and safety and security measures under cover of the EASA jurisdiction.

Finally, Spain also has its own domestic legislation. The core legal provision regulating the use of drones is Royal Decree 1036/2017, of 15 December, pursuant to which the use of civil remotely piloted aircraft is regulated (RD 1036/2017). This Royal Decree contains the main terms and obligations with which an operator must comply to use drones lawfully. Spain's Aviation Safety State Agency (AESA) is the main government entity in charge of the control, surveillance and enforcement of RD 1036/2017, although Spain's Ministry of Interior Affairs also has jurisdiction to authorise certain specific operations where public security issues arise. RD 1036/2017 provides a wide regulatory framework that covers all parts of drone operation, such as identification of the aircraft, obligations for recordation with the Spanish Aircraft Registry for aircraft that exceed the 25kg maximum take-off weight (MTOW) threshold, certification and manufacturing, maintenance of aircraft, and pilots and rules for the use of airspace for the different types of aircraft and operations developed.

In addition to RD 1036/2017, the legal framework governing drones is scattered across different other regulations and acts. A non-exhaustive list of such applicable regulations includes:

- Royal Decree 384/2015, of 22 May, on Regulations of the Spanish Civil Aircraft Registry: since certain aircraft are subject to registration, this Royal Decree also applies to the drones that meet certain requirements.
- Air Navigation Act 48/1960, of 21 July: as users of the Spanish airspace, the rules of air traffic, air crew, transportation, insurances and compensations in cases of damage and accident assistance on drone operations are regulated herein.
- Air Safety Act 21/2003, of 7 July: this piece of legislation applies to cases of accident, incident and inspections of AESA, and it also regulates the specific administrative proceedings that apply in the case of non-compliance and breaches of the law by drone operators, as well as the relevant fines and appropriate sanctions.
- Presidential Order of the Government, of 14 March 1957: this is one of the oldest regulations applicable to drone operations and provides the different requirements and restrictions for drone operations based on aerial photography restricted to certain areas of Spanish territory owing to their sensitive material or essential infrastructure.

In addition to the main air navigation framework, other non-specific regulations will also be applicable to drone operations depending on the nature and purposes of the operations. Some of these could relate to the telecommunications and radioelectric public domain (Royal Decree 863/2008, of 23 May, and Act 32/2003, of 3 November), or to data protection (Regulation (EU) 2016/679, Spanish Organic Law 3/2018, of 5 December).

2 What are the penalties for non-compliance with the laws and regulations governing drones?

RD 1036/2017 provides that a breach of its provisions shall be considered as an administrative violation and thus, the penalty proceedings foreseen in the Air Safety Act shall be applicable. Under article 44 of the Act, it can be considered a serious penalty, for example, to cause injury to people, or cause death, or damage to goods and property on the ground or to other airspace users. The fines for these administrative offences can range from minor offences with a simple warning letter to fines of €4.5 million depending on the severity of the case for serious offences.

Beyond the administrative penalties and in addition to the possible court claims, if certain damages, injuries or even death is caused by the pilot or the operator during a drone operation, criminal proceedings could also be initiated. In Spain not just natural persons but also legal entities can be subject to such proceedings, since article 31-bis of the Spanish Criminal Code establishes that companies will be criminally liable for certain crimes – for example, in the drone industry, crimes against the environment, nuclear energy, crimes of risk provoked by explosives, trafficking drugs or smuggling, to mention a few examples.

Classification

3 | Is there any distinction between public and private drones, as well as between leisure use and commercial use?

Under Spanish regulations, there are a few differences between public and private drones. RD 1036/2017 sets forth the requirements that all operators must comply with to fly lawfully; however, for public drones, there are certain particular exclusions to those requirements. Article 3 of RD 1036/2017 provides that for state security forces (ie, the various police, national or regional bodies, traffic surveillance, National Intelligence Centre activities and customs authorities) the distance (BVLOS, VLOS or EVLOS) and weight restrictions applicable to civil operators shall not be applicable and their specific protocols will apply to adjust their activities to the scope of the public body that is providing the service or carrying out the relevant activity. Therefore, it would be such public body and not AESA that is responsible for authorising the operation and establishing the requirements guaranteeing the compliance with certain minimum safety measures.

Notwithstanding the above, public drones of more than 25kg are also subject to the requirement to record the aircraft with the Spanish Aircraft Registry. Besides, as happens with manned aircraft, in the case of anti-drug, anti-terrorism or where there are severe public threats, state security forces shall not be obliged to issue a notice to airmen (NOTAM) for the specific operations carried out in the airspace.

Concerning the leisure use and commercial use distinction, the differentiation made by RD 1036/2017 is not strictly based on the commercial activity. The regulation distinguishes between the use of drones for specialised air operations, experimental flights and leisure, aeromodelling or sportive or exhibition activities. The wording of this differentiation makes it clear that leisure activities with drones are minimally regulated, opening a window for the lawmaker to regulate it in the future. In respect of other activities, namely specialised air operations, the law makes a distinction between commercial and non-commercial specialised air operations, defining the former as an air operation carried out by a drone for hire or reward in which a remuneration, financial compensation or consideration is given or promised with respect to the object of the flight. Therefore, any operation falling outside this definition could not be considered as a commercial operation.

4 | Is there a weight-based classification system for drones resulting in the application of different rules?

Yes, there is. RD 1036/2017 establishes different requirements depending on the weight of the drone carrying out the air operation. In the first place, the regulation clearly establishes that it is not applicable to those drones exceeding 150kg, which are, therefore, subject to the general provisions governing aircraft. Then, there are certain general features applicable to the different scenarios depending on the weight of the drone.

Scenario 1: those drones with an MTOW up to 2kg will be allowed to fly within uncontrolled airspace up to 121.92 metres in VLOS or BVLOS range capacity of the radio and under visual meteorological conditions (VMC).

Scenario 2: those drones with an MTOW up to 10kg will be allowed to fly within uncontrolled airspace up to 4121.92 metres in VLOS range and no more than 100 metres away from the position of the pilot. This operation can be done above groups of people and in urban areas with certain additional requirements and authorisations.

Scenario 3: drones with an MTOW between 10kg and 25kg are permitted to fly within uncontrolled airspace up to 121.92 metres in VLOS of the pilot or in a range and no more than 500 metres of horizontal distance, in non-urban areas and away from groups of people.

Scenario 4: drones with an MTOW exceeding 25kg, the capabilities of the operations will be strictly subject to the provisions and restrictions of its relevant remotely piloted aircraft airworthiness certificate issued by AESA. These drones must be registered at the Spanish Aircraft Registry.

Under certain conditions, the restrictions of the above scenarios can be modified to allow the operations to be more flexible.

5 | Is there any distinction between completely autonomous drones and remotely piloted drones?

Yes. The Spanish legal framework provides that the drone legislation shall only be applicable to civil remotely piloted aircraft systems (RPAS) – this is expressly stated in article 2.1.(b) of RD 1036/2017. It is expressly foreseen that this regulation does not apply to autonomous drones as such have only been regulated and defined under the scope of military operations as per Royal Decree 601/2016, of 2 December, pursuant to which the Regulation on Operational Air Traffic is approved. Taking into account both regulations, the main distinction between autonomous drones and RPAS is the capacity of the pilot to access the control to manage and pilot the aircraft at any time. Thus, under current Spanish regulations, if a pilot cannot control a drone from take-off until landing, then the drone should be considered as an autonomous drone and subject to military regulations.

DESIGN AND MANUFACTURE

Regulation

6 | Do specific rules regulate the design and manufacture of drones in your jurisdiction?

RD 1036/2017 establishes certain rules for design and manufacturing organisations, although the most relevant provisions stem from European regulations. Manufacturers and designers must comply with the obligations of Part 21 of Commission Regulation (EU) No. 748/2012 of 3 August 2012 laying down implementing rules for the airworthiness and environmental certification of aircraft and related products, parts and appliances. Both design and manufacturing organisations will need to be approved in advance by AESA.

Additionally, the Commission Delegated Regulation (EU) 2019/945, of 12 March 2019, on unmanned aircraft systems and on third-country operators of unmanned aircraft systems and Commission Implementing Regulation (EU) 2019/947, of 24 May 2019, on the rules and procedures for the operation of unmanned aircraft, also apply to designer and manufacturing organisations.

Manufacturing authorisation

7 | Must drone manufacturers obtain any licences or other authorisation to carry out their business? Are manufacturers subject to any other specific rules?

The same legal provisions applicable to design and manufacturing organisations shall apply to drone designers and manufacturers being previously approved by AESA. However, one exemption is made for a specific case if the following requirements are met:

- the drone manufacturer must be considered as a micro or small enterprise in accordance with European Commission Recommendation, of 6 May 2003, concerning the definition of micro, small and medium-sized enterprises;
- the manufacturer is exclusively dedicated to drone production of remotely piloted aircraft with simple design and technology;
- the manufacturer must hold a production inspection system and be certified so that it complies with the conditions of Sub-part F of Part 21 supported with documentation and evidence foreseen in this Part; and
- the production flow of the manufacturer is not constant and limited to a reduced number of batches of aircraft per year.

Product liability

8 | Do general product liability rules (or other specific liability rules) apply to the manufacture of drones?

On leisure drones, general product liability rules established in the Royal Legislative Decree 1/2007, of 16 November, pursuant to which the restated wording of the General Law of Defence of Consumers and Users and other ancillary laws is approved, shall apply in cases of damage caused by defective products.

However, for drones aimed at professional or commercial operations, RD 1036/2017 establishes that manufacturers will be liable for the damage caused by malfunctions in drones produced by these organisations. This has also been implemented in the recent Commission Delegated Regulation (EU) 2019/945, of 12 March 2019, pursuant to which drones subject to the regulations shall be compliant with CE marking and EU conformity.

In addition to these rules applicable to drone product liability, special warranties given by the manufacturers must also be taken into account, provided that these do not contravene the legislation in force in this matter.

REGISTRATION AND IDENTIFICATION

Registration

9 | Must drones be registered in a specific national registry? If so, who is entitled to register drones and what requirements and restrictions apply? Is the registry organised as an operator registry or an owner registry?

In accordance with applicable regulations, only drones with an MTOW exceeding 25kg will be subject to mandatory registration at the Spanish Aircraft Registry (RMA). However, owing to the singular aircraft registration system in Spain, those drones subject to registration at the Aircraft Registry will need to be registered first with the Movable Assets Registry (MAR). The basis for this dual registration system lies in the provisions of Royal Decree 384/2015, of 22 May, pursuant to which the regulation of the civil aircraft registry is approved.

The main features of this dual registration system can be summarised as follows.

Spanish Aircraft Registry: the RMA falls under the jurisdiction of AESA. The RMA is an administrative registry of aircraft, but not a registry of title or ownership of aircraft. It is operator-based. The main effect of registration is that an aircraft is provided with a Spanish registration number (beginning with the letters EC, followed by a hyphen and a combination of three letters, eg, EC-XXX) and thus becomes a Spanish aircraft.

Movable Assets Registry: the MAR falls under the jurisdiction of the Directorate General of Registries and Notaries, a body of the Ministry of Justice. The MAR is a register of title, ownership and encumbrances over movable assets, including aircraft. The main effect of registration is that evidence is provided in respect of the status of ownership and liens over assets.

Identification

10 | Are drones identified through a marking system similar to that used for manned aircraft?

As a general rule, all drones shall bear a fireproof identification plate affixed to their structure including the name of the manufacturer, type, model and serial number if applicable, as well as the name of the operator and its contact details. Specifically, for drones subject to registration at the Spanish Aircraft Registry, in addition to the fireproof plate, the marking system will be the same as that applicable to manned aircraft pursuant to Order FOM/1687/2015, of 30 July, pursuant to which the provisions relating to national marks and registration of civil aircraft are established. These marks will need to be clean and visible at all times.

CERTIFICATION AND LICENSING

Basic requirements and procedures

11 | What certificates or licences are required to operate drones and what procedures apply?

Flying drones lawfully in Spain requires carrying out certain administrative procedures. Depending on the MTOW of the drone, the administrative proceeding will differ.

For drone operations with an MTOW of less than 25kg, outside controlled airspace, crowds and urban areas, with VMC and VLOS range, it is only necessary to submit a prior communication to AESA five business days before starting the operations. That notice shall contain certain technical documents of the aircraft, information about the pilots, insurance certificates and some other information such as an aeronautical safety test. Once the communication has been received, the licence is valid without time restrictions of any kind, but new communications need to be submitted if there is any modification to the documents or details initially provided to the authorities.

If the drone exceeds 25kg MTOW, then the operation shall require an administrative authorisation to be issued by AESA. Also, an RPA airworthiness certificate needs to be obtained, and registration of the drone will be also required by the authorities.

Additionally, operators flying drones between 25kg and 50kg MTOW will need to comply with several additional measures such as having an appropriate business organisation and management to guarantee compliance with the legal requirements and the nomination of duly qualified operations managers.

In addition to the foregoing, a drone operator can request and obtain special certificates for specific types of operations, such as flying above urban areas, within controlled airspace, during the night or from moving vehicles. For each special certificate, certain documents and evidence of accomplishment of tests will need to be submitted to AESA.

Taxes and fees

12 | Are certification and licensing procedures subject to any taxes or fees?

As the time of writing, no taxes or fees are required for the communication of activities for a drone of less than 25kg MTOW. With respect to authorisations or certifications, certain taxes and administrative fees are involved, not for the authorisation process itself but for other procedures before applying for the authorisation, such as the airworthiness certificate procedure or the registrar fees of the Spanish Aircraft Registry.

Eligibility

13 | Who may apply for certifications and licences? Do any restrictions apply?

In respect of operators: for the time being, there are no nationality or citizenship restrictions applying to drone operators. If a company or a person (whether a Spanish resident or not) wishes to obtain a licence as a Spanish drone operator, certain documentary requirements must be met, such as insurance certificates, affidavits relating to the intended operations, evidence of satisfactory flight tests, personal details of the pilots and the drones subject to the licence of the operator, an operations manual and risk assessments.

In respect of the aircraft:

- if the drone has an MTOW of less than 25kg, no licensing restrictions apply; or
- if the drone has an MTOW of 25kg or more, then it must have either an EASA type certificate or, if it holds an airworthiness certificate issued by a non-EASA aviation authority, its airworthiness certificate will have to be recognised first by AESA.

In respect of pilots: there are no general restrictions provided in RD 1036/2017 to obtain remote pilot licences.

Notwithstanding the foregoing, when licences and authorisations are requested by non-Spanish individuals, an NIE (tax ID number) or foreigner's ID number shall be also required, and for both cases at least a Spanish address will need to be included in the application form. Also, a Spanish tax ID number will be required for non-Spanish companies prior to the application process to become a Spanish operator.

Remote pilot licences

14 | Must remote pilots obtain any certifications or licences to operate drones? If so, do the relevant procedures differ based on the type of drone or operation?

Yes, remote pilots need to pass a theorical and a practical test to obtain the appropriate pilot's licence. In addition, pilots cannot fly on their own unless they obtain an operator's licence as well or have been hired by an operator. Once the pilot's licence has been granted, it needs to be updated periodically by flying regularly and at least three times every three months. If the aircraft weighs more than 25kg, then a higher licence is required, such as the private pilot's licence.

Medical certificates in accordance with section MED.B.095 of Annex IV, Part MED, of Regulation (EU) No. 1178/2011, of 3 November 2011, are required for pilots permitted to fly aircraft up to 25kg MTOW and Class 2 medical certificates for those pilots flying drones exceeding this MTOW limit.

Foreign operators

15 | Are foreign operators authorised to fly drones in your jurisdiction? If so, what requirements and restrictions apply?

As per RD 1036/2017, AESA may permit foreign operators to perform drone operations within the Spanish territory if they comply with the requirements established in the Commission Implementing Regulation (EU) 2019/947, of 24 May 2019. In addition to this regulation, all foreign operators will need to be expressly authorised to perform any type of aerial work. AESA will authorise operations in Spanish airspace provided that the foreign drone operator submits sufficient evidence to certify that its licence complies with all the requirements provided in Spanish regulations.

Certificate of airworthiness

16 | Is a certificate of airworthiness required to operate drones? If so, what procedures apply?

Those aircraft not exceeding 25kg MTOW will not be obliged to request and obtain a certificate of airworthiness to operate, although they may request it voluntarily. Drones with an MTOW of 25kg or more must obtain a certificate of airworthiness from AESA. A term of six months from the application is foreseen for the airworthiness certification procedure. Airworthiness certification can be conducted, in principle, in two different ways.

First, if the aircraft already has an EASA or AESA type certificate, this can be provided together with a manufacturer's statement to the authorities that will confirm that the aircraft is aligned with the provisions of that type certificate.

Otherwise, the procedure foreseen in Annex I, Part 21 of Regulation 748/2012, laying down implementing rules for the airworthiness and environmental certification of aircraft and related products, parts and appliances, as well as for the certification of design and production organisations, will apply. The airworthiness certificates shall include the aircraft itself, the remote pilot station, and the command and control links, as well as any other device or element used during any operation. These certificates shall have an indefinite validity unless the conditions of the aircraft change.

OPERATIONS AND MAINTENANCE

One drone, one pilot

17 | Does the 'one drone, one pilot' rule apply in your jurisdiction?

Yes, it does apply. RD 1036/2017 establishes that the pilot shall not perform a flight in respect of more than one aircraft at the same moment.

Maintenance

18 | Do specific rules regulate the maintenance of drones?

The conditions for drone maintenance are provided in RD 1036/2017. Operators are obliged to establish a maintenance programme adjusted to the recommendations of the manufacturer. AESA has published on its website a set of guiding materials and acceptable means of compliance with the reviews and tests to be carried out in a drone operator's maintenance programme, which provides the minimum necessary revisions and tests to be carried out on the aircraft. The operator is obliged to have an updated log system of the status, inspections and significant events that occurred in each aircraft.

Basic operational rules and restrictions

19 | What rules and restrictions apply to flights performed in 'visual line of sight' (VLOS) and 'beyond visual line of sight' (BVLOS)? Is there a distinction in this regard?

Under RD 1036/2017, VLOS is defined as an operation mode where the pilot maintains constant and direct visual contact with the aircraft without the assistance or help of any optical or electronic devices (eg, first-person view glasses). The main difference with BVLOS is that there is no direct contact with the aircraft. In addition, RD 1036/2017 also foresees the possibility to operate under extended VLOS by using alternative means to keep the contact with the aircraft, using observers with permanent radio contact with the pilot.

Except for drones below 2kg MTOW, the general rule in Spain is that all operations shall be carried out in VLOS conditions. This notwithstanding, BVLOS can be carried out if a specific authorisation is requested and obtained from AESA, or if the aircraft has been installed

with a sense-and-avoid system approved by AESA or the aircraft has a certificate of airworthiness allowing it to carry out BVLOS flights.

20 | What rules and restrictions apply to critical and non-critical operations? Is there a distinction in this regard?

Under RD 1036/2017 all operations shall be considered as non-critical unless expressly provided for therein. Critical operations definition and requirements are provided in article 44 of RD 1036/2017, whereby in cases of great risk or human or natural disasters some exemptions and other specific rules shall apply. When local or state authorities request citizens' collaboration in disaster situations, those operators that have volunteered to help the public authorities may be declared exempt from complying with most of the requirements. However, coordination with air traffic control (ATC) will be necessary as well in these cases. In the case of damage during disaster situations, operators may claim compensation from the administration.

Critical operations shall be also considered as operating in special facilities, being those affected by national defence or state security as well as those performed above or near critical infrastructures that are considered of strategic interest, such as nuclear power plants, transport facilities, energy, water and communication facilities. Flying above or near these zones shall be subject to the distance restrictions provided for under article 32 of RD 1036/2017 and also to the provisions of Act 8/2011, pursuant to which protection measures on critical infrastructures are established but ultimately shall be subject to the restrictions established by the state secretary.

Transport operations

21 | Is air transport via drone (eg, cargo and mail) regulated in your jurisdiction? If so, what requirements, limitations and restrictions apply?

Under Spanish regulations, the use of drones for transportation of cargo is not yet regulated. To our knowledge, to date no licences have been granted to operators for the carriage of goods. Notwithstanding the foregoing, the Spanish aviation authority may allow certain operators to carry out transport operations in specific cases if previously and specifically authorised for said purposes, mainly for experimental tests.

22 | Do any specific provisions governing consumer protection and tracking systems apply with respect to cargo and delivery operations via drone?

Not applicable.

Insurance requirements

23 | What insurance requirements apply to the operation of drones?

RD 1036/2017 sets out the obligation for the operator to subscribe and maintain an insurance policy or any other equivalent financial guarantee to operate drones. This insurance must be specific for the aviation industry because drones fall under the category of 'aircraft' under Spanish law. Therefore, a normal liability insurance policy is not enough. It would be necessary to subscribe a specific insurance, often referred to as third-party liability insurance, covering operators for damage caused by their aircraft or its payload to the ground (people and property damage) and other airspace users.

These insurances are subject to the limits set forth in Royal Decree 37/2001, of 19 January, by which compensation for damage is updated in the Air Navigation Act (specifically article 119 of the Air Navigation Act), which is applicable for RPAS that do not exceed 20kg MTOW.

The above-mentioned Royal Decree establishes economic compensation for each aircraft and accident that are limited in relation to the weight to a certain amount in special drawing rights. For drones of more than 20kg MTOW, the limits and liabilities for surface damage of Regulation (EC) No. 785/2004 shall apply.

Safety requirements

24 | What safety requirements apply to the operation of drones?

The safety requirements of RD 1036/2017 are aligned with the general safety measures foreseen by other supranational bodies, EASA and ICAO mainly. Operators are responsible for the safety of each drone operation and also for compliance with other applicable legal provisions, such as personal data protection regulations, for example.

Common obligations apply for drones not exceeding 25kg MTOW other than security distances for take-off and during the flight. Furthermore, the flight needs to comply with the drone's operations manual, and generic or specific security tests and safety risk assessments need to be performed before the operation. During the flight, pilots must ensure they avoid reckless manoeuvres, and take additional measures in the case of operations performed above properties or groups of people on the ground. Before the operation is performed, the pilot should establish protection zones as well as recovery zones in case of malfunctions during the flight.

AIRSPACE

Air traffic control

25 | How is air traffic control regulated in your jurisdiction? Which authority provides air traffic control services for drones?

ATC is provided by certain entities all over the country. The main entity in charge of providing flight information and air control is ENAIRE for area controls, approach and aerodrome tower services. These services are provided for manned aircraft and, since the enactment of RD 1036/2017, for unmanned aviation as well.

ENAIRE recently launched an initiative consisting of a smartphone application with a map of Spain to inform all drone operators and leisure pilots of the type of airspace and their respective flight levels, alerts, NOTAMs and other relevant information to help operators to plan their flight schedules in compliance with ATC requirements.

Restrictions

26 | Are there any airspace restrictions on the operation of drones?

Yes, there are. As a general rule, operations must be performed away from groups of people, cities and urban areas and within uncontrolled airspace, out of the flight information zone, within aviation, visual meteorological conditions and respecting the safety distances in each specific scenario. Nevertheless, with the corresponding authorisations and taking account certain restrictions, drones may operate above urban areas and even within controlled airspace.

In operations in urban areas, the operator must coordinate with the competent authority to limit the access on the surface where the operation takes place. In drone operations within controlled airspace, the operator and pilot must comply with Standardised European Rules of the Air 5005 and with the relevant authorisations. In addition, the pilot must have ATC clearance to operate in said space, providing and updating its position at all times.

Additionally, pilots performing operations close to airports and aerodromes must comply with certain restrictions. It is necessary to keep a distance of at least 8km from any aerodrome if it has Visual Flight

Rules procedures or a distance of 15km if those aerodromes have instrumental procedures. The latter is only available for BVLOS flights and always in coordination with the relevant authorities and ATC. Prohibited, restricted and dangerous zones are also restricted for drone operations.

Finally, drones that cannot obtain a certificate of airworthiness but are obliged to obtain one, or experimental test flights, shall only be allowed to carry out operations in temporary segregated areas.

Take-off and landing

27 | Must take-off and landing of drones take place in specific areas or facilities?

The operator must establish a protection area for the take-off and landing, consisting of a minimum radius of 30 metres from the aircraft and ensuring that there are no groups of people who can be injured during both manouevres. If the aircraft is a quadcopter or takes off vertically, then this area is reduced to a radius of 10 metres.

LIABILITY AND ACCIDENTS

Cargo liability

28 | Are there any specific rules governing the liability of drones for losses or damage to cargo?

As the RD 1036/2017 does not foresee drones transporting cargo unless AESA grants a special permit, no specific rules govern the liability of drones for losses or damage to cargo.

Third-party liability

29 | Are there any specific rules governing the liability of drones for damage to third parties on the surface or in the air?

Under the Air Navigation Act, drones are considered as aircraft, hence in case of damage to third parties, the same liabilities that apply to conventional aircraft will be applicable to drones. Pursuant to RD 1036/2017, the operator is liable for the operations carried out by its drone towards the authorities and against third parties. In this regard, the compensation rules foreseen in Royal Decree 37/2001 are applicable to those drones whose MTOW does not exceed 20kg. For drones of more than 20kg MTOW, the limits and liabilities for surface damage of Regulation (EC) No. 785/2004 shall apply.

Accident investigations

30 | How are investigations of air accidents involving drones regulated in your jurisdiction?

If a drone accident occurs, the operator must notify the event to the Commission for the Investigation of Accidents and Incidents on Civil Aviation, to the Occurrence Reporting System (SNS) or the Events National System of AESA. If the Commission considers that the incident presents an important issue for operational security, an investigation will be opened in accordance with the provisions of Regulation (EU) No. 996/2010.

Accident reporting

31 | Is there a mandatory accident and incident reporting system for drone operators in your jurisdiction?

All events that can be considered a potential incident or accident must be notified by the drone operator to the SNS within 72 hours of the moment the event occurred. Communication with the authority can be made electronically through the AESA website. Then, the administrative process will start in accordance with the Air Safety Act.

Safety management and risk assessment

32 | Are drone operators required to implement safety management systems and risk assessment procedures within their organisation?

Aside from the risk assessment and the safety tests required by RD 1036/2017 – at the time of obtaining the licence that needs to be implemented in each operation, maintained during all flights and modified in case of any change in the operations or drones operated by the operators – the regulation foresees additional remedies to protect third parties in certain situations.

For example, operators performing special operations with drones exceeding 25kg MTOW shall have an operative and technical organisation and management adequate to guarantee compliance with the requirements established in its licence, or an authorisation taking into account the risk of the operations to be performed to keep operational control of any flight. In addition, these operators shall appoint a duly qualified operations manager to comply with the operations manual, as well as a sufficiently trained airworthiness officer.

ANCILLARY CONSIDERATIONS

Import and export control

33 | Do specific import and export control rules apply to drones in your jurisdiction?

Originally, the Spanish customs authorities considered light drones as toys. However, with the approval and entry into force of the Commission Delegated Regulation 2019/945 this will change, and the provisions of the European regulation shall apply for imported drones. Article 8 of the Regulation shall apply to all importers and distributors in the European Union.

Taking into account the consideration of drones as aircraft, the provisions of the Union Customs Code shall apply to their export outside the European Union, and procedures for issuance of the single administrative document will need to be followed. For those drones registered at the Spanish Aircraft Registry, the single administrative document is one of the key documents required for the deregistration of aircraft.

Certain drones and related electronic devices may have to comply with the legal provisions relating to the control of dual-use products and technologies, which in Spain are embodied mainly in Act 53/2007 and in Royal Decree 679/2014.

Data privacy and IP protection

34 | How are personal data privacy and IP protection regulated in your country with specific reference to drone operations?

Article 26 of RD 1036/2017 provides that data protection regulations are applicable to drone operations and operators shall be responsible for complying with said regulations if certain personal data are collected during the operation and individuals can be identified by it.

If this is the case, the requirements, obligations, rights and fines foreseen in the Spanish Data Protection Act and in the General Data Protection Regulation (Regulation (EU) 2016/679) shall be applicable, and the Spanish Data Protection Agency may start administrative proceedings against the operator if those provisions have not been complied with or some persons submit complaints against operators.

UPDATE AND TRENDS

Sector trends and regulatory developments

35 Which industry sectors have seen the most development in the use of drones in your jurisdiction and which sectors are expected to see further development in future? Have there been any notable recent regulatory developments relating to drones?

The last review released by the Spanish Ministry of Development, titled 'Strategic Plan for the development of the civil drone sector in Spain 2018–2020', reveals the development of the Spanish drone industry in the years since the first drone regulation was enacted. As in other bordering countries, drone economic activity in Spain is divided into two large groups: manufacturing companies and specific service providers. The second group has a higher number of stakeholders, although the drone manufacturing sector is strongly competitive if we take into account the drone military industry. However, for now, the sector with more revenue from the drone industry in Spain is still leisure and aeromodelling.

From the total of civil drone operators duly licensed or authorised by AESA for special and commercial operations since the enactment of the first Spanish drone regulation, 90 per cent of the operators's services are focused on photography, filming and photogrammetry. The rest of the operators are focused on surveillance and security, rescue and emergency, aerial advertising or agriculture treatment.

The 'Strategic Plan for the development of the civil drone sector in Spain 2018–2020' expects that agriculture, energy plant inspections, surveillance, telecommunications, e-commerce and transport and even air mobility are sectors with a high potential for increasing the number of operations in the future. However, at national level, the last key development presented was RD 1036/2017 AESA, together with the main stakeholders of the industry, are developing guidance materials to fill in the blank spaces left by the law.

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GENERAL FRAMEWORK

Basic rules and regulators

1 | What basic rules govern the operation of remotely piloted aircraft and unmanned aircraft (drones) in your jurisdiction? Which regulatory bodies are charged with enforcing these rules?

Although located in the centre of Europe, Switzerland is neither a member state of the European Union (EU) nor of the European Economic Area (EEA). However, in relation to aviation, the relevant EU legislation applies to the extent adopted by Switzerland on the basis of the bilateral agreement on Air Transportation of 21 June 1999 (as amended from time to time) between Switzerland and the EU. In relation to remotely piloted or unmanned civil aircraft above 150kg, the relevant EU Directives and Regulations currently in force apply in Switzerland, whereas drones below 150kg are (still) subject to Switzerland's own domestic regulation, in particular the Federal Act on Air Transport and the respective ordinances, as well as the Ordinance on Special Category Aircraft of the Federal Department of the Environment, Transport, Energy and Communications (DETEC).

The most recently revised EU legislation that applies to drones of all sizes regardless of their operating mass (Commission Delegated Regulation (EU) 2019/945 on drone manufacturing and selling requirements and Commission Implementing Regulation (EU) 2019/947 on drone operation (collectively the New EU Drone Regulations)) is not (yet) applicable in Switzerland but on 22 August 2019 the Swiss Federal Office of Civil Aviation (FOCA) communicated that the New EU Drone Regulations will be implemented and applicable in Switzerland as of June 2020 (also see question 35).

The competent regulatory body charged with enforcing these rules is FOCA.

2 | What are the penalties for non-compliance with the laws and regulations governing drones?

Penalties for non-compliance with laws and regulations governing drones are not specifically regulated, but the general provisions of the Federal Act on Air Transport apply. Sanctions range from fines of up to 20,000 Swiss francs (or in severe cases up to 40,000 francs) to withdrawals of licences and permits. In addition, and depending on the offence, sanctions as per the general provisions of the Swiss Penal Code, the Federal Act on Administrative Criminal Law and also penal provisions of special legislation (such as the Federal Act on Data Protection) may apply.

Classification

3 | Is there any distinction between public and private drones, as well as between leisure use and commercial use?

With regard to the distinction between public and private drones, there is a special regulation for military and other state drones (ie, the use of drones by authorities). The applicable regulation must be determined according to the planned operation and the respective drone used.

However, Swiss regulation currently does not make any distinction between commercial and non-commercial drone operations. Although, in the event drones would become able to commercially transport cargo or passengers, it is likely that a distinction will be made between leisure and commercial use to implement a higher security standard for the latter.

4 | Is there a weight-based classification system for drones resulting in the application of different rules?

Yes, Swiss law currently provides for different rules to apply for drones below 30kg, drones between 30kg and 150kg, and drones above 150kg (see also question 11).

As of June 2020, the classification system and rules as per the New EU Drone Regulations will apply (see question 35).

5 | Is there any distinction between completely autonomous drones and remotely piloted drones?

No. However, in general the operation of completely autonomous drones is, in principle, not permitted in Switzerland, as a mandatory visual line of sight (VLOS) requirement for the pilot of a drone applies. FOCA may, however, issue a special permit to exempt an operation from this requirement, if other users of the airspace and people on the ground are not endangered (see question 11).

As of June 2020, the rules as per the New EU Drone Regulations will apply (see question 35).

DESIGN AND MANUFACTURE

Regulation

6 | Do specific rules regulate the design and manufacture of drones in your jurisdiction?

No, drone manufacturers are not specifically regulated. However, specific rules may apply in relation to the procurement of state drones. Moreover, the design may be evaluated by FOCA during an authorisation process for a special permit (see question 11).

As of June 2020, the detailed rules regarding manufacture and design as per the New EU Drone Regulations will apply (see question 35).

Manufacturing authorisation

7 Must drone manufacturers obtain any licences or other authorisation to carry out their business? Are manufacturers subject to any other specific rules?

In general no. However, specific rules may apply in relation to the procurement of state drones (see question 6).

Product liability

8 Do general product liability rules (or other specific liability rules) apply to the manufacture of drones?

In Switzerland product liability is governed mainly by the Federal Product Liability Act, the Federal Product Safety Act, contract law, general tort law and criminal law, which also apply to the manufacture of drones.

As of June 2020, the detailed rules regarding manufacture of drones as per the New EU Drone Regulations will apply (see question 35).

REGISTRATION AND IDENTIFICATION

Registration

9 Must drones be registered in a specific national registry? If so, who is entitled to register drones and what requirements and restrictions apply? Is the registry organised as an operator registry or an owner registry?

Drones are currently not eligible for registration in the Swiss aeronautical registry (which is the national Swiss aircraft registry), nor is there any other specific registry for drones in Switzerland. However, FOCA registers its authorisations granted in relation to drones between 30kg and 150kg and special permits for drones below 30kg (see question 11).

As of June 2020, the registration requirements as per the New EU Drone Regulations will apply (see question 35).

Identification

10 Are drones identified through a marking system similar to that used for manned aircraft?

There is currently no marking system for drones in Switzerland. As of June 2020, however, the rules as per the New EU Drone Regulations will apply (see question 35).

CERTIFICATION AND LICENSING

Basic requirements and procedures

11 What certificates or licences are required to operate drones and what procedures apply?

The respective procedures and permits according to the regulations currently applicable differ according to the weight of the respective drone and its operation:

- drones above 150kg: rules and procedures according to European aviation law;
- drones between 30kg and 150kg: operations of such drones require in any case the prior authorisation by FOCA;
- drones below 30kg: (i) if a drone is operated without direct eye contact (beyond visual line of sight) and within a radius of 100 metres from gatherings of people, a FOCA permit is required, and (ii) for flights with drones at a distance closer than 5km to a runway of a Swiss aerodrome (other than Zurich Airport and Geneva Airport for which currently no permits are being granted) and flights with drones within the control zone of a Swiss aerodrome if exceeding a height of 150 metres above ground, an authorisation is required from Skyguide or the aerodrome operator (in the case of aerodromes without control zone) (see also question 24).

For each application for a permit, FOCA requires a safety test evaluated on a case-by-case basis. However, FOCA applies standard procedures for:

- operating drones above private gatherings (also for tethered drones);
- operating drones beyond visual line of sight (BVLOS) (see also question 19);
- operating for first person view drone racing; and
- the use of drones for spreading.

Due to the high demand, such permits are currently subject to a processing time of at least four weeks.

For operations that do not qualify for a standard procedure, a complete safety test in accordance with the Joint Authorities for Rulemaking of Unmanned Systems Guidelines on Specific Operations Risk Assessment (SORA) is required. Among other things, a detailed description of the planned activity, the technical system as well as a risk analysis and emergency procedures are to be provided by the applicant. Due to the high demand, such permits are currently subject to a processing time of at least three months.

The permits granted by the competent authority may be subject to certain operational constraints or requirements regarding the drone, the pilots, technology or safety procedures.

However, as of June 2020, the detailed rules as per the New EU Drone Regulations will apply (see question 35).

Taxes and fees

12 Are certification and licensing procedures subject to any taxes or fees?

The fees FOCA permits for certain operations of drones below 30kg or any operation of drones above 30kg (see question 11) are charged on a time spent basis, depending on how much processing is required by FOCA and may vary between 90 and 5,000 francs. Taxes and fees for drones above 150kg are to be evaluated on a case-by-case basis.

As of June 2020, the relevant weight classification as per the New EU Drone Regulations will apply (see question 35), but the impact on the fees of FOCA is not clear at the time of writing.

Eligibility

13 Who may apply for certifications and licences? Do any restrictions apply?

There are currently no restrictions and FOCA grants authorisations depending on the intended operation at hand.

As of June 2020, the rules as per the New EU Drone Regulations will apply (see question 35).

Remote pilot licences

14 Must remote pilots obtain any certifications or licences to operate drones? If so, do the relevant procedures differ based on the type of drone or operation?

The pilot of a drone is currently not required to obtain any certifications or licences for him or herself. However, the respective operation of the drone itself may require a permit and such permit may be subject to certain requirements for the drone crew (see question 11).

As of June 2020, the rules as per the New EU Drone Regulations will apply (see question 35).

Foreign operators

15 | Are foreign operators authorised to fly drones in your jurisdiction? If so, what requirements and restrictions apply?

In general, there is currently no distinction between foreign and domestic drone operators when operating drones within Switzerland. However, in the case of cross-border flights, according to article 8 of the Chicago Convention 1944, unmanned civil aircraft are only allowed to fly over the sovereign territory of another country with that country's special permission. To operate to or from Switzerland, one must also specifically be aware of Swiss customs law and possibly tax law.

As of June 2020, the rules as per the New EU Drone Regulations will apply (see question 35).

Certificate of airworthiness

16 | Is a certificate of airworthiness required to operate drones? If so, what procedures apply?

Currently a certificate of airworthiness is mandatory for drones above 150kg according to the European aviation law. The airworthiness of drones below 150kg is, in principle, not examined. However, in relation to drones between 30kg and 150kg, FOCA determines the operation conditions on a case-by-case basis and authorisation may be subject to certain operational constraints or technical requirements. Operations of drones below 30kg do not require a certificate of airworthiness.

As of June 2020, the rules as per the New EU Drone Regulations will apply (see question 35).

OPERATIONS AND MAINTENANCE

One drone, one pilot

17 | Does the 'one drone, one pilot' rule apply in your jurisdiction?

Yes, as the operation of completely autonomous drones is in principle not permitted in Switzerland but a visual line of sight (VLOS) requirement for the pilot of a drone applies, the 'one drone, one pilot' rule is inherent in the VLOS requirement. However, FOCA may issue a special permit to exempt an operation from this requirement if other users of the airspace and people on the ground are not endangered and certain safety prerequisites are met (see questions 11 and 19).

As of June 2020, the rules as per the New EU Drone Regulations will apply (see question 35).

Maintenance

18 | Do specific rules regulate the maintenance of drones?

This is currently not the case. As of June 2020, the rules as per the New EU Drone Regulations will apply (see question 35).

Basic operational rules and restrictions

19 | What rules and restrictions apply to flights performed in 'visual line of sight' (VLOS) and 'beyond visual line of sight' (BVLOS)? Is there a distinction in this regard?

While, in principle, a VLOS requirement for the pilot of a drone applies, FOCA may grant permits for the operation of drones BVLOS, which applies also to drone flights using video eyewear if direct eye contact cannot be established with the drone by a co-pilot at any time. For drones up to 30kg a standard procedure may apply (see question 11). However, the standard BVLOS procedure is intended for operation below 150 metres above the ground for the purpose of filming and photographing and the operation beyond the direct visual line of sight of the pilot is permitted only as long as airspace observers are deployed. The task of these observers is to ensure that approaching aircraft can be recognised at all times. The maximum permissible distance between the observer and the drone is 2km.

As of June 2020, the rules as per the New EU Drone Regulations will apply (see question 35).

20 | What rules and restrictions apply to critical and non-critical operations? Is there a distinction in this regard?

There is currently no distinction regarding critical and non-critical operations of drones, subject to FOCA's permits for the operation of drones (see question 11) as well as the safety requirements applicable to any drone operation (see question 24).

As of June 2020, the rules as per the New EU Drone Regulations will apply (see question 35).

Transport operations

21 | Is air transport via drone (eg, cargo and mail) regulated in your jurisdiction? If so, what requirements, limitations and restrictions apply?

Drone transport is not prohibited but regulated, in particular by the Montreal Convention 1999 and the Swiss Ordinance on Air Transport. Moreover, additional regulations may apply depending on the specific goods transported (eg, dangerous goods).

As of June 2020, the rules as per the New EU Drone Regulations will apply (see question 35).

22 | Do any specific provisions governing consumer protection and tracking systems apply with respect to cargo and delivery operations via drone?

No, there is currently no such regulation.

Insurance requirements

23 | What insurance requirements apply to the operation of drones?

Swiss law requires any operator (which does not necessarily correspond to its legal owner) of drones between 0.5kg and 150kg to enter into a third-party liability insurance policy covering at least 1 million Swiss francs. Only third-party liability insurance is mandatory for the operator, whether this is an individual person or a legal entity. Insurance of the drone itself is optional.

As of June 2020, the rules as per the New EU Drone Regulations will apply (see question 35).

Safety requirements

24 | What safety requirements apply to the operation of drones?

FOCA is responsible for drone safety regulations and generally without a special permit (see question 11), a drone must be operated by the operator in direct visual contact with the drone and the surrounding airspace (VLOS) and must not be operated:

- closer than 5km to airfields and heliports,
- above an altitude of 150 metres within control zones;
- close to where emergency services are working; or
- less than 100 metres from or over groups of people (ie, a gathering of 24 people or more).

The following safety rules shall be strictly respected during every flight with a drone:

- the drone operator shall at all times and under all circumstances be responsible for collision avoidance with all other aircraft and

operate the drone only under weather and other environmental conditions that allow the application of this principle;
- other aircraft have priority over drones at all times; and
- if an aircraft approaches, the drone shall be landed immediately.

For drones below 150kg, Swiss law further provides for rules on dropping or spraying of items or liquids according to the general Swiss ordinance on air traffic rules as well as further air traffic rules according to the Swiss ordinance of DETEC on special categories of aircraft.

As of June 2020, the rules as per the New EU Drone Regulations will apply (see question 35).

AIRSPACE

Air traffic control

25 | How is air traffic control regulated in your jurisdiction? Which authority provides air traffic control services for drones?

Air traffic control services are provided by Skyguide, a Swiss company headquartered in Geneva and majority-owned by the Swiss Confederation. At the moment there is no air traffic control service for drones in place. However, drones air traffic control will be part of the Swiss U-space programme that is being developed and tested by Skyguide and shall be implemented in the near future (see question 35).

Restrictions

26 | Are there any airspace restrictions on the operation of drones?

The general restrictions of airspace (eg, bans) apply. FOCA provides a map of flight zones in Switzerland (https://www.bazl.admin.ch/bazl/en/home/good-to-know/drones-and-aircraft-models/drohnen-karte.html).

Further airspace restrictions apply to the operation of drones within a radius of 100 metres of a gathering of people, within a distance of 5km from runways of any civil or military airport as well as above an altitude of 150 metres within the control zones of airports (ie, zones serving to protect aircraft during take-off and landing) that require a special permit by the competent authority (see question 11).

As of June 2020, the rules as per the New EU Drone Regulations will apply (see question 35).

Take-off and landing

27 | Must take-off and landing of drones take place in specific areas or facilities?

No (other than the no-fly zones around airports, see question 26). However, take-off or landing from non-public places may infringe civil law in relation to privacy protection.

LIABILITY AND ACCIDENTS

Cargo liability

28 | Are there any specific rules governing the liability of drones for losses or damage to cargo?

Switzerland has ratified the Montreal Convention 1999, which provides for special rules in this regard. Insofar as the Montreal Convention 1999 is not applicable, as there are no specific rules for drones, the Swiss Ordinance on Air Transport provides further rules.

Third-party liability

29 | Are there any specific rules governing the liability of drones for damage to third parties on the surface or in the air?

Article 64 of the Federal Act on Air Transport provides for a liability of the operator of the drone (which does not necessarily correspond to its legal owner) for damage to persons or things on the ground. This liability is construed as a strict liability (ie, irrespective of negligence or fault).

Accident investigations

30 | How are investigations of air accidents involving drones regulated in your jurisdiction?

The Federal Swiss Transportation Safety Investigation Board is mandated to investigate accidents and dangerous incidents involving aircraft. Penal authorities may conduct further investigations in relation to criminal activities.

Accident reporting

31 | Is there a mandatory accident and incident reporting system for drone operators in your jurisdiction?

Yes, in accordance with Regulation (EU) No. 376/2014, which is applicable in Switzerland, irregular occurrences that compromise or that could compromise air safety must be reported by using the reporting portal provided by the European Union (see www.aviation-reporting.eu/AviationReporting/). Such reports are then automatically forwarded to FOCA.

Safety management and risk assessment

32 | Are drone operators required to implement safety management systems and risk assessment procedures within their organisation?

If a permit is required for the respective drone operation (see question 11), the granting of a permit by FOCA may be subject to the implementation of certain management systems or risk assessment procedures.

As of June 2020, the rules as per the New EU Drone Regulations will apply (see question 35).

ANCILLARY CONSIDERATIONS

Import and export control

33 | Do specific import and export control rules apply to drones in your jurisdiction?

The general limitations on the control of goods with both civil and military application (dual-use), as well as special military goods that are not subject to the Federal War Material Act, apply.

Data privacy and IP protection

34 | How are personal data privacy and IP protection regulated in your country with specific reference to drone operations?

The general Federal Act on Data Protection and the general civil rights in relation to the protection of individual privacy are applicable to drone operations. However, specific regulations in relation to data protection and drone operations are currently being discussed in Switzerland. There is no specific IP protection in relation to drones or drone operations.

UPDATE AND TRENDS

Sector trends and regulatory developments

35 Which industry sectors have seen the most development in the use of drones in your jurisdiction and which sectors are expected to see further development in future? Have there been any notable recent regulatory developments relating to drones?

The Swiss drone sector is growing rapidly, and Switzerland is considered a leader in the research and development of drones. The term 'drone valley' is increasingly used between the top-ranked Swiss Federal Institutes of Technology in Zurich and Lausanne, which have been home to about 80 drone start-ups in recent years. Moreover, more than two dozen larger companies developing drones foster Switzerland's position as one of the industry leaders in the development of drones. The Drone Industry Association Switzerland represents, supports, defends and promotes Swiss drone companies as well as embracing the use and acceptance of drones. The drone sector will attract further investors and other stakeholders in the field, which will certainly lead to a continuance of its growth.

The Swiss U-Space is currently being developed by Skyguide and is promoted to ensure that all categories, as well as all types of missions, of drones can operate in Swiss airspace by enabling a safe, efficient, sustainable and secure integration of drones into airspace. This shall be achieved by a set of U-space services and specific procedures, such as registration of both operator and drone, airspace authorisation, geo-fencing, live drone telemetry and real-time alerts to the operators. Skyguide in partnership with industry players and with the support of FOCA recently presented Europe's first live demonstration of U-space capabilities.

The regulation of drones in Switzerland will change as of June 2020 as the New EU Drone Regulations will apply (see question 1). Nevertheless, Switzerland may add its own rules in addition to the New EU Drone Regulations, if justified on safety, security, privacy or environmental grounds. The rules are proportionate to the risk of the relevant operations of drones classified in three categories: open, specific and certified.

The open category is for low-risk drone operations that do not require any prior authorisation but are subject to specific operational restrictions. In general, operators of a drone (other than drones lighter than 250g without a camera) must meet the minimum age of 16 years (unless reduced by FOCA), register themselves and take an online test. Further, such drones may only be operated at a maximum altitude of 120 metres above ground, outside restricted flight zones and only in VLOS. The drone itself must meet certain basic industrial standards and receive a CE marking. The open category is further divided into three subcategories (flying over, close or far away from people) with different requirements for the capabilities of the controller and the respective drone used, depending on the operation. Within the open category, drones are classified in four classes depending on their weight (<250g, <900g, <4kg and <25kg) being subject to different technical requirements (such product classes will be evident on the CE marking).

The specific category is for drone operations that involve an increased risk and, thus, require prior authorisation from FOCA. The assessment of operational risk shall take into account the risk mitigation measures identified. The specific category applies whenever the conditions of the open category cannot be met. Various drone operations will be subject to standard scenarios that require the prior submission of a declaration by the drone operator to FOCA containing an operational risk assessment describing the operation in detail, proposing adequate operational safety objectives, identifying operational risks as well as risk-mitigating measures. If no standard procedure is applicable, during the authorisation process FOCA will conduct a SORA.

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The certified category is for high-risk operations, in particular the operation of drones over assemblies of people, involving the transport of people, or involving the transport of dangerous goods. Also, the operation of large drones (ie, with a characteristic dimension of >3m) are subject to the certified category. Drones in this category must be certified for airworthiness, pilots must be certified and safety supervision will be performed by FOCA.

FOCA has just started to pave the way to implement the New EU Drone Regulations in Switzerland, such as the drone registration platform, adaptation of Swiss regulations (in particular, adjustments to the Ordinance on Special Category Aircraft of the DETEC) as well as the related communication.

United Kingdom

Peter Neenan
Stewarts

GENERAL FRAMEWORK

Basic rules and regulators

1 What basic rules govern the operation of remotely piloted aircraft and unmanned aircraft (drones) in your jurisdiction? Which regulatory bodies are charged with enforcing these rules?

The Air Navigation Order 2016 (SI 2016/765) (ANO) is the primary national regulation governing the operation of remotely piloted aircraft and drones in the UK. It has been amended by Air Navigation (Amendment) Orders 2017/1112, 2018/623, 2018/1160 and 2019/261. The UK is currently also subject to European Regulations including the Basic Regulation (Regulation (EU) 2018/1139) and the Standardised European Rules of Air (Regulation (EU) 923/2012).

The ANO as amended includes specific rules governing drone operation in the UK. For drones with a mass greater than 20kg, the drone must comply with all rules within the ANO as if it is a manned aircraft (subject to an exemption from the Civil Aviation Authority (CAA). Drones weighing 20kg or less are defined assmall unmanned drones (article 2) and are automatically exempted from the majority of the provisions of the ANO (article 23). Absent exemptions or permissions allowing derogation from the remaining provisions of the ANO, the reduced provisions cover obligations including conducting safe flight (articles 94(2) and 241), maintaining visual contact (article 94(3)), not flying the drone for commercial purposes (article 94(5)), not flying the drone above 400ft (article 94A(2)), complying with specific airspace restriction over or near aerodromes (article 94(A) and 94(B)) and, in the case of drones used for surveillance or data gathering, restrictions on operation around congested areas, open-air crowds and third parties (objects or people) (article 95).

Permissions and exemptions are obtained by applying to the CAA with evidence of pilot competency and an operating safety case (OSC). The OSC is simply a structured and evidenced case showing that the drone can be safely operated, and that safety risks have been identified and reduced to a tolerable and as low as reasonably practicable level. For commercial operations, an operations manual will need to be submitted (OSC Volume 1). For flights in congested areas, above 400ft, reduced distance operations (whether commercial or not), and operations involving a drone weighing over 20kg, applicants are also required to submit a systems description (OSC Volume 2) and a risk assessment (OSC Volume 3).

The CAA is the independent statutory authority responsible for regulating civil aircraft in the UK, including drones, and is charged with enforcing these rules.

2 What are the penalties for non-compliance with the laws and regulations governing drones?

In accordance with article 265 of the ANO 2016 (offences and penalties), the following penalties apply for non-compliance with the following regulations governing drones:

- For non-compliance with ANO provisions specified in Part 1 of Schedule 13 (including, eg, registration requirements under article 94D – not in force until 30 November 2019), a person is liable on summary conviction to a fine not exceeding level 3 on the standard scale (currently £1,000).
- For non-compliance with ANO provisions specified in Part 2 of Schedule 13 (including, eg, requirements for small unmanned aircraft under article 94 and restrictions for surveillance drones under article 95), a person is liable on summary conviction to a fine not exceeding level 4 on the standard scale (currently £2,500). For non-compliance with ANO provisions specified in Part 3 of Schedule 13 (including, eg, endangering the safety of any person or property), a person is punishable on summary conviction to a fine or on conviction to a fine or by imprisonment for a term not exceeding two years, or both.

Classification

3 Is there any distinction between public and private drones, as well as between leisure use and commercial use?

In the case of a drone that is available to the public, any flight other than for public transport (which is currently not applicable to drones) will fall within the definition of a commercial operation under article 7 of the ANO. 'Available to the public' means a service that any member of the public can make use of or actively choose to use.

In the case of a drone that is private and not available to the public, any flight performed under a contract between the drone operator and a customer (where the customer has no control over the drone operator) in return for remuneration or other valuable consideration will fall within the definition of a commercial operation under article 7 of the ANO.

Flying operations such as research or development flights conducted 'in house' are not normally considered as commercial operations provided there is no valuable consideration given or promised in respect of the flight.

Where an operation is considered as a leisure use of a drone and the drone is less than 20kg, the drone pilot should follow the reduced provisions set out in question 1. Where an operation is considered a commercial operation, permission from the CAA is required under article 94(5).

4 | Is there a weight-based classification system for drones resulting in the application of different rules?

Yes. Under article 2 of the ANO, a 'small unmanned aircraft' is a drone with a mass of 20kg or less. The mass of the drone is calculated without the drone's fuel but including any articles or equipment installed in or attached to the drone at the commencement of its flight. Drones determined to be small unmanned aircraft are exempted from the majority of the provisions of the ANO (article 23). The reduced provisions are set out at question 1.

For drones with a mass greater than 20kg, the drone must comply with all rules within the ANO as if it is a manned aircraft.

Additionally, for drones weighing less than 250g, drone operators are exempt from a requirement to register as an operator (article 94D) and hold an acknowledgment of competency (article 94F). This is due to come into force from 30 November 2019.

5 | Is there any distinction between completely autonomous drones and remotely piloted drones?

In accordance with the CAA's guidance, there are currently no unmanned aircraft systems (UASs) that meet the definition of completely autonomous (ie, free from external control or influence). There are drone systems that could be classed as highly automated (meaning that the drone system requires human operator inputs but can action those inputs without further human interaction) and highlyy automated systems (meaning that the drone system can evaluate data, select a course of action and implement the action without the need for human interaction). However, such highly automated systems only control certain defined aspects of the drone's behaviour (eg, engine control systems). A completely autonomous drone will do everything for itself using highly automated systems.

All current drone operational standards have an inherent assumption that a competent human is able to intervene and take control. It is anticipated that, for the foreseeable future, this human intervention facility will still be required by the CAA.

DESIGN AND MANUFACTURE

Regulation

6 | Do specific rules regulate the design and manufacture of drones in your jurisdiction?

There are currently no rules regulating the design and manufacture of drones in the UK. However, in any application for a non-standard permission or an exemption from the CAA (ie, not including recreational or commercial under 20kg drone operation within the parameters of the reduced provisions of the ANO), the CAA requires details of the designer and manufacturer of the drone in the UAS description component of the Operating Safety Case (OSC Volume 2). Care should be given to include any recognised standards to which the drone has been designed, built and tested (eg, aeronautical standards such as EUROCAE and RTCA, or product standards such as ISO, ASTM, STANAG and BSI).

It should be noted that a package of regulations covering all aspects of drone design and manufacture will be effective from 1 July 2020 (see question 36), with the intention of harmonising drone regulation across Europe.

Manufacturing authorisation

7 | Must drone manufacturers obtain any licences or other authorisation to carry out their business? Are manufacturers subject to any other specific rules?

At present no drone manufacturer licences or authorisations are required in the UK. However, as discussed in other questions, the rules are due to be updated in this regard in July 2020.

Product liability

8 | Do general product liability rules (or other specific liability rules) apply to the manufacture of drones?

There are currently no specific product liability rules applicable to the manufacture of drones in the UK. However, the Consumer Protection Act 1987 (CPA) (implementing the EU Product Liability Directive (85/374/EEC)), claims in negligence or in breach of contract (express or implied terms) would apply to manufacturers of drones. The EU Product Liability Directive establishes the principle of strict liability in circumstances where a defective product caused damage to a consumer. The CPA may not apply to claims where the damage occurs outside the European Economic Area (EEA), the claimants had no connection with the EEA and the defective product was supplied outside the EEA. The CPA may apply to non-EEA producers in the event that damage is suffered within the EEA by an EEA-domiciled claimant. Importers of products from outside the EAA and, subject to certain conditions, suppliers, may also be liable under the CPA.

Claimants must establish a defect and causation to succeed under the CPA. A product is defective where the safety of the product is not such as persons generally are entitled to expect. There are various defences available, including the state of the art defence (ie, that the state of technical knowledge at the relevant time was such that the person claimed to be liable could not have been expected to discover the defect). In relation to negligence, claimants must establish that the manufacturer of the drone owed a duty of care to the consumer, that the manufacturer breached the duty of care and that the breach caused the damage. In relation to breach of contract, there must be privity of contract between the manufacturer of the drone and the consumer, and the claim will depend upon the terms of the contract (express) but may include additional terms (implied).

REGISTRATION AND IDENTIFICATION

Registration

9 | Must drones be registered in a specific national registry? If so, who is entitled to register drones and what requirements and restrictions apply? Is the registry organised as an operator registry or an owner registry?

Drones with a mass under 20kg do not need to be registered, but small unmanned aircraft operators (SUA operators) do. From 30 November 2019, in accordance with article 94D ANO, for drones weighing 250g or more, an SUA operator must not cause or permit the SUA (ie, a drone under 20kg) to be flown unless the CAA has issued the SUA operator with a certificate of registration, and this registration is displayed on all drones that the SUA operator is responsible for. A certificate of registration may relate to a particular description of SUA or to a particular description of flight by SUA. The CAA launched the registration scheme on 1 October 2019 to meet the 30 November 2019 deadline.

It should be noted that the obligation is on the SUA operator, who is the person who has the management of the SUA pursuant to article 94G, not on the remote pilot who is the person who actually operates

the flight controls of the small unmanned aircraft (or monitors the flight for automatic flight).

For drones weighing more than 20kg, as part of the OSC for seeking an exemption to operate the drone, specific details of the drone should be submitted to the CAA (including photographs and schematic diagrams).

Identification

10 | Are drones identified through a marking system similar to that used for manned aircraft?

In relation to drones weighing under 20kg, the 10-digit registration number provided to an SUA operator must be displayed on the drone in the manner that is prescribed (article 94D(2)(b) of the ANO, as amended).

CERTIFICATION AND LICENSING

Basic requirements and procedures

11 | What certificates or licences are required to operate drones and what procedures apply?

Currently, there is no formal remote pilot's licence in the UK. It is anticipated that the UK will follow the International Civil Aviation Organization Standards and Recommended Practices currently being developed. The UK operates on a system of permissions and exemptions depending on the type of drone flight.

From 30 November 2019, for drones under 20kg and over 250g, the SUA operator will need to obtain a certificate of registration (see question 9), and the remote pilot will need to have obtained an acknowledgement of competency under article 94F ANO, as amended. To obtain the acknowledgement of competency, the remote pilot will have to pass an online test. The acknowledgement of competency is not a licence, and is the basic competency for drone operation. The acknowledgement of competency lasts three years.

For commercial operations, the drone operator will also need to obtain a permission from the CAA, called a permission for commercial operations (PfCO). As part of the process of obtaining a PfCO, an assessment of the pilot's competency needs to be undertaken by a national qualified entity (NQE) (ie, an organisation approved by the CAA). This assessment will include consideration of adequate theoretical knowledge or general airmanship and the successful completion of a practical flight test. Permissions are valid for 12 months and require the submission of an operations manual (OSC Volume 1).

Where a recreational user intends to operate a drone outside the reduced provisions (see question 1), a permission must also be obtained from the CAA (as for commercial operations). In addition to the evidence of pilot competency, an operations manual will need to be submitted (OSC Volume 1). For flights in congested areas, above 400ft, and reduced distance operations (whether commercial or not), applicants are also required to submit a systems description (OSC Volume 2) and a risk assessment (OSC Volume 3).

For drones weighing over 20kg, evidence of pilot competency needs to be submitted as part of the OSC to obtain an exemption from the CAA. The submissions will include any training or qualifications obtained beyond the basic NQE competency assessment. An operations manual (OSC Volume 1), systems description (OSC Volume 2) and risk assessment (OSC Volume 3) also need to be submitted.

Taxes and fees

12 | Are certification and licensing procedures subject to any taxes or fees?

The CAA is proposing an annual registration fee of £16.50 for any SUA operator to obtain their certificate of registration under article 94D ANO. There is no proposed charge for the acknowledgement of competency test under article 94F ANO.

CAA approved NQEs are responsible for setting individual prices for their PfCO drone courses. Once a PfCO drone course is complete or the requirements for obtaining PfCO certification are otherwise met, the cost for applying to the CAA for standard permission to undertake commercial operations is £253, with annual renewals charged at £190.

For non-standard permissions (eg, reduced distance operations, above 400ft operations, congested area operations) requiring the assessment of an entire OSC (OSC Volumes 1-3), the fee is £1,771 (plus charges in excess of seven hours' work at £253 per hour) with an annual renewal charge of £190.

Exemptions for operations on drones weighing more than 20kg have the same initial assessment charge of £1,771 with an annual renewal charge of £506.

Eligibility

13 | Who may apply for certifications and licences? Do any restrictions apply?

There are no nationality or financial stability restrictions applicable to drone ownership in the UK. Where an application for permission or exemption requires the submission of a risk assessment as part of the OSC (ie, non-standard permissions), it should be noted that financial risks (including financial stability) do not form part of the risks that should be included, which should be solely limited to aviation safety risks.

Remote pilot licences

14 | Must remote pilots obtain any certifications or licences to operate drones? If so, do the relevant procedures differ based on the type of drone or operation?

As set out above, from 30 November 2019 remote pilots must have obtained an acknowledgement of competency before they will be permitted to fly a drone weighing between 250g and 20kg. A person with management of the drone (drone operator) must not allow the drone to be flown unless satisfied that the remote pilot has passed the appropriate competency test. Similarly, a remote pilot must not fly an SUA unless satisfied that the SUA operator has a valid registration and the registration number is displayed on the drone.

Remote pilots of commercial drones or recreational drones intending to fly beyond the reduced provisions of the ANO must obtain a permission from the CAA, which will include an assessment of the pilot's competency. Likewise, for exemptions in cases of drones weighing over 20kg, the OSC that must be submitted includes evidence of the pilot's competency.

Foreign operators

15 | Are foreign operators authorised to fly drones in your jurisdiction? If so, what requirements and restrictions apply?

Yes, foreign operators can operate in the UK. Any foreign operator wishing to undertake commercial work will need to obtain a permission from the CAA evidencing the same safety requirements that are required for UK operators. This will include evidence of remote pilot competency (see question 11) and an operations manual detailing how the operations will be conducted.

It should be noted that approvals from foreign governments will not automatically be accepted. A foreign operator must obtain a valid UK permission before undertaking UK-based commercial operations.

Certificate of airworthiness

16 | Is a certificate of airworthiness required to operate drones? If so, what procedures apply?

There is no requirement for a certificate of airworthiness for recreational drones weighing under 20kg.

In relation to drones for which a permission or exemption is required, the current approach of the CAA is not to mandate a certificate of airworthiness for the operation of drones, but to make use of the OSC framework. However, the OSC requires the provision of information that would be necessary for the initial, continuing and continued airworthiness processes in any event.

OPERATIONS AND MAINTENANCE

One drone, one pilot

17 | Does the 'one drone, one pilot' rule apply in your jurisdiction?

With respect to recreational drone operations for drones weighing under 20kg, a drone pilot must maintain direct, unaided visual contact with the drone pursuant to article 94(3) ANO, as amended. Consequently, a drone pilot may only operate one drone absent an exemption from the CAA.

An exemption may be obtained from the CAA with respect to this provision or as part of the exemption for an operation involving drones weighing over 20kg. The OSC submitted as part of the exemption process relates to the unmanned aircraft system, which may include multiple unmanned aircraft within one system. Multiple unmanned aircraft may be operated using swarming technology (where multiple drones are controlled collectively rather than individually). The OSC will need to demonstrate that the operation can be conducted in a safe manner.

Maintenance

18 | Do specific rules regulate the maintenance of drones?

There are no specific rules relating to maintenance for recreational use of drones weighing under 20kg.

For any operation requiring a permission or an exemption (ie, any operation that is not an under 20kg recreational drone operation within the parameters of the reduced provisions of the ANO), detail of the process for reporting defects and maintenance is required in the application to the CAA. This may include full details of the maintenance regime of the drone, including timescales, procedures, spare part validation and record-keeping.

Basic operational rules and restrictions

19 | What rules and restrictions apply to flights performed in 'visual line of sight' (VLOS) and 'beyond visual line of sight' (BVLOS)? Is there a distinction in this regard?

Article 94(3) ANO requires VLOS operations for SUA. This means that the remote pilot must be able to clearly see the drone at all times in order to manoeuvre it to avoid collisions. Corrective spectacles can be used, but the use of any vision enhancing device (eg, binoculars) is prohibited. VLOS operations are normally accepted to be limited to 500m, but this depends on the size of the drone and whether visual contact can be maintained.

BVLOS operations for drones of any size are prohibited absent an exemption from the CAA. BVLOS operations are drone operations that are not conducted in the visual line of sight of the remote pilot (or a competent observer). To undertake BVLOS operations, an operator will need to apply for an exemption from the CAA evidencing in an OSC that the BVLOS operation can be conducted safely. The primary consideration is whether the operation can mitigate the risk of collision (with aircraft, objects and people). With the exception of a segregated airspace, at a technical level this requires a detect and avoid system that is sufficiently advanced to operate at least as well as the ability of a pilot to see and avoid potential collisions.

20 | What rules and restrictions apply to critical and non-critical operations? Is there a distinction in this regard?

The critical and non-critical operations distinction does not exist in the UK, but it is equivalent to the distinctions that the UK exercises with respect to which operations require a permission or exemption from the CAA.

Non-critical operations are equivalent to recreational drones weighing under 20kg being operated within the parameters of the reduced provisions of the ANO, as amended (ie, without the need for any application for permission or exemption). Critical operations are equivalent to all operations that require a permission or exemption.

With respect to nighttime operations, provided direct visual contact can be maintained (in accordance with srticle 94(3) ANO), there is no prohibition on operating as SUA for recreation purposes at night. For any application for a permission or an exemption for an operation that will involve VLOS night flying, the OSC will need to address operating procedures at night, including aircraft and landing site lighting, hazard identification and weather limitations.

Transport operations

21 | Is air transport via drone (eg, cargo and mail) regulated in your jurisdiction? If so, what requirements, limitations and restrictions apply?

Mail and cargo delivery is at an early stage of development in the UK and there are a number of technological challenges associated with its implementation. Any such operation would constitute a commercial operation and would invariably need to be operated BVLOS and within congested areas.

An operation involving transport via drone would require an exemption from the CAA. The OSC would need to satisfactorily deal with aviation risks relating to BVLOS, operations in congested areas (including take-off and landing), the effect of differing cargo weights on the flight envelope (including payload maximums), cargo release mechanisms, and a system coordinating drone traffic if there are multiple cargo drones operating in the same airspace (among other potential safety issues).

22 | Do any specific provisions governing consumer protection and tracking systems apply with respect to cargo and delivery operations via drone?

There are no consumer protection and tracking provisions that are relevant to cargo drone operations in the UK. However, as stated, this area is in an early stage of regulatory development in the UK.

Insurance requirements

23 | What insurance requirements apply to the operation of drones?

Pursuant to article 2(b) of Regulation (EC) No. 785/2004, there are no requirements for 'model aircraft' with a maximum takeoff mass (MTOM) of less than 20kg. The United Kingdom has defined a 'model aircraft' as an SUA with an MTOM of less than 20kg used for sport or recreational purposes only.

In relation to all other SUA (including commercial operations) and drones with an MTOM of 20kg or more, insurance cover must be sought that meets the requirements of Regulation (EC) No. 785/2004. Regulation (EC) 785/2004 requires drone operators to have insurance cover for each and every flight covering their aviation-specific liability with respect to cargo and third parties (passenger and baggage insurance not being relevant to drone operations).

For drones with an MTOM of less than 500kg, minimum insurance for third-party liability is 750,000 special drawing rights (SDR) (article 7). Minimum insurance in respect of cargo liability is 19 SDR (article 6, as amended by the revised limits in Regulation (EU) No. 285/2010)

Safety requirements

24 | What safety requirements apply to the operation of drones?

The entire structure of the CAA permissions and exemptions process is safety driven. Low-risk and low-complexity operations for drones weighing less than 20kg can take place within the limitations of the ANO, as amended. Basic pilot competency is required to be evidenced from 30 November 2019.

For medium-risk or complex operations, operators are required to submit an OSC and obtain permission or exemption from the CAA. The level of detail required in the OSC (ie, whether risk assessments and systems descriptions need to be provided in addition to an operations manual) is based on the risk of the operation. The process requires the operator to have evidenced drone piloting competency and a full appreciation of the risks of the operation (and how those risks are mitigated).

For high-risk or complex operations, full certification is required from the CAA as if the operation was a manned operation. This includes certification of the UAS, the UAS operator and the remote pilots.

AIRSPACE

Air traffic control

25 | How is air traffic control regulated in your jurisdiction? Which authority provides air traffic control services for drones?

The CAA is the national airspace regulator in the UK. While airports are responsible for managing terminal airspace (provided by different companies), flights outside terminal airspace are managed by NATS (this encompasses the UK's flight information regions and the Shanwick Oceanic Control Area). For drone flight in controlled airspace, either NATS or the terminal airspace air traffic control (ATC) company would provide AC services for drones.

Restrictions

26 | Are there any airspace restrictions on the operation of drones?

Article 94A and 94B ANO 2016 as amended provide airspace restrictions for the operation of SUA (with a mass of less than 20kg and not used for commercial operations). The airspace restrictions include flight limited to 400 feet above the surface and a prohibition on flight within the flight restriction zone of a protected aerodrome.

The flight restriction zone comprises three elements:

- the aerodrome traffic zone (a 2 or 2.5 nautical mile radius cylinder (depending on the length of the runway) around the aerodrome, extending 2,000 feet above ground level centred on the mid-point of the longest runway);
- the runway protection zone (a rectangle extending 5km out from the ends of the runways with a width of 1km (1.5km at Heathrow), and extending 2,000 feet above ground level); and
- an additional boundary zone (a 1km boundary of an aerodrome, where this extends beyond the aerodrome traffic zone, extending 2,000 feet above ground level).

Derogations from the above airspace restrictions require permission from the CAA (400ft restriction) or the air traffic control (ATC) (or flight information service) for entry into the flight restriction zone.

For all commercial operations and operations of drones above 20kg, a permission (in the case of commercial operations) or an exemption (in the case of drones above 20kg) will be required from the CAA. The application for permission or exemption will necessitate the submission of an operations manual (and potentially a risk assessment) considering the airspace that the drone is to be operated in.

Take-off and landing

27 | Must take-off and landing of drones take place in specific areas or facilities?

No. There are no restrictions on take-off or landing for SUA in the ANO, save that small unmanned surveillance aircraft must not be flown within 30 metres of any person during take-off or landing.

For operations requiring a permission or exemption, an OSC must be submitted. The OSC must include details of the main and alternate take-off and landing sites, as well as an explanation of the methods employed by the operator for selecting take-off and landing sites, conducting risk assessments, and ensuring that the take-off and landing sites will be kept clear.

LIABILITY AND ACCIDENTS

Cargo liability

28 | Are there any specific rules governing the liability of drones for losses or damage to cargo?

There are no specific rules governing the liability of drones for losses or damage to cargo. However, unmanned aircraft are not excluded from the Montreal Convention 1999 for international cargo carriage or the Montreal Convention as applied by the Carriage by Air Acts (Application of Provisions) Order 2004 for domestic cargo carriage. The Montreal Convention provides for strict liability of the drone operator, subject to some exceptions covering defects in the product, defective packing, war,or public authority intervention.

Pursuant to article 22 of the Montreal Convention (and as amended by the Carriage by Air (Revision of Limits of Liability under the Montreal Convention) Order 2009), in the absence of a special declaration of interest, liability is limited to 19 SDR per kilogram.

Third-party liability

29 | Are there any specific rules governing the liability of drones for damage to third parties on the surface or in the air?

In relation to the liability of drone operators for damage to third parties on the surface, section 76(2) of the Civil Aviation Act 1982 provides strict liability of the drone owner where material loss or damage (including personal injury) is caused to any person or property on land or water. In circumstances where a drone has been bona fide demised, let or hired out for a period exceeding 14 days, then the person to whom the drone was demised, let or hired will be liable as if they were the owner.

The Civil Aviation Act 1982 does not cover mid-air collisions. Liability for mid-air collisions will be governed by common law principles of negligence.

Accident investigations

30 How are investigations of air accidents involving drones regulated in your jurisdiction?

Pursuant to article 5(1) of Regulation (EU) No. 996/2010 (and Annex 13 of the Chicago Convention 1944), the obligation to investigate a drone accident arises when an accident or serious incident occurs in the territory of the UK involving a drone weighing more than 150kg. Investigations are performed by the Air Accidents Investigation Branch (AAIB). Since January 2015, the AAIB has extended the remit of its investigation authority to cover all drone accidents and serious incidents regardless of weight. This is pursuant to the AAIB's power to investigate where the chief inspector expects to draw safety lessons and was most recently embodied in section 10 of The Civil Aviation (Investigation of Air Accidents and Incidents) Regulations 2018.

In the relevant part with respect to drones, an accident is defined as occurring when either (i) a fatal or serious injury occurs as a result of direct contact with the drone; (ii) the drone sustains damage or structural failure that adversely affects its structural strength, performance or flight characteristics; or (iii) the drone is missing or completely inaccessible, with the event occurring between the time that the drone is ready to move with the purpose of flight until such time as it comes to rest. A serious incident occurs where there is a high probability of an accident and is associated with the operation of the drone.

Accident reporting

31 Is there a mandatory accident and incident reporting system for drone operators in your jurisdiction?

Pursuant to Regulation (EU) No. 376/2014, an occurrence is defined as any safety-related event that endangers, or if not corrected or addressed, could endanger an aircraft, its occupants or any other person. This includes an accident or serious incident (see question 30).

Pursuant to Regulation (EU) No. 996/2010, any person involved or who has knowledge of an accident or serious incident involving a drone in UK airspace must report it to the AAIB. Such persons include (but are not limited to) the owner, operator and remote pilot of a drone. All drone accidents and serious incidents are required to be reported to the AAIB, regardless of weight or whether they are being used for commercial operations.

All other occurrences (ie, not accidents or serious incidents) involving drones must be reported under the CAA Occurrence Reporting Scheme pursuant to Regulation (EU) No. 376/2014 and Implementing Regulation 2015/2018. This also applies to UK-registered drones operating outside UK airspace.

Safety management and risk assessment

32 Are drone operators required to implement safety management systems and risk assessment procedures within their organisation?

For recreational SUA (under 20kg) operators, operating their drone within the reduced provisions of the ANO as amended (see question 1), there is no need for a safety management system or risk assessment procedure.

For all other drone operations (including commercial work, operations outside the reduced provisions of the ANO, and drone operations using drones weighing over 20kg), there is a requirement to detail the safety management system within the operations manual (OSC Volume 1), which is submitted as part of the permission or exemption process. In addition, for flights in congested areas, over 400ft and reduced distance operations (whether commercial or not), and operations using drones weighing over 20kg, a safety risk assessment must also be submitted (OSC Volume 3).

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ANCILLARY CONSIDERATIONS

Import and export control

33 Do specific import and export control rules apply to drones in your jurisdiction?

The UK Strategic Export Control Lists set out a consolidated list of strategic military and dual-use items that require export authorisation. Unmanned aerial vehicles and components feature on the list, including unmanned vehicles specially designed or modified for military use, or capable of a range exceeding 300km.

Trading in controlled goods requires a licence. Trading without a valid licence can result in financial penalties or imprisonment.

Data privacy and IP protection

34 How are personal data privacy and IP protection regulated in your country with specific reference to drone operations?

No specific data privacy and IP protection rules apply in relation to drone operations in the ANO. However, if a drone operator or remote pilot is using a drone to record people with a film or still camera loaded onto the drone, they will also have to comply with the UK's Data Protection Act 2018 and privacy laws contained in the Human Rights Act 1998.

UPDATE AND TRENDS

Sector trends and regulatory developments

35 Which industry sectors have seen the most development in the use of drones in your jurisdiction and which sectors are expected to see further development in future? Have there been any notable recent regulatory developments relating to drones?

Drone use in the UK is considered in the UK government's Civilian Drones Briefing Paper dated 11 February 2019. The Paper found that drones operating in aerial photography, border control, precision agriculture and public safety are in the latest stage of development.

Further development is anticipated across a wide range of sectors. A PwC study in May 2018 predicts that by 2030 there could be 76,000 drones operating in the UK skies leading to a £42 billion uplift in GDP. Industries where the GDP uplift will focus include the public sector (£11.4 billion, including defence, health and education), construction and manufacturing (£8.6 billion) and wholesale, retail trade and food services (£7.7 billion). Other areas likely to see a considerable uptake in

drone technology (particularly once BVLOS technology and regulation is fully developed) include oil and gas operations, utilities and logistics.

On 11 June 2019, the Commission Delegated Regulation (EU) 2019/945 (the Delegated Regulation) and the Commission Implementing Regulation (EU) 2019/947 (the Implementing Regulation) were published in the Official Journal. The Regulations establish an operation-centric, proportionate, risk and performance-based regulatory framework for the operation of drones.

Three categories of drone operation have been established under the Implementing Regulation (open, specific and certified). Open category operations involve low (or no) risk to third parties and are capable of taking place without any further authorisation requirements. Certified operations are operations that are equivalent in risk to manned aviation and should be subject to the same regulatory regime. Specific operations are those that are neither open nor certified and involve a greater risk than open category operations. Such operations require operational authorisation similar to the current permissions and exemptions process. The Regulations are wholesale EU Regulations covering all aspects of drone operation and manufacture (ie, not just aviation safety).

It is uncertain what the impact of Brexit will be on the above, but it is understood that the CAA is working towards implementation of these Regulations as if the UK were to remain a member state.

In addition, the UK government has indicated plans to increase police powers in relation to drone misuse where there is reasonable suspicion that a drone has been used in the commission of an offence, and provide police with powers to issue fixed penalty notices for minor drone-related offences.

United States

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GENERAL FRAMEWORK

Basic rules and regulators

1 What basic rules govern the operation of remotely piloted aircraft and unmanned aircraft (drones) in your jurisdiction? Which regulatory bodies are charged with enforcing these rules?

In accordance with several legislative and regulatory initiatives over the past several years, the US government – led by the Federal Aviation Administration (FAA) – has been rolling out new regulations, rule-makings, and pilot programmes to speed the integration of unmanned aircraft systems (UAS) into the National Airspace System (NAS). Currently, there are three main operational categories permitted under US law, each with its own set of rules and regulations:

- recreational or hobbyist operations;
- commercial or non-recreational operations; and
- public aircraft operations.

FAA is the regulatory agency with primary oversight of UAS operations, with the involvement of other agencies as discussed herein.

The US federal government has exclusive jurisdiction to regulate aviation safety and operations in US navigable airspace, including UAS operations. Nevertheless, many states and municipalities have their own restrictions on use of UAS. In general, where they related to airspace or safety issues, they are pre-empted by federal law. However, those related to state and local police powers, including land use, zoning, privacy, trespass and law enforcement are not pre-empted. While this summary touches upon such state and local laws, it does not include a comprehensive review of these rules.

This chapter does not address US military operation of UAS.

2 What are the penalties for non-compliance with the laws and regulations governing drones?

While the monetary limits vary depending on whether the subject of an enforcement action is an individual, a small business entity or a larger business entity, and on the particular violation involved, civil penalties of up to $33,333 per violation, as well as criminal penalties, may be assessed for failure to comply with UAS operational requirements and limitations. A UAS operator may also have his or her remote pilot licence suspended or revoked in response to certain violations.

Some examples include:

- Failure to register a UAS may result in civil penalties of up to $33,333, and criminal penalties up to $250,000 or imprisonment for up to three years, or both.
- A civil penalty of up to $20,408 and a criminal penalty of up to $250,000 or imprisonment for up to two years applies to anyone who operates a UAS and deliberately or recklessly interferes with wildfire suppression, law enforcement or emergency response efforts.
- Knowingly or recklessly interfering with a manned aircraft or knowingly operating within an airport runway exclusion zone could result in a criminal penalty of up to $250,000 or imprisonment for up to one year, or both. If serious bodily injury or death results, the term of imprisonment may be increased to up to 10 years for reckless violations, and up to life in prison for knowing violations.

Most UAS violations are treated in accordance with FAA's general Compliance Program, which focuses on resolving non-compliance through informal compliance actions, such as education or counselling, whenever possible. If FAA does not believe a compliance action will be effective, but the violation does not require formal legal enforcement, FAA will take administrative action, such as issuing a letter of correction or a warning. If neither compliance action or administrative action would be sufficient (or if such actions have been taken but non-compliance continues), FAA will take legal enforcement action, such as suspending or revoking a remote pilot certificate, or issuing a civil penalty.

However, for cases involving interference with wildfire suppression, law enforcement or emergency response efforts, FAA policy requires legal enforcement action without exception.

Classification

3 Is there any distinction between public and private drones, as well as between leisure use and commercial use?

Yes, public UAS operations must meet the same statutory criteria as public manned aircraft operations. All operations that do not meet the public aircraft operations criteria constitute civil operations. Civil UAS operations are either recreational or commercial in nature. For example, UAS operations to take photographs for personal use would be recreational in nature, whereas operations to take photographs for compensation (eg, wedding photography) or sale would be commercial.

Public aircraft operations

Generally, a public aircraft is an aircraft (i) owned or leased exclusively by the US government, or by the government of a US state, the District of Columbia, or a territory or possession of the United States or a political subdivision of one of those governments, or a tribal government, (ii) that is operated for purposes that meet the statutory criteria of a 'governmental function', and (iii) that is not operated for commercial purposes (ie, operations for compensation or hire).

Recreational operations

Recreational operators must comply with 49 U.S.C. section 44809, which requires that the UAS be operated:

- strictly for recreational purposes;
- in accordance with a community-based organisation's set of safety guidelines that are developed in coordination with FAA;
- within the visual line of sight of the person (VLOS) operating the aircraft or a visual observer co-located and in direct communication with the operator;
- in a manner that does not interfere with and gives way to any manned aircraft;
- solely in Class G airspace from the surface to not more than 400ft above ground level, unless the operator obtains prior authorisation from FAA before operating in Class B, C, D or E airspace.
- in compliance with all airspace restrictions and prohibitions;
- by an operator who has passed an aeronautical knowledge and safety test; and
- with appropriate registration and marking.

FAA has not yet approved any particular community-based organisation safety guidelines. However, the Academy of Model Aeronautics, which has worked with FAA on recreational operations policies, has developed a safety handbook for recreational fliers, which may be of use.

Operations outside these criteria will need to comply with commercial rules.

Commercial operations

14 C.F.R. Part 107, finalised in mid-2016, contains FAA's rules and operating limitations for commercial operation of small UAS (sUAS) (defined as UAS weighing less than 55lb (25kg) at take-off, including 'everything onboard or otherwise attached'). Provided all of the requirements in the regulations are met, sUAS operators do not require specific authorisation or licensing to operate under Part 107; the exception is operators wishing to obtain waivers from certain operational limitations. Commercial operations using UAS weighing 55lb or more must be specifically authorised by FAA, as described in question 4.

Operations under Part 107 must conform to the following conditions and restrictions:

- UA must weigh less than 55lb.
- VLOS only; the unmanned aircraft (UA) must remain within VLOS of the remote pilot in command (PIC) and the person manipulating the flight controls of the sUAS with vision unaided by any device other than corrective lenses. Alternatively, the UA must remain within VLOS of a visual observer (VO). Use of a VO is permitted, but not required.* Æ
- PIC must have a remote pilot certificate.
- May not operate over any persons not directly participating in the operation, not under a covered structure, and not inside a covered stationary vehicle.*
- Daylight-only operations, or civil twilight (30 minutes before official sunrise to 30 minutes after official sunset, local time) with appropriate anti-collision lighting.*
- Must yield right of way to other aircraft.*
- First-person view camera cannot satisfy 'see-and-avoid' requirement but can be used as long as requirement is satisfied in other ways.
- Maximum groundspeed of 100mph (87 knots).*
- Maximum altitude of 400ft above ground level (AGL) or, if higher than 400ft AGL, remain within 400ft of a structure.*
- Minimum weather visibility of three miles from control station.*
- Minimum distance of sUAS from clouds no less than (i) 500ft below the cloud and (ii) 2,000ft horizontally from the cloud.
- Operations in Class B, C, D and E airspace are allowed with the required ATC permission.
- Operations in Class G airspace are allowed without ATC permission.
- No person may act as a remote PIC or VO for more than one UA operation at one time.*
- No operations from a moving aircraft, or from a moving vehicle unless the operation is over a sparsely populated area. * Æ
- No careless or reckless operations.
- No carriage of hazardous materials.
- Requires preflight inspection by the remote PIC.
- Operator must not have any physical or mental condition that would interfere with the safe operation of an sUAS.
- External load operations are allowed if the object being carried by the UA is securely attached and does not adversely affect the flight characteristics or controllability of the aircraft.

* Requirement is waivable if the operator obtains authorisation from FAA by demonstrating that the anticipated operation can safely be conducted under the terms of a certificate of waiver.
Æ Not waivable for operations involving the carriage of property of another by aircraft for compensation or hire.

Additionally, transportation of property for compensation or hire is allowed under Part 107 provided that:

- the aircraft, including its attached systems, payload and cargo weigh less than 55lb total;
- the flight is conducted within VLOS and not from a moving vehicle or aircraft; and
- the flight occurs wholly within the bounds of a state and does not involve transport between (i) Hawaii and another place in Hawaii through airspace outside Hawaii; (ii) the District of Columbia and another place in the District of Columbia; or (iii) a territory or possession of the United States and another place in the same territory or possession.

4 Is there a weight-based classification system for drones resulting in the application of different rules?

Yes, as noted in question 3, Part 107 operating rules apply only to sUAS, which weigh less than 55lb. Operation of recreational UAS also is limited to UAS weighing less than 55lb, 'unless otherwise certified through a design, construction, inspection, flight test, and operational safety program administered by a community-based organization'.

There is no codified set of operating standards for UAS weighing 55lb or more. Entities wishing to operate such UAS for commercial purposes must obtain either an airworthiness certificate or an exemption under 49 U.S.C. section 44807 (Special Authority for Certain Unmanned Systems). FAA will grant such an exemption if it finds the proposed operations to be in the public interest and that it would not adversely affect safety, or would provide a level of safety equal to that provided by the regulation. For example, FAA has granted a number of section 44807 exemptions for commercial agricultural-related services (eg, crop dusting).

If the UAS of 55lb or more will be used only for research and development purposes, an operator can apply for a special airworthiness certificate in the experimental category.

5 Is there any distinction between completely autonomous drones and remotely piloted drones?

Completely autonomous drones are not currently permitted to operate in the NAS.

DESIGN AND MANUFACTURE

Regulation

6 Do specific rules regulate the design and manufacture of drones in your jurisdiction?

No, except as noted in question 16.

However, section 345 of the 2018 FAA Reauthorization Act requires FAA to establish a process for manufacturers to self-certify that an sUAS model complies with FAA-accepted consensus safety standards. Implementation of section 345 will require FAA to accept risk-based consensus safety standards related to the design, production and modification of sUAS, authorise the operation of sUAS conforming to the accepted standards, and authorise manufacturers to self-certify compliance with the accepted standards. This process has not yet been established.

Manufacturing authorisation

7 Must drone manufacturers obtain any licences or other authorisation to carry out their business? Are manufacturers subject to any other specific rules?

No licences or authorisations are required at this time, except as noted in question 16.

Under section 2203 of the 2016 FAA Extension, Safety, and Security Act, manufacturers of sUAS are required to include a 'safety statement' with their products offered for sale. The safety statement must provide information about the laws and rules applicable to sUAS, including recreational use. FAA has developed and posted on its website a one-page statement that it deems to meet the statutory requirements, which manufacturers can print and use.

Product liability

8 Do general product liability rules (or other specific liability rules) apply to the manufacture of drones?

There are no UAS-specific product liability rules.

REGISTRATION AND IDENTIFICATION

Registration

9 Must drones be registered in a specific national registry? If so, who is entitled to register drones and what requirements and restrictions apply? Is the registry organised as an operator registry or an owner registry?

All owners of UAS weighing more than 0.55lb and less than 55lb must register the UAS with FAA's small UA registry to operate in the US NAS. This can be accomplished through web registration or by paper registration. This requirement applies to UAS intended for either recreational or commercial operations. However, owners of UAS that will be used only for recreational purposes are not required to register each UAS they operate; instead, they are provided with one registration number that applies to all their recreational UAS. Owners of UAS to be used for all other purposes must register each individual UAS. Note that 'owner' for the purposes of registration includes a buyer in possession, a bailee, a lessee of an sUAS under a contract of conditional sale, and the assignee of that person.

To be eligible for registration with the small UA registry, the sUAS must not be registered under the laws of a foreign country and must be (i) owned by a US citizen; (ii) owned by an individual citizen of a foreign country lawfully admitted for permanent residence in the United States; (iii) owned by a corporation not a citizen of the United States when the corporation is organised and doing business under the laws of the United States or a state within the United States, and the aircraft is based and primarily used in the United States; or (iv) owned by the US government or a US state or local government.

UAS must be registered through FAA's Civil Aviation Registry (N-Number registry used for manned aircraft) if:

- the UA is 55lb or greater;
- the owner wants to qualify an sUA for operation outside the United States;
- the owner holds title to an aircraft in trust; or
- the small UA owner uses a voting trust to meet US citizenship requirements.

Identification

10 Are drones identified through a marking system similar to that used for manned aircraft?

Operators of sUAS must ensure that an FAA registration number is affixed to, or marked on, the outside surface of their UA. There is no required method for marking small unmanned aircraft – operators may use engraving, permanent labels or permanent marker, as long as the number is legible and remains affixed to the UA during the operation.

An owner of only recreational UAS will affix the same registration number to all of his or her UA. An owner of UAS operated for any non-recreational purpose will have a unique registration number for each UAS to affix on each UA.

UAS weighing 55lb or more must meet the marking requirements for manned aircraft.

CERTIFICATION AND LICENSING

Basic requirements and procedures

11 What certificates or licences are required to operate drones and what procedures apply?

The PIC of an sUAS operating under Part 107 must obtain a remote pilot certificate with an sUAS rating, as described further in question 14.

Non-US citizens must obtain permission from the Department of Transportation (DOT) under 14 C.F.R. Part 375 before operating an sUAS under Part 107.

For operations involving transportation of property for compensation or hire that exceed the operational limitations in Part 107 (eg, BVLOS), a UAS operator will need to apply for an air carrier certificate under 14 C.F.R. Part 135. If interstate air transportation is involved, the operator will also need to hold DOT economic authority in the form of an Air Taxi Registration. These authorities are available only to US citizens.

Airworthiness certification or type certification of UAS are required for certain operations, as described in question 16.

Taxes and fees

12 Are certification and licensing procedures subject to any taxes or fees?

The following are some of the fees that may apply:

- registration of UAS with FAA – commercial operations: $5 per UAS (renewal required every three years);
- registration of UAS with FAA – recreational operations: $5 (renewal required every three years);
- remote pilot certification aeronautical knowledge test – $150 (recurrent test required every two years);
- DOT Air Taxi Registration – $8; and
- DOT Part 375 Foreign Civil Aircraft Permit – $25.

No taxes specific to UAS certification and licensing apply.

Eligibility

13 | Who may apply for certifications and licences? Do any restrictions apply?

Eligibility criteria and restrictions are addressed with the description of the various authorisations elsewhere in this chapter.

Remote pilot licences

14 | Must remote pilots obtain any certifications or licences to operate drones? If so, do the relevant procedures differ based on the type of drone or operation?

Part 107 remote pilot certification

A remote pilot operating under Part 107 must obtain a remote pilot certificate with an sUAS rating. To qualify for certification, the applicant must:

- be at least 16 years of age;
- be able to read, speak, write and understand the English language;
- be in a physical and mental condition that would not interfere with the safe operation of a UAS;
- pass an initial aeronautical knowledge written exam; and
- pass Transportation Security Administration background security screening.

Operators already holding a Part 61 airmen certificate (ie, a pilot's licence for manned operations) who have completed a flight review within the past 24 months are not required to take the written aeronautical knowledge test. Instead, they may complete an online course on safe operation of UAS.

To maintain the validity of the remote pilot certificate, the holder must pass a recurrent aeronautical knowledge written test every 24 months.

Remote pilots of recreational UAS

Recreational operators are not required to obtain a remote pilot certificate, but must pass an online aeronautical knowledge and safety test and carry proof of test passage. This test is currently under development by FAA.

Public UAS pilots

No FAA certification requirements are applicable to pilots of public UAS operations.

Foreign operators

15 | Are foreign operators authorised to fly drones in your jurisdiction? If so, what requirements and restrictions apply?

Yes, under certain conditions. The following requirements apply:

- for recreational operations, a foreign operator must register his or her UAS. FAA will treat the registration as a recognition of ownership rather than a certificate of US aircraft registration; and
- for commercial operations, an operator must
  - obtain authority from DOT to operate a foreign civil aircraft in the NAS (in accordance with 14 C.F.R. Part 375 or NAFTA blanket permit);
  - obtain a remote pilot certification; and
  - operate in accordance with Part 107 (for sUAS) or an exemption under 49 U.S.C. section 44807 (if the aircraft weighs 55lb or more).

Certificate of airworthiness

16 | Is a certificate of airworthiness required to operate drones? If so, what procedures apply?

UAS used in recreational operations, public operations and for operations conducted under Part 107 (including any waivers granted by FAA) or a section 44807 exemption are exempt from FAA's aircraft airworthiness certification requirements.

UAS intended for advanced operations beyond the limitations of these authorities must obtain airworthiness certification. Operators of such UAS may apply for the following type certification (design approval) or airworthiness certification under existing regulations applicable to manned aircraft:

- type certificate for special class aircraft (14 C.F.R. section 21.17b) and standard airworthiness certificate for special class aircraft (14 C.F.R. section 21.183);
- Type certificate for restricted category aircraft (14 C.F.R. section 21.25) and special airworthiness certificate in the restricted category (14 C.F.R. section 21.185);
- Special airworthiness certificate in the experimental category (14 C.F.R. section 21.191) for the purposes of research and development, demonstrating regulatory compliance, crew training, exhibition, and market survey; or
- special flight permit for the purpose of production flight testing new aircraft (14 C.F.R. section 21.197).

OPERATIONS AND MAINTENANCE

One drone, one pilot

17 | Does the 'one drone, one pilot' rule apply in your jurisdiction?

Generally, yes. Part 107 explicitly states: 'a person may not operate or act as a remote pilot in command or visual observer in the operation of more than one unmanned aircraft at the same time.' However, this is one of the provisions in the rule that may be waived if FAA determines that an applicant has demonstrated such operations can be safety conducted under a certificate of waiver. FAA has issued such waivers, which contain operational restrictions tailored specifically to the proposed applications.

Maintenance

18 | Do specific rules regulate the maintenance of drones?

No. FAA has not issued specific maintenance regulations for UAS.

For sUAS commercial operations, Part 107 requires that the sUAS be in a condition for safe operation and that the remote PIC check that the system is safe prior to each flight. The regulations also require a pre-flight assessment of the operations to be conducted and inspection of the UA, ground control station and any payload attached or carried.

Basic operational rules and restrictions

19 | What rules and restrictions apply to flights performed in 'visual line of sight' (VLOS) and 'beyond visual line of sight' (BVLOS)? Is there a distinction in this regard?

For sUAS commercial operations, unless a person obtains a waiver, operations must be within VLOS. The regulations require that 'with vision that is unaided by any device other than corrective lenses, the remote pilot in command, the visual observer (if one is used), and the person manipulating the flight control of the small unmanned aircraft system must be able to see the unmanned aircraft throughout the entire flight ....' FAA has granted waivers permitting BVLOS operations under certain conditions.

20 | What rules and restrictions apply to critical and non-critical operations? Is there a distinction in this regard?

Night-time sUAS commercial operations are prohibited under Part 107. For operation during civil twilight, the rules require that small UAs have anti-collision lighting visible for three statute miles. The daylight operations requirement is subject to waiver if FAA determines that an applicant has demonstrated such operations can be safely conducted under a certificate of waiver. FAA has issued many waivers for night operations.

Transport operations

21 | Is air transport via drone (eg, cargo and mail) regulated in your jurisdiction? If so, what requirements, limitations and restrictions apply?

Part 107 allows for limited transportation of property for compensation or hire, as described in question 3. For operations that exceed the limitations in Part 107, there are no UAS-specific rules. Accordingly, an operator interested in transportation of property without the limitations of Part 107 in most cases would be required to obtain an air carrier certificate under 14 C.F.R. Part 135, which applies to certain manned air carrier operations.

22 | Do any specific provisions governing consumer protection and tracking systems apply with respect to cargo and delivery operations via drone?

No, although FAA is currently drafting proposed rules on remote ID capability, which is 'the ability of a UAS in flight to provide identification information that can be received by other parties'. FAA is targeting December 2019 for publication of a Notice of Proposed Rulemaking.

Insurance requirements

23 | What insurance requirements apply to the operation of drones?

There are no formal regulations requiring insurance for recreational operations or sUAS commercial operations under Part 107.

If operating under 14 C.F.R. Part 135 or an air taxi registration, the same insurance requirements applicable to manned aircraft would apply.

Safety requirements

24 | What safety requirements apply to the operation of drones?

The safety requirements for recreational operations are described in question 3. Additional requirements will likely apply when FAA accepts a particular community-based organisation's safety guidelines.

The requirements applicable to commercial sUAS operations also are described in question 3.

If an operator requests a waiver under Part 107 or an exemption under 49 U.S.C. section 44807, it will be required to submit a detailed safety case to FAA to demonstrate the safety of the operations proposed. FAA incorporates additional safety requirements into the certificates of waiver or exemption tailored to the specific operations authorised.

AIRSPACE

Air traffic control

25 | How is air traffic control regulated in your jurisdiction? Which authority provides air traffic control services for drones?

FAA, NASA and UAS industry stakeholders are actively collaborating on the research and development of a US UAS Traffic Management System that will be separate from, but complementary to, FAA's Air Traffic Management System.

Restrictions

26 | Are there any airspace restrictions on the operation of drones?

At this time, recreational and sUAS commercial operations are limited to Class G uncontrolled airspace. Access to controlled airspace (limited to flights under 400ft) is granted by waiver. FAA is continuing to expand its Low Altitude Authorization and Notification Capability system, which automates the application and approval process for airspace authorisations. This system has allowed for near real-time authorisations in most areas of the country and is available to both recreational and Part 107 operators.

Additionally, UAS must comply at all times with restricted and prohibited airspace designations, temporary flight restrictions, and notices to airmen, including airspace restrictions over national security sensitive locations.

Take-off and landing

27 | Must take-off and landing of drones take place in specific areas or facilities?

No. However, some state and local governments have enacted restrictions on the take-off and landing of UAS within their boundaries.

LIABILITY AND ACCIDENTS

Cargo liability

28 | Are there any specific rules governing the liability of drones for losses or damage to cargo?

No, except for UAS air carrier operations, to which DOT conditions of carriage requirements for manned air carriers may apply.

Third-party liability

29 | Are there any specific rules governing the liability of drones for damage to third parties on the surface or in the air?

Not specifically. However, drone operation may be considered an 'ultra-hazardous' activity under some state laws, making the operator strictly liable to third parties on the ground, or even in the air (ie, a plaintiff would not need to prove negligence).

Accident investigations

30 | How are investigations of air accidents involving drones regulated in your jurisdiction?

The National Transportation Safety Board (NTSB) is required to investigate all civil aircraft accidents. FAA participates in NTSB investigations of civil aircraft. The NTSB regulations define UA accident to mean:

> *an occurrence associated with the operation of any public or civil unmanned aircraft system that takes place between the time that*

the system is activated with the purpose of flight and the time that the system is deactivated at the conclusion of its mission, in which: (1) Any person suffers death or serious injury; or (2) The aircraft has a maximum gross takeoff weight of 300 pounds or greater and sustains substantial damage.

Accident reporting

31 | Is there a mandatory accident and incident reporting system for drone operators in your jurisdiction?

Immediate notification to the NTSB is required for accidents and certain serious incidents listed at 49 C.F.R. section 830.5. For accidents, a report must then be filed with the NTSB within 10 days. Reports for serious incidents are only filed upon request by FAA.

Additionally, a PIC must notify FAA of any operation involving at least:

- serious injury to any person or any loss of consciousness; or
- damage to any property, other than the small UA, unless one of the following conditions is satisfied:
  - the cost of repair (including materials and labour) does not exceed $500; or
  - the fair market value of the property does not exceed $500 in the event of total loss.

Safety management and risk assessment

32 | Are drone operators required to implement safety management systems and risk assessment procedures within their organisation?

No, but it is a best practice. UAS operators requesting authority to operate outside Part 107 must make a robust safety case in support of FAA granting the requested authority. Many of these operators have voluntarily adopted safety management or risk assessment procedures within their organisations.

ANCILLARY CONSIDERATIONS

Import and export control

33 | Do specific import and export control rules apply to drones in your jurisdiction?

There are currently no specific import classifications for civilian UAS. Rather, they generally will be classified as civil aircraft under the Harmonized Tariff Schedule of the US for import classification and duty assessment (which classifications are generally duty free). However, certain UAS may be classifiable as toys, video cameras or other items based on their primary function. Parts and components of civil UAS may also qualify for duty free treatment under the Agreement on Trade in Civil Aircraft.

The US International Trade Commission is currently investigating certain intellectual property infringements related to UAS. Importing military UAS is more complex as the import may require a licence from the State Department Directorate of Defense Trade Controls (DDTC) for temporary imports, or from the Bureau of Alcohol Tobacco and Firearms for permanent import.

The United States has specific export controls over certain civilian and military UAS. UAS incorporating defence articles, drone airborne launch systems, and drone controls with swarming capability are controlled under the US Munitions List, and exports are strictly controlled by the DDTC. Civilian UAS having certain characteristics in terms of range, payload, or incorporating aerosol dispersing systems are controlled under the US Export Administration Regulations administered by the US Department of Commerce Bureau of Industry and Security (BIS). For example, UAS with a 300km range are subject to enhanced controls under the Missile Technology Control Regime. Similarly, engines, certain sensors and specially designed components may be subject to export licensing requirements.

In addition, US export laws control the export of technology, including technical data, to produce and develop certain UAS and related technologies. This would include disclosure of such controlled technology to a foreign person in the United States. Hence, collaborations between US and non-US companies on drone development or production may require authorisation from BIS or DDTC. BIS is also considering new controls on certain emerging technologies, including micro-UAS, swarming technology and certain flight control algorithms.

Data privacy and IP protection

34 | How are personal data privacy and IP protection regulated in your country with specific reference to drone operations?

In the United States, personal data privacy rights are generally governed by state and local law, while intellectual property rights are generally governed by federal law.

State tort laws protect individuals in the state from civil privacy violations, such as 'intrusion upon seclusion', and the 'public disclosure of private facts'. State criminal laws protect individuals from criminal privacy violations, such as trespassing, wiretapping or stalking. These state laws have evolved over time and are generally technology agnostic and apply to data collection by drone as they do to other conduct. Some states have established technology-specific drone privacy laws that protect against surveillance in certain circumstances where legislators have concluded there is a right to privacy. For instance, the state of Florida passed a state drone law establishing a 'reasonable expectation of privacy on his or her privately owned real property if he or she is not observable by persons located at ground level in a place where they have a legal right to be'. While the United States is currently considering the establishment of a federal consumer data privacy standard following the establishment of the EU General Data Protection Regulation and the enactment of the California Consumer Privacy Act, no federal legislation has progressed to date.

Federal law generally guarantees rights to intellectual property in the United States. The US Patents and Trademark Office serves as the registry of patents and trademarks, and the Copyright Office fulfils a similar role for copyrights. A person or object in a public space generally does not have intellectual property rights to his, her or its likeness whether captured by drone or any other medium. Data collected by drone is governed in the same manner as works developed by other forms of technology. Therefore, it is important for a drone operator to establish the copyright ownership to data collected prior to the collection of data.

UPDATE AND TRENDS

Sector trends and regulatory developments

35 | Which industry sectors have seen the most development in the use of drones in your jurisdiction and which sectors are expected to see further development in future? Have there been any notable recent regulatory developments relating to drones?

In the United States, there has been steady progress towards enhanced drone operations across different sectors. The sectors that have experienced the most significant progress over the past year are agriculture, energy and logistics.

A major step in UAS integration was the finalisation of Part 107 in June 2019. Part 107 allows for the operation of UAS under 55lb for

commercial purposes subject to certain restrictions, such as operation within VLOS, in unrestricted (Class G) airspace and not over people. Many of the restrictions can be waived as described in question 3, allowing operators to fly enhanced operations beyond the conditions allowed in Part 107.

In May 2018, the US DOT established the Drone Integration Pilot Program (IPP) where 10 state, local and tribal governments were selected to enable enhanced drone operations. FAA has now granted over 3,000 waivers for enhanced drone operations, including numerous waivers to operate at the IPP sites. The most significant progress has been achieved by companies performing precision agriculture operations, long-line infrastructure inspections and package deliveries. For instance, FAA granted UPS a Part 135 certificate to deliver goods by drone for compensation in October 2019.

There are several regulatory developments that are currently under way in the United States to expand drone operations. In February 2019, FAA released a Notice of Proposed Rulemaking that would allow UAS to be operated over people. However, FAA stated that it will not finalise its rule to permit drone operations over people until the agency has established a drone remote identification standard. Remote identification is required because US law enforcement agencies objected to allowing UAS to fly over people until a rule is in place to establish accountability for the operators that fly UAS over people. FAA intends to issue a Notice of Proposed Rulemaking on drone remote identification by December 2019 and hopes to complete the rule-makings on both flights over people and remote identification in 2020.

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