大成DENTONS

Remotely Piloted Aircraft Systems

A comparative guide of the drone regulatory laws around the world

2021

Contents

Overview

Remotely piloted aircraft systems is a burgeoning sector that stands to significantly transform many industries, including: telecommunications, agriculture, logistics, data privacy and security, manufacturing, construction and mining.

While RPAs have been flying for decades, the recent transition to non-military RPA applications has spurred changes far beyond the change in nomenclature from "drones" to "RPA". (RPAs) have been flying for decades, the transition from mainly military use has changed more than just the nomenclature away from "drones" to RPAs. Military uses for RPAs have paved the way for many more civilian and commercial applications that are limited only by the creativity and imagination of their designers – and by the applicable regulations.

This global guide examines and compares the regulatory, sanctions and liability, privacy and future prospects for regulatory and innovative developments:

1. Australia;
2. Canada;
3. European Union (France);
4. Korea;
5. Singapore; and
6. United States.

Opportunities abound in the increasingly complex regulatory environment surrounding RPAS operations. Greater development in the regulatory foundation will attract investment and provide the financial imperative to commercialize RPAs services and technology. This Guide explores some of the key industries and sectors that are ripe for the continued expansion of RPAS technology, including, agriculture and AgTech, construction and infrastructure and mining

Why did Dentons select the terminology of "RPA" and "RPAS" for this Guide?

There is a lack of uniformity around the globe about what terminology to use when referring to "remotely piloted aircraft" – some nations say "unmanned aerial vehicles", "drones" or "uncrewed aerial vehicles". The terminology of "RPA" and "RPAS" has been selected and used throughout this Guide for consistency and because many international organizations promoting harmonization of regulations and technical and safety requirements in this space are using these terms. Many nations have not (yet) adopted gender neutral language when referring to RPAs. As with many of the laws discussed in this Guide, we expect that the accepted terminology will continue to adapt and evolve as the industry develops.

List of Abbreviations

Abbreviation	Definition
AGL	Above Ground Level
BVLOS	Beyond Visual Line of Sight
DAA	Detect-and-avoid
EASA	European Aviation Safety Agency
FAA	Federal Aviation Authority
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
JARUS	Joint Authorities for Rulemaking on Unmanned Systems
LAANC	Low Altitude Authorization and Notice Capability
RPAs	Remotely Piloted Aircraft
RPAS	Remotely Piloted Aircraft Systems
RTM	Remote Traffic Management
SORA	Specific Operations Risk Assessment
VLOS	Visual Line of Sight

Australia

Overview

RPAs are regulated in Australia at the federal level of government by the Civil Aviation Safety Authority (CASA) in accordance with the *Civil Aviation Act 1988 (Cth).* CASA is Australia's national aviation regulatory body and was established as an independent statutory authority in July 1995.

The *Civil Aviation Act 1988 (Cth)* was passed along with an ancillary set of regulations, the *Civil Aviation Safety Regulations 1998 (Cth)*. Together, they form the legislative framework that regulates the operation of RPAs in Australia.

The legislative framework distinguishes RPAs into two distinct major flight purposes:

- RPAs that are flown for commercial or business reasons; and
- RPAs that are flown for sport or recreation.

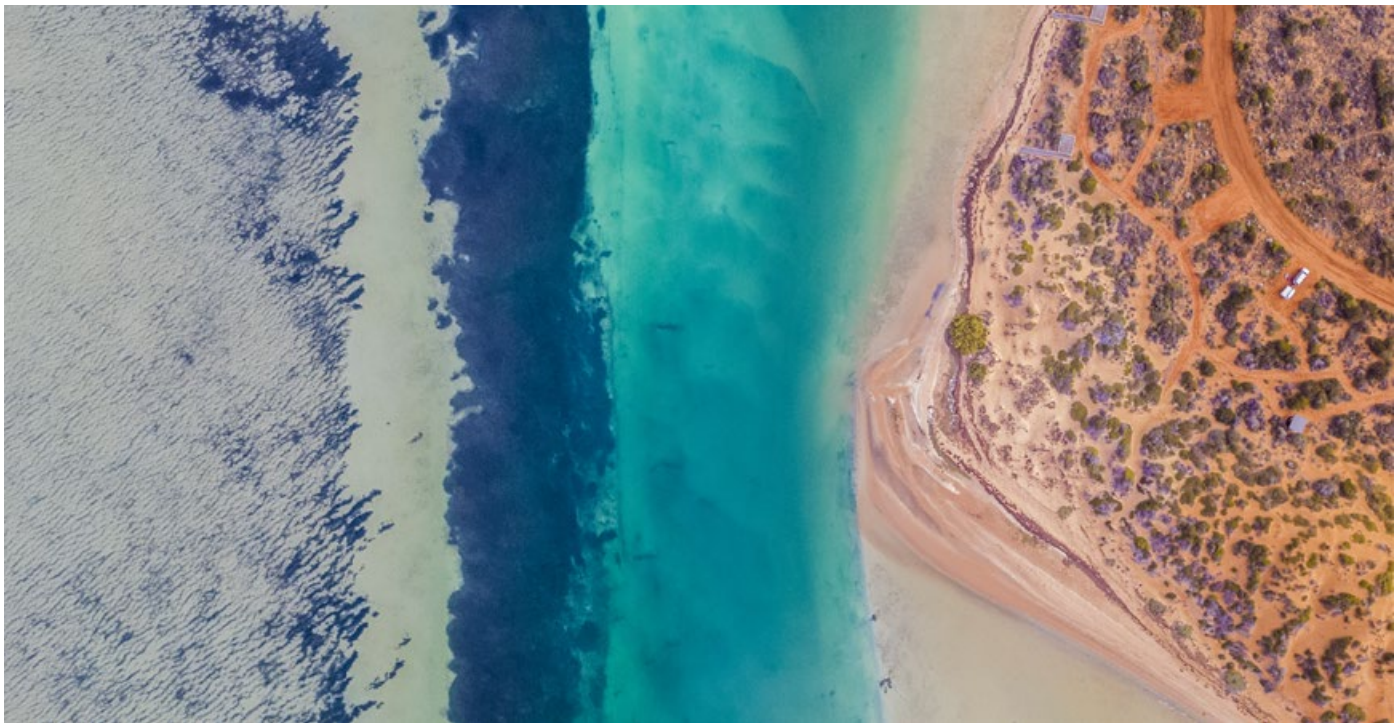
Registration is mandatory for RPAs that are flown for commercial or business reasons and their operator must be accredited with CASA.

CASA considers that anything other than sport or recreation constitutes a commercial or business reason for flying an RPA. Therefore, if an RPA is to be flown for professional activities such as research, training, community and government services, or any work undertaken on behalf of one's employer, the RPA must be registered and its operator must be accredited with CASA.

Since the establishment of a registration system in September 2020, more than 22,000 RPAs have been registered with CASA and over 13,000 operator accreditations have been issued. By way of comparison, CASA records indicate that Australia has 15,771 registered aircraft[1].

The laws and regulations that regulate RPAs in Australia are largely distinguished between the two major flight purposes (commercial or business reasons and sport or recreation). They do not distinguish based on the risks associated with the flight of the RPA.

CASA's regulations extend to both the pilot (the person manipulating the flight controls of the RPA) and the operator (the person, organisation or enterprise engaged in, or offering to engage in, an aircraft operation).



1 https://updates.communication.casa.gov.au/link/id/zzzz603ed9f383dc0116/page.html

VLOS and BVLOS regulations

Government agencies with jurisdiction over RPAs	Region this agency covers (e.g entire jurisdiction or province/state)	Role of the agency
Civil Aviation Safety Authority (CASA)[2]	Entire jurisdiction of Australia	CASA is a government body that regulates Australian aviation safety and the operation of Australian aircraft overseas. CASA employs about 800 people working across Australia to keep our skies safe for all. CASA licenses pilots, register aircraft, oversee aviation safety and promote safety awareness. CASA is also responsible for making sure that Australian airspace is administered and used safely.[3]

CASA's regulations classify RPAs according to size and extend to both the pilot and the operator of the RPA.[4]

The categories of size are:

Size	Weight
Micro	Less than 250g
Very Small	250gm to 2kg
Small	2 to 25kg
Medium	25 to150kg
Large	Greater than 150 kg

CASA's regulations impose Standard Operating Conditions on pilots and operators.[5] Some important aspects of the Standard Operating Conditions include:

- The RPA must be operated during daytime and by the visual line of sight only;
- The maximum operating height for an RPA is 120 metres (400 feet) above ground level in controlled airspace or outside a CASA-approved area. These restrictions are subject to any permission that has been given by CASA to fly above this height;
- The RPA must not be flown over any populous area, which is any area where the failure of the RPA could cause injury to people or property not connected with the operation of the RPA; and
- The RPA must not be flown within 30 metres of people. In certain circumstances, CASA's regulations will permit the RPA to be flown within 15 metres of people.[6]

RPAs classified as micro or very small generally are entitled to certain exemptions from the Standard Operating Conditions.

There are certain circumstances where an RPA operator can apply for flight authorization to fly outside of the Standard Operating Conditions. Such flight authorizations are available to pilots who:[7]

- Intend to fly the RPA for commercial or business reasons; and
- Hold a remotely piloted aircraft operator's certificate.

Some of the flight authorization available include:

- Operating the RPA BVLOS;[8]
- Operating the RPA more than 120 metres (400 feet) above ground level; and[9]
- Operating the RPA within 3 nautical miles of controlled airspace.[10]

2 Sections 8 and 9 of the *Civil Aviation Act 1988 (Cth)*
3 https://www.casa.gov.au/about-us/who-we-are
4 Regulation 101.022 of the *Civil Aviation Safety Regulations 1998 (Cth)*
5 Regulation 101.238 of the *Civil Aviation Safety Regulations 1998 (Cth)*
6 Regulation 101.245 of the *Civil Aviation Safety Regulations 1998 (Cth)*
7 Regulations 101.029, 101.030 and 101.080 of the *Civil Aviation Safety Regulations 1998 (Cth)*
8 Regulation 101.029 of the *Civil Aviation Safety Regulations 1998 (Cth)*
9 Regulation 101.030 of the *Civil Aviation Safety Regulations 1998 (Cth)*
10 Regulation 101.030 of the *Civil Aviation Safety Regulations 1998 (Cth)*

VLOS is defined in CASA's regulations as being where the person operating the RPA can continually see, orientate and navigate the RPA to meet the person's separation and collision avoidance responsibilities, with or without corrective lenses, but without the use of binoculars, a telescope or other similar device.[11]

In October 2021, new legislation commenced whose purpose is to incorporate drones into the incident reporting requirements that already exist for other forms of aircraft[12]:

- For drones classified as medium or large[13]:
  - If they are involved in an incident that involves death, serious injury or serious property damage, its pilot and operator must immediately report the incident to the Australian Transport Safety Bureau; and[14]
  - If they are involved in an incident that involves any procedure for overcoming an emergency or other occurrences that result in difficulty, its pilot and operator must report the incident to the Australian Transport Safety Bureau within 72 hours;[15]
- For drones classified as very small or small:[16]
  - If they are involved in an incident that involves death or serious injury, its pilot and operator must immediately report the incident to the Australian Transport Safety Bureau; and[17]
  - If they are involved in an incident that involves serious property damage, its pilot and operator must report the incident to the Australian Transport Safety Bureau within 72 hours[18]

Liability

Non-compliance with specific regulations/laws

Failure to comply with CASA's regulations for RPAs generally constitute strict liability criminal offences that attract penalties, which are measured by a certain number of penalty units. At the date of this report, one penalty unit is AUD $222.[19]

Some of the strict liability offences include:

- Operating an unregistered RPA or without an operator accreditation (or remote pilot licence) for commercial or business reasons – carrying a penalty of up to 50 penalty units (approximately AUD $11,100);[20]
- Failure to operate an RPA over a populous area at a height less than the height from which, if any of its components fails, it would be able to clear the area – carrying a penalty of up to 50 penalty units (approximately AUD $11,100); and[21]
- Failure to operate an RPA within the operator's visual line of sight – carrying a penalty of up to 50 penalty units[22]
- Operating an RPA in or over a prohibited area, or in or over a restricted area, without the permission of, or not in accordance with any conditions imposed by, the authority controlling the area – carrying a penalty of up to 25 penalty units (approximately AUD $5,550).[23]

11 Regulation 101.073 of the *Civil Aviation Safety Regulations 1998 (Cth)*
12 Transport Safety Investigation Act 2003 (Cth)
13 Regulation 6 of the Transport Safety Investigation Regulations 2021 (Cth)
14 Section 18 of the Transport Safety Investigation Act 2003 (Cth) and Regulation 11(1) of the Transport Safety Investigation Regulations 2021 (Cth)
15 Section 19 of the Transport Safety Investigation Act 2003 (Cth) and Regulation 12(1) of the Transport Safety Investigation Regulations 2021 (Cth)
16 Regulation 6 of the Transport Safety Investigation Regulations 2021 (Cth)
17 Section 18 of the Transport Safety Investigation Act 2003 (Cth) and Regulation 11(3) of the Transport Safety Investigation Regulations 2021 (Cth)
18 Section 19 of the Transport Safety Investigation Act 2003 (Cth) and Regulation 12(3) of the Transport Safety Investigation Regulations 2021 (Cth)
19 Section 4AA of the *Crimes Act 1914* (Cth)
20 Regulation 101.252 of the *Civil Aviation Safety Regulations 1998 (Cth)*
21 Regulation 101.280 of the *Civil Aviation Safety Regulations 1998 (Cth)*
22 Regulation 101.073 of the *Civil Aviation Safety Regulations 1998 (Cth)*
23 Regulation 101.065 of the *Civil Aviation Safety Regulations 1998 (Cth)*

Civil liability

RPA operators should be aware of the risk of breaching confidence if images are surreptitiously obtained. This tort is considered the closest form of protection that Australia has to a common law right protecting our privacy. The traditional formulation of the cause of action for breach of confidence has three elements:

1. The information must have the necessary quality of confidence;
2. The information must be communicated in circumstances importing an obligation of confidence; and
3. There must be an unauthorized use of that information to the detriment of the communicator.

The first limb has been broadened in recent times to include the protection of personal identities and domestic activities.[24]

RPA operators should also be aware that it may risk trespassing on private property if the altitude of the RPA intrudes the airspace necessary for the occupier's ordinary use and enjoyment of the land.[25]

Furthermore, where the RPA substantially and unreasonably interferes with rights in relation to or in connection with the use of the land of a particular individual, a complainant may be able to make out a breach of the tort of nuisance.[26] Generally, a complainant must make out multiple infractions for a breach to occur[27].

Data privacy and security

Private organizations with a turnover of more than AU$3 million annually and certain government agencies must comply with the *Privacy Act 1988* (Cth) and the Australian Privacy Principles which impose certain rules in relation to the collection, use and dissemination of personal information by an organisation. It is relevant to surveillance equipment on RPAs insofar that a person's identity is clear or can be reasonably ascertained from the recorded information.

In the *Surveillance Devices Act 2007* (Cth), the use of a "listening device" or "optical surveillance devices" to record a private conversation without the consent of the person the subject of the recording is a Commonwealth criminal offence. Most Australian states, including New South Wales and Victoria, have equivalent state legislation prohibiting the use of listening and optical surveillance devices. Aside from the above statutory remedies, RPA operators should be aware of the risk of breaching confidence if images are surreptitiously obtained. A cause of action for 'breach of confidence' is considered the closest form of protection that Australia has to a common law right protecting a person's privacy.

Unmanned traffic management

In 2020, Airservices Australia, the government-owned organization responsible for the safe and efficient management of Australian airspace, released a Request for Information seeking information from industry on the key elements that may constitute a future Flight Information Management System with a view to connecting Unmanned Traffic Management participants with Australia's air traffic management system.

The results of the Request for Information are currently under review.

Counter-RPA technology

Currently, Australia's RPA specific legislation and regulations generally address RPA usage from a safety perspective only.

Jamming devices

Under the *Radiocommunications Act 1992 (Cth)*, the Australian Communications and Media Authority (ACMA) may declare that the operation, supply and possession of certain devices are prohibited.[28]

24 See, for example, *Australian Football League v The Age Co Ltd* (2006) 15 VR 419
25 See, for example, *JP Investments Pty Ltd v Howard Chia Investments Pty Ltd* (1989) 24 NSWLR 490, 495-6
26 *AG v PYA Quarries Ltd* [1957] 2 QB 169 at 190-1
27 See *JP Investments Pty Ltd v Howard Chia Investments Pty Ltd* (1989) 24 NSWLR 490 at 496
28 Section 190 of the *Radiocommunications Act 1992 (Cth)*

To date, ACMA has issued declarations prohibiting two forms of jamming devices:

- In 2011, public mobile telecommunications service jammers, i.e., mobile phone jammers;[29] and
- In 2014, devices that were capable of jamming frequencies used by satellite navigation services such as GPS (radio navigation-satellite service).[30]

In 2018, the ACMA issued temporary authorization for the Australian Federal Police to employ RPA-jamming devices as part of providing security for the Invictus Games in Sydney.[31]

On 8 October 2020, ACMA issued an authorization for police to use counter-RPA devices to respond to threats.[32]

RPA operator qualification requirements

The legislative framework distinguishes between two principal classes of person in relation to RPAs:

- Pilot (the person manipulating the flight controls of the RPA) ; and
- Operator (the person, organisation or enterprise engaged in, or offering to engage in, an aircraft operation).

There are circumstances where the pilot and/or the operator are required under CASA regulations to be accredited/registered.[33]

The pilot of an RPA must hold a Remote Pilot Licence in order to fly an RPA larger than the Very Small category (i.e. above 2kg) for commercial or business reasons.[34]

There is no minimum age requirement to obtain a Remote Pilot Licence.

For RPAs that are of the Medium category size or under, there are a limited number of Excluded Category scenarios where a Remote Pilot Licence may not be required.[35]

As of 28 January 2021, the operator of an RPA must be accredited for any RPA that is flown for commercial or business reasons.

An applicant to be an accredited operator of an RPA must be at least 16 years of age.[36]

Operating an unregistered RPA or without an operator accreditation (or remote pilot licence) for commercial or business reasons is a strict liability offence under CASA regulations and carries a penalty of up to 50 penalty units (approximately AUD $11,100).[37]

Developments

We expect that the opportunities presented by the commercialization of RPAs will continue driving innovations in Australia, as well as continue to exert pressure on CASA to develop practical and useful regulations.

29 *Radiocommunications (Prohibition of PMTS Jamming Devices) Declaration 2011*
30 *Radiocommunications (Prohibited Device) (RNSS Jamming Devices) Declaration 2014*
31 *Radiocommunications (Invictus Games Anti-Drone Technology/RNSS Jamming Devices) Exemption Determination 2018*
32 *Radiocommunications (Police Forces – Disruption of Unmanned Aircraft) Exemption Determination 2020*
33 Regulation 101.374B of the *Civil Aviation Safety Regulations 1998 (Cth)*
34 Regulation 101.252 of the *Civil Aviation Safety Regulations 1998 (Cth)*
35 Regulation 101.237 of the *Civil Aviation Safety Regulations 1998 (Cth)*
36 Regulation 101.374F of the *Civil Aviation Safety Regulations 1998 (Cth)*
37 Regulation 101.252 of the *Civil Aviation Safety Regulations 1998 (Cth)* and Regulation 101.270 of the *Civil Aviation Safety Regulations 1998 (Cth)*

Industry Focus

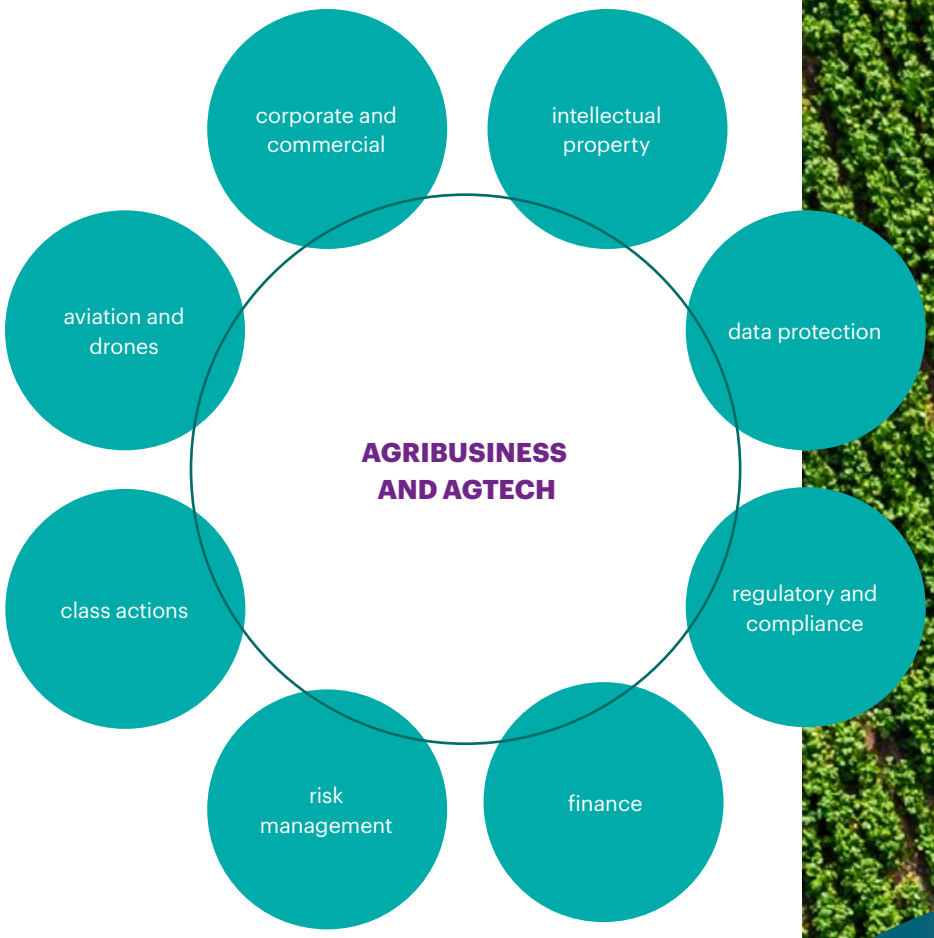
Agribusiness and AgTech

The growth of the agribusiness industry is grounded in innovation. New technologies are a high-growth area and an important contributor to global food security and economic prosperity. More businesses are using RPAs and semi-autonomous machinery to make their enterprises smarter, effective and profitable. Progressive research and development, along with strategic alliances and joint ventures, have acted as revitalization tools in agriculture around the world. While exchange rates and raw material prices continue to be an ongoing concern, the constant move to expand product lines, find operational efficiencies and develop new markets keep this industry moving forward.

New opportunities for agribusiness and AgTech with BVLOS operations

Many nations and international organizations are working on regulations to permit the safe, regular and autonomous operations of RPAs beyond the visual line of sight of the operator. Not only will creating regulations for BVLOS operations provide greater commercial certainty and fruitful ground for financing and investment, BVLOS operations creates particular advantages for agriculture operations. Without the need to be proximate to an operator, an RPA to travel over greater distances, behind obstacles and for lengthier periods of time. Gathering data and completing tasks by RPA stands to save significant costs for businesses, through a combination of multispectral, thermal and high resolution and infrared cameras to monitor crop status.

Gathering more data means more profit and cost saving opportunities. Artificial intelligence and deep learning software will be increasingly used to analyze the agricultural data gathered by RPAs, leading to a new frontier in the agriculture business to feed the world's growing population.



Legal issues where agribusiness and RPAs intersect

The increased usage of RPAs in agribusiness raises a series of legal issues that will be considered by the courts, including:

- Trade secrets: can a commercial farming operation prohibit a competing ag operation from overflying its crops in order to gain a competitive information advantage?
- Seed, fertilizer and pesticide delivery by RPA: what is the scope of liability for RPA manufacturers if an entire crop fails? How can RPA manufacturers protect themselves in their contractual agreements?
- Enforcing possession rights on otherwise unoccupied / unharvested lands: does regular RPA surveillance constitute "possession" for the purposes of legal ownership rights?

Dentons has the in-depth and comprehensive industry knowledge to help grow, protect, operate and finance businesses focused on agriculture and burgeoning AgTech. We work with AgTech and biotech companies, start-ups and research consortiums to identify strategic partnerships for research, development and project financing. Our team ensures that your intellectual assets and ground-breaking discoveries are brought to market properly by advising on licensing and branding opportunities, navigating regulatory approvals, and protecting and enforcing propriety rights. We provide comprehensive and tailored solutions that leverage multi-disciplinary experience across our global platform to advise you on the corporate, financial, operational, employment and labour, immigration, real estate, trademarks, litigation, competition, compliance and regulatory issues faced in the agribusiness and forestry sectors.

Canada

Overview

The Canadian Aviation Regulations (CARs) currently authorize the VLOS operation of RPAs based on weight (250g to 25kg) and the risk level of the operation. Operations outside those parameters, such as RPAs weighing in excess of 25kg or BVLOS currently require a special flight operations certificate (SFOC). Subject to a few exceptions, pilot certification and registration are required for RPA flights in Canada.

On April 23, 2020, the regulator, Transport Canada, took the first step towards making BVLOS operations a reality in Canada by releasing a notice of proposed amendment for lower-risk beyond visual line of sight (the Notice). The Notice is a foundational step in the Canadian Aviation Regulation Advisory Council process to solicit feedback about potential laws and regulations. The Notice proposes permitting lower risk BVLOS flights without the need for a SFOC, expanding permissible VLOS operations, requiring declarations of airworthiness for RPAs and altering requirements for operational and pilot certifications.

While Transport Canada requires RPA operators to register their RPAs, they have not enacted regulations regarding remote ID, nor have they taken an official position on remote ID.

While VLOS operations are currently permitted by regulations, draft regulations to permit low risk BVLOS operations without the need for advanced or special permission from Transport Canada are in progress.

VLOS and BVLOS regulations

As aircraft, RPAs are regulated under the existing aeronautical and aviation statutes (being the *Aeronautics Act* and the CARs, primarily). The CARs govern civil aviation safety and security in Canada and are administered by Transport Canada. *Part IX – Remotely Piloted Aircraft Systems* of the CARs covers most of the rules that apply to RPAs weighing 250 grams to 25 kilograms. The regulations do not govern the operations of RPAs that weigh less than 250 grams. RPAs weighing in excess of 25kg require a SFOC.

Pilot certifications

There are currently two types of pilot certificates in Canada: 1) Small Remotely Piloted Aircraft (VLOS) - Basic Operations; and 2) Small Remotely Piloted Aircraft (VLOS) - Advanced Operations. In order to obtain a basic operations pilot certificate, the pilot must be at least 14 years old and have completed the basic operations exam, a flight review, and certain recurring training obligations. Subject to a few exceptions, to obtain an advanced operation pilot certificate, the pilot must be at least 16 years of age, have completed the advance operations exam, successfully completed a flight review and must complete recurring training operations.

Registration

All RPAs weighing between 250g to 25kg are required to be registered and the registration number must be clearly visible on the RPA. RPAs under 250g do not need to be registered and RPAs over 25kg do not need to be registered but require an SFOC to operate. In order to be a registered owner of an RPA, you must be a citizen or permanent resident of Canada that is over the age of 14, a Canadian or provincially incorporated company, or a municipal, provincial or federal entity. Pilots must keep the certificate of registration in an accessible location for the entire duration of the operation.

Non-Canadian RPA operators who wish to operate in Canada must have a SFOC to fly an RPA for any purpose and must also complete the necessary pilot certification in Canada (regardless of whether they are licenced in their home jurisdiction). The foreign RPA operator must already be allowed to use the RPA for the same purpose in the foreign operators' home jurisdiction,

and the approval/authorization must be included in the application for a Canadian SFOC.

Operation types

At this time, RPA operations fall into one of four categories for VLOS operations: micro RPAs, basic operations, advanced operations and SFOC operations.[38]

Micro RPAs (under 250g)

Pilots of micro RPA do not need to register their RPA or get an RPA pilot certificate to fly them. While they are not bound by the same requirements as other RPAs, they must not operate in a reckless or negligent manner as to endanger or be likely to endanger aviation safety or the safety of anyone. While there are no prescriptive elements of the regulations, there is an expectation that the pilot of a micro RPA to use good judgement, identify potential hazards, and take all necessary steps to avoid any risks associated with flying their RPA.

Basic operations

If an operator meets all five of the following conditions when flying, they qualify to conduct "basic" operations:

1. **Fly it in uncontrolled airspace;**
2. **Fly more than 30 metres (100 feet) horizontally from bystanders;**
3. **Never fly over bystanders;**
4. **Fly more than 3 nautical miles from a certified airport or a military aerodrome; and**
5. **Fly it more than 1 nautical mile from a certified heliport.**

When conducting basic operations, the operator must: a) register the RPA with Transport Canada, b) mark it with its unique registration number, c) hold a RPAS Certificate – Basic Operations issued by Transport Canada and d) when flying, carry that the pilot certificate and proof of the RPA's registration.

Advanced operations

If an operator meets any of the following conditions when flying, they qualify to conduct "advanced" operations:

1. **Flying in controlled airspace;**
2. **Flying over bystanders;**
3. **Flying within 30 metres of bystanders (measured horizontally);**
4. **Flying less than 3 nautical miles from a certified airport or a military aerodrome; or**
5. **Flying less than 1 nautical mile from a certified heliport.**

If you are conducting advanced operations, you must: a) register your RPA with Transport Canada; b) mark your RPA with the registration number; c) use an RPA with an appropriate safety declaration; d) pass the Small Advanced Exam; e) pass a flight review with a flight reviewer; and f) when flying, carry the pilot certificate and proof of the RPA's registration. If flying in controlled airspace, advanced approval is required from Canada's air navigation service provider, NAV CANADA. NAV CANADA recently launched an application to assist RPA pilots with flight planning, NAV DRONE.

38 For more helpful information on basic and advance operations, please refer to the following link on Transport Canada's website

SFOC operations

For RPA operations outside the basic/advanced operation rules, or BVLOS, pilots must apply to Transport Canada to obtain a SFOC in advance of flying.

Government agencies with jurisdiction over RPAs	Region this agency covers (e.g. entire jurisdiction or province/state)	Role of the agency
Transport Canada	All of Canada	Transport Canada is the civil regulatory authority for Canada. Transport Canada is responsible for establishing, managing, developing the safety and security standards for civil aviation, which includes all RPAs with the exception of military RPAs.
Department of National Defence	All of Canada when operating in civil or military restricted airspace	Department of National Defence (DND) is the military authority for Canada. Domestic or foreign military UAVs come under the authority of DND when operating in civil airspace or military restricted airspace.[39]
NAV CANADA	All of Canada	NAV CANADA is a not-for-profit, self-regulating, private corporation. It owns and operates Canada's civil air navigation service, providing air traffic control services, airport advisory and flight information, and aeronautical information to users of Canada's airspace.

39 Drones in Canada, March 2013 Report

Liability

RPA operations are subject to several areas of liability: regulatory penalties for non-compliance, civil, criminal, and other laws.

Non-compliance with Canadian Aviation Regulations (CARs)

First and foremost, an RPA operator must comply with RPA regulations. In general, the CARs prescribe offences for conducting RPA operations that violates principles of aviation safety. Transport Canada has broad jurisdiction to investigate and enforce non-compliance. As of recently, Canadian law enforcement has also been authorized to issue administrative monetary penalties for violations of the CARs. The failure to comply can result in fines and can impact the operator or a business' ability to use RPAs in the future. Depending on the severity of the offence, individual fines range from CA$1,000 to CA$5,000, and fines for businesses range from CA$5,000 to CA$25,000. Some noteworthy offences and fines include:

Fines for individuals:

- Up to CA$1,000 for flying without an RPA pilot certificate;
- Up to CA$1,000 for flying unregistered or unmarked RPAs;
- Up to CA$1,000 for flying where you are not allowed; and
- Up to CA$3,000 for putting aircraft and people at risk.

Fines for corporations:

- Up to $5,000 for flying without an RPA pilot certificate;
- Up to $5,000 for flying unregistered or unmarked RPAs;
- Up to $5,000 for flying where you are not allowed; and
- Up to $15,000 for putting aircraft and people at risk.

If you break more than one rule, you could receive multiple penalties.

Civil liability

As well as the regulations and criminal law risks above, individuals and businesses may be liable under a variety of statutes and the common law for negligence, trespass, nuisance, and breach of privacy. As an example, under the Ontario *Trespass to Property Act*, a trespasser can be found guilty of an offence and on conviction is liable to a fine of up to $10,000 plus any damages and costs. An RPA that wanders or deliberately ventures onto private property could result in the operator and the business who hired them, being liable for trespass.

Criminal liability

Operating an RPA outside of the law can also have criminal consequences (though most likely for the RPA operator personally rather than the business or person who has hired them). The *Criminal Code of Canada* also contains a number of offences including: Section 77(c) and (d) damaging an aircraft while in service in a manner that could endanger the safe operation of the aircraft or airport; and Section 77(e) and interfering with the operation of any air navigation facility in a manner likely to endanger the safety of an aircraft in flight. In addition to these offences, criminal negligence could also apply under section 219 of the *Criminal Code* along with relevant sections of the *Criminal Code* relating to: breaking and entering, and mischief.

Other liability – municipal bylaw infractions

In order to mitigate legal risks when conducting flights, RPA operators need to analyze and abide by all applicable municipal bylaws before flight. Unless a court determines that a municipal bylaw impacting RPA operations is invalid, RPA operators must comply with the bylaw at all times. For example, in Calgary, Alberta, municipal bylaws prohibit the launch or operation in a park of "any remote control device including ... planes" and prohibit the operation of "model airplanes of any nature" from using a street for the "purposes of flying".[40]

Parks Canada also prohibits the recreational flight of RPAs in Canada's national parks, although certain non-recreational flights are permitted in some circumstances with advance permission.[41]

40 For more information, please see our article on municipal bylaws and drone operations, here
41 For more information, please refer to our article on Canadian National Parks, here

Other liability – privacy torts

In Canada, statutory torts and common law torts are available for breaches of privacy by individuals and organizations. In tort law, an individual can launch an action in court to obtain a civil remedy, such as damages, against the person who committed the act or omission (e.g., an invasion of privacy).

Certain provinces have established a statutory tort for the invasion of privacy, which allows an individual to bring a civil action for improper access to or use of personal information. For example, under the *Privacy Act* in British Columbia, an individual has a right to sue for invasion of privacy. It is a tort for a person to use the portrait (or image) of another for commercial purposes without consent.

Individuals can also use common law torts to seek redress for breaches of privacy. This includes the tort of "intrusion upon seclusion" and the novel tort for "disclosure of private facts." These torts and others (such as the tort of trespass) are potentially available to individuals who have their privacy invaded by RPAs.

The tort of intrusion upon seclusion may occur where:

- The RPA operator's conduct was intentional (including recklessness);
- The RPA operator invaded, without lawful justification, the plaintiff's private affairs or concerns; and
- A reasonable person would regard the invasion as highly offensive, causing distress, humiliation or anguish.

The tort of disclosure of private facts may occur where:

- The RPA operator publicized an aspect of the plaintiff's private life;
- The plaintiff did not consent to the publication;
- The matter publicized or its publication would be highly offensive to a reasonable person; and
- The publication was not of legitimate concern to the public.

There are no reported court cases in Canada alleging an RPA operator had committed any of these privacy torts. When it does occur, the accused RPA operator will be well advised to follow certain best practices of operations to avoid committing privacy breaches.

Data privacy and security

Canada's privacy laws apply to commercial and recreational RPA operators alike, and should be considered before all operations. Transport Canada has also released privacy guidelines for RPA users. The privacy guidelines are available by clicking on the following link. Transport Canada suggests that recreational RPA operations bear the following privacy principles in mind when operating an RPA: 1) be accountable; 2) limit collection; 3) obtain consent; 4) store information securely; and 5) be open and responsive about your activities.

Relevant privacy law

Commercial RPA operators must follow the *Personal Information Protection and Electronic Documents Act* (PIPEDA). In Canada, federal legislation, PIPEDA, as well as substantially similar provincial legislation in the provinces of British Columbia, Alberta and Québec, establish rules on how private-sector organizations may collect, use or disclose "personal information" in the course of commercial activities.

One important threshold issue is whether information and data collected by RPAs is "personal information." "Personal information" is information about an identified or identifiable individual, either alone or in combination with other information.

Every organization subject to PIPEDA must comply with 10 principles. The most notable principles for commercial RPA operators are:

- **Accountability**: An organization is accountable for personal information under its control, and must implement a governance structure and privacy policies to demonstrate compliance with privacy law.
- **Consent**: Consent (express or implied) of an individual is required to collect personal information. Whether consent be express or implied depends on the sensitivity of the information, the reasonable expectations of the individual in the circumstances and the risk of harm. Consent must be informed, free and meaningful.
- **Limiting collection**: An organization cannot collect information beyond what it needs to provide the goods or services offered.

- **Safeguards**: Personal information must be protected by security safeguards at a level appropriate to its sensitivity.
- **Openness**: An organization must proactively make available their policies and procedures on information management in clear and accessible language.
- **Individual access**: Individuals have the right to obtain access to their personal information upon request.
- **Remedies**: Individuals must have recourse to complain about compliance concerns.

Unmanned traffic management

While Transport Canada requires RPA operators to register their RPAs, there are no regulations (either proposed or enacted) regarding remote ID.

In June 2020, Transport Canada published a call for proposals to select innovators to help set the requirements for UTM and the required services needed for a remote traffic management system. Transport Canada selected the proposals of SkySensus and AirMarket.[42]

SkySensus

According to Transport Canada "...Their trial proposal, "RTM Enabler I", consists of several phases of RPAS flight operations with objectives such as pipeline inspection, obstacle limitation surfaces (OLS) detection, foreign object debris (FOD) detection, and runway marking analysis. This trial will derive value from the deployment of Unifly's Broadcast Location and Identification Platform (BLIP – a form of Remote ID) as well as the collection of rich data sets to inform the performance levels with each of their objectives. Data sets include registration/remote ID, flight preparation, surveillance/tracking, ground radar based Detect and Avoid (DAA), cellular data links, contingency management, flight/conflict management, and communications."[43]

Proposed BVLOS regulations (discussed below) will likely include the requirement for detect and avoid technology for all RPAs operated under certain conditions.

42 For more information, please visit Transport Canada's website, here.
43 For more information, please visit Transport Canada's website, here.

Counter-RPA technology

While technology that assists in the detection of RPAs is likely legal in Canada, the use of counter-RPA technology to disrupt or interfere with RPAs in flight is generally illegal. The three most common counter-RPA measures are jamming devices, software exploitation devices and physical disruption. All of these counter-RPA measures are illegal in Canada.

Jamming devices

Jamming devices operate by interfering with, or 'jamming', the radiofrequency between the controller and the RPA and/or the GPS function of the RPA that relays its location. If successful, jamming devices often render the RPA inoperative.

Sections 4(4) and 9(1)(b) of the *Radiocommunication Act* prohibit the use, possession, manufacturing, importing, distribution, leasing, offering for sale and sale of jamming devices in Canada. Individuals charged under these provisions can face a fine of up to CA$5,000 and/or imprisonment for up to one year. Corporations may face fines of CA$25,000, and in some cases, several millions of dollars per offence.

Though generally illegal for civilians, the RCMP may possess and operate jammers in specific circumstances. On July 2, 2019, an exemption order for RCMP officers entitled the Radiocommunication Act Exemption Order [Jammers – Royal Canadian Mounted Police came into force. Similar to the exemption that was previously in force since 2015, this exemption allows RCMP officers who are required, as part of their duties or training, to install, use, possess, manufacture or import a jammer for purposes like ensuring national security, public safety and the investigation of offences. Before use, RCMP officers must notify the Minister of Industry. Further, officers must maintain records of all usage and make every reasonable effort to limit the jammer's interference with other radio communications.

Software exploitation devices

Software exploitation devices target the RPA's software directly, and often allow the attacker to take control of the RPA and to obtain access to data from the RPA.

Section 342.1 and Section 342.2 of the *Criminal Code* prohibit counter-RPA technology that exploits the RPA's software. Under these sections, it is unlawful to intercept or cause an interception of any function of a computer system and to make, possess, sell, offer for sale, import, obtain for use, distribute or make available a device that is designed or adapted primarily to intercept any function of a computer system. RPAs and the associated equipment likely constitute a "computer system" for the purposes of these provisions, rendering these devices unlawful. Penalties under these sections range from summary conviction to an indictable offence with imprisonment of up to 10 years.

Physical disruption

Physical disruption devices include objects like lasers, nets and projectiles that are used to physically interfere with or intercept an RPA

While these devices are not expressly prohibited by regulation or statute, their use likely constitutes a trespass to the property of the RPA owner. There have yet to be a judicial decisions in Canada to confirm this interpretation. Further, it is unclear how a court would handle a case where an RPA conducted an unauthorized flight over private property and the property owner used a physical disruption method to interrupt the RPA's flight.

RPA operator qualification requirements

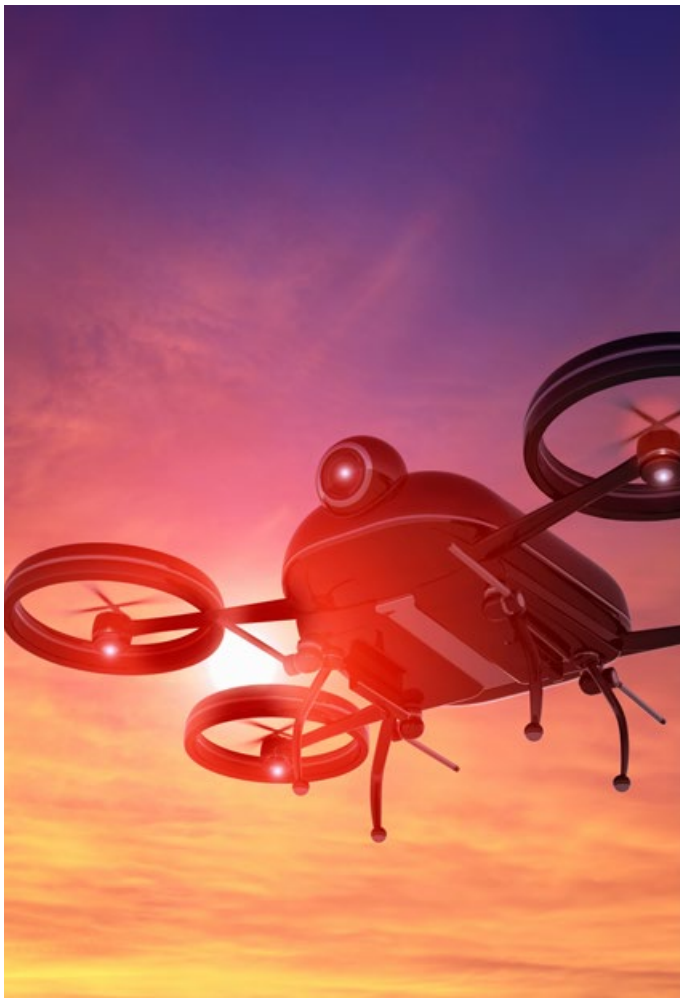
RPA weight	License requirement
Under 250 g	No license required
250 grams – 25 kg	Pilot Certificate-Basic Operations or Pilot Certificate-Advanced Operations is required
Over 25 kg	Special Permission from Transport Canada is required

In Canada, an RPA pilot certificate is required to operate an RPA. Two notable exemptions will allow for an RPA flight without an RPA pilot license. The first exemption is for RPAs that weigh less than 250 grams. RPAs that weigh less than 250 grams are commonly referred to as "micro RPAs", an example of such an RPA is a "DJI Mini."

At present, there are two different RPA pilot certificates. The first one is called "Pilot Certificate-Basic Operations", the second one is called "Pilot Certificate – Advanced Operations". Which certificate you will need depends on if you are conducting an advanced or basic operation. In addition to pilot certification, pilots are required to keep retained your knowledge whenever you fly. Standard 921.04 – Recency Requirements outlines acceptable activities, including: (a) attending a safety seminar endorsed by Transport Canada Civil Aviation; (b) completing a recurrent RPA training program; and (c) completing a self-paced study program endorsed by Transport Canada Civil Aviation.

Developments

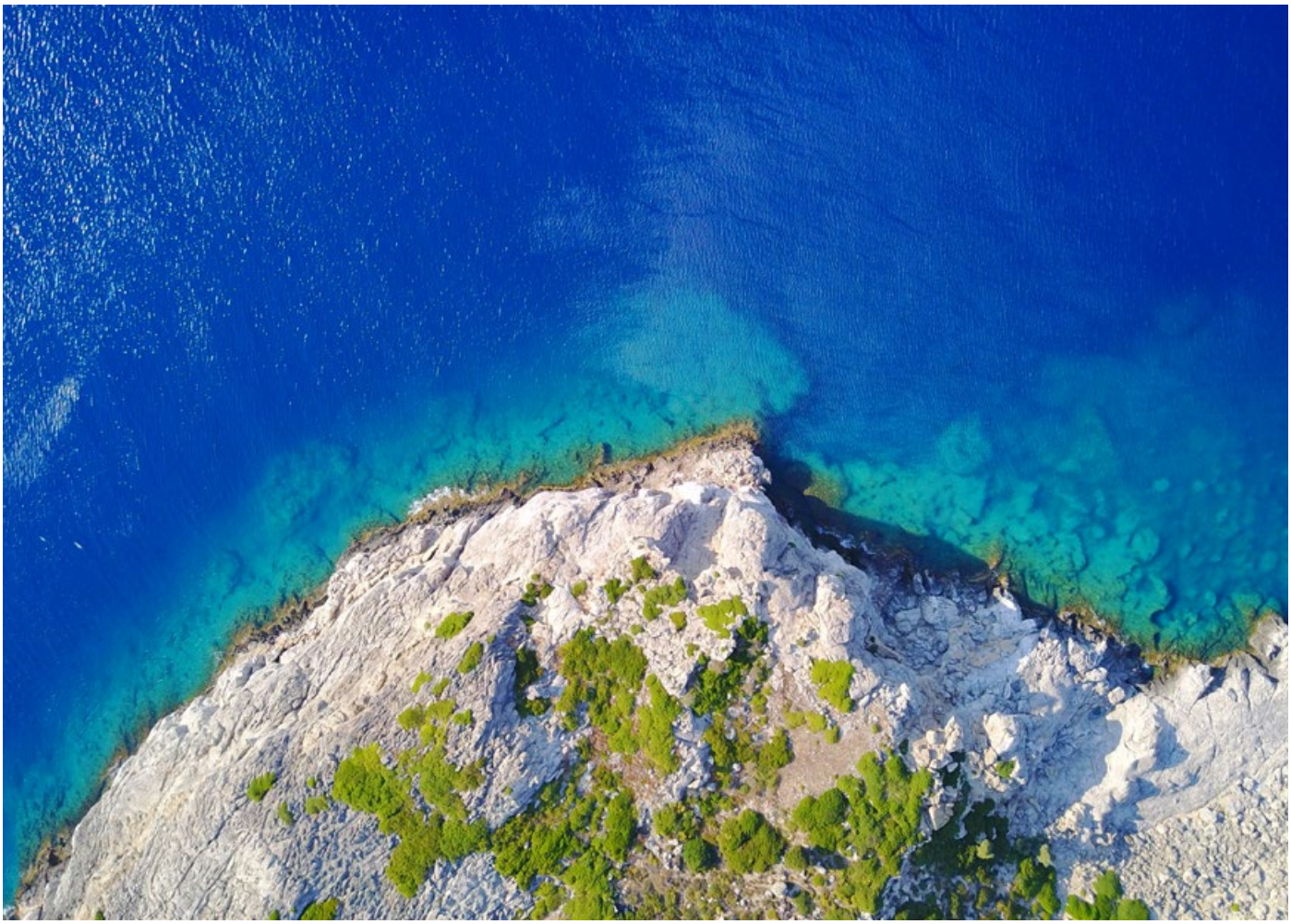
On April 23, 2020, Transport Canada took the first step towards making BVLOS operations a reality in Canada by releasing the Notice. The Notice is a foundational step in the Canadian Aviation Regulation Advisory Council process to solicit feedback about potential laws and regulations. The Notice proposes permitting lower risk BVLOS flights without the need for a SFOC, expanding permissible VLOS operations, requiring declarations of airworthiness for RPAs and changes to operational and pilot certifications. The Notice does not address more complex and high-risk BVLOS operations such as regular door-to-door package delivery in population centers and the carriage of passengers on board RPAS but are anticipated to be part of future amendments.



Under the proposed new regulations:

- **VLOS expansion**: VLOS regulations would be improved by expanding on permissible operations without getting an SFOC. Instead, the new procedures will be based on weight and four types of operating locations: basic or isolated environment, near people, over people and in controlled airspace.
- **Detect and avoid** (**DAA**): Transport Canada anticipates that DAA will be required in all BVLOS operations except for those operating in air risk "Class A" (isolated areas without traditional aircraft).
- **Remote identification**: Remote ID is an important factor for remote-traffic management and airport security. Transport Canada is assessing requirements and operational needs but no further detail has been provided, including whether and when Canada may see regulations relating to remote ID of RPAs. It remains to be seen whether Transport Canada will follow suit and implement their own regulations regarding remote ID of RPAs.
- **Mandatory Insurance**: Transport Canada is also proposing to require liability insurance in some cases. The Notice did not provide further detail but mandatory insurance was a topic discussed at length the VLOS regulations were released in 2019 (which **do not** require operators to carry insurance). For a discussion of the VLOS regulations that came into force in June 2019, please click here.

Transport Canada is expected to publish the new regulations in Canada Gazette, Part 1, by or sometime in 2022.



ICAO

Extending international aviation policy to RPAs

What is ICAO?

The International Civil Aviation Organization (ICAO) was formed by the Chicago Convention in 1944 by 193 national governments to support cooperation and standardization of policy in air transport.

It serves as the global forum for international civil aviation, maintaining an administrative and expert bureaucracy to research and develop new aviation policies and standards, undertaking compliance audits, performing studies and analyses, and providing assistance to member states.[44] It convenes panels, task forces, conferences and seminars to support these policy developments.

ICAO's burgeoning involvement in RPA policy - ICAO model regulations

With respect to unmanned aircraft systems, ICAO has developed a set of model regulations, model training and competency materials for operators, a toolkit for recreational and professional operators, and guidance on the use of UAS for the purposes of humanitarian aid. It reviewed the existing UAS regulations prepared by many states to identify commonalities and best practices consistent with the ICAO aviation framework which could be implemented across states. The ICAO Model UAS Regulations are intended to be a starting point for states without existing RPA regulations or to be used as a guide for states to bolster and improve upon their existing regulations.

The ICAO Model UAS Regulations, which can be found in their entirety in PDF form here, currently include three parts, which provide template language for states to use in creating regulations for different categories of operation and for the creation of approved aviation organizations certification:

"Open Category" – Part 101:

- All unmanned aircraft should be registered;
- UA weighing 25 kg or less and operating in Standard UA Operating Conditions (101.7) require no additional operational review; however, if the UA weighs more than 15 kg, the UA must be inspected and approved under 101.21 or 102.301.

"Specific Category" – Part 102:

- Addresses all UA operations using UA that weigh more than 25 kg or those weighing 25 kg or less but do not adhere to Part 101 requirements;
- Enables on-going operations or one-time events through certification; and
- Enables a more expeditious review when manufacturers declare a type or model of UA as being sufficiently tested for a specific operational category or that has received an approval through an Approved Aviation Organization.

Approved Aviation Organizations Certification – Part 149:

- Promotes the use of an Approved Aviation Organization to serve as a designee authorized by the civil aviation authority to perform specific tasks. Once the organization has been certified, the authorized tasks (remote pilot licensing, UA inspection, UA approval, etc.) may provide more expeditious processing and may reduce the workload for CAA Inspectors.

The ICAO has also prepared advisory circulars which clarify and expand on particular sections of the model UAS regulations, including the carriage of dangerous goods using UAS, and RPAS safety assurance.

Manufacturing standards

ICAO advisory circular 922-001 provides a model of performance based criteria for UAS manufacturing standards based on the standards set by Transport Canada. This document lays out criteria for system design and description, aircraft serviceability, payloads and command and control data link, among other things. It also sets out methods for demonstrating compliance on the part of the manufacturer, as well as specific guidelines for modifications.

44 www.icao.int/about-icao/Pages/default.aspx

Training and educational recommendations

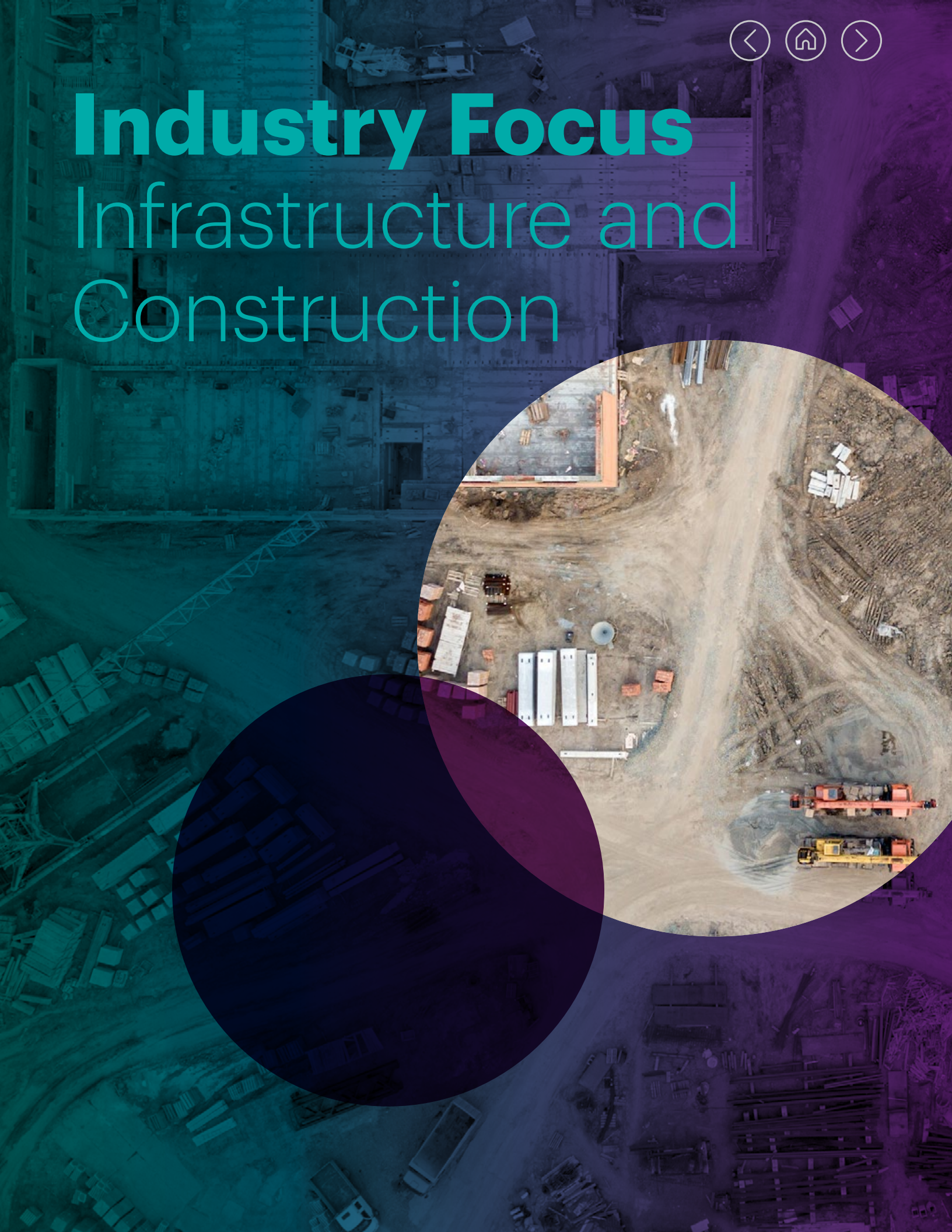
The foundation of the ICAO's training and education recommendations is the Remotely Piloted Aircraft Systems (RPAS) Manual. The manual provides guidance on the technical and operational issues applicable to the integration of RPA into non-segregated airspace and at aerodromes. The primary focus of the RPAS manual addresses international IFR operations of RPA versus the operation of smaller and likely non-certified RPAs. The manual also provides recommendations on training of certifying authority personnel, minimum ages for remote pilots, competencies and training objectives for pilot training programs, practical skills and tests for remote pilots, and medical and licensing standards.

ICAO's role in the future of the RPAS industry

Given the continued integration of RPAs into airspace, and the potential for travel by RPAs across international borders, we expect that the need for harmonization and the role for international organizations like ICAO to continue promoting best practices and pioneering thought leadership will intensify.

To assist governments, civil aviation authorities and other organizations, ICAO has developed an Implementation Package (termed an "iPack") for establishing a regulatory framework for RPAS. Access ICAO's iPack here.

Industry Focus
Infrastructure and Construction



RPAs are workhorses in infrastructure inspection and construction.

From monitoring development of new buildings to inspecting aging infrastructure, RPAs can be easily launched to gather information in locations where traditional methods are difficult or dangerous. Real-time data on construction sites and development projects forwards cost-efficiency objectives shared by both the private and public sectors. Additionally, RPAs will facilitate the move toward a 5G network by assisting in network building and detecting dead spots. In turn, a 5G network will enable thousands of RPAs to operate simultaneously, offer faster connection speeds and allow RPAs to fly over greater distances uninterrupted by network changes.

Existing regulations in most countries permit all manner of infrastructure and construction inspection by RPAs. Managing construction project progress (and measuring progress on KPI) are facilitated by using RPAs.

Pipeline, wind farm, hazardous waste and power plant inspections can be completed most efficiently and safely by employing an RPA to gather the necessary data. Proper safety equipment must be outfitted on the RPA and the necessary government and regulatory approvals must be obtained.

As more RPAs take to the skies around construction sites and critical infrastructure, the liability risks similarly increase. Advising companies on the necessary steps to manage these risks is a core function of Dentons' RPA regulatory team. In addition, legal experts in a wide array of other areas are necessary when navigating the complex regulatory world engaged when flying RPAs around construction sites and critical infrastructure. Ensuring the opportunities presented by RPAs are capitalized upon while the risks are managed is a key function of our a multi-disciplinary team of lawyers across the gamut of regulatory practice areas, including energy regulation, aviation and RPA regulatory, intellectual property, and communications.

European Union (France)

Overview

As of January 1, 2021, national regulations in European countries relating to RPAs have largely been replaced by European regulations[45] (the EU Regulations). EU Regulations aim at simplifying and standardizing the rules for all EU countries in order to "encourage the development of the RPA business in Europe." The responses in this section will focus on France by providing insight into the transition from French national regulations to the EU Regulations.

While French national regulations distinguished between recreational activities and professional activities, EU Regulations no longer make this distinction and base their requirements solely on the risk levels of the operations, regardless of any commercial consideration of the operation.

EU Regulations create three categories:

Category	Risk
Open	The Open category for low-risk operations (line-of-sight flying in geographical areas that represent a low risk to air traffic and people).
Specific	The Specific category for moderate risk operations (line-of-sight or out-of-sight flight in conditions that are not compliant with the "open" category).
Certified	The Certified category for high-risk operations requiring a high level of reliability of the aircraft and operations (e.g. transport of people, dangerous goods, etc.).

Recreational activity is mainly included in the Open category; professional activity usually corresponds to the Specific category.

French regulations that are applicable relate to matters governed by national authorities (safety or use of French airspace) and to the organization of a smooth transition to comply with EU Regulations (transition period until January 1, 2023).

VLOS and BVLOS regulations

Government agencies with jurisdiction over RPAs	Region this agency covers (e.g entire jurisdiction or province/ state.)	Role of the agency
Parent direction: Directorate-General for Civil Aviation (DGAC)	All of France	DGAC is a department of the Ministry of Ecological Transition, which groups together all the State services **responsible for regulating and supervising air safety, air transport and civil aviation activities in general**. In particular, DGAC is responsible for various missions relating to civil aviation, such as: • Air traffic control; • Support for research and development in the field of aeronautical construction; and • Certification of aircraft.
Directorate attached to the DGAC: Directorate of Civil Aviation Safety (DSAC)	All of France	DSAC is a service within the DGCA. DSAG is the French authority responsible for oversight and certification in the field of civil aviation.

DGAC and DSAC are responsible for regulating RPA activities on the French national territory.

45 Commission Implementing Regulation (EU) 2019/947 of 24 May 2019 ; Commission Implementing Regulation (EU) 2019/945 of 12 March 2019

To do so, they rely on EU regulations but also on French texts still in force concerning among others: matriculation[46], use of remotely piloted aircraft[47], registration of aircraft[48], requirements applicable to remote pilots[49].

Focus on VLOS

Open category RPAs covered by the EU Regulations are those with a particular focus on VLOS.

EU Regulations for the Open category require RPAs to have a CE marking accompanied by an indication of their class, noted from C0 to C4. The class depends on technical characteristics such as mass or speed. In simple terms, the requirements are higher for heavier RPAs or ones operating closer to people. From January 1, 2023, all RPAs marketed will have to include an indication of their class; without such an indication, RPAs will no longer be sold in Europe (with one exception for privately manufactured RPAs). French regulations provide for transitional measures (until January 1, 2023) for RPAs without any indication of class.

The Open category includes subcategories A1, A2 and A3, which may allow, in some cases, overflight of people (but never of gatherings of people):

Subcategory	Class	Overflight of people
A1	C0, C1	• Tolerated for C0 (<250g) • Yes if unintentional for C1 (max 400g)
A2	C2	• Overflight is forbidden • Flight at 5m from people with low speed mode • Flight at 30m from people otherwise
A3	C2, C3, C4	• Forbidden

EU Regulations for the Open category provide notably that:

- The pilot is held responsible for the safety of the flight;
- One must register to obtain a "UAS operator number" to fly an RPA weighing more than 250 g or equipped with a camera. In France, registration takes place on line and for free (AlphaTango website[50]);
- A mandatory online training course is required to operate an aircraft weighing more than 250 g (validated by passing an exam);
- The maximum flight height is 120 metres (except for certain model aircraft clubs);
- It is forbidden to fly over a gathering of people;
- It is necessary to fly in direct view of the pilot;
- In the case of immersion flights, the pilot must be assisted by an observer (who must keep the aircraft in direct view);
- It is forbidden to transport dangerous materials; and
- Flying in the vicinity of emergency services is prohibited.

If the above conditions are not met, the RPA cannot be identified in the Open category and will fall in the Specific category

In addition, French regulations contains specific requirements such as:

- Minimum age of 14 to operate an RPA;
- Only daytime flight is allowed;
- It is forbidden to drop a load;
- RPAs weighing more than 800 g must be equipped with an electronic reporting system;
- Flying over public areas in urban areas is forbidden (authorized over private areas with the agreement of the occupant);

46 Decree no. 2019-247 of March 27, 2019 and order of July 28, 2015n°2018
47 Order of December 3, 2020
48 Decree no. 2018-882 of October 11, 2018 and order of October 19, 2018
49 Order of December 3, 2020
50 https://www.ecologie.gouv.fr/sites/default/files/Guide_categorie_Ouverte.pdf (p.12) and https://fox-alphatango.aviation-civile.gouv.fr/

- Some areas are forbidden to fly or limited in height and aerial photographs are sometimes forbidden (e.g. prisons, nuclear power plants, military zones, airports and airfields;
- Aerial photography in the visible spectrum is subject to declaration and aerial photography in the invisible spectrum is subject to authorization; and
- To operate an RPA weighing more than 800 g, it is necessary to register it on the Alpha Tango website (in addition of identification UAS imposed by EU Regulation).

Focus on BVLOS

In general, any operation that does not meet the requirements of the Open category falls into the Specific or Certified category.

French regulations require registration on the Alpha Tango website when operating within the Specific or Certified categories. The operator of a Specific category RPA must also have an operations manual (MANEX) which describes, among other things, its organization, operational and aircraft maintenance procedures, training, evaluation and maintenance programs for remote pilots. Prior to the implementation of the European regulation, operators performing specific activities were required to have, maintain and enforce a Manual of Particular Activities (MAP). This requirement has been replaced in the European regulations by an equivalent obligation to hold, update and apply an Operations Manual (MANEX) "when the risk and complexity of the operation so require". The DSAC considers that in the Specific category, the drafting of a MANEX is necessary. In France, operating a Specific or Certified category RPA requires prior declaration or authorization by the DSAC depending on the operating conditions[51].

Operation subject to declaration in France

The RPA is operating according to one of the national standard scenario (S1, S2 or S3).

National standard scenario	Operation
S1	Use outside populated areas, without overflight of third parties, operation in sight and at a maximum horizontal distance of 200 m from the pilot.
S2	Use outside populated areas, without third parties on the ground in the area of evolution, not meeting the criteria of scenario S1, at a maximum horizontal distance of one km from the pilot.
S3	Use in populated areas, without overflight of third parties, operating in direct view and at a maximum horizontal distance of 100 m from the pilot.

As of December 2, 2021, it will be possible for an operator to declare itself according to one of the European standard scenarios STS-01 or STS-02. From this date, no new declaration can be made according to the national standard scenarios.

The RPA is operating according to a European standard scenario STS-01 or STS-02 (entry into force: December 2, 2021).

Scenario	Operations
STS-01	Covers operations in direct view (VLOS) at a maximum height of 120 m above a controlled area on the ground in a populated environment.
STS-02	Covers beyond visual line of sight ("BVLOS") operations at a maximum height of 120 m above a controlled area on the ground in a low population density environment. It can be operated at a maximum of 1 km from the pilot; this distance may be increased to 2 km if an observer is present.

51 https://www.ecologie.gouv.fr/sites/default/files/Guide_categorie_Specifique_0.pdf

A Light UAS Operator Certificate (LUC) is an organizational approval certificate that can be used by RPA operators to have their organization assessment by the National Aviation Authority.[52].

Operations subject to authorization in France:

Any operation outside the standard scenarios described above requires an operating authorization issued by the DSAC after assessing the risk analysis submitted by the applicant and in accordance with the Specific Operations Risk Assessment (SORA) method defined in the "Acceptable Means of Compliance" proposed by the European Aviation Safety Agency (EASA).

The operator must provide a statement confirming that the proposed operation complies with applicable EU and national rules, including privacy, data protection, liability, insurance, safety and environmental protection.

Liability

Civil liability

For the Open category in France, the DGAC[53] recommends that pilots check the conditions under which their activity is insured, by civil liability contract (e.g. multi-risk contract for the home) or by specific insurance.

For all categories, the remote pilot of an RPA may be found liable, under the *French Civil Code*, for damage caused to other aircraft and is automatically liable for damage caused to persons and property.[54]

Criminal liability

For all categories of RPAs:

The use an RPAunder conditions that do not comply with the rules enacted to ensure safety is punishable pursuant to French law by one year's imprisonment and a fine of 75,000 euros[55].

In addition, it is punishable by six months imprisonment and a fine of 15,000 euros for a remote pilot to fly an RPA, by clumsiness or negligence, over an area of French territory in violation of a flight ban. Penalties are increased to one year of imprisonment and 45,000 euros of fine in case of voluntary overflight or refusal to comply with the injunctions of the administrative authority[56].

RPAs between 800 g and 25 kg

Even though the EU Regulations are in force, liability can still accrue to RPA operators under the European country's national laws. The *French Civil Aviation Code*[57] code provides for a series of sanctions:

- The use of a civilian RPA without having undergone training is punishable by a fine of 450 euros;[58]
- The use of a professional RPA without having undergone training is punishable by a fine of 750 euros;[59]

52 The requirements are defined in Part C of Regulation (EU) 2019/947 (p.35)
53 DGCA, Guide: simplified recreational and professional use of aircraft without crew on board, Open category, ed.1, version 1.2, 26 March 2021, p.51.
54 Articles L. 6131-1 and L. 6131-2 of the Transportation Code
55 Article L. 6232-4 of the Transportation Code
56 Article L.6232-2, L.6232-12 and L.6232-13 of the Transportation Code
57 Articles R.151-2 and R.151-3 of the Civil Aviation Code
58 Article R.151-2, I of the Civil Aviation Code
59 Article R.151-2, II of the Civil Aviation Code

- The use of an RPA (civil or professional) without being able to immediately present the documents authorising it to the State agents is punishable by a fine of 38 euros;[60]
- The use of an unregistered RPA is punishable by a fine of 750 euros;[61]
- Providing false information on the identity or address of the owner of the RPA (or failing to update this information) when registering is punishable by a fine of 750 euros;[62]
- The use of an RPA (civil or professional) without being able to immediately present the documents attesting to its registration to the agents of the State is punishable by a fine of 38 euros; and[63]
- The use of an RPA (civil or professional) without affixing its registration number is punishable by a fine of 750 euros.[64]

Data privacy and security

The right to privacy and personal data protection is considered a fundamental right in Europe. Privacy laws are generally specific to each European country, however, there are some common principles that apply throughout the EU.

In France, RPA use must respect privacy.

The persons present when using RPAs must at least be informed if the aircraft is equipped with a camera or any other sensor likely to record personal data allowing their identification.

The capture, transmission, modification or consultation – relating to the image of recognizable persons constitutes processing of personal data within the meaning of GDPR regulation[65].

Any dissemination of images that allow people to be recognized or identified (e.g. faces, number plates, etc.) must be authorized by the persons concerned or by the owner in the case of a private space (house, garden, etc.) and this dissemination must respect people's rights to image, privacy and private property in application of law of 6 January 1978 known as the *Informatique et Libertés* law.

Data processing

The processing of data must be governed by a legislative or regulatory provision. If the processing relates to sensitive data, it must also be authorized by a decree.

For example, on 12 January 2021, the French national regulation authority (CNIL – *Commission Nationale Informatique et Libertés*) sanctioned the Ministry of the Interior for having illegally used RPAs equipped with cameras, notably to monitor compliance with lock-down measures, as no legal framework had been put in place to do so.

This decision is in line with two recent French judicial decisions where, in the context of the Covid-19 crisis and protests, the French administrative supreme court enjoined the State to cease surveillance measures by RPA as no legal framework was in place.

Violating the privacy and personal data protection is punishable, pursuant to French regulations, by one year of imprisonment and a fine of 45,000 euros.

60 Article R.151-2, III of the Civil Aviation Code
61 Article R.151-3, I of the Civil Aviation Code
62 Article R. 151-3, II of the Civil Aviation Code
63 Article R.151-3, III of the Civil Aviation Code
64 Article R.151-3, IV of the Civil Aviation Code
65 Article 4.2 of the General Data Protection Regulation (EU) 2016/679 of 27 April 2016 (GDPR).

Unmanned traffic management (UTM)

UTM is recognized as a key enabler to ensure the safe and efficient integration of unmanned vehicles in the airspace. UTM is a project that the European Union is approaching as a whole. It is a management ecosystem that brings together several government agencies, particularly American ones, such as the FAA and NASA, as well as industry.

However, the French authorities have not put in place legislation to regulate the management of 'unmanned traffic', but the DSNA (*Direction des services de la navigation aérienne*) and IATA (International Air Transport Association) strategic plan for the modernisation of air traffic management foresees the integration of a future plan by 2030.

This plan aims to create a traffic management system to facilitate the expansion of the RPA sector in a safe and efficient manner while maintaining the resilience of conventional forms of aviation.

The plan states that: "DSNA is currently working with the SESAR programme on the scope and functionality of an initial UTM system for France that is in line with the European plan for RPAS integration. The DSNA is also deploying a prototype surveillance system at Paris Charles de Gaulle Airport with the objective of validating the concept of operations adapted to ensure both smooth RPA operations in a complex airport environment and continuity of operations at a major airport in the face of potential uncooperative RPAs".

It is essential to put in place an efficient traffic management system for unmanned aircraft that could also interact with manned air vehicles. In a real-world operational environment, the EU-funded PODIUM (Proving Operations of RPAs with Initial UTM Management) project is demonstrating an online, integrated, and comprehensive UTM solution at five sites in three countries.

The trials consisted of very low altitude operations in rural and urban areas, near airports, in uncontrolled and controlled airspace, and in mixed environments with manned aviation.

For their part, the French Agency for Transport Innovation and the French Agency for Defense Innovation have launched the "U-Space Together" call for projects, which aims to conduct very large-scale experiments on solutions for air traffic management services for drones, at very low altitudes, in almost the entire territory of metropolitan France.

Counter-RPA technology

In France, the purchase and use of jamming technologies are only intended for the needs of public order, defense and national security, or the public service of justice[66]. Electronic countermeasures are subject to restrictions on use and export. They are strictly reserved for military use and intended for the exclusive use of law enforcement authorities.

However, faced with illegal overflights, many companies have started to develop more daring devices to detect and neutralize RPAs. For example the French Defense Procurement Agency (Direction Générale de l'Armement) has launched a call for information[67] to expand its anti-RPA capabilities in 2021/2022.

RPA operator qualification requirements

Category	Requirements
Open Category in France	• Registration as "UAS operator" is mandatory to fly an RPA weighing more than 250 g or RPAs equipped with a camera; • Additional registration is mandatory to operate an RPA weighing more than 800 g, • Pilot must pass the mandatory online exam (5 years validity) for the Open category when operating an RPA weighing more than 250 g; • For RPAs of the A2 subcategory, a self-training and a complementary exam are required (issuance of a certificate by the DGAC).
Specific/Certified category in France	• Prior declaration or authorization is required, depending on the operating conditions; • To operate under one of the recognized scenario, pilot must obtain a certificate issued by the DGAC; • To operate under the authorization regime, training is defined on a case by case basis by the DGAC.

Developments

The Commission wishes to adopt a "Drones 2.0 strategy" by 2022, which aims to ensure that drones contribute, through digitization and automation, to a new offer of sustainable services and transport, while taking into account possible civil/military technological synergies. The Commission has already opened a public consultation on this project, which will end on 31 December 2021.

On a national scale, however, we do not project any changes in the near future given the fact that there is no upcoming reform in France until December 31, 2022.

66 Article L33-3-1 of the code of posts and electronic communications
67 Appel à projets : « Drone intercepteur de drone » (defense.gouv.fr)

JARUS

A path toward global RPAS regulations

What is JARUS?

The Joint Authorities for Rulemaking on Unmanned Systems (JARUS) is an international expert group specifically focused on the RPAS sector. JARUS is comprised of 63 member countries who contribute experts for the development of its publications. The European Aviation Safety Agency (EASA) and EUROCONTROL, who also contribute to the development of JARUS work products.

JARUS is structured into four working groups: (i) operation, organization and personnel, (ii) airworthiness, (iii) safety and risk management, and (iv) automation concept of operation. These working groups consult with stakeholders and produce publications aimed at providing guidance, model regulation and standards, and recommendations to national aviation authorities. These reports are subject to comment through internal and external consultation before being finally published.

JARUS' mandate on RPAS pegulations

Similar to the ICAO, JARUS focuses largely on the harmonization of regulations across national aviation authorities. JARUS aims "to recommend a single set of technical, safety and operational requirements for all aspects linked to the safe operation of the Unmanned Aircraft Systems (UAS)." According to JARUS, "this requires review and consideration of existing regulations and other material applicable to manned aircraft, the analysis of the specific tasks linked to RPAS and the drafting of material to cover the unique features of UAS".

Stakeholder Consultation Body

As part of its external consultation process, JARUS works with its stakeholder consultation body (SCB). The SCB is self-governing association of aviation industry organizations, established to provide expertise and advice to support the JARUS Work Program, JARUS Working Groups, and deliverables. SCB representatives and alternates represent communities of interest and represent all sectors of the aviation industry. The SCB acts as a forum to promote stakeholder interests and a platform to facilitate the creation of balanced deliverables.

JARUS publications

JARUS publishes a variety of guidance materials that have informed the regulatory framework adopted by nations around the globe. These publications include:

SORA (Package) and Standard Scenarios – recommends a risk assessment methodology to establish a sufficient level of confidence that a specific operation can be conducted safely.

GM to JARUS recommendation UAS RPC CAT A and CAT B – provides JARUS guidance material on the qualification for an entity that a competent authority may recognise as a provider for theoretical knowledge examination and practical skill assessment.

CS-UAS – aims at providing recommendations for States to use for their own national legislation, concerning "Certification Specification for Unmanned Aircraft Systems."

UAS RPC CAT A and CAT B – provides recommendations to competent authorities (national authorities or Regional Safety Oversight Organisations) to use their own national legislation, concerning uniform remote pilot competency for operations in the Open Category and Specific Category.

AMC RPAS 1309 (package) – Document developed as an integral part of a type-certification process. It is a means of compliance for RPAS to a 1309 airworthiness requirement modeled from the US Federal Aviation Regulations.

Korea

Overview

From 1961 until 2017, Korea's aviation industry was managed under a single legislative act, the *Aviation Act*. But incorporating all aviation-related laws into a single piece of legislation made adapting to the activities of the fast-evolving aviation industry challenging. Recognizing this, in 2017 the Aviation Act was divided into *the Aviation Safety Act* (the Act), *the Aviation Business Act,* and *the Airport Facilities Act*.

Like many other jurisdictions, increasing use of RPAs by civilians and in business applications has presented South Korea with growing regulatory challenges. Legislative regulation of RPAs was first implemented in Korea by the amendment of the *Act* in 2012. But recognizing that the regulations were lagging behind advances in the RPA industry, changes to regulations governing RPA use have occurred since that time. Recent developments include the initiation of various RPA-related projects and a shift toward stricter regulations by Korean government agencies.

The *Act* required a user/pilot to assess the empty weight (excluding fuel weight but including battery weight) of the RPA and the commercial nature of its use to determine whether the RPA and the pilot were subject to additional regulatory requirements. Under the then-existing rules, a non-commercial unmanned powered aerial vehicle with an empty weight of 12 kilograms or less (referred to as an Ultra-light Vehicle in the Act) was subject to almost no regulation. The pilot of an Ultra-light Vehicle was not required to i) register the RPA, ii) obtain an RPA pilot license, or iii) subscribe to any insurance coverage.

That has now changed. New enforcement rules have been added to the *Act*. These rules, implemented on January 1, 2021, demonstrate the government's intention to tighten the requirements for operating RPAs. The weight requirement is now assessed based on the RPA's maximum takeoff weight. A non-commercial user with an RPA weighing between 250 grams to 2 kilograms must register the RPA and complete an online course, and a non-commercial user with an RPA weighing more than 2 kilograms is required to obtain an RPA pilot license. For a commercial user, the user license requirements are the same as non-commercial users but all RPAs must be registered regardless of its weight. Such a shift toward more stringent requirements naturally has increased the variety of compliance mechanisms and requirements for approvals.

Additionally, as part of an effort to tighten regulations, the Korean government recognized the need for a more centralized approach to regulate and support RPA technology development. In 2019, the *Act on Promotion of Utilization of Drones and Creation of Infrastructure* was enacted (the *Drone Act*), to go into effect in May 2020. The *Drone Act* requires the government to establish and renew a five-year master plan aimed at developing the RPA industry. Since the *Drone Act* came into force in May 2020, funding of US $33.7 million has been allocated to promote the development of RPA technologies[68]. In November 2020, the Ministry of Public Administration and Security signed a business agreement with seven partnering public and private institutions to create a RPA-based emergency response system[69], and in February 2021, the Ministry of Land, Infrastructure, and Transport designated 33 areas as deregulated zones for RPA technology development[70].

It is also important to understand that because South Korea technically is still at war with North Korea, albeit under a ceasefire, additional regulatory complexity exists stemming from the fact that many defense sites, scattered throughout the country, are restricted from use by civilians. To clarify the conditions of use, government agencies began implementing simpler and faster methods for granting licenses and approvals for RPA use. The Ministry of Land, Infrastructure, and Transport created an app named Ready to Fly, which shows all the restricted areas and conditions of flight. The Ministry of National Defense launched a website simplifying the process for obtaining an authorization to conduct aerial photography.

68 https://english.etnews.com/20201218200003
69 http://www.safetimes.co.kr/news/articleView.html?idxno=88047
70 https://www.yna.co.kr/view/AKR20210210029700530?input=1195m

VLOS and BVLOS regulations

Government agencies with jurisdiction over RPAs	Region this agency covers (e.g entire jurisdiction or province/state)	Role of the agency
Korea Transportation Safety Authority	All South Korea	Device registration Issues pilot licenses
Regional Offices of Aviation	Provinces	Registration of aviation business licenses Approval of flights
Korean Institute of Aviation Safety Technology	All South Korea	Issues safety certifications (only required for RPAs weighing more than 25 kg)
Ministry of National Defense	All South Korea	Approves flights Approves aerial photography

Regulatory oversight via the RPA laws in Korea can be largely differentiated into two categories – those regulations that apply before a flight occurs and those that apply during a flight.

Before flying an RPA, the pilot must weigh the RPA and determine whether the RPA is subject to registration. If the maximum takeoff weight of a non-commercial RPA is above 250 grams (all commercial RPAs must be registered regardless of their weight) it must be registered at the Korea Transportation Safety Authority (the KTSA). Once the RPA is registered, the KTSA will issue an identification sticker that must always be placed and appear on the RPA. During or after the registration, the pilot will also need to obtain a relevant pilot license at the KTSA. The type of license required depends on the takeoff weight of the RPA. Heavier RPAs require passing written and practical exams, as well as more extensive flight practice hours, under the supervision of a recognized teaching institution.

Registration of an RPA, placing the identification marker, and obtaining the necessary pilot license allows a user to fly the RPA. However, before flying the RPA, the pilot must confirm that he/she will not be flying within a no-fly zone. As mentioned above, information concerning unauthorized or restricted fly zones may be obtained by downloading the Ready to Fly app or the same information can be obtained through a regional office of aviation. Regardless of the area in which the RPA is flown, if a pilot wishes to fly an RPA that weighs more than 25 kilograms, the pilot must obtain i) an approval from the applicable regional office of aviation, and ii) a safety certification from the Korean Institute of Aviation Safety Technology.

After complying with all of the aforementioned requirements, the pilot is permitted to fly the RPA. However, pursuant to Article 298 of the latest enforcement rules of the Aviation Safety Act, the pilot must ensure that the RPA remains within the pilot's visual line of sight at all times (during daylight) and the RPA must not fly near a densely populated area. If a pilot wishes to take pictures or record videos while flying an RPA, the pilot must obtain a permit from the Ministry of National Defence. In recent years, the process of obtaining approval to engage in RPA photography has become easier. There is now an online approval website and an applicant is more likely to succeed in obtaining approval as regulators have become more comfortable with RPAs being used for this purpose.

Liability

Criminal and civil liability

Criminal and civil liability associated with flying RPAs is mainly addressed by the *Aviation Safety Act* and the *Aviation Business Act*. The maximum criminal liability that may be imposed on an RPA pilot is imprisonment up to three years or a fine not exceeding KRW 30 million (US $26,400), and the maximum administrative penalty is an administrative fine not exceeding KRW 5 million (US $4,400).

If an individual decides to make illegal video records or photographs while piloting an RPA, possible sanctions may extend further, but under different regulatory regimes. For example, there have been increasing reports of individuals illegally recording and/or photographing others in their homes. Such criminal activity is dealt with under the *Personal Information Protection Act* and the Act on Special Cases Concerning the Punishment, etc. of Sexual Crimes. A person found guilty of breaching such laws may be imprisoned for up to 7 years or a fine not exceeding KRW 30 million (US $26,400).

Non-compliance with specific regulations/laws

Articles 131 and 161 of the *Aviation Safety Act*: Anyone who operates a drone while under the influence of alcohol or drugs is subject to imprisonment with labor for up to three years or a fine not exceeding KRW 30 million (US $26,400).

Articles 122 and 161(3) of the *Aviation Safety Act*: A person who fails to satisfy drone registration and filing requirements is subject to imprisonment with labor for up to six months or a fine not exceeding KRW 5 million (US $4,400).

Articles 48 and 78 of the *Aviation Business Act*: A person operating a commercial drone business (e.g. spraying pesticide or taking photographs by using a drone) without registration is subject to imprisonment with labor for up to one year or a fine not exceeding KRW 10 million (US $8,800).

Articles 71 and 80 of the *Aviation Business Act*: A person using an unregistered drone for commercial purposes is subject to imprisonment with labor for up to six months or a fine not exceeding KRW 5 million (US $4,400).

Articles 127 and 161 of the *Aviation Safety Act*: A person operating a drone within restricted airspace, without obtaining approval from the regional office of aviation and the Ministry of National Defense, is subject to a fine not exceeding KRW 2 million (US $1,760).

Articles 129 and 166 of the *Aviation Safety Act*: A person operating a drone without observing matters prescribed by the Ordinance of the Ministry of Land Infrastructure and Transport is subject to an administrative fine not exceeding KRW 2 million (US $1,760). This could include:

- Flying over a densely populated area;
- Flying within a no-fly zone; or
- Flying after sunset.

Articles 124 and 166 of the *Aviation Safety Act*: A person operating a drone without obtaining the required safety certification is subject to an administrative fine not exceeding KRW 5 million (US $4,400).

Articles 125 and 166 of the *Aviation Safety Act*: A person operating a drone without obtaining the required pilot license is subject to an administrative fine not exceeding KRW 3 million (US $2,600).

Articles 70 and 84 of the *Aviation Business Act*: A person operating a drone without subscribing to required insurance is subject to an administrative fine not exceeding KRW 5 million (US $4,400).

KOREA

Data privacy and security

Data privacy and security in Korea generally are regulated by the *Personal Information Protection Act* (the PIPA), and location information is regulated by the Act on the Protection, Use, etc., of Location Information. Unfortunately, privacy and security laws specifically related to RPAs have not been introduced yet, and the absence of specific RPA laws related to data privacy and security has potentially left civilians exposed to blind spots in the law or at least ignorant of laws that might relate to them.

Article 25 of the *PIPA* provides that "no one shall install and operate any visual data processing device so as to look into places which are likely to noticeably threaten individual privacy [...]," and Article 2 of the same *Act* provides "personal information includes information that identifies a particular individual by his or her [...] image." Article 44 and Article 45 of the *Act on Promotion of Information and Communications Network Utilization and Information Protection* (the "*Information Protection Act*") provides that, "No user may circulate any information violative of other person's rights, including invasion of privacy and defamation, through an information and communications network" and a "person who manufacturers or imports devices that connect to the information and communication network shall take protective measures to secure the reliability of the information and security of the information and communications networks."

Pursuant to Article 25 and Article 2 of *PIPA*, all photographs and recordings taken by RPAs that show any individual's face or identifying characteristics could be in breach of the regulation and, pursuant to Article 44 and Article 45 of the *Information Protection Act*, distribution of such photographs or videos could also be prohibited. However, Article 2(7) of the *PIPA* provides that the term "visual data processing devices means [...] devices continuously installed at a certain place to take pictures of persons or images of things" and RPAs do not fall within this definition because RPAs are not continuously installed at a certain place. Therefore, an individual's privacy and security are not protected against any misuse of RPAs and cameras.
An individual would have to bring a claim under the breach of individual publicity/portrait rights (*Cho-sang Kwon*). It is generally understood

that Article 17 (*the right and freedom to privacy*) of the Korean Constitution guarantees an individual's portrait right. However, inconsistent case precedents on portrait rights add confusion and uncertainty.

Further, from an RPA pilot's perspective, confidently adhering to the current Korean rules and regulations presents a host of challenges. Practically, to avoid violations, a pilot will require at least some understanding of rules related to statutes like the *PIPA*, the *Act on the Protection*, Use, etc. of Location Information, the *Aviation Safety Act*, and *Protection of Military Bases and Installations Act*. This increased probability of innocent or negligent breach of the law and the uncertainty created by blind spots in the regulations has made enforcement and commercial viability more difficult.

Unmanned traffic management

Korea has seen steps taken by the government and in the private sector to develop a UTM system and RPA use BVLOS.

For example, in April 2017, the Korea Institute of Aviation Safety Technology (KIAST), a government agency created under the Ministry of Land, Infrastructure, and Transportation to research and develop aviation technologies, implemented a 5-year project to develop a UAS (unmanned aircraft system) Traffic Management system[71]. The UAS Traffic Management project aims to design and establish a low altitude unmanned aerial vehicle traffic management system that supports safe and efficient operation of unmanned aerial vehicles. This project, which is scheduled to continue until the end of 2021, is conducted in conjunction with various other private companies and national institutions, such as Korean Telecom, Metabuild Co., Ltd., Uconsystem Inc, Davo E&C, BluezenDrone Co., Ltd., Seoul National University, Korean Aerospace University, Korea Advanced Institute of Science and Technology, and Korea Aerospace Research Institute. In addition to the UAS Traffic Management project, KIAST has set up a support hub for RPA businesses to promote and nurture the domestic RPA industry. KIAST provides labs, test sites, office space, marketing, and funding for RPA-related start-ups[72].

On November 5, 2020, the Ministry of Public Administration and Security signed a business agreement with seven partnering entities and institutions[73] (Seongnam City, Seongnam Fire Station, Bundang Fire Station, 55th Division of the Korean Army, Sujeon Police Station, Jungwon Police Station, and SK Telecom) to create an emergency RPA-based multi-control system. The system aims to deploy RPAs to emergency sites to provide real-time accurate information and reduce the average emergency response time. A fund of US $443,000 has been dedicated to this project, and completion is expected to be around December 2021. There has been no further news or development information reported on this project.

On December 17, 2020, the Ministry of Science and ICT announced that a five-year fund of US $33.7 million has been designated for the development of RPA-related technologies, such as counter-RPA technology, an emergency report system, and an autonomous BVLOS system[74]. Because confirmation of the fund occurred relatively recently, specific details regarding how the fund will be allocated and progress made to date has not yet been reported.

On December 2020, RPAs developed by Pablo Air successfully shipped medical supplies to two islands. The RPAs flew from Inchon New Port (management pier) to Yeongheungdo Island and Jawoldo Island, a 50-mile roundtrip journey in one hour and 20 minutes[75]. Founded in 2018, Pablo Air is one of the leading developers of unmanned aerial software and hardware. Its core business is the development of RPA swarm platforms and related solutions. In 2019, Pablio Air's potential was recognized by Lee Soo-man, the chief producer of SM Entertainment, and the company secured KRW 3 billion in Series A funding. Pablo Air attracting such interest also could be seen as evidence of the private sector's growing interest in RPA technology.

71 https://www.kiast.or.kr/en/sub06_02.do
72 https://www.kiast.or.kr/en/sub06_03.do
73 http://www.safetimes.co.kr/news/articleView.html?idxno=88047
74 https://english.etnews.com/20201218200003
75 https://www.unmannedairspace.info/latest-news-and-information/three-different-communication-technologies-used-for-korean-50-mile-bvlos-flight/

Counter-RPA technology

Increased accessibility of RPAs has exposed civilians to greater danger created by negligent or malicious use of RPAs. Growing concerns have initiated government agencies to develop/import counter-RPA technology with domestic and foreign companies.

In May 2018, Department 13, a Maryland-based unmanned-aircraft mitigation specialist company, agreed to an exclusive distribution deal to sell counter-RPA technology in Korea[76]. The distribution deal was made so Department 13's anti-RPA system could be distributed to the Korean military, local airports, manufacturers, and corporations.

In June 2019, SK Telecom, Silla University, the 53rd Homeland Defense Infantry Division of the Korean Army, and Hanbit Drone demonstrated their jointly developed anti-RPA system[77]. The anti-RPA system encompasses detection, identification, tracking, neutralization, and removal. The demonstration showed a jamming device as one of the methods of neutralization. The jamming device is currently used by the Korean Army, but its commercial application faces further regulatory hurdles. Counter-RPA measures that use jamming devices and software exploitation are regulated by the *Radio Waves Act*. Unless expressly approved by the Minister of Science and ICT, Article 58 of the *Radio Waves Act* prohibits approval of any equipment that "interferes with other communication." Therefore, under the current Korean legislation, counter-RPA devices that rely on interfering with a RPA's methods of communication are prohibited to civilians.

In conjunction with the development of counter-RPA technology, recent amendments made to the *Airport Facilities Act* showed the legislator's awareness of the need for a counter-RPA system. On December 8, 2020, Article 56 of the *Airport Facilities Act* was amended to provide that unauthorized RPAs flying near an airfield may be "eradicated, crashed, or captured." Unfortunately, the included wording did not differentiate or acknowledge different methods of counter-RPA technology.

RPA operator qualification requirements

Article 125 of the *Enforcement Rule of the Aviation Safety Act* identifies four different types of RPA operation licenses.

RPA type	Weight	Requirements
Type 1 RPA license	For RPAs that have maximum takeoff weight above 25 kgs but below 150 kgs	Must pass a multiple-choice exam, practical exam, and have 20 hours of flight experience
Type 2 RPA license	For RPAs that have maximum takeoff weight above 7 kgs but below 25 kgs	Must pass a multiple-choice exam, practical exam, and have 10 hours of flight experience
Type 3 RPA license	For RPAs that have maximum takeoff weight above 2 kgs but below 7 kgs	Must pass a multiple-choice exam and have 6 hours of flight experience
Type 4 RPA license	for RPAs that have maximum takeoff weight above 250 g but below 2 kgs	Must complete an online course

The above requirements are generally intended for commercial RPA use. Non-commercial RPAs with a maximum takeoff weight below 250 grams do not require any qualification of operators.

76 https://internetofbusiness.com/department-13-agrees-south-korean-deal-for-counter-drone-tech/
77 https://www.electronicsweekly.com/news/business/korea-makes-anti-drone-system-2019-06/

Developments

Korea has seen local companies realizing their vision and technology staying ahead of the fast-growing RPA market. On January 2019, Nearthlab, a RPA-based wind turbine inspection company, successfully conducted a safety inspection of wind farms owned by Korea Southern Power Co., Ltd[78]. Pablo Air currently holds the record for the longest RPA delivery flight in Korea, and it was the first Korean company that successfully performed a RPA art show with 100 RPAs using swarm flight technology at the 2019 Drone Regulatory Sandbox Fair[79]. However, with over 90 percent of RPAs coming from overseas markets[80], Korean companies' success in maintaining their competitiveness has been challenging. In recognition of such hardship, various types of government projects and support are being implemented.

The Ministry of Science and ICT's US $33.7 million fund is part of a 5-year plan to develop RPA-related technologies[81]. This 41% increase in funding, compared to the previous year, shows the government's commitment toward supporting the development of RPA technology, and such commitment can be further evidenced by the recent developments made by the Ministry of Land, Infrastructure, and Transport. On February 10, 2021, the Ministry of Land, Infrastructure, and Transport (Minister Byeon Chang-heum) announced that the government will designate 33 areas nationwide as "special deregulated zones for RPAs."[82] The aim of assigning deregulated zones is to ensure that new RPA infrastructures and services may be tested and implemented with minimum regulatory challenges. These special deregulated zones will either exempt or ease regulations on matters such as safety certifications and flight approval procedures. A total of 15 local governments are participating in this program and each local jurisdiction plans to implement different RPA services, such as environment monitoring, transportation and logistics, facility inspections, counter-RPA systems, etc. Therefore, any RPA-based system or technologies developed through this program will enjoy lowered regulatory hurdles and efficiency.

An example of such efforts being materialised is the recent R&D corporation agreement signed between Korean Air, Incheon International Airport Corporation (IIAC), and the Korea Aerospace Research Institute (KARI) on August 5, 2021. The agreement was signed to establish a safe and efficient UAM transportation management system and the three organisations will conduct joint R&D to develop Korea's first UAM industry[83].According to a report published by the Ministry of Land, Infrastructure and Transport, passenger drones is expected to be available in Korea in 2025 and autonomous UAM by 2035[84].

It is evident that the Korean government is designating increasing amounts of funding for the development of RPA-related technologies and lowering barriers to entry into the RPA market. The type of projects under development show that the government is focusing more on core software technology rather than hardware. This strategy appears to have taken note of recent trends in the tech industry, as well as Korea's neighboring countries which have competitive manufacturing capabilities. With the government's support, start-ups and small to medium-size businesses will be able to develop their RPA technologies more efficiently for the next few years. However, based on the review of the current legislation, actual practical implementation still will likely require lengthy safety tests of RPA products as well as further amendments to the applicable rules and regulations.

78 https://drive.google.com/file/d/1q7HAQB_mGDLO2g-j6E2URSXShtscppPO/view
79 https://www.prnewswire.com/news-releases/pablo-air-becomes-the-first-korean-company-to-have-succeed-in-a-57-5-km-package-deliver-with-1-hour-and-56-minutes-flying-time-using-a-drone-300978195.html
80 https://www.investkorea.org/ik-en/bbs/i-308/detail.do?ntt_sn=487638
81 https://english.etnews.com/20201218200003
82 https://www.yna.co.kr/view/AKR20210210029700530?input=1195m
83 https://asianaviation.com/korean-air-signs-uam-research-deal/
84 https://koreajoongangdaily.joins.com/2021/09/29/business/industry/airtaxi-passengerdrone-uam/20210929162238130.html

Singapore

Overview

As Singapore is a small, highly urbanised island city state, the operation of RPAs, or unmanned aircraft is tightly regulated. RPAs exceeding 250g in mass have to be registered. Depending on the weight of the RPA, the location and height the RPA is flown and the purpose for flying (recreation, education or business), there are different licensing requirements.

Since 1 February 2021, a pilot of an unmanned aircraft that has a total mass exceeding 1.5kg but not exceeding 7kg for a recreation or education purpose must be at least 16 years of age and hold an formal unmanned aircraft (UA) basic training certificate or an UA pilot licence. A pilot of an unmanned aircraft that has a total mass exceeding 7kg or for any non-recreation or non-education purpose must hold a UA pilot licence.

Within 4 months of the new regulatory regime, as at 31 May 2021, about 12,000 UA have been registered, close to 800 persons have obtained a UA basic training certificate, and close to 700 persons have obtained a UA pilot licence.

On 12 March 2021, trials of an air traffic control system for unmanned aircraft were successfully completed. The system was the culmination of a request for proposals issued in 2017 by the Ministry of Transport and Civil Aviation Authority of Singapore.

This is a timely development given the increased interest in unmanned aircraft usage by both the public sector (e.g. use of RPAs by the National Parks Board to monitor crowds in parks to ensure safe distancing, Singapore Police Force to patrol industrial estates during the circuit-breaker lockdown period, Public Utilities Board to inspect canals, National Environment Agency to inspect dengue mosquito breeding sites) and private sector (use of RPAs for shore-to-ship deliveries).

To foster and facilitate more applications, in September 2021, the Singapore Land Authority launched a 3D map to help pilots visualize no-fly zones and to plan their flight paths.

VLOS and BVLOS regulations

Government agencies with jurisdiction over RPAs	Region this agency covers (e.g. entire jurisdiction or province/state)	Role of the agency
Civil Aviation Authority of Singapore	All of Singapore	Registration and regulation of unmanned aircraft, pilots and operators.

RPAs are regulated in Singapore principally by the Air Navigation Act and the Air Navigation (101 — Unmanned Aircraft Operations) Regulations 2019.

Permits

No further permits are required if the RPA is flown by a person:

1. Below 200 feet. above mean sea level;
2. Outside any restricted area or danger area;
3. Outside 5 km of any aerodrome;
4. Within the person's visual line of sight for:
    (i) A recreation purpose if the RPA has a total mass of 25 kg or less;
    (ii) An education purpose where mass is 7 kg or less; and
    (iii) Providing training or instruction by an unmanned training and assessment organisation.

An RPA operator permit and Class 1 activity permit must be obtained to operate an RPA.

1. That has a total mass exceeding 25 kg for any purpose;
2. That has a total mass exceeding 7 kg but not exceeding 25 kg for an education purpose; and
3. Of any total mass in the course of business or for a purpose that is neither a recreation purpose nor an .education purpose.

A Class 2 activity permit must be obtained to operate an RPA:

1. That has a total mass of 25 kg or below for a recreation purpose; and
2. That has a total mass of 7 kg or below for an education purpose.

The failure to comply with the permit requirements is an offence subject to a fine not exceeding S$50,000 and/or to imprisonment for a term not exceeding 2 years. The penalties are increased to a maximum fine of S$100,000 or 5 years' imprisonment and/or for repeat offenders.

Training or licensing

A person must not act as an RPA pilot of an RPA that has a total mass exceeding 1.5 kg but not exceeding 7 kg for a recreation purpose or an education purpose unless the person is at least 16 years in age and holds an RPA basic training certificate or holds an RPA pilot licence.

A person must not act as a RPA pilot of an RPA of any mass in the course of business or for a purpose that is neither a recreation purpose nor an education purpose or an RPA of a total mass exceeding 7 kg for any purpose unless the person holds an RPA pilot licence.

The failure to comply is an offence subject to a fine not exceeding S$50,000 or to imprisonment for a term not exceeding 2 years. The penalties are increased to a maximum fine of S$100,000 and/or 5 years' imprisonment for repeat offenders.

A UA pilot must ensure that the unmanned aircraft is within VLOS at all times (directed, unobstructed, unaided and up to a limit of 400 m) unless the UA pilot licence allows the pilot to operate the RPA BVLOS.

The failure to comply is an offence subject to a fine not exceeding S$50,000 or to imprisonment for a term not exceeding 2 years or to both. The penalties are increased to a maximum fine of S$100,000 or 5 years' imprisonment for repeat offenders.

The CAAS has an Advisory Circular on Beyond Visual Line of Sight Operations for Unmanned Aircraft providing an overview of its assessment methodology for approval of BVLOS operations.

Registration

All unmanned aircraft with a total mass exceeding 250g must be registered. Upon registration, the registration label must be permanently affixed on the RPA.

Failure to comply is an offence subject to a fine not exceeding SGD $10,000 and/or to imprisonment for a term not exceeding 6 months.

Protected areas

If an RPA flies over any part of a protected area, the operator of the RPA is guilty of an offence.

If an RPA takes a photograph of a protected area using equipment on board, the operator of the RPA and the person taking the photograph, if not the operator, are both guilty of an offence.

The penalty for each offence above is a fine not exceeding S$50,000 and/or to imprisonment for a term not exceeding 2 years. The penalties are increased to a maximum fine of S$100,000 or 5 years' imprisonment for repeat offenders.

SINGAPORE

A person who operates an unmanned aircraft outdoors within the boundaries of any prohibited area is guilty of an offence. The penalty is a fine not exceeding S$50,000 and/or to imprisonment for a term not exceeding 2 years. The penalties are increased to a maximum fine of S$100,000 and/or 5 years' imprisonment for repeat offenders.

Carriage of prohibited items

It is an offence if a person operates an RPA anywhere (including indoors) carrying a prohibited item (including weapons, explosive substances, fireworks, radioactive or other hazardous material). The punishment is a fine not exceeding S$100,000 and/or to imprisonment for a term not exceeding 5 years.

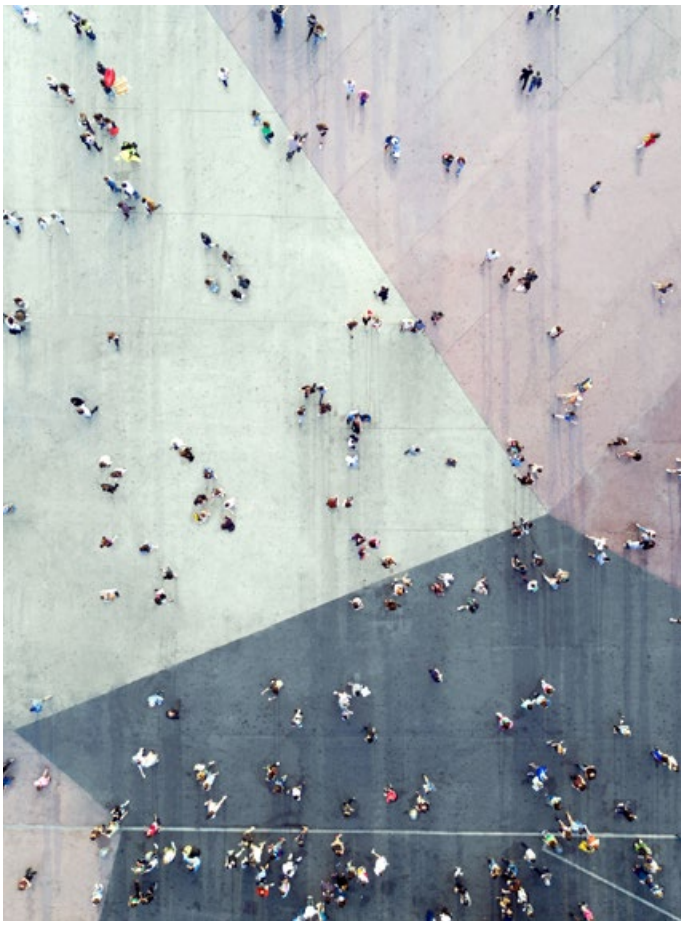
Discharge from unmanned aircraft

It is an offence if a person operates an RPA anywhere (including indoors) and the unmanned aircraft discharges anything (whether gaseous, liquid or solid) when flying. The penalty is a fine not exceeding S$50,000 or to imprisonment for a term not exceeding 2 years and/or. The penalties are increased to a maximum fine of S$100,000 and/or 5 years' imprisonment for repeat offenders.

It is not a defence that no individual dies or is hurt, no property is destroyed or damaged or no hazard is caused to another aircraft, to anyone or any property.

Dangerous activity

If a person does any act, or causing or permitting any act involving an unmanned aircraft and knowing that or reckless as to whether, when so acting or causing or permitting the act, the life or property of another person could be endangered or the person could be endangered shall be guilty of an offence. The penalty is a fine not exceeding S$100,000 and/or to imprisonment for a term not exceeding 10 years.



Liability

Criminal liability

Criminal liability is founded on statute – laws passed by the legislature. The principal statute is the *Penal Code* which defines general criminal offences and their punishment, as well as exceptions and defences. The use of RPAs to commit such criminal offences will be governed by the Penal Code. Specific offences arising from the use of RPAs are found in other statutes, such as the *Air Navigation Act* that regulates the use of unmanned aircraft.

Civil liability

Civil liability is based on both common law – judge made law established by precedent – and on statute. Civil liability may arise from the tort of negligence, trespass and nuisance, and the statutory tort of harassment. Usually, liability only arises if there was negligence or the act was intentional.

However, the *Air Navigation Act* provides that if damage or loss is caused by the use of an unmanned aircraft, the damage or loss shall be recovered without proof of negligence or intention, except where the damage or loss was caused by or contributed to the negligence of the person who suffered the damage or loss.

Accident reporting

An RPA pilot must notify the Authority by the quickest available means upon becoming aware of an accident associated with the operation of an RPA resulting in serious injury to the RPA pilot, serious injury or death of any other person, or damage to any property. Failure to do so is an offence subject to a fine not exceeding S$50,000 and is increased to a maximum fine of S$100,000 for repeat offenders.

Data privacy and security

Data privacy is regulated in Singapore by the *Personal Data Protection Act 2012*. It governs the collection, use and disclosure of personal data by organizations. No obligations are imposed on individuals acting in a personal or domestic capacity.

The Personal Data Protection Commission issued Advisory Guidelines to illustrate the application of the PDPA. One section concerns RPAs that capture personal data of individuals through photography, video or audio recording, or otherwise.

Unless excepted, such individuals should be informed of the purposes for which their personal data will be collected, used and disclosed and their consent obtained before it is collected by the RPAs. The notices should be placed so that individuals are made sufficiently aware that personal data is being collected by RPAs providing them the choice not to enter..

One exception is the collection, use and disclosure of personal data that is publicly available. Thus the use of an RPA to collect personal data in a public place (e.g. a park, a shopping mall) does not require consent.

Unmanned traffic management (UTM)

On 12 March 2021, trials of an air traffic control system for unmanned aircraft were successfully completed. The system was the culmination of a request for proposals issued in 2017 by the Ministry of Transport and Civil Aviation Authority of Singapore.

The trial tested services such as flight planning and authorization, strategic deconfliction, conformance monitoring, real time alerts, dynamic rerouting, constraint management, inter-Unmanned Aircraft System Service Supplier communication and Remote Identification capabilities through a mix of live flights and simulations. Its ability to manage large scale BVLOS RPA operations was demonstrated.

Counter-RPA technology

Tampering with an aircraft, including an RPA, if tampering with it may endanger the safety of the aircraft or any person or property is an offence under the *Air Navigation Act*. The penalty is a fine not exceeding S$100,000 or imprisonment for a term not exceeding 5 years and/or to both.

Under the *Telecommunications Act*, it is an offence to import any radio-communication jamming device operating in any frequency band unless authorized. It is also an offence to possess any radio-communication equipment without a licence. The penalty for both offences is a fine not exceeding S$10,000 or to imprisonment for a term not exceeding 3 years.

Where an unmanned aircraft is being operated in a manner that contravenes the *Air Navigation Act* or any aviation safety subsidiary legislation, or poses a serious and an imminent risk to safety of the public, an authorized person may exercise powers to prevent the further contravention or to prevent or stop the actual or imminent risk to public safety. Such powers include directing the operator to end the flight or to fly it in the manner specified by the authorized person, assuming control of the unmanned aircraft by such force as is necessary, and to seize the unmanned aircraft and any component of the unmanned aircraft system.

Developments

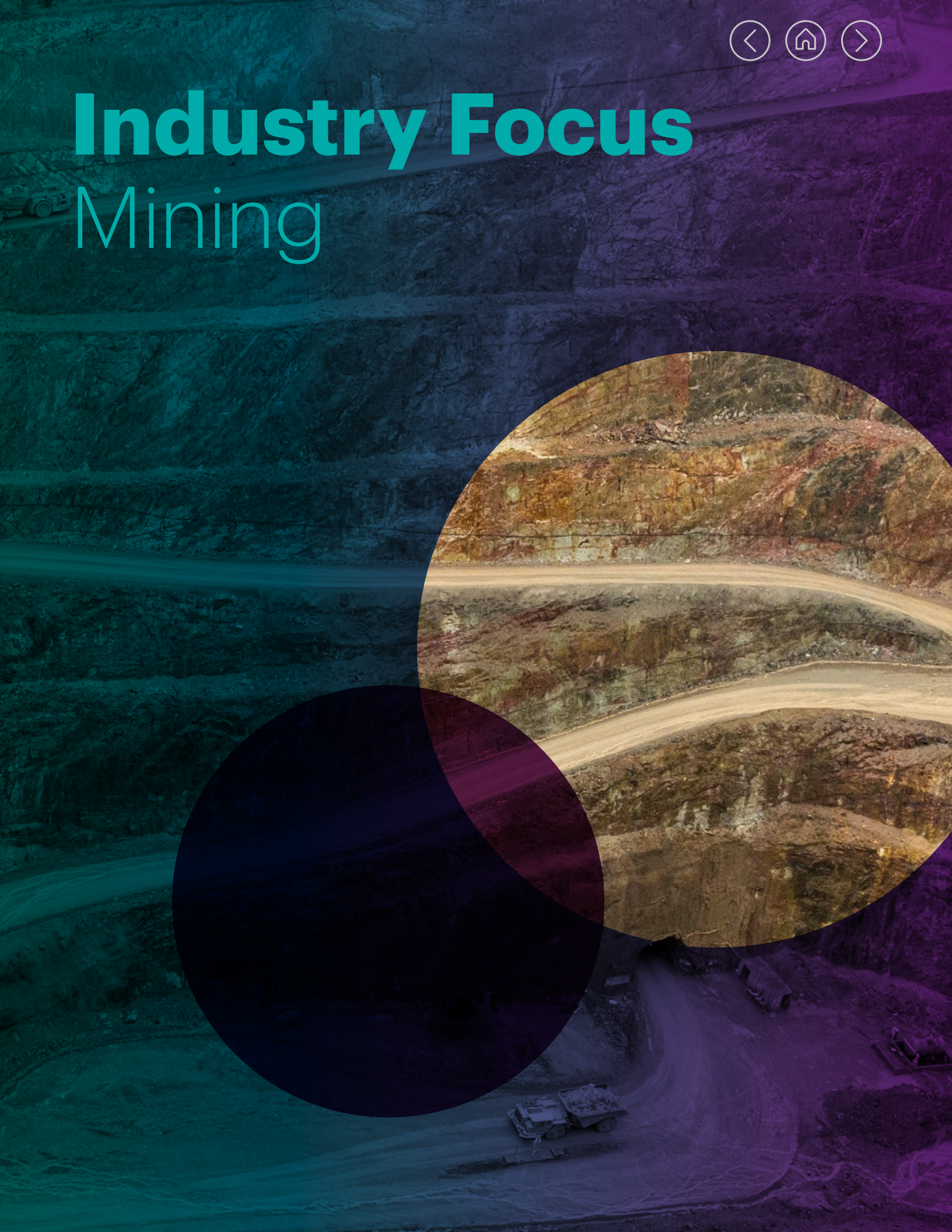
In September 2020, the Singapore Academy of Law published its Report on the Attribution of Civil Liability for Accidents Involving Autonomous Cars. The report only addressed the use of autonomous vehicles in cars and did not address any other forms of automous vehicles such as RPAs. This exclusion was premised on the fact that autonomous cars are likely to see broader mainstream adoption as opposed to RPAs. The Report also expressly did not consider criminal liability.

Given the successful trials in March 2021 of an air traffic control system for RPAs, the increasing interest in RPA usage by both the public and private sector, and the pace of technological improvements, it may not be too long before autonomous RPAs become commonplace. Indeed, a test flight of a manned air taxi – but intended to be autonomous in the future – was conducted in Singapore in October 2019.

It is expected that the necessity to review the existing legal framework for both civil and criminal liability in relation to the use of autonomous RPAs will take place sooner rather than later.

Industry Focus

Mining



Mining operations are poised to incorporate RPAs into daily operations to perform a myriad of tasks that are inefficient, impractical or unsafe for people. Common tasks for RPAs include monitoring environmental and weather conditions, conducting geophysical surveys, identifying hazardous situations, monitoring emissions and warning against intruders on-site. Geologists, surveyors and engineers alike benefit from the data gathering capabilities of RPAs to propel operational efficiency and profitability.

Regulations for RPA operations apply to some mining operations and not others. Operations in open pit mines will usually be governed by the regulations applying to RPA flight, whereas underground mines are exempt from adherence to the regulations in some countries.

Our Dentons' team offers a truly global mining practice. We have extensive experience providing sophisticated advice to our clients, operating on every continent, with both early-stage and developed mining projects and the regulatory frameworks that apply for using RPAs as part of mining operations. No matter where you are in the course of mineral exploration and development, Dentons is able to assist you at every stage of the process, including financing, construction, production and reclamation.

United States

Overview

The Federal Aviation Administration (FAA) issued Part 107 in 2016, the first comprehensive regulation of commercial operations of small RPAS (not to exceed 55 lbs.).[85] Part 107 authorizes commercial RPA operations without the RPA having either a type or airworthiness certificate, and therefore such operations are subject to a number of conditions and limitations.

Key limitations are operating within the VLOS of the remote pilot, during daytime, below 400 feet AGL, not directly over people, and only in uncontrolled airspace. Part 107 does allow RPAS operators to obtain a waiver to operate at night, over people, BVLOS, as well as obtain authorization to fly in controlled airspace.

Part 107 does not permit a waiver to conduct package delivery BVLOS. At the end of 2020 FAA released a final rule authorizing operations over people (OOP), subject to several conditions and limitations.[86] The RPA must obtain certification before it may be flown over an assembly of people. The FAA also released a final rule requiring commercial and recreational RPAs to be equipped with remote identification (remote ID).[87] Model and recreational operations within designated areas are not required to have remote ID. Operation of an RPA with payload over 55 lbs. commonly to conduct agricultural spraying, may be authorized by exemption.

The FAA has begun issuing certificates, thereby obviating waivers and exemptions, but has yet to issue a type or airworthiness certificate, except in the experimental category (R&D only), and has issued only a few air carrier operating certificates to date.

VLOS and BVLOS regulations

Government agencies with jurisdiction over RPAs	Region this agency covers (e.g entire jurisdiction or province/state.)	Role of the agency
United Stated Department of Transportation	United States	Parent of FAA; grants economic authority to UAS air carriers
Federal Aviation Administration (FAA)	United States	Exclusive safety regulator of UAS, UAS pilots, UAS operators, and UAS airspace

Commercial RPA operations are governed by 14 CFR Part 107. The rule applies only to "small" UAS. For commercial operation of RPAs with payload weighing more than 55 lbs, an exemption under 49 U.S.C. 44807 is required.

Currently, commercial RPA operations are not required to be certificated.[88] Commercial package delivery BVLOS does require an air carrier certificate. FAA is developing Part 23 Special Class airworthiness standards so that it can issue type, production, and airworthiness certificates.

Part 107 includes a number of prohibitions or limitations subject to waiver, including:

- Operations at night are prohibited, but FAA has routinely granted waivers to operate at night. In the OOP final rule, FAA now permits operations at night by rule;
- Operations must be conducted within the VLOS of the remote pilot. FAA has granted waivers to operate BVLOS over relatively short distances, requiring one or more visual observers to monitoring other aircraft operations in the vicinity, except in very rural and remote locations. First Person View operations are not considered VLOS.

85 Operation and Certification of Small Unmanned Aircraft Systems, 81 Fed. Reg. 42064 (June 28, 2016)
86 Operation of Small Aircraft Systems Over People, 86 Fed. Reg. 431'4 (Jan.15, 2021)
87 Remote Identification of Unmanned Aircraft Systems, 86 Fed. Reg. 4390 (Jan. 15, 2021)
88 49 U.S.C. 44807(a). This authority is set to expire September 30, 2023, but the sunset will be effective only prospectively. Any authority granted before that date, including Part 107, will continue by its terms

- Operations must not exceed 400 feet AGL, except that operations may be conducted up to 400 feet above a structure;
- A remote pilot may operate only one RPA at a time. FAA has granted waivers for multiple RPAs per pilot, and has authorized RPA light shows with several hundred RPAs operating virtually autonomously within a geo-fenced area;
- Commercial RPAs may not be operated in prohibited or restricted airspace, except as may be authorized by Air Traffic Control. More broadly, FAA authorization is required to operate in controlled airspace (generally, near commercial service airports). FAA and the RPAS industry have stood up the Low Altitude Authorization and Notice Capability (LAANC) system to provide real-time online authorization to operate in certain segments of controlled airspace;
- Commercial RPA operations may not carry hazardous materials (dangerous goods). Air carriers must obtain special permission to carry hazmat;
- RPAs must give the right of way to manned aircraft, and may not operate so close to another aircraft as to create a collision hazard;
- RPAs may not be operated at a speed in excess of 87 knots (100 mph). FAA may grant a waiver from this speed limit;
- Minimum flight visibility must be no less than 3 statute miles from the control station and the minimum distance from clouds must be no less than 500 feet below the cloud and 2,000 feet horizontally from the cloud. FAA may grant waivers from one or more of these limitations; and
- All RPAs weighing .55 lbs. or more must be registered.

Liability

Criminal liability

A knowing and wilful violation of any FAA regulation for which a civil penalty is not provided warrants a criminal penalty.[89]

Civil liability

A person who violates any FAA regulation, including any provision of Part 107, is subject to a civil penalty. Each flight is a separate penalty and a flight may involve more than one violation. Penalties are greater for commercial operators by a company that is not a small business (US$34,777) than for small businesses or individuals (US$1,527). These amounts are periodically adjusted for inflation.[90]

The FAA also has the authority to revoke or suspend any certificate for a violation of FAA rules. For RPAs, that would include an aircraft registration certificate, a remote pilot certificate with a small RPA rating, and an air carrier operating certificate.

Non-compliance with specific regulations/laws

18 U.S.C. 40A was added in 2018 to make it a crime punishable up to two years in prison for a knowing or reckless RPAS operation that interferes with a wildfire suppression effort, or a law enforcement or emergency response effort.

18 U.S.C. 39B was also added in 2018 to make it a crime punishable up to one year in prison for a knowing or reckless RPAS operation that interferes with a passenger aircraft in a manner that poses an imminent threat to occupants.

49 U.S.C. 44802 note, added in 2018, provides a civil penalty of US$25,441 (adjusted for inflation) for operating a RPAS equipped or armed with a dangerous weapon.

There is also a statutory fine[91] added in 2016 for up to US $21,292 for interfering with wildfire fire suppression, law enforcement or emergency response efforts.

89 49 U.S.C. 46316
90 49 U.S.C. 46301
91 49 U.S.C. 46320

Data privacy and security

There is no Federal law relating to privacy that applies to RPAS. State and local governments have enacted laws relating to low altitude RPA operations, ostensibly to protect the privacy of citizens. These laws may be pre-empted by Federal law.

Data privacy and data security laws that may impact RPAS operations because the operation may collect personal information vary among the 50 states. Some of these laws have been challenged in court. See *National Press Photographers Association v. McCraw,* 2020 WL 7029159 (W.D. Tex. 2020) (granting in part and denying in part defendant's motion to dismiss).[92]

Unmanned traffic management

The FAA, working with the National Aeronautics and Space Administration (NASA), is developing a UTM system. There is a pilot program underway in which there is testing of BVLOS operations at selected sites, and FAA has published a Concept of Operations document, with 2.0 published and version 3.0 expected later this year. There is no UTM rulemaking underway.

As noted, the FAA published a final rule in January 2021 requiring all RPAs that are required to register to be equipped with remote ID that employs broadcast technology. RPAS manufacturers must comply by September 16, 2022 and RPAS operators must comply by September 16, 2023. The UTM concept of operations contemplates network-based remote ID technology as well as broadcast technology, while the final rule does not permit the use of network technology to meet remote ID requirements.

92 See also *Long Lake Township v. Maxon*, 2021 WL 1047366 (Mich, Cit. App)(holding Fourth Amendment of the U.S. Constitution violation by Township's use of drones for surveillance without a warrant,

Counter RPA technology

Laws have been enacted in recent years giving counter-UAS authority to the Departments of Defense, Energy, Justice, and Homeland Security. Passive detection technology is not illegal if it does not interfere with air navigation or FCC-related spectrum. But active measures are prohibited by several longstanding Federal criminal laws Violation of any of these laws carries a prison term.

- 18 U.S.C. 32 prohibits destruction or damage to an aircraft.
- 49 U.S.C. 46502 prohibits the seizing or control of an aircraft by force or violence.
- 18 U.S.C. 1030 prohibits access to a computer without authorization.
- 18 U.S.C. Chapter 119 prohibits the interception of wire communications.
- 18 U.S.C. Chapter 206 prohibits trap and trace devices without a court order.
- 18 U.S.C. 1367 prohibits obstructing or interfering with a satellite transmission.

RPA operator qualification requirements

Commercial RPA operations must be conducted by an individual who has obtained a remote pilot certificate with small UAS rating, or who holds a Part 61 airman certificate. To obtain a remote pilot certificate, the individual must pass an aeronautical knowledge and safety test, covering the subjects listed in 14 CFR 107.73, but is not required to pass any flight test. In the OOP final rule, the FAA decided to allow remote pilot certificate holders to complete online training in lieu of passing a recurrent knowledge test.

In 2018, Congress[93] required recreational RPA pilots to pass an online aeronautical knowledge and safety test administered by the FAA or a person designated by the Administrator. The FAA is still working to develop the test and determine the process to designate third parties to administer it.

Developments

As required by Congress in 2016[94] and in 2018[95], FAA is expected to publish a proposed rule to set up a process to receive and approve requests to restrict RPAS operations above and near critical infrastructure facilities.

FAA has established a BEYOND program, as a successor to the FAA UAS Integration Pilot Program (IPP), which expired in October 2020. This program is intended to develop standards for BVLOS operations, which will include DAA technology. It is also expected to engage with local communities.

FAA is working to establish special class airworthiness standards for small UAS models that would support type and airworthiness certification of small UAS. In November 2020, the FAA published identical proposed airworthiness criteria for 10 small UAS models for public comment. The FAA is working on a proposal to cover UAS as well as light sport aircraft in the Modernization of Special Airworthiness Certificates (MOSAIC) rule, which is not likely to be published until next year.

In 2021, the FAA also intends to publish a proposed rule to clarify air carrier definitions, partially in response to a statutory requirement to issue a rule governing UAS air carriers, and a proposed rule to clarify airspace right-of-way rules in 14 CFR 91.113.

93 Section 349 of the FAA Reauthorization Act of 2018.
94 Section 2209 of the FAA Extension, Safety, and Security Act of 2016.
95 Section 369 of the FAA Reauthorization Act of 2018.

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Dentons' Comprehensive Legal Services for RPAS Operations

No matter where you are in the RPAS industry, Dentons is with you. Seize the opportunities presented in the RPAS industry by ensuring profitable, safe and compliant drone operations with comprehensive and proactive legal advice at any stage.

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- Contract drafting
- Internal policies
- User manuals

Regulatory compliance

- RPAS regulations
- Aeronautics statutes
- Municipal bylaws

Data collection and privacy

- Data collection policies
- Cybersecurity
- Privacy breach support

Risk mitigation

- Litigation
- Regulatory charges
- IP protection

Growth

- Financing
- Insurance
- Leasing
- Emerging company support

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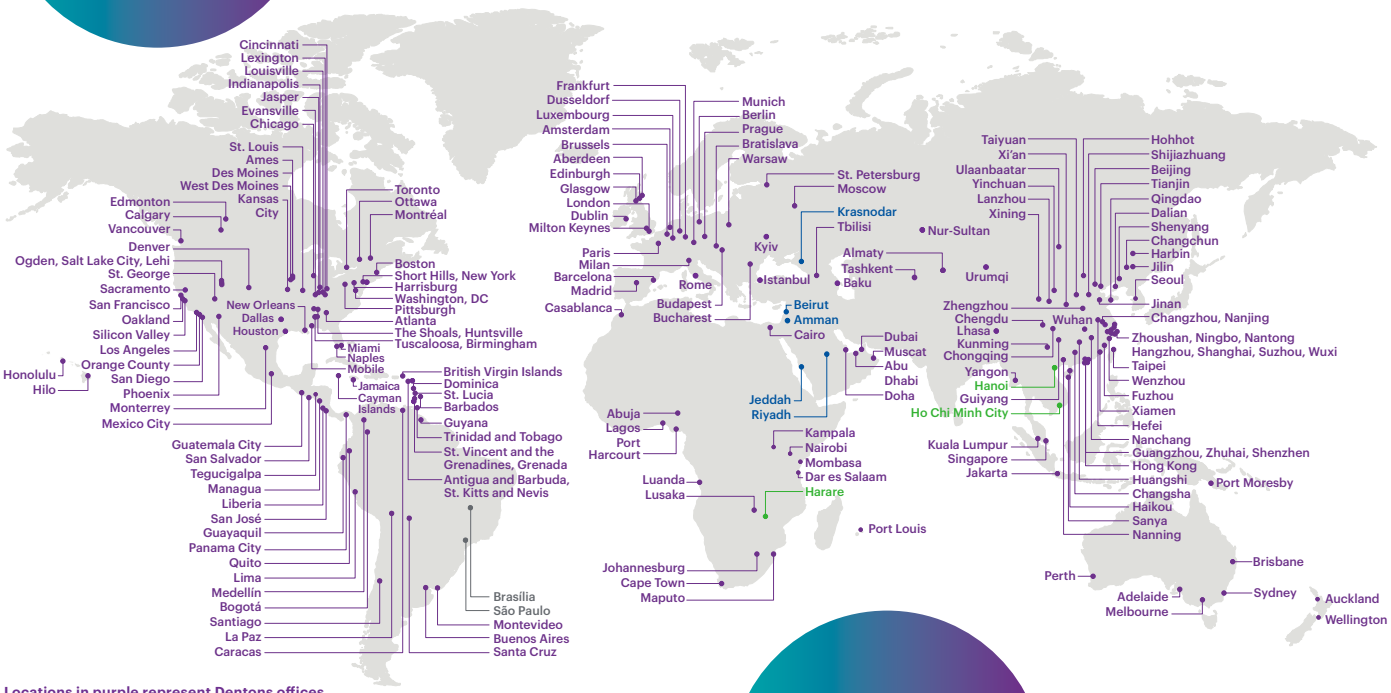
locations



Locations in purple represent Dentons offices.
Locations in blue represent associate firms, offices or special alliances as required by law or regulation.
Locations in green represent approved combinations that have not yet been formalized.
Locations in gray represent Brazil Strategic Alliance.

82
countries

12,000+
Total number of lawyers

14,000+
All timekeepers

20,000+
Total number of people

700+
Chambers rated lawyers

80+
languages spoken

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